THIS DOCUMENT IS IMPORTANT AND REQUIRES YOUR IMMEDIATE ATTENTION. If you are in any doubt about the contents of this document or as to what action you should take and you are resident in the UK, you should consult a person authorised under the Financial Services and Markets Act 2000 (as amended, "FSMA") who specialises in advising on the acquisition of shares and other securities. If you are not resident in the UK, you should consult a person from another appropriately authorised independent financial advisor in your own jurisdiction.

This document comprises an Admission document drawn up in accordance with the rules of the alternative investment market of London Stock Exchange plc ("**AIM**") and has been issued in connection with the application for Re-Admission to trading on AIM of the Ordinary Shares of Chaarat Gold Holdings Limited (the "**Company**" or "**Chaarat Gold Holdings**" or "**CGHL**" or "**Chaarat**"). This document does not constitute, and the Company is not making, an offer to the public within the meaning of Section 85 and 102B of FSMA. This document is therefore not an approved prospectus for the purposes of Section 85 of FSMA, has not been prepared in accordance with the Prospectus Rules and as such has not been approved by the Financial Conduct Authority or by any other authority which could be a competent authority for the purposes of the Prospectus Directive.

The Company and the Directors of the Company, whose names appear on page 5 of this document, accept responsibility for the information contained in this document and, in the case of the Directors, including individual and collective responsibility for compliance with the AIM Rules published by London Stock Exchange plc. To the best of the knowledge and belief of the Directors and the Company, who have taken all reasonable care to ensure that such is the case, the information contained in this document is in accordance with the facts and does not omit anything likely to affect the importance of such information.

Each AIM company is required pursuant to the AIM Rules for Companies to have a nominated adviser. The nominated adviser is required to make a declaration to London Stock Exchange plc on Re-Admission in the form set out in Schedule Two to the AIM Rules for Nominated Advisers. The London Stock Exchange plc has not itself examined or approved the contents of this document.

Application will be made for the entire issued and to be issued ordinary share capital of the Company to be admitted to trading on AIM. AIM is a market designed primarily for emerging or small companies to which a higher investment risk tends to be attached than to larger or more established companies. AIM securities are not admitted to the official list of the United Kingdom Listing Authority. A prospective investor should be aware of the risks involved in investing in such companies and should make the decision to invest only after careful consideration and, if appropriate, consultation with an independent financial adviser. London Stock Exchange plc has not itself examined or approved the contents of this document. It is expected that Re-Admission will occur and trading in the Ordinary Shares will commence on AIM on or before 15 January 2019.

THE WHOLE TEXT OF THIS DOCUMENT SHOULD BE READ. IN PARTICULAR, YOUR ATTENTION IS DRAWN TO THE RISK FACTORS SET OUT IN PART III OF THIS DOCUMENT.

CHAARAT GOLD HOLDINGS LIMITED

(incorporated in the British Virgin Islands under the laws of the British Virgin Islands with Registered Number 1420336)

Proposed acquisition of Kapan Mining and Processing Company CJSC

Proposed Re-Admission of the ordinary share capital to trading on AIM

and

Notice of General Meeting

Nominated Adviser and Broker
Numis Securities Limited

Ordinary Share Capital immediately following Re-Admission

Authorised		Issued and fully paid	
Amount	**Number**	**Amount**	**Number**
US$6,000,000.00	600,000,000	US$3,951,670.15	395,167,015

Numis Securities Limited, which is authorised and regulated in the United Kingdom by the Financial Conduct Authority, is acting as nominated adviser and joint broker to the Company (for the purposes of the AIM Rules) and no one else in connection with the proposed Re-Admission. Its responsibilities as the Company's nominated adviser under the AIM Rules are owed solely to London Stock Exchange plc and are not owed to the Company or to any Director or to any other person in respect of his decision to acquire Ordinary Shares in the Company in reliance on any part of this document. No representation or warranty, express or implied, is made by Numis Securities Limited as to any of the contents of this document (without limiting the statutory rights of any person to whom this document is issued), and Numis Securities Limited will not be offering advice and will not otherwise be responsible for providing customer protections to recipients of this document or for advising them on the contents of this document or any other matter.

This document does not constitute an offer to sell, or the solicitation of an offer to subscribe for or buy Ordinary Shares, to any person in any jurisdiction to whom or in which such offer or solicitation is unlawful to make such offer or solicitation in such jurisdiction. The Ordinary Shares have not been, and will not be, registered under the United States Securities Act of 1933, as amended, or under the securities legislation of any state of the United States. The relevant clearances have not been, and will not be, obtained from the Securities Commission of any province or territory of Canada; no document in relation to Re-Admission has been, or will be, lodged with, or registered by, the Australian Securities and Investments Commission; and no registration statement has been, or will be, filed with the Japanese Ministry of Finance in relation to Re-Admission or the Ordinary Shares. Subject to certain exceptions, the Ordinary Shares may not, directly or indirectly, be offered or sold within the United States, Canada, Australia, Japan, or the Republic of South Africa or offered or sold to a person within the United States or a resident of Canada, Australia, Japan, or the Republic of South Africa or any other territory in which an offer or sale of the Ordinary Shares would be prohibited.

CONTENTS

GENERAL

This document does not constitute an offer to sell or an invitation to subscribe for, or the solicitation of an offer to buy or to subscribe for, Ordinary Shares in any jurisdiction in which such an offer or solicitation is unlawful and this document is not for distribution in or into any jurisdiction where action to that purpose is required. The distribution of this document may be restricted by law and therefore persons into whose possession this document comes should inform themselves about and observe any such restrictions. Any failure to comply with these restrictions may constitute a violation of the securities laws of such jurisdictions.

The Ordinary Shares have not nor will they be registered under the US Securities Act of 1933, as amended or with any securities regulatory authority or under the applicable securities laws of any state or other jurisdiction and, unless an exemption under such act or laws is available, may not be offered for sale or subscription or sold or subscribed directly or indirectly within any jurisdiction except under circumstances that will result in compliance with any applicable laws and regulations for the account or benefit of any national, resident or citizen of such jurisdictions.

No person has been authorised to give any information or to make any representations other than those contained in this document and, if given or made, such information or representations must not be relied upon as having been authorised by or on behalf of the Company, the Directors or Numis Securities Limited. No representation or warranty, express or implied, is made by Numis Securities Limited or any selling agent as to the accuracy or completeness of such information, and nothing contained in this document is, or shall be relied upon as, a promise or representation by Numis Securities Limited or any selling agent as to the past, present or future. Neither the delivery of this document nor any sale made in connection with this document shall, under any circumstances, create any implication that there has been no change in the business or affairs of the Company and/or its Subsidiaries since the date hereof or that the information contained herein is correct as of any time subsequent to the earlier of the date hereof and any earlier specified date with respect to such information.

The Company does not accept any responsibility for the accuracy or completeness of any information reported by the press or other media, nor the fairness or appropriateness of any forecasts, views or opinions expressed by the press or other media or any other person regarding the Kapan Acquisition, the Company and/or the Group. The Company makes no representation as to the appropriateness, accuracy, completeness or reliability of any such information or publication.

As required by the AIM Rules for Companies, the Company will update the information provided in this document by means of a supplement to it if a significant new factor that may affect the Kapan Acquisition occurs prior to Re-Admission or if it is noted that this document contains any mistake or substantial inaccuracy. This document and any supplement thereto will be made public in accordance with the AIM Rules for Companies.

The contents of this document are not to be construed as legal, financial, business or tax advice. Each prospective investor should consult his or her own lawyer, financial adviser or tax adviser for legal, financial, business or tax advice in relation to any purchase or proposed purchase of Ordinary Shares. Each prospective investor should consult with such advisers as needed to make its investment decision and to determine whether it is legally permitted to hold shares under applicable investment or similar laws or regulations.

This document should be read in its entirety and, in particular, the section headed "Risk Factors" in Part III of this document.

None of the Company, the Directors, Numis Securities Limited or any of their representatives is making any representation to any subscriber or purchaser of Ordinary Shares regarding the legality of an investment by such subscriber or purchaser.

Numis Securities Limited and any of its respective affiliates may have engaged in transactions with, and provided various investment banking, financial advisory and other services to the Company, for which

they would have received customary fees. Numis Securities Limited and any of its respective affiliates may provide such services to the Company and any of its affiliates in the future.

FORWARD-LOOKING STATEMENTS

All statements, other than statements of historical facts, included in this document, including, without limitation, those regarding the Company's financial position, business strategy, plans and objectives of management for future operations or statements relating to expectations in relation to dividends or any statements preceded by, followed by or that include the words "targets", "believes", "expects", "aims", "intends", "plans", "will", "may", "anticipates", "would", "could" or similar expressions or the negative thereof, are forward-looking statements. Such forward-looking statements involve known and unknown risks, uncertainties and other important factors beyond the Company's control that could cause the actual results, performance, achievements of or dividends paid by the Company to be materially different from actual results, performance or achievements, or dividend payments expressed or implied by such forward looking statements. Such forward-looking statements are based on numerous assumptions regarding the Company's net asset value, present and future business strategies and income flows and the environment in which the Company will operate in the future.

These forward-looking statements speak only as of the date of this document. The Company expressly disclaims any obligation or undertaking to disseminate any updates or revisions to any forward-looking statements contained herein to reflect any change in the Company's expectations with regard thereto, any new information or any change in events, conditions or circumstances on which any such statements are based, unless required to do so by law or any appropriate regulatory authority.

Prospective investors should read the risk factors set out in Part III of this document for a more complete discussion of the risk factors that could affect the Company's future performance and the industry in which the Company operates. In light of these risks, uncertainties and assumptions, the events described in the forward-looking statements in this document may not occur.

SELLING RESTRICTIONS

The distribution of this document in certain jurisdictions may be restricted by law and therefore persons into whose possession this document comes should inform themselves about and observe any such restrictions. Any failure to comply with these restrictions may constitute a violation of the securities laws of any such jurisdiction.

No action has been or will be taken in any jurisdiction that would permit the possession or distribution of this document or any other offering material in any country or jurisdiction where action for that purpose is required. Accordingly, neither this document nor any other offering material or advertisement in connection with the Company may be distributed or published in or from any country or jurisdiction, except in circumstances that will result in compliance with all applicable rules and regulations of any such country or jurisdiction. Persons into whose possession this document comes should inform themselves about and observe any restrictions on the distribution of this document. Any failure to comply with these restrictions may constitute a violation of the securities laws of any such jurisdiction. This document does not constitute an offer to subscribe for or purchase any Ordinary Shares to any person in any jurisdiction to whom it is unlawful to make such offer or solicitation in such jurisdiction.

BASES AND SOURCES

Various market data and forecasts used in this document have been obtained from independent industry sources. The Company has not verified the data, statistics, or information obtained from these sources and cannot give any guarantee of the accuracy or completeness of the data. Forecasts and other forward looking information obtained from these sources are subject to the same qualifications, risks and uncertainties as above. Various figures and percentages in tables in this document have been rounded and accordingly may not total. Certain financial data has also been rounded. As a result of this rounding, the totals of data presented in this document may vary slightly form the actual arithmetical totals of such data. All times referred to in this document are, unless otherwise stated, references to London time.

DIRECTORS, SECRETARY AND ADVISERS

Directors	Martin Axel Christer Andersson *(Executive Chairman)* Artem Olegovich Volynets *(Chief Executive Officer)* Gordon Ferguson Wylie *(Deputy Chairman and Senior Independent Non-Executive Director)* Martin Wiwen-Nilsson *(Non-Executive Director)* Robert (Rob) Willem John Edwards *(Independent Non-Executive Director)* Robert (Bob) Duane Benbow *(Chief Operating Officer)* Hussein Barma *(Independent Non-Executive Director)*
Secretary	Sergei Zhukov *(Company Secretary)* c/o ACG Eurasia LLC 7-3 Znamenka Street Moscow Russia 119019
Registered Office	Palm Grove House PO Box 438 Road Town Tortola British Virgin Islands VG1110
Nominated Adviser and Broker	Numis Securities Ltd The London Stock Exchange Building 10 Paternoster Square London EC4M 7LT
Solicitors to the Company As to English law	Watson Farley & Williams LLP 15 Appold Street London EC2A 2HB
Solicitors to the Company As to Kyrgyz law	Arte Law Firm 176, Abdrahmanov Street Bishkek Kyrgyz Republic
Solicitors to the Company As to BVI law	Ogier Ritter House Wickhams Cay II PO Box 3170 Road Town Tortola British Virgin Islands VG110
Solicitors to the Company As to Armenian law	Ameria Legal 9, G. Lusavorich Street Yerevan 0015 Armenia
Solicitors to the Nominated Adviser	Bryan Cave Leighton Paisner LLP Adelaide House London Bridge London EC4R 9HA

Auditors and Reporting Accountant	BDO LLP 55 Baker Street London W1U 7EU
Chaarat Competent Person	Coffey Geotechnics Ltd (t/a Tetra Tech) 1 Northfield Road Reading RG1 8AH
Kapan Competent Person	CSA Global (UK) Ltd First Floor, Suite 2 Springfield House Springfield Road Horsham West Sussex RH12 2RG
Principal Bankers	HSBC Bank plc 70 Pall Mall London SW1Y 5EZ
Registrars	Link Market Services (Guernsey) Limited Mont Crevelt House Bulwer Avenue St Sampson Guernsey GY2 4LH
Depositary	Link Market Services Trustees Limited The Registry 34 Beckenham Road Beckenham Kent BR3 4TU
Financial PR Advisers	Powerscourt Limited 1 Tudor Street London EC4Y 0AH
Web Site	www.chaarat.com

EXPECTED TIMETABLE OF PRINCIPAL EVENTS

Publication of this document	14 December 2018
General Meeting	31 December 2018
Completion of the Kapan Acquisition	on or before 15 January 2019
Re-Admission effective and dealings in the Ordinary Shares to commence on AIM	on or before 15 January 2019

All times are London times. If any of the above times or dates should change, the revised times and/or dates will be notified by an announcement on a Regulatory Information Service.

EXCHANGE RATES

The following exchange rates were provided on 13 December 2018, being the latest practicable date prior to publication of this document.

AMD to £	:	613.612
AMD to US$	:	485.70
Soms to £	:	88.2198
Soms to US$	:	69.83
US$ to £	:	1.2633

DEFINITIONS

In this document, unless the context requires otherwise, the words and expressions set out below shall bear the following meanings:

"**ACG Eurasia**"	ACG Eurasia LLC, a company registered in Russia with registered number PRSN 5147746128657, owned as to 70% by Artem Volynets and as to 30% by Dmitry Yudin
"**AIM**"	the market of that name operated by the London Stock Exchange
"**AIM Rules**"	the Company Rules and/or Nomad Rules as the context may require
"**AMD**"	Armenian dram, the lawful currency of Republic of Armenia
"**Annex I**"	Annex I of Regulation 809/2009 of the European Commission (referred to as the "PD Regulation" in the FCA Handbook), as reprinted in the Prospectus Rules contained in the FCA Handbook (as amended from time to time)
"**Articles**"	the articles of association of the Company (as amended)
"**Audit Committee**"	has the meaning ascribed to it in paragraph 13 of Part I
"**BCA**"	the BVI Business Companies Act, 2004 including any modification, extension, re-enactment, or renewal thereof and any regulations made thereunder
"**BDO**"	BDO LLP, 55 Baker Street, London W1U 7EU
"**Board**" or "**Board of Directors**"	the board of directors of the Company from time to time
"**Broker**"	Numis
"**BVI**"	the British Virgin Islands
"**CGIL**"	Chaarat Gold International Limited, a company registered under the law of Cyprus with registered number HE 375757 and whose registered office is at Julia House, 3 Themistokli Dervi Str, 1066 Nicosia, Cyprus
"**Chaarat Competent Person**"	means Tetra Tech
"**Chaarat Competent Person's Report**" or "**Chaarat CPR**"	the report prepared by the Chaarat Competent Person, as set out in Part A of Part IV of this document
"**Chaarat Deposit Area**"	the area that is subject to the Mining Licence held by CZ as detailed in paragraph 2 of Part I of this document
"**Chaarat Gold Project**"	the activities undertaken by Chaarat and CZ under the Chaarat Gold Project Licences in the Chaarat Licence Area
"**Chaarat Gold Project Licences**"	the Exploration Licence and the Mining Licence
"**Chaarat Group**", "**Chaarat Gold Group**" or "**Group**"	Chaarat and its subsidiaries, listed in paragraph 1.3 of Part VI of this document
"**Chaarat Licence Area**"	the Chaarat Deposit Area and the Exploration Licence Area
"**City Code**"	the UK City Code on Takeovers and Mergers
"**CNMIM**"	means China Nonferrous Metals Int'l Mining Co. Ltd.

"**Company**" or "**Chaarat Gold Holdings**" or "**Chaarat**" or "**CGHL**"	Chaarat Gold Holdings Limited, a company registered under the laws of the BVI with registered number 1420336 and whose registered office is at Palm Grove House, PO Box 438, Road Town, Tortola, British Virgin Islands, VG1110
"**Company Rules**"	the AIM Rules for companies together with the Guidance Note published by the London Stock Exchange as amended from time to time
"**Competent Persons**"	the Chaarat Competent Person and the Kapan Competent Person
"**Competent Person's Reports**" or "**CPRs**"	the Chaarat CPR and the Kapan CPR, as set out in Part IV of this document
"**Concert Party**"	Labro, Martin Wiwen-Nilsson (who is also a Director of Chaarat) and Willem De Geer who owns some of his Ordinary Shares directly and some through his investment vehicle, Deer Invest AB, who collectively hold, as at the date of this admission document, 149,773,966 Ordinary Shares representing approximately 37.90 per cent. of Chaarat's issued share capital
"**Control**"	as defined in Section 840 of the UK Income and Corporation Taxes Act 1988 (as amended from time to time)
"**Convertible Loan Notes**"	10 per cent. secured convertible loan notes 2021 issued or to be issued pursuant to the terms of the Placing Letter, the Kapan Acquisition Agreement or (as the case may be) and the Convertible Loan Note Instrument, further details of which are set out in paragraphs 7.19(c) and 7.19(d) of Part VI of this document
"**Convertible Loan Note Holder**"	a holder of Convertible Loan Notes from time to time
"**Convertible Loan Note Instrument**"	the convertible loan note instrument dated 11 September 2018 constituting the Convertible Loan Notes
"**CREST**"	the relevant system (as defined in the CREST Regulations) to facilitate the transfer of title of shares in uncertificated form, in respect of which Euroclear is the Operator (as defined in the CREST Regulations)
"**CREST Regulations**"	the Uncertificated Securities Regulations 2001, as amended
"**CSA**" or "**CSA Global**"	CSA Global (UK) Ltd, a company incorporated in England and with company number 06506117, and whose registered office is at First Floor Suite 2, Springfield House, Horsham, West Sussex, England, RH12 2RG, United Kingdom
"**CZ**"	Chaarat Zaav CJSC, a company registered under the laws of the Kyrgyz Republic with registered number 18675-3300-AO (HY) and whose registered office is at 19, Razzakov Street, 14th Floor, Bishkek, Kyrgyz Republic
"**Deed Poll**"	the deed poll dated 25 October 2007 entered into by the Depositary
"**Depositary**"	Link Market Services Trustees Limited, a company incorporated in England with company number 02729260 whose registered office is at The Registry, 34 Beckenham Road, Beckenham, Kent, BR3 4TU, acting in its capacity as Depositary pursuant to the terms of the Depositary Agreement (previously known as Capita IRG Trustees Limited)

"**Depositary Agreement**"	the agreement for depositary services provided to the Company by the Depositary, as described in paragraph 7.2 of Part VI of this document
"**Depositary Interests**"	the interests representing one Ordinary Share of the Company in uncertificated form issued by the Depository as described in paragraph 7.1 of Part VI of this document
"**Directors**"	the directors of the Company at the date of this document, whose names are set out on page 5 of this document
"**EBITDA**"	earnings before interest, tax, depreciation and amortisation
"**English Companies Act 2006**"	the Companies Act 2006 of England and Wales, including any modifications, extensions, re-enactments or renewals and any regulations made thereunder
"**English Subsidiary**"	Chaarat Gold Services Limited, incorporated in England and Wales, with company number 11488741 and registered office at 15 Appold Street, London, United Kingdom, EC2A 2HB
"**Euroclear**"	Euroclear UK & Ireland Limited, a company incorporated in England, and the operator of CREST
"**Existing Shares**"	the existing 395,167,015 Ordinary Shares in issue as at the date of this document
"**Exploration License**"	the exploration licence dated 7 October 2013 no. 3319AP in respect of the Exploration License Area held by CZ and the Exploration Licence Agreement (as described in paragraph 7.5 of Part VI of this document)
"**Exploration Licence Agreement**"	the licence agreement no.3 dated 21 April 2016 and the licence agreement no. 4 dated 29 July 2016 entered into between the SCIESM and CZ in relation to the Exploration Licence, which sets out the terms and conditions of the Exploration Licence
"**Exploration License Area**"	the area that is subject to the Exploration Licence held by CZ as detailed in paragraph 2 of Part I of this document
"**FCA**"	the Financial Conduct Authority
"**Feasibility Study**"	has the meaning given to that term in paragraph 3 of Part I of this document
"**FSMA**"	the Financial Services and Markets Act 2000 (as amended)
"**FSU**"	the former Soviet Union
"**General Meeting**"	the general meeting of the Company, a notice of meeting in respect of which is set out in Part VII of this document
"**Group**"	means the Company and its direct and indirect subsidiaries as at the date of this document and, following Re-Admission, Kapan; and "**Group Company**" means any member of that Group
"**Income Tax Ordinance**"	British Virgin Islands Income Tax Ordinance (Cap 206) (as revised)
"**Introduction Agreement**"	the introduction agreement dated 14 December 2018 between the Company, the Directors and Nomad, relating to the Re-Admission, further details of which are set out in paragraph 7.25 of Part VI of this document
"**JORC**"	joint ore reserves committee

"**JORC Code**"	means the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves published by JORC (2012)
"**Kapan**"	Kapan Mining and Processing Company CJSC, a company incorporated in the Republic of Armenia with registered number 2712001216 and whose registered office is at 4 Gortsaranayin Street, Kapan 3302, Syunik Region, 377810, Republic of Armenia
"**Kapan Acquisition**"	the purchase by CGIL from PMTL of 100 per cent. of the shares in Kapan as described in paragraph 4 of Part I of this document
"**Kapan Acquisition Agreement**"	the agreement entered into between CGIL as buyer, the Company as guarantor for CGIL and PMTL as seller dated 30 October 2018, as amended on 14 December 2018, in relation to the Kapan Acquisition as further described in paragraph 7.20(a) of Part VI of this document
"**Kapan Acquisition Financing**"	the proposed US$40 million financing of the Kapan Acquisition as further described in paragraph 4 of Part II and paragraph 7.24 of Part VI of this document
"**Kapan Competent Person**"	CSA
"**Kapan Competent Person's Report**" or "**Kapan CPR**"	the report prepared by the Kapan Competent Person, as set out in Part B of Part IV of this document
"**Kapan Licence**"	the licence held by Kapan as detailed in paragraph 2 of Part I and paragraph 7.23 of Part VI of this document
"**Kapan Licence Area**"	the area that is subject to the Kapan Licence as detailed in paragraph 2 of Part I of this document
"**Kapan Mine**"	means the Kapan Mine, further details of which are set out in paragraph 2 of Part I of this document
"**km²**"	square kilometres
"**Koz**"	thousand ounces
"**Kyrgyz Investments Law**"	the Law of the Kyrgyz Republic "On Investments in the Kyrgyz Republic" dated 27 March 2003 No. 66
"**Kyrgyz Mining Law**"	the Law of the Kyrgyz Republic "On Subsoil" dated 19 May 2018 No. 49
"**Kyzyltash**"	the Kyzyltash refractory sulphide mineralisation zone with the Chaarat Deposit Area
"**Labro**"	Labro Investments Limited, a company incorporated and registered in Bermuda under company number 48485, the registered office of which is at Wessex House, 2nd Floor, 45 Reid Street, Hamilton HM12, Bermuda and in relation to which Martin Andersson is indirectly interested in the majority of its shares
"**Labro Loan Agreement**"	the US$15 million revolving term loan facility agreement between Labro and the Company described in paragraph 7.26 of Part VI of this document
"**Lichkvaz**"	Lichkvaz CJSC, a company incorporated in the Republic of Armenia with registered number 28612007744 at 2/1, M. Adamyan Street, Yerevan 0010, Republic of Armenia

"**Loan Note Placing**"	the placing of Convertible Loan Notes described in paragraph 7.19 of Part VI of this document
"**Lock-in Deeds**"	lock-in deeds entered into between certain existing Shareholders, the Company and Numis as detailed in paragraph 7.26 of Part VI of this document
"**London Stock Exchange**"	London Stock Exchange plc
"**Mada**"	Mada Limited, a company incorporated and registered in the British Virgin Islands under company number 190057, whose registered office is at Woodbourne Hall, PO Box 3162, Road Town, Tortola, British Virgin Islands
"**MAR**"	Market Abuse Regulation (*Regulation 596/2014*), which took effect from 3 July 2016
"**Memorandum**"	the memorandum of association of the Company
"**Mineral Resources**"	has the meaning given to that term in the JORC Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves
"**Mining Licence**"	the mining licence dated 22 January 2014, no. 3117AE in respect of the Chaarat Deposit Area held by CZ and the Mining Licence Agreement (as described further in paragraph 7.6 of Part VI of this document)
"**Mining Licence Agreement**"	the licence agreement no. 4 dated 7 September 2017 entered into between the SCIESM and CZ in relation to the Mining Licence, which sets out the terms and conditions of the Mining Licence
"**Mining Note**"	the mining note dated June 2009 entitled "Guidance for Mining and Oil & Gas Companies" as published by the London Stock Exchange by way of AIM note 16 and as may be amended from time to time
"**NAV**"	net asset value
"**NEC**"	North Exploration Company LLC, a company incorporated in the Republic of Armenia with registered number 286.110.993988 at 2/1, M. Adamyan Street, Yerevan 0010, Republic of Armenia
"**Nomad Rules**"	the AIM Rules for nominated advisers published by the London Stock Exchange as amended from time to time
"**NPV**"	net present value
"**Numis**"/"**Nomad**"	Numis Securities Limited, a company incorporated in England with company number 02285918, whose registered office is at 10 Paternoster Square, London, EC4M 7LT
"**Official List**"	the Official List of the United Kingdom Listing Authority
"**Option**"	an option to subscribe for one Ordinary Share
"**Option Holders**"	a holder of an Option from time to time
"**Ordinary Resolution**"	a resolution of the Company in a general meeting carried by a majority of at least half of the Shareholders entitled to vote who were present at the meeting and voted or consented to in writing by such a majority
"**Ordinary Shares**"	the ordinary shares of US$0.01 per share in the capital of the Company, including (where the context requires) Depositary Interests

"**Ore Reserves**"	has the meaning given to that term in the JORC Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves
"**oz**"	ounces
"**Panel**"	the Panel on Takeovers and Mergers
"**PBT**"	profit before tax
"**Placing Letters**"	placing letters entered into by holders of Previous Notes and new investors in connection with the Loan Note Placing, details of which are set out in paragraphs 7.19(a) and 7.19(b) of Part VI of this document
"**Placing Price**"	a price of US$1 per Convertible Loan Note
"**Previous Notes**"	the 10 per cent. secured loan notes 2018 and the 10 per cent. secured loan notes 2019 of the Company which were convertible into Ordinary Shares, pursuant to loan note instruments dated 26 April 2017 and 6 February 2018 respectively, and which were either reinvested into Convertible Loan Notes, converted into Ordinary Shares or redeemed, in each case pursuant to the Loan Note Placing
"**PMTL**"	PMTL Holding Ltd, a company incorporated in Cyprus with registered number HE 272743, whose registered office is at Zinas Kanther & Origenous, Office 6, 3035, Limassol, Cyprus
"**P/NAV**"	price to net asset value
"**Poly Armenia**"	Polymetal Armenia LLC, a company incorporated in the Republic of Armenia with registered number 264110849028 at 2/1, M. Adamyan Street, Yerevan 0010, Republic of Armenia
"**Polymetal**"	Polymetal International Plc, a company incorporated in Jersey with registered number 106196 whose principal place of business is at Zinas Kanther & Origenous, Office 6, 3035, Limassol, Cyprus (together with its subsidiaries where relevant)
"**Poly Armenia Companies**"	Poly Armenia, Lichkvaz and NEC
"**Re-Admission**"	Re-Admission of the Ordinary Shares to trading on AIM becoming effective in accordance with the AIM Rules
"**Registrars**"	Link Market Services (Guernsey) Limited, Mont Crevelt House, Bulwer Avenue, St Sampson, Guernsey, GY2 4LH
"**Registrars Agreement**"	the agreement for registry services to be provided to the Company by the Registrars, as described in paragraph 7.3 of Part VI of this document
"**Remuneration Committee**"	has the meaning ascribed to it in paragraph 13 of Part I of this document
"**Resolution**"	the resolution proposed to be approved at the General Meeting
"**ROFR Agreement**"	the right of first refusal agreement to be entered into at completion of the Kapan Acquisition as further described in paragraph 7.20(b) of Part VI of this document
"**SCIESM**"	the State Committee for Industry, Energy and Subsoil Management of the Kyrgyz Republic and its predecessors
"**SCPEC**"	the State Commission for the Protection of Economic Competition of the Republic of Armenia

"**Senior Management**"	means the senior management of the Company as listed in paragraph 5.4 of Part VI of this document
"**Shareholders**"	holders of Ordinary Shares from time to time
"**Soms**" or "**Som**" or "**KGS**"	the lawful currency of the Kyrgyz Republic
"**Special Resolution**"	a resolution of the Company in a general meeting carried by a majority of at least three-quarters of the Shareholders entitled to vote who were present at the meeting and voted or consented to in writing by such a majority
"**Technical Committee**"	has the meaning ascribed to it in paragraph 13 of Part I
"**Tetra Tech**"	Coffey Geotechnics Ltd., trading as Tetra Tech, a company incorporated in England with registered number 06328315 and whose registered office is at 1 Northfield Road, Reading RG1 8AH, United Kingdom
"**Tulkubash**"	the Tulkubash oxide zone within the Chaarat Deposit Area
"**United Kingdom Listing Authority**"	a division of the FCA acting in its capacity as the competent authority for the purpose of Part V of FSMA
"**Warrant**"	a warrant over one Ordinary Share, further details of which are set out in paragraphs 2.10 and 4.3 of Part VI of this document
"**Warrant Holder**"	a holder of a Warrant from time to time
"**UK**"	the United Kingdom
"**US$**" or "**US dollars**" or "**USD**"	the lawful currency of the United States of America
"**£**" or "**pound**"	the lawful currency of the UK

GLOSSARY

Please refer to pages xx-xxiv of the Chaarat CPR and pages 129-134 of the Kapan CPR in Part IV of this document for glossaries of technical terms, abbreviations and units.

PART I

CHAIRMAN'S LETTER

Palm Grove House, Po Box 428, Road Town, Tortola, British Virgin Islands, VG1110

(incorporated in the British Virgin Islands under the laws of the British Virgin Islands with registered number 1420336)

DIRECTORS

Martin Andersson *(Executive Chairman)*
Artem Volynets *(Chief Executive Officer)*
Gordon Wylie *(Deputy Chairman and Senior Independent Director)*
Martin Wiwen-Nilsson *(Non-Executive Director)*
Robert (Bob) D Benbow *(Chief Operating Officer)*
Robert (Rob) Edwards *(Independent Non-Executive Director)*
Hussein Barma *(Independent Non-Executive Director)*

14 December 2018

Dear Shareholder, and for information only, Convertible Loan Note Holder, Option Holder and Warrant Holder

Proposed acquisition of Kapan Mining and Processing Company CJSC

Proposed Re-Admission of the enlarged ordinary share capital to trading on AIM

and

Notice of General Meeting

1. INTRODUCTION

The Company announced on 30 October 2018 that it and one of its wholly-owned subsidiaries, CGIL, had entered into a binding conditional sale and purchase agreement (being the Kapan Acquisition Agreement) with PMTL, a subsidiary of Polymetal International plc, to acquire Kapan, which owns the medium-sized polymetallic Kapan Mine in the Republic of Armenia.

As the Acquisition constitutes a "reverse takeover" under the AIM Rules, it is conditional upon, among other things, the approval of Shareholders at a general meeting. A reverse takeover also involves the cancellation of existing ordinary shares from trading on AIM and a new application for the enlarged share capital to be admitted to trading on AIM. Under the terms of the Kapan Acquisition Agreement, the Company has agreed to acquire the entire issued share capital of Kapan for a total consideration of US$55 million (subject to net debt, working capital and other adjustments). The consideration for the Kapan Acquisition is payable in cash, save that US$10 million (or, if completion is after 15 January 2019, US$5 million) of the consideration may be satisfied by way of the issue by the Company of such amount of Convertible Loan Notes. As required by the AIM Rules, the Company is publishing this document, which describes the Kapan Acquisition and contains notice of the General Meeting to approve the Resolution which is required to enable the Company to complete the Kapan Acquisition.

You are recommended to read the whole of this document and not to rely on only part of it. In particular, you are advised to consider carefully Part III (Risk Factors), the Definitions and the CPRs in Part IV of this document for glossaries of technical terms, abbreviations and units.

2. HISTORY OF THE GROUP AND BACKGROUND TO THE KAPAN ACQUISITION

History of the Group

Chaarat Gold Holdings Limited is an AIM-quoted company that was founded for the purpose of exploring and developing the Chaarat Gold Project in the Tien Shan Gold Belt, in the North West of the Kyrgyz Republic.

Chaarat currently has a Mining Licence to develop the Tulkubash oxide zone and an Exploration Licence in respect of the parallel Kyzyltash refractory sulphide mineralisation zone.

The entire issued and to be issued ordinary share capital of the Company was admitted to trading on AIM on 8 November 2007.

The Kapan Acquisition represents an important milestone for Chaarat in executing on its consolidation strategy for the regional gold sector. Chaarat continues to pursue other selected M&A targets and the Directors believe the Company is well positioned to be a driver of consolidation in Central Asia and the former Soviet Union.

The Group's principal assets will, following completion of the Kapan Acquisition, comprise the Chaarat Gold Project and the Kapan Mine.

Chaarat Gold Project

The Group currently has two projects in the Kyrgyz Republic, details of which are as follows:

Asset	Holder	Interest (%)	Status	Licence Expiry Date	Licence Area (Km^2)
Mining Licence no. 3117AE in the Kyrgyz Republic	CZ	100	Development of subsurface mineral resources	25 June 2032	7.0003
Exploration Licence no. 3319AP in the Kyrgyz Republic	CZ	100	Subsoil use and geological exploration	7 October 2023	67.7600

The Mining Licence was granted by the SCIESM to CZ on 22 January 2014 and is valid until 25 June 2032. The Mining Licence covers the development of subsurface gold resources in the Chaarat Deposit Area.

The Exploration Licence was granted by the SCIESM to CZ on 7 October 2013 and is valid until 7 October 2023. The Exploration Licence covers subsoil use and geological exploration for gold, molybdenum, copper and tungsten in the Exploration License Area.

The Chaarat Deposit Area has two ore bodies parallel to each other: the Tulkubash oxide zone and the Kyzyltash refractory sulphide mineralisation zone.

Further details regarding the Chaarat Gold Project and the Kyrgyz Republic mining regime are set out in Parts A and B of Part II of this document.

Further details regarding the Chaarat Project Licenses are set out in paragraphs 7.5 and 7.6 of Part VI of this document.

Kapan Mine

The Company has agreed to purchase Kapan pursuant to the Kapan Acquisition Agreement. Kapan is the owner of the Kapan Mine (also known as Shahumyan). Details of the Kapan Licence are set out below:

Asset	Permit Holder	Interest (%)	Status	Licence Expiry Date	Licence Area, (km^2)
Mining Permit - ՇԱԹՎ 29/183, Subsoil Use Contract N ՊՎ 183, Land Mass Allotment Act N ԼՎ-183 and relevant mining project	Kapan	100	Mining right on extraction of natural resources in Shahumyan underground mine	01 April 2050	3.786

The Kapan Licence was granted to Kapan on 27 November 2012 and is valid until 1 April 2050. The Kapan Licence covers the extraction of gold, copper, silver and zinc in the Kapan Licence Area.

Further details regarding the Kapan Mine and the Armenian mining regime are set out in Parts C and D of Part II of this document.

Further details regarding the Kapan Licence are set out in paragraph 7.23 of Part VI of this document.

Rationale for the Kapan Acquisition

The consideration for the Kapan Acquisition is US$55 million, subject to net debt, working capital and other adjustments, and is payable in cash, save that US$10 million (or, if completion is after 15 January 2019, US$5 million) of the consideration may be satisfied by way of the issue by the Company of such amount of Convertible Loan Notes. Chaarat expects to fund the cash portion of the consideration through the Kapan Acquisition Financing, its existing cash resources, and the proceeds of the previous issues of Convertible Loan Notes. Further details of the principal terms of the Kapan Acquisition are set out in Section 4 of this Part I and paragraph 7.20 of Part VI of this document.

The Kapan Acquisition is an important step in achieving Chaarat's goal of building a leading emerging markets gold company with an initial focus on Central Asia and the FSU through organic growth and selective M&A. In particular, the Kapan Acquisition:

- accelerates Chaarat's transformation from a developer to a producer
- provides a catalyst for a potential re-rating
- strengthens the Company's portfolio of assets, with an anticipated group production of approximately 65 Koz Au Eq in 2019 (based on Chaarat management's analysis)
- significantly improves the Company's financial strength for the development of Tulkubash and Kyzyltash at the Chaarat Gold Project
- advances Chaarat's ability to implement future mergers and acquisitions
- transforms Chaarat into a cashflow generating company with a significant growth profile
- has a valuation which the Directors believe is attractive; anticipated to imply a P/ NPV 10 of 0.37x (based on Polymetal's analysis) and 0.78x (based on Chaarat management's analysis).

Chaarat is well placed to take advantage of the opportunities presented by this cash generative asset, which, following significant investment in the asset over the last two years, is estimated to grow production by approximately 30 per cent. per annum in 2019 versus 2017 (based on Chaarat management's analysis).

Production at the Kapan Mine commenced in 2003 and the current reserve life extends to 2023; however, the Company believes that conversion of current inferred resources to reserves and new exploration success is likely to extend the mine life. Indeed, the Company's internal modelling assumes production will continue until 2029. For the year ended December 2017, the Kapan Mine produced around 50K oz of gold equivalent, generating a PBT of US$2.155 million, and had gross assets of US$95.445 million (based on the reporting accountant's audited historical financial information report). Meanwhile, 2019 production guidance is currently 65 Koz of gold equivalent (based on Chaarat management's analysis).

During the due diligence process, Chaarat Management reviewed the mine plan and economic analysis for the Kapan Mine prepared by Polymetal, and with assistance from CSA, have developed a more conservative model which, amongst other things, results in an NPV of US$70.2 million. The NPV is based only on JORC-compliant reserves and mine production through to 2023 with average annual production of around 65 Koz of gold equivalent. This implies the acquisition of Kapan at what the Chaarat Directors consider an attractive P/NAV of 0.78x. Chaarat management is confident in the potential of Kapan to extend production beyond 2023.

PMTL has made significant investment into the mine in recent years (approximately US$35 million), with throughput increased from mechanised mine operations and increased mill capacity. The increased throughput capacity provides operating cost efficiencies and the historical high ratio of resource to reserve conversion is expected to continue. Applying conservative resource to reserve conversion ratios based on historical ratios achieved, the asset is anticipated by Chaarat management to deliver an additional 6 years of mine life from current resources (although there is no assurance that this will be

the case). Identified resources within the Kapan Mine footprint are anticipated to be converted into reserves without extensive underground development. In addition, there are multiple walk-up targets and favourable structures/identified mineralization within hundreds of metres of existing workings.

As noted in paragraph 8 of this Part I, Chaarat management's view differs in certain respects from the various views expressed in the Kapan CPR in relation to project financial results and the proposed mining plan. The Kapan CPR identifies project financial results that are higher than Chaarat management's and Chaarat management additionally believes that the PMTL mining plan detailed in the Kapan CPR is overly optimistic.

3. STRATEGY AND EXPLORATION PLANS

Group Strategy

The Company's strategic objective is to become a leading mid-tier low cost gold producer focused in Central Asia and the FSU through a mixture of organic growth and selective acquisitions.

Due to perceived risk, most of the assets in the Commonwealth of Independent States region trade at a significant discount compared to equivalent assets in other emerging market locations. This delivers the opportunity for industry consolidation, which the Company intends to lead. Ultimately, the Company believes that a diversified portfolio of producing and developing mines will generate the cash flow to fund ongoing organic growth and deliver a strong equity return to investors. By maintaining a focus on active engagement with host communities, the Company believes that the benefits of this strategy will flow to all stakeholders, helping to manage ongoing risks.

The Company's criteria for merger and acquisition candidates are:

- Gold production or near-term gold production at a competitive cash cost;
- Geographic/operational synergies;
- Exploration upside;
- Potential for extended mine life; and
- Value accretive to shareholders.

The Tien Shan Gold Belt hosts numerous world class ore bodies, however, the Central Asia and FSU gold industry is highly fragmented. The Company intends to lead the consolidation of the industry focusing on projects within the relevant geographical clusters. The Kapan Acquisition is an important milestone for Chaarat in executing on its consolidation strategy for the regional gold sector.

Tulkubash Exploration and Development

The Company's strategy in the Kyrgyz Republic is focussed on the development of the Tulkubash heap leach project, with an initial reserve comprising 16 million tonnes of ore with an average gold grade of 0.91 grams per tonne for 470,000 ounces of contained gold. A feasibility study was completed in April 2018 which sets out a blueprint for the development of the Chaarat Gold Project (the "**Feasibility Study**"). The design is based on processing 13,500 tonnes of ore per day to produce over 100,000 ounces of gold per annum during steady state operations with an average post tax free annual cash flow of US$58.6 million for an initial four year mine life. The Company is currently completing an approximately 20,500 metre drilling programme at Tulkubash. The results of this drilling are expected to be incorporated into an updated year-end resource update to be completed in the first quarter of 2019. This resource update is intended to be the basis for an updated reserve estimate and financial model also to be completed in the first quarter of 2019.

In September 2018, the Company released results of an interim resource for Tulkubash, based on the first 10,500 metres of the year's drilling. This resource update demonstrated an increase in contained in Measured and Indicated Resource of 46 per cent. (relative to the prior resource estimate on which the feasibility study was based) to over 1.4 million ounces of gold. The resource grade also increased by 57 per cent. to 1.35 g/t Au. Drilling since then has continued to add new mineralisation, which is expected to be included in the year-end resource and reserve updates. Dependent upon raising sufficient additional funds, significant ongoing exploration is planned for 2019 (25,000 to 30,000 metres of

drilling) and thereafter (15,000 to 20,000 metres per year). This is expected to focus initially on defining the extent of mineralisation within the six-kilometre long mining license and later on extending mineralisation along strike into the adjoining exploration license. To date, only about 3.5 kilometres of the prospective 24-kilometre strike length of favourable geology within the Company's licenses have been drilled. Substantial gold-in-soil geochemical anomalies, at or above the reserve grade, have already been defined in this area. The Company is confident it can add significantly to the Tulkubash reserve base and hence mine life ahead of first gold production which is anticipated in 2020 (following completion of the financing required to develop the mine).

Organic growth should follow from the neighbouring Kyzyltash deposit. The Kyzyltash project has a large, higher grade defined resource comprising 46.1 million tonnes of ore at a gold grade of 3.75 grammes per tonne for 5.4 million ounces of contained gold. Whilst this is a substantial ore body, it remains open both along strike and down-dip. Based on the work performed by China Nerin Engineering Co. Ltd., Kyzyltash has the potential to produce 200,000-300,000 ounces of gold per annum at low operating cash costs. The Company plans to develop the Kyzyltash project once the Tulkubash project is in operation, but plans to have both projects in production in parallel in the medium term, producing up to 400,000 ounces of gold per annum from the Chaarat Gold Project.

Kapan Mine Near Term Actions

In respect of the Kapan Mine, the Company is currently planning several near term actions.

In relation to environment and health and safety, the Company intends to replace the existing safety system based on rules and punishment and to establish a behaviour-based safety culture that emphasises personal responsibility and accountability. The Company additionally aims to ensure that environmental management is independent of production.

In relation to the mine, the Company aims to get exploratory development out ahead of production mining and to improve the short and medium term accuracy of the reserve model, with mine bottom up planning being positioned to reduce dilution. The Company intends to increase the mining fleet availability, reduce waiting time for parts and to complete activities in-house as far as possible at a lower cost.

The Company additionally intends to improve the mill, with planned upgrades to enhance throughput, improve crushing efficiency and reduce primary grinding feed size. The Company aims to stabilise flotation and process recovery and is considering dewatering options to stabilise the dam while sourcing material for buttress.

As regards management, the Company aims to reduce reliance on corporate decision making, promoting teamwork and interdepartmental efficiency. The Company plans to educate the workforce in cost and budget management and to introduce effective reporting and variance analysis.

In respect of capital management, the Company intends to ensure timely payment for finished goods and to monetise obsolete inventory. The Company also plans to rationalise buying to ensure inventory does not exceed operational requirements and to contract out mine development to reduce capital equipment replacement.

4. PRINCIPAL TERMS OF THE KAPAN ACQUISITION AND KAPAN ACQUISITION FINANCING

Kapan Acquisition

The Kapan Acquisition Agreement comprises the purchase of the entire issued share capital of Kapan by CGIL from PMTL. CGIL will also acquire all debt owed by Kapan to members of the PMTL group under intra-group loan agreements. The Company is a guarantor of all of CGIL's obligations under the Kapan Acquisition Agreement.

The consideration for the Kapan Acquisition will be US$55,000,000 (subject to net debt and working capital adjustments) payable in cash with the option to pay US$10,000,000 (or, if completion is after 15 January 2019, US$5,000,000) thereof at completion by the issue by the Company of Convertible Notes equal to that amount.

The Kapan Acquisition Agreement is conditional on (amongst other things): (i) Shareholder approval of the Resolution; (ii) approval by the SCPEC; and (iii) the Company obtaining the Kapan Acquisition Financing. These conditions are to be satisfied as soon as reasonably practicable and in any case by 15 February 2019.

CGIL paid a deposit of US$5,000,000 on or around 12 November 2018 (the "**Deposit**") to PMTL. If the Kapan Acquisition Agreement is terminated: (i) because CGIL fails to satisfy its conditions (including Shareholder approval of the Resolution and obtaining the Kapan Acquisition Financing) or fails to comply with its material completion obligations, PMTL will retain the Deposit and CGIL must pay an additional US$5,000,000 (or the Company may issue Convertible Notes for that amount to PMTL) by way of a total termination fee of US$10,000,000 or (ii) because PMTL fails to satisfy its conditions or material completion obligations, PMTL must repay the Deposit and pay US$5,000,000 to CGIL by way of termination fee; or (iii) for any other reason, PMTL must repay the Deposit to CGIL and no further amounts are payable.

The Kapan Acquisition Agreement also provides for certain arrangements regarding the transfer of the royalty agreement between PMTL, Polymetal and Dundee Precious Metals Inc in relation to Kapan.

PMTL has given certain warranties and other protections to CGIL concerning, among other things, Kapan and its business and operations, subject to certain limitations of liability.

If any Convertible Notes are issued as summarised above, PMTL may require CGIL to purchase those notes at par (including accrued interest) no earlier than 19 months after issue thereof or upon an earlier change of control of the Company.

On completion of the Kapan Acquisition, and pursuant to the ROFR Agreement, PMTL and Polymetal Netherlands B.V., the minority shareholder of Poly Armenia, will also grant the Company: (a) exclusive rights for a period of 6 months from completion of the Kapan Acquisition to negotiate terms in relation to the acquisition of the entire issued share capital of Poly Armenia, together with its two subsidiaries, Lichkvaz and NEC (together, the "**Poly Armenia Companies**"); and (b) a right of first refusal in respect of: (i) the Poly Armenia Companies for a period of 12 months beginning on expiry of the exclusivity period; and (ii) ore concentrate produced by Lichkvaz for a period of 18 months from completion of the Kapan Acquisition. The Poly Armenia Companies comprise Polymetal's other mining interests in Armenia. Polymetal Armenia is the holding company for Lichkvaz, which is the owner of the Lichkvaz deposit, a gold deposit located approximately 70 km from the town of Kapan. NEC is an exploration company which currently is a dormant company with no material assets.

Further details of the Kapan Acquisition Agreement and ROFR Agreement are set out in paragraph 7.20 of Part VI of this document.

Kapan Acquisition Financing

As at the date of this document, in order to fund the Kapan Acquisition, the Company has signed a definitive term sheet with Ameriabank CJSC for a US$20 million acquisition financing facility, supported by a letter confirming that the bank will seek to raise a further US$20 million of financing through syndication with other banks in Armenia (together comprising the Kapan Acquisition Financing). Legally binding documents for the Kapan Acquisition Financing remain to be prepared, negotiated and executed and any and all conditions precedent to drawdown of the financing thereunder will also need to be satisfied. These facilities are required in order to enable the Group to proceed to completion of the Kapan Acquisition and it is therefore anticipated that these facilities will be in place and drawn down by the time of Re-Admission.

Further details of the Kapan Acquisition Financing are set out in paragraph 7.24 of Part VI of this document.

The Company has also entered into a US$15 million revolving credit facility with Labro in order to provide further working capital for the Company if and when needed for a period of up to 19 months from Re-Admission. Further details of the Labro Loan Agreement are set out in paragraph 7.26 of Part VI of this document.

5. RE-ADMISSION TO AIM

On Re-Admission, the Company will have 395,167,015 Ordinary Shares in issue.

The Company will also have US$18,580,000 Convertible Loan Notes in issue (principal value).

In addition, the Company has:

(a) received a short term loan of US$10 million as further described in paragraph 7.17 of Part VI of this document;

(b) agreed to issue US$10 million (or, if completion is after 15 January 2019, US$5 million) of Convertible Loan Notes to PMTL as described in paragraph 7.20 of Part VI of this document;

(c) entered into a term sheet and related letter for the Kapan Acquisition Financing as further described in paragraph 7.24 of Part VI of this document; and

(d) entered into the Labro Loan Agreement as further described in paragraph 7.26 of Part VI of this document.

6. BOARD OF DIRECTORS

(a) **Mr Martin Andersson (*Executive Chairman*) (Age 51)**

A graduate of the Stockholm School of Economics and HEC Paris, Mr Andersson worked in mergers and acquisitions at Booz Allen Hamilton and advised the Russian Government on its privatization programme. In 1993 he co-founded Brunswick Brokerage – a Moscow based investment bank that was later sold to UBS – initially holding the position of chief executive officer and, from 1999, chairman of the joint venture, Brunswick UBS Warburg. Between 2006 and 2013 he was a shareholder and served on the board of Siberian Coal Energy Company, one of the largest thermal coal producers in Russia.

Mr Andersson first invested in Chaarat in 2011 and he intends (via Labro) to be a long term and supportive shareholder. Labro is also providing loan facilities under the Labro Loan Agreement as further described in paragraph 7.26 of Part VI of this document.

Mr Andersson manages an active portfolio with an interest in real estate, financial services and information technology.

(b) **Mr Artem Volynets (*Chief Executive Officer*) (Age 51)**

Mr Volynets has more than 20 years' experience in mergers and acquisitions, capital markets, and senior corporate management roles. During this time, he has led private and public transactions worth more than US$30 billion and managed leading businesses in the metals and mining industry.

From 2003 to 2013 Mr Volynets held executive positions in the Russian aluminium and energy sectors, including CEO of En+ Group, Deputy CEO and Director for Corporate Strategy at UC RUSAL, and SVP Strategy at SUAL International. In 2009 and 2010 he also served as chairman of the International Aluminium Institute. From 1997 to 2003, Mr Volynets was a management consultant and corporate finance advisor with Monitor Group in London. Mr Volynets studied at Moscow State University, The American University in Washington DC, Georgetown University and INSEAD.

Mr Volynets founded ACG Amur Capital Group Ltd, an advisory and investment management firm in 2014. He is also an independent director and a member of the Strategy and Budget Committees of PJSC MMC Norilsk Nickel.

(c) **Mr Gordon Wylie (*Deputy Chairman and Senior Independent Non-Executive Director*) (Age 66)**

During his eight years as a member of AngloGold Ashanti's senior management team, Mr Wylie was responsible for their global exploration programme, part of which included moving into new prospective, higher risk geographical regions. Mr Wylie has been a non-executive director of numerous junior exploration companies operating globally since leaving AngloGold Ashanti. He was previously the chairman of Lydian International. Lydian International has been constructing a mine at the Amulsar open pit, heap leach gold project in Armenia.

Mr Wylie brings to the Board of Chaarat 42 years' experience in the mining industry and directly relevant experience of growing companies from exploration to production.

(d) **Mr Martin Wiwen-Nilsson (*Non-Executive Director*) (Age 47)**

Mr Wiwen-Nilsson spent 21 years at Goldman Sachs, where he was a partner from 2008 to 2015. He held leadership positions in, amongst others, the global emerging markets business, the global commodities business and the global sovereign wealth fund business.

He is an associate of the Executive Chairman, Mr Andersson.

(e) **Mr Robert Edwards (*Non-Executive Director*) (Age 52)**

A mining engineer with a degree from the Camborne School of Mines, Mr Edwards is the former chairman of Global Mining at Renaissance Capital and has also worked for HSBC and the Royal Bank of Canada. He has worked in the global natural resources industry for 27 years, primarily in frontier and emerging markets, advising the managements of numerous companies on a range of industrial issues. As well as bringing deep sector knowledge, he has played a central role on multiple IPOs, capital raisings and M&A transactions.

Mr Edwards is currently an independent non-executive director and member of the audit and corporate governance and remuneration committees of PJSC MMC Norilsk Nickel, and an adviser to several private natural resource companies.

(f) **Mr Robert D Benbow (*Chief Operating Officer*) (Age 65)**

Mr Benbow's responsibilities include oversight of the Company's operations and project development. During his 45 year career, Mr Benbow has taken three green field gold developments into production, including Alacer Gold Corp.'s Çöpler Gold Mine in Eastern Turkey which has produced over 1 million ounces as one of the lowest cost producers in the world. The Çöpler mine is now moving into development of the refractory ore contained within the deposit.

(g) **Dr Hussein Barma (*Independent Non-Executive Director*) (Age 53)**

Dr Barma has significant FTSE-50 senior executive experience, gained through over 15 years at Antofagasta plc, where he led its UK presence through a period of change and growth as the UK-based Chief Financial Officer. He is currently an independent non-executive director and audit chair of Atalaya Mining plc and is a principal at Barma Advisory where he has worked on various assignments within the natural resources and other sectors. He has also had earlier careers in professional services and academia. Mr Barma is a qualified lawyer and chartered accountant. He holds a doctorate in corporate law from the University of Oxford.

7. SENIOR MANAGERS

Chris Eger (*Chief Financial Officer*)

Mr Eger has extensive financial, M&A and commercial expertise in the metals and mining sector, gained over a 20-year career in investment banking, metals trading and private equity. He was previously the chief financial officer of Nyrstar NV, where he played a major role in developing and implementing the Company's transformation strategy in addition to strengthening the balance sheet. Prior to that, he was M&A director at Trafigura AG and a member of the investment banking group of Bank of America Merrill Lynch, where he worked with metals and mining companies on debt and equity financing and M&A. He also worked as a director in the global metals and mining group at BMO.

8. COMPETENT PERSON'S REPORTS

The attention of readers of this document is drawn to the CPRs set out in Part IV of this document.

The Company is addressing or intending to address the various recommendations set out in the CPRs as appropriate, including as set out below.

Chaarat CPR

The Company has started addressing various recommendations set out in the Chaarat CPR as follows:

Social and Community Risks

In respect of the use of land for grazing livestock, the land-plot owned by the Company under the Chaarat Gold Project Licenses has been transformed from agricultural and forestry lands to industrial category. In accordance with the laws of the Kyrgyz Republic industrial lands are not used for grazing livestock. In August 2018 the Company organized ESIA Public Hearings led by WAI. During these hearings no grievances regarding grazing land use were raised by local communities and the Company also confirmed that Company roads will be made available for herders use, if necessary.

Environmental Impact

The environmental baseline with all data required under Kyrgyz Republic laws was established in summer of 2018 using local consultants. An environmental monitoring plan was also developed and approved by competent state authorities. The first periodic monitoring was completed in late autumn of 2018.

Acid Rock drainage and metal leaching (ARD)

Preliminary test work identified that the majority of ARD in Tulkubash is from ore, which will be treated in Heap Leach Pad (HLP), and therefore is not considered to be a major issue. There is a limited amount of ARD which will be taken to a waste dump as part of uneconomic (below cut-off-grade) ore. The Company has started arrangements to perform additional test work to identify the potential impact and develop mitigation strategy.

Timeframes to obtain environmental permits

The Company has completed its review of Kyrgyz Republic legislation and confirmed timeframes to obtain necessary environmental permits, which has been accounted for in the Tulkubash Gold Project development schedule.

Personnel

The Company currently employs one Health and Safety Manager and three Safety Engineers, an Environmental Engineer with practical experience and knowledge of environmental aspects and a Community Relations Specialist with practical experience and knowledge of social aspects.

Operational Risks

The Tulkubash Gold Project plant design criteria take into account the elevation and wide range of temperature fluctuations. Allowance was made for slow-down of heap leach kinetics below 7 degrees Celsius.

Geohazards Risks

The Company has performed rock and avalanche studies using both international and local subject matter experts. The avalanche, rock-fall, debris-flow and other geohazards risks were identified in relevant reports, mapped and are expected to be accounted for during the design of the plant.

Economic Risks

The Company has verified feasibility study figures by obtaining quotes from various vendors and suppliers. The equipment and consumables supply contracts are being negotiated and are within Feasibility Study estimates. Mining cost was verified via competitive tender, the preferred mining contractor's rates were negotiated and the contractor has started mobilization to site.

Freight and Logistics Concerns

The Company has started mobilization of a mining contractor and started obtaining real-time data on freight and logistics costs. All costs incurred so far for mobilization of heavy machinery, camp and construction materials are within original estimates.

Kapan CPR

The Company also understands that Kapan is addressing, or has addressed, some of the items covered by recommendations in the Kapan CPR. In particular, Kapan has conducted internal investigations and initiated mitigation actions to prevent accidents (see paragraph 3 of Part III under "*Labour and health & safety issues at Kapan*") including to obtain portable gas analysers and distribute these to the workforce, implement new administrative controls, provide additional training, commission new ventilation systems, conduct regular air quality controls and obtain mine fleet exhaust gas checking equipment. Following completion of the Kapan Acquisition, the Company intends to address the recommendations in the Kapan CPR which then remain outstanding as and when appropriate.

In addition, the Kapan CPR identifies project financial results as provided by PMTL that are higher than Chaarat management's case. The PMTL case includes the mining of resources which are not yet converted to reserves. While Chaarat management believes there is a high probability of converting these resources to reserves, compliance with JORC reporting standards does not allow the inclusion of resources not yet sufficiently defined to be classified as reserves. Additionally, Chaarat management, after reviewing the PMTL mining plan used to support the Kapan CPR financial model, believe the mining plan is overly optimistic. Chaarat management, working with CSA, developed an alternative mining plan and prepared a financial model based on that mining plan. The alternative mining plan provides a more balanced production schedule. The Chaarat management case is based on the same unit operating costs as the Kapan CPR case but the capital expenditures have been increased to more adequately cover mining equipment rebuilds and replacements. The increase in capital expenditures for mining equipment is $6.4 million over the life of the mine reserves base. The Chaarat management case indicates a net present value of $70 million.

9. FINANCIAL INFORMATION ON KAPAN AND THE GROUP

Part V of this document contains historical financial information on Kapan for three years ended 31 December 2015, 2016, 2017 and for the six month period ended 30 June 2018, along with an unaudited pro forma statement of net assets of the Group.

In accordance with Rule 28 of the AIM Rules for Companies, the Company has not included in this document historical information in respect of itself as is normally required by Section 20 of Annex I.

The Company's historical reports and accounts can be accessed on the Company's website at www.chaarat.com.

10. CURRENT TRADING AND PROSPECTS

The companies that will comprise the Group following Re-Admission, assuming that the Kapan Acquisition is completed, generated combined revenues of US$29.7 million during the six months ended 30 June 2018, and a combined loss before tax of US$4.3 million.

The Directors believe that the Group, following completion of the Kapan Acquisition, will have a portfolio of assets that will be immediately cash-generative. The Directors will be focusing the majority of their efforts in integrating the Kapan Mine, raising additional funding to continue developing the Chaarat Gold Project and identifying further acquisitions in line with the Company's growth strategy.

Further information on current trading and prospects at the Chaarat Gold Project and the Kapan Mine are set out below.

The Chaarat Group

Currently, the Chaarat Group's main priority is continued exploration drilling at Tulkubash. Drilling in the second half of this year has focused on developing resources in Segment I and Segment IV that could have the potential to add reserves to the project. Drilling in Segment I is targeting oxide mineralization on the footwall and hanging wall of the main pit that has the potential to expand the pit design. At the end of the season, two drill rigs were in operation on site and the programme has been completed with approximately 20,500 metres drilled. The drilling was impacted by adverse weather and logistical issues (drill water shortages). The drill water shortages were caused by an abnormally dry spring and summer during the year. Steps are being taken to engineer a water delivery system to preclude reoccurrence of this during future drill campaigns. This year's exploration in Segment V has

confirmed that the Tulkubash oxide mineralization continues to the northeast and represents an attractive target for follow-up drilling in the 2019 season. In addition, construction of site infrastructure and detailed engineering are underway in order to accelerate fast track development with the mobilization of the mining/earthworks contractor at the site. Subject to funding, the Company expects full-scale construction of the Tulkubash heap leach project to begin in the second quarter of 2019 and sees the potential to increase the existing Tulkubash resources and reserves prior to the planned first gold pour in 2020.

The Kapan Mine

During the 6 months to 30 June 2018, the Kapan Mine generated revenue of approximately US$29.7 million, an operating profit of approximately US$1.5m and total comprehensive income of US$811,000. During that period, the Kapan Mine experienced two production interruptions; the first related to the mine ventilation failure in March which sadly resulted in a fatality, and the second a strike by employees which was precipitated by a nation-wide protest for higher wages. The area of the mine where the fatality occurred remains closed at this time and Kapan agreed a pay rise of 10 per cent. in order to end the strike.

During the year, several improvements and expansions have been completed at the mine, including an increase of ventilation capacity from 380 cubic meters per second to 450 cubic meters per second, achieved by the installation of new vent fans at Adits 6 and 12. The mill has been improved and benefits are expected to be seen from early 2019.

Despite the temporary closures of the mine, tonnes mined and milled during the year to date are slightly ahead of the budget.

11. WORKING CAPITAL

It is the opinion of the Directors, having made due and careful enquiry, that, taking account of the net proceeds of the Kapan Acquisition Financing and the Company's ability to draw down funds under the Labro Loan Agreement, the working capital available to the Company and its group will be sufficient for its present requirements, that is for at least twelve months from the date of Re-Admission.

12. LOCK-INS AND ORDERLY MARKET ARRANGEMENTS

Upon Re-Admission, the Directors, their related parties and applicable employees (each as defined in the AIM Rules) will hold an aggregate of 151,795,474 Ordinary Shares representing 38.41 per cent., of the Ordinary Shares and have undertaken to the Company and the Nomad that they will not, except in certain limited circumstances, sell or dispose of any of their respective interests in Ordinary Shares for a period of 12 months immediately following Re-Admission. They have further undertaken that, after the expiry of such 12 month period, they will not, except in certain limited circumstances, make any such sale or disposal save through the broker of the Company for the time being and in such manner as the broker may reasonably require so as to maintain an orderly market in the Ordinary Shares.

Upon Re-Admission, the Directors, their related parties and applicable employees will have options over an aggregate of 4,200,000 Ordinary Shares and have undertaken to the Company and the Nomad that they will not, except in certain limited circumstances, sell or dispose of any of their respective interests in such Ordinary Shares for a period of 12 months immediately following Re-Admission. They have further undertaken that after the expiry of such 12 month period, they will not, except in certain limited circumstances, make any such sale or disposal save through the broker of the Company for the time being and in such manner as the broker may reasonably require so as to maintain an orderly market in the Ordinary Shares.

13. CORPORATE GOVERNANCE

The Company is guided by the 10 principles set out in the Quoted Companies Alliance's Corporate Governance Code (2018). Continuous assessment and an emphasis on continuing improvement are the foundation of the Company's approach to corporate governance, and all employees of the Group are encouraged to contribute ideas to improve operations whether these relate to safety or efficiency.

In addition, the BCA contains provisions which codify various directors' duties and liabilities and shareholder rights which apply to all BVI companies, including the Company.

The Board

The Board is responsible for formulating, reviewing and approving the Company's strategy, budgets and corporate actions. The Board will meet regularly throughout the year. To enable the Board to perform its duties, each Director will have full access to all relevant information and to the services of the Company Secretary. If necessary, the non-executive Directors may take independent professional advice at the Company's expense. The Board includes four non executive Directors, of whom three are independent. It is intended to appoint a further independent non-executive Director in due course. The Board has delegated specific responsibilities to the committees below.

In line with its current practice, the Company's Chief Financial Officer will not be a member of the Board at Re-Admission. The Board does not currently consider it necessary for the Chief Financial Officer to be a Director of the Company, and is confident that the Board as currently constituted has strong financial experience sufficient for the Company's current requirements. The Chief Financial Officer prepares materials for Board meetings and is invited to attend Board meetings to provide input and analysis, and to challenge the Board on areas such as forecasting and budgeting. The Chief Financial Officer is fully involved in the day to day management of the Company, its strategy and business. The audit committee has full access to the Chief Financial Officer in order to ensure it is comfortable with the Company's financial accounting and reporting framework and to ensure continued compliance with the AIM Rules. The Board will keep this matter under consideration.

The Company has established the following committees, which have adopted the following terms of reference:

Remuneration Committee

The remuneration committee is a sub-committee of the Board and is established to achieve the Board's aim to ensure that the Company's directors and senior executives are fairly rewarded for their individual contributions to the Company's overall performance by determining their pay and prerequisites. The Board seeks to demonstrate to all shareholders that the remuneration of the senior executive members of the Company is set out by a committee of the Board who will give due regard to the interests of the shareholders and to the financial and commercial health of the Company (the "**Remuneration Committee Objectives**").

The remuneration committee is appointed by the Board and comprises at least 2 independent non-executive directors of the Company (so far as possible). Currently, the remuneration committee comprises Gordon Wylie as chair and Hussein Barma and Martin Wiwen-Nilsson, all of whom are non-executive directors with Gordon Wylie and Hussein Barma both being independent (the "**Remuneration Committee**"). Members of the Remuneration Committee shall serve for periods of up to three years which may be extended for two further three year periods provided the director remains independent. Meetings of the Remuneration Committee shall be held as required but not less than twice a year, at which a quorum is two members. Each member shall have one vote which may be cast only if the member attends the meeting. Members with a direct or indirect personal interest in the matters considered at the meeting shall not be permitted to vote. Save where he has a personal interest, the chairman of the Remuneration Committee will have the casting vote.

In order to achieve the Remuneration Committee Objectives, the Remuneration Committee shall follow certain duties and terms of reference, which include: (A) agreeing the framework for the remuneration of the Company's executive management; (B) ongoing review of the remuneration policy, and the Company's arrangements for its employees to raise concerns about possible wrongdoing; (C) approving all service contracts; (D) determining the policy for pension arrangements; (E) establishing the selection criteria, selecting, appointing and setting the terms of reference for any remuneration consultants who advise the Remuneration Committee and to obtain reliable information about remuneration in other companies; and (F) making a report each year to the shareholders on behalf of the Board addressing, *inter alia*: directors' remuneration, the Company's general policy on executive remuneration, details of all elements of the directors' remuneration package, information on share options, information on grants under executive share options, pension entitlements, information on annual bonuses, any service contracts which provide for, or imply notice periods in excess of one year and shareholdings and other

relevant business interests and activities of the directors, which should continue to be disclosed as required in the BCA and the AIM Rules.

Audit Committee

The audit committee is a sub-committee of the Board and is established to increase shareholder confidence and the credibility and objectivity of published financial information, to assist the Board in meeting their financial reporting responsibilities, to strengthen the independent position of the Company's external auditors by providing channels of communication between them and non-executive directors and to review the performance of the auditors (the "**Audit Committee Objectives**").

The audit committee is appointed by the Board and comprises at least two independent non-executive directors of the Company (so far as possible) one of whom shall have recent and relevant financial experience. Currently, the audit committee comprises Hussein Barma as chair and Gordon Wylie and Martin Wiwen-Nilsson, all of whom are non-executive directors with Hussein Barma and Gordon Wylie both being independent, and Hussein Barma brings to the committee his knowledge and experience as a chartered accountant (the "**Audit Committee**"). Members of the Audit Committee shall serve for periods of up to three years which may be extended for two further three year periods provided the director remains independent. Meetings of the Audit Committee shall be held as required but not less than twice a year, at which a quorum is two members. Each member shall have one vote which may be cast only if the member attends the meeting. Members with a direct or indirect personal interest in the matters considered at the meeting shall not be permitted to vote. Save where he has a personal interest, the chairman of the Audit Committee will have the casting vote.

In order to achieve the Audit Committee Objectives, the Audit Committee shall follow certain duties and terms of reference, which include: (A) monitoring the integrity of and reviewing the financial statements of the Company; (B) reviewing the Company's interim and annual financial statements before submission to the Board for approval; (C) reviewing and challenging where necessary accounting policies, unusual transactions, disclosure in the Company's financial reports and material information in financial statements; (D) where requested by the Board, reviewing the annual report and accounts; (E) reviewing internal controls and risk management systems; (F) reviewing arrangements for employees to raise concerns about possible wrongdoing; (G) considering and making recommendations to the Board regarding an internal audit function; (H) considering and making recommendations to the Board regarding the Company's external auditor; (I) regularly meeting with the external auditor; (J) reviewing and approving the annual audit plan; (K) reviewing the finding of the audit; (L) reviewing any representation letter(s); (M) reviewing the management letter and management's response to the auditor's findings and recommendations; (N) developing and implementing a policy of the supply of non-audit services by the external auditor; (O) reporting formally to the Board on its proceedings; (P) making whatever recommendations to the Board it deems appropriate on any area within its remit where action or improvement is needed; (Q) compiling a report to shareholders on its activities to be included in the Company's annual report; and (R) considering such other matters as may be requested by the Board.

Technical Committee

The technical committee is a sub-committee of the Board and is established to, amongst other things, provide advice to the Company's Board on the Company's technical functions (the "**Technical Committee**"). The Technical Committee's main functions are: (A) to review and approve the Company's technical disclosures and to ensure technical excellence of the Company's ongoing technical workstreams; (B) to provide advice to the Board about the scope of the Company's standards; (C) to make decisions on such technical functions as are delegated by the Board; (D) to provide advice to the Board about further development, modification, and the technical and operational interpretation of the Company standards/sustainability criteria and the application of these interpretations; (E) to review and comment on the KPI reporting of accreditation bodies commissioned by the Company; (F) to address and give views on specific matters on which the Board requests advice; (G) to propose topics for the establishment of subject related the Company's working groups and working group membership composition; (H) to develop and approve the Company's working groups' terms of reference; (I) to review and provide advice and guidance on the work and output from the Company's working groups; and (J) to be responsible for the content of the certification requirements for mining and exploration, and relevant associated information.

The Technical Committee comprises a maximum of 4 members. Candidates for appointment as a member are identified by the Nominations Committee (defined below) and appointed by a two-thirds majority of the votes at a duly convened meeting of the Technical Committee. Currently, the Technical Committee comprises Robert Benbow (who is an executive director) as chair and Gordon Wylie and Robert Edwards, both of whom are independent non-executive directors. Members are initially appointed for a 3 year term and are eligible for re-appointment.

The Board has appointed the chair for a period of 3 years on the expiry of which the chair shall be required to seek re-election. Where the chair has held two consecutive 3 year terms of office, s/he must vacate the position for a period of not less than 1 year. The chair leads the Technical Committee and engages members on issues arising for Board and CEO consideration, reporting to the Board on the work of the Technical Committee. The chair and the CEO shall be invited to attend for all or part of any meeting as considered appropriate, but have no right to vote.

The Technical Committee shall meet 3 times a year.

Nominations Committee

The nomination committee is a sub-committee of the Board (the "**Nomination Committee**") and is established to, amongst other things: (A) regularly review the requirements of the Board compared to its current position and make recommendations; (B) give full consideration to succession planning for directors and other senior executives; (C) identify and nominate for the approval of the board, candidates to fill Board vacancies; (D) prepare a description of the role and capabilities required for a particular appointment; (E) keep under review the leadership needs of the organisation to compete effectively in the marketplace; (F) keep up to date and fully informed about strategic issues and commercial changes; (G) review annually the time required from non-executive directors; (H) ensure that on appointment to the board, non-executive directors receive a formal letter of appointment setting out clearly what is expected of them; (I) seek advice from the Company's Nomad at the earliest opportunity about any proposed changes to the board and succession planning; and (J) make various recommendations to the board on the above and also on membership of the other committees and the re-appointment of directors.

The members of the Nomination Committee, the majority of which should be independent non-executive directors, are appointed by the Board. The Board has appointed the chair of the Nomination Committee who should be either the chair of the Company or an independent non-executive director. Currently, the Nomination Committee comprises Martin Andersson (the executive Chairman of the Company) as chair together with all other directors. Appointments to the Nomination Committee are for a period of up to 3 years, which may be extended for two further periods of three years. The Committee shall have at least two members and a quorum shall be any 2 independent non-executive director members. The members of the Nomination Committee can be varied at any time by a majority resolution of the existing members of the Nomination Committee.

Each member of the Nomination Committee has one vote which may be cast on matters considered at the meeting. Votes can only be cast by members attending a meeting of the Nomination Committee. If a matter that is considered by the Nomination Committee is one where a member of the Nomination Committee, either directly or indirectly has a personal interest, that member shall not be permitted to vote at the meeting. Save where he has a personal interest, the chairman will have a casting vote. The Committee will meet at least 3 times a year but may meet at other times during the year as agreed between the members of the Nomination Committee. Other directors and external advisers may be invited to attend all or part of any meeting as and when appropriate. The company secretary shall be the secretary of the Nomination Committee.

The Nomination Committee is authorised by the board of directors to examine any activity within its terms of reference and is authorised to have unrestricted access to the company's external auditors and to obtain, at the company's expense, professional advice on any matter within its terms of reference, including from the Company's Nomad. The Nomination Committee is authorised to seek any information it requires from any employee or director, and all such employees or directors will be directed to co-operate with any request made by the Nomination Committee.

HSE Committee

The health, safety and environment ("**HSE**") and community committee is a sub-committee of the Board (the "**HSE and Community Committee**") and is established to, amongst other things, provide advice to the Company Board on the Company's HSE and community functions. The HSE and Community Committee's main functions are: (A) to ensure that the Company safeguards the health of its employees, contractors and the public; (B) to ensure that the Company maintains safety and respect for the environment; (C) to ensure that the adopted standards and procedures meet relevant requirements; (C) to ensure that health and safety hazards and environmental impacts have been fully assessed and mitigated; (D) to ensure that all personnel are properly trained; (E) to undertake regular monitoring of the Company's operational activity; (F) to review and approve the Company's HSE and community plans and procedures; (G) to provide advice to the Board about the scope of the Company's HSE and community standards; (H) to make decisions on such HSE and community functions; (I) to provide advice to the Board and the CEO about further development of the Company's HSE and community standards; (J) to review and comment on the KPI reporting of any HSE and community accreditation bodies commissioned by the Company; (K) to address and give views on specific HSE and community matters; (L) to propose topics for the establishment of the Company's HSE and community working groups; (M) to develop and approve the Company's HSE and community working groups' terms of reference; (N) to provide advice and guidance on the Company's HSE and community working groups; and (O) to maintain responsibility for advising the Board and the CEO on the form and content of meetings.

The HSE and Community Committee comprises a maximum of 4 members all of whom shall be directors of the Company. Currently, this committee comprises Gordon Wylie, as chair, and Robert Benbow and Robert Edwards. The Board has appointed the chair for a period of 3 years on the expiry of which the chair shall be required to seek re-election. Where the chair has held two consecutive 3 year terms of office, s/he must vacate the position for a period of not less than 1 year. Candidates for appointment as a member are identified by a nominations committee and appointed by a two-thirds majority of the votes at a duly convened meeting of the HSE and Community Committee. Members shall initially be appointed for a 3 year term and are eligible for re-appointment.

The HSE and Community shall select relevant issues and topics for its focus and discussion in pursuit of its objectives. The chair shall consult with the Board and the CEO to also suggest topics for the HSE and Community Committee's consideration. Only members have the right to attend HSE and Community Committee meetings. The chair and the CEO shall be invited to attend for all or part of any meeting as considered appropriate, but have no right to vote. Others such as the chair(s) of any working groups, committees, advisory bodies or similar may be invited to attend for all or part of any meeting, as and when appropriate.

The HSE and Community Committee shall meet 3 times a year.

The share dealing code

The Company has adopted a share dealing code for the Directors and its employees, which is appropriate for a company whose shares are admitted to trading on AIM (in order to, among other things, ensure compliance with the UK Market Abuse Regulation and Rule 21 of the AIM Rules). The Company will take all reasonable steps to ensure compliance with the terms of the share dealing code by the Directors and their connected persons and employees.

CZ Anti-bribery and Anti-corruption Policy

CZ has adopted an anti-corruption and bribery policy 2017 (the "CZ Anti-Bribery Policy"), which sets out its policy to conduct all its business in an honest and ethical manner, and takes a zero-tolerance approach to bribery and corruption. The CZ Anti-Bribery Policy applies to all individuals of, and associated with, CZ including its subsidiaries or their employees. The CZ Anti-Bribery Policy outlines a procedure whereby employees and associated persons should submit requests for proposed hospitality and promotional expenditure in excess of USD 1,000 in advance to the compliance director for approval, and outlines how to raise concerns on suspicion of malpractice.

Appendix 1 to the CZ Anti-Bribery Policy sets out certain extracts from the Criminal Code of the Kyrgyz Republic and applicable punishments (fines and/or imprisonment).

Chaarat Anti-bribery and Anti-corruption Policy

Chaarat has adopted an anti-corruption and bribery policy, which applies to the Group as a whole and which supplements the CZ Anti-Bribery Policy (the "**Chaarat Anti-Bribery Policy**").

The Chaarat Anti-Bribery Policy sets out the key principle of the Group to avoid any involvement in corrupt or illicit activities or conduct and records the Group's commitment to uphold all laws relevant to countering bribery and corruption in all jurisdictions in which the Group operates, including the Bribery Act 2010 (the "**Bribery Act**").

The Chaarat Anti-Bribery Policy applies to all persons working for any member of the Group or on its behalf at all levels and grades, including senior managers, officers, directors, employees (whether permanent, fixed-term or temporary), consultants, contractors or any other person associated with the Group, wherever located. A person 'associated' with the Group is any person who works or performs services in any capacity and in any place, for, or on behalf of, any member of the Group.

The Chaarat Anti-Bribery Policy names Sergei Zhukov as compliance officer and as compliance director for the purposes of the CZ Anti Bribery Policy.

The Chaarat Anti-Bribery Policy sets out (*inter alia*):

- what constitutes bribery for the purposes of the Bribery Act (with examples of giving and receiving a bribe), and the prohibition on bribery;
- the prohibition on bribery of a foreign official;
- rules governing corporate hospitality and gifts (and does not prohibit normal and appropriate hospitality (given and received) to or from third parties, for the purposes of establishing or maintaining good business relationships, improving or maintaining the Group's image or reputation or marketing or presenting the Group's products and/or services effectively;
- the prohibition on making facilitation payments (being small payments made to secure or speed up routine actions, usually by public officials, such as issuing permits or approvals, immigration controls, providing services or releasing goods held in customs);
- the Group's policy as regards political and charitable donations (being not to make contributions to political parties, to the campaign funds of any person standing for election or to lobbying or pressure groups);
- the Group's record keeping requirements (being that all payments made or received on behalf of the Group shall be accounted for and properly recorded in the Group's financial records in accordance with applicable laws);
- staff responsibilities as regards the Chaarat Anti-Bribery Policy, and communication/reporting procedures.

The Chaarat Anti-Bribery Policy provides that regular training on will be provided as necessary to all members of staff. Further, it is agreed that the board will monitor the effectiveness and review the implementation of the Chaarat Anti-Bribery Policy, regularly considering its suitability, adequacy and effectiveness. Any improvements identified will be made as soon as possible. Internal control systems and procedures will be subject to regular audits to provide assurance that they are effective in countering bribery and corruption.

14. TAXATION

Your attention is drawn to the information relating to the UK and BVI tax implications applicable to investors holding Ordinary Shares as an investment contained in paragraph 15 of Part VI of this document.

15. DIVIDEND POLICY

The nature of the Company's business means that it is unlikely that the Directors will recommend a dividend in the early years following Re-Admission as any cash surpluses are likely to be reinvested into the Group's business. The Directors believe the Company should seek to generate capital growth for its

Shareholders but may recommend distributions at some future date, depending upon the generation of sustainable profits and creation of sufficient reserves, when it becomes commercially prudent to do so.

16. SHARE OPTIONS

As at the date of this document, there are in issue 23,704,609 Options. Details of such Options are included in paragraphs 2.9 and 4.2 of Part VI of this Document.

The Directors intend to implement an incentive scheme to reward Directors and certain employees. It is intended that the proposed incentive scheme if approved will provide for three main elements: (i) conversion of existing Option plans into a new uniform scheme; (ii) a one-off grant of equity equal to around 5 per cent. of the outstanding share capital at the date of Re-Admission; and (iii) Options equal to around 3 times of equity granted under the scheme at a strike price of 42p per Ordinary Share to the Board and senior managers which will be subject to a vesting schedule.

The first element of the scheme will require conversion of vested and unvested Options into Ordinary Shares based on a price of 33p per Ordinary Share; these will have a three year vesting period and if an employee leaves during this period the unvested Options will lapse. This first element will also require consent from the existing Option holders to join the new incentive plan and, if all holders consent, would result in around 6,471,873 new Ordinary Shares.

The second element of the scheme is expected to comprise a one-off grant of 19,731,156 new Ordinary Shares forming part of future remuneration packages.

The third element of the Scheme is expected to comprise 59,193,469 Options which will have a similar three year vesting period with the same consequences if an employee leaves. Delivery of vested Ordinary Shares will be made on the basis of 50 per cent. of the entitlement at the date of vesting with the remaining part of the entitlement to be delivered at the end of year three, whether or not in employment at such time.

Conversion of the existing Options into Ordinary Shares and full grant of new Options and new equity is expected to represent approximately 14 per cent. of the Company's fully diluted share capital as at Re-Admission, assuming implementation of the new incentive scheme described at paragraph 16 of this Part I of this document and full exercise or conversion of all Options, Warrants and Convertible Loan Notes.

The board will have full discretion to amend the incentive scheme or adjust unvested Ordinary Shares and options. The senior managers of the Company that will participate in the new incentive scheme will not be entitled to cash bonuses during the three year vesting period. The scheme will make provision for future employees.

The Company intends to propose a special resolution in the near future to increase or remove its current authorised share capital limit of 600,000,000 Ordinary Shares in order to enable it, among other things, to implement this incentive scheme in full.

Please also refer to paragraph 13.2 of Part VI of this document regarding potential issues of Ordinary Shares to Artem Volynets and Dmitry Yudin.

17. DEALING ARRANGEMENTS AND CREST

The Company, through the Depositary, has established a depositary arrangement whereby Depositary Interests established pursuant to a deed of trust executed by the Depositary and representing Ordinary Shares, are issued to investors who wish to hold their Ordinary Shares in electronic form within the CREST system. The Depositary Interests will continue to be admitted to CREST with effect from Re-Admission. Accordingly, settlement of transactions in Ordinary Shares, represented by Depositary Interests, following Re-Admission may take place within the CREST system if the relevant investors so wish. CREST is a UK electronic paperless share transfer and settlement system, which allows shares and other securities (including Depositary Interests) to be held in electronic rather than paper form. The Ordinary Shares may be traded using this system. Please note that CREST is a voluntary system and holders of shares who wish to receive and retain share certificates will also be able to do so.

Further details of the depositary arrangements are set out in paragraphs 7.1, 7.2 and 7.3 of Part VI of this document.

Further information regarding the depositary arrangement and the holding of Ordinary Shares in the form of Depositary Interests is available from the Depositary located at The Registry, 34 Beckenham Road, Beckenham, Kent, BR3 4TU.

18. TAKEOVERS AND MERGERS

As a BVI incorporated company, the Company is not directly subject to any restrictions on takeover offers such as those which exist in the UK pursuant to the UK Takeover Code. However, the Company has included in the Chaarat Articles provisions dealing with takeover bids, squeeze-out and sell-out, a summary of which is contained in paragraph 3.1(b)(xix) of Part VI of this document, including a provision which states that the Directors have the right (but not obligation) to require any holder of more than 20 per cent. of the Ordinary Shares to make a mandatory offer to all the Company's shareholders to acquire their Ordinary Shares if they acquire an additional interest in any Ordinary Shares. The Directors have previously exercised their discretion to waive the requirement for a mandatory offer when the Concert Party acquired Ordinary Shares in excess of a 20 per cent. holding. Further details of the Concert Party are set out in paragraph 4.7 of Part VI of this document.

19. GENERAL MEETING

A notice convening a General Meeting of the Company to be held at 11a.m. (UK time) on 31 December 2018 at the offices of Watson Farley & Williams LLP, 15 Appold Street, London, EC2A 2HB is set out at Part VII of this document. At that meeting, the Resolution will be proposed in order to seek shareholder approval for the Kapan Acquisition as required by the AIM Rules.

If you have sold or otherwise transferred all of your Ordinary Shares since the date of this document, please forward this document at once to the purchaser or transferee or to the bank, stockbroker or other agent through whom you have sold or transferred your shares for delivery to the purchaser or transferee. If you have acquired Ordinary Shares since the date of this document, please refer to the notice of General Meeting contained in Part VII of this document for details of the General Meeting and the Resolution. If you require any assistance, please contact the Company's Registrars, Link Asset Services, 34 Beckenham Road, Beckenham, Kent, BR3 4TU (telephone number: UK – 0871 664 0300 or from overseas +44 (0)371 664 0300). Calls cost 12p per minute plus your phone company's access charge. Calls outside the United Kingdom will be charged at the applicable international rate. The Registrars are open between 09:00 – 17:30, Monday to Friday excluding public holidays in England and Wales.

20. ADDITIONAL INFORMATION

Your attention is drawn to the information included in the rest of this document. In particular, you are advised to consider carefully the risk factors set out in Part III of this document.

21. ACTION TO BE TAKEN

Shareholders will not receive a Form of Proxy or Form of Direction for the General Meeting in the post. Instead, Shareholders will receive instructions to enable you to vote electronically and how to register to do so, and Depositary Interest Holders will be able to vote in Crest. Shareholders will still be able to vote in person at the General Meeting, and may request a hard copy Proxy Form directly from the Registrars, Link Asset Services, 34 Beckenham Road, Beckenham, Kent, BR3 4TU (telephone number: UK – 0871 664 0300 or from overseas +44 (0)371 664 0300). Calls outside the United Kingdom will be charged at the applicable international rate. The Registrars are open between 09:00 – 17:30, Monday to Friday excluding public holidays in England and Wales.

22. RECOMMENDATION AND VOTING INTENTIONS

The Directors consider that the terms of the Kapan Acquisition are in the best interests of the Shareholders and the Company as a whole.

Accordingly, the Directors unanimously recommend that you vote in favour of the Resolution necessary to approve and implement the Kapan Acquisition.

In addition, Labro, Martin Wiwen-Nilsson and Richard Rae have irrevocably undertaken to vote in favour of the Resolution in respect of the Ordinary Shares respectively held by them, totalling 142,820,162 Ordinary Shares (representing 36.14 per cent. of the Ordinary Shares).

Yours faithfully,

Martin Andersson
Executive Chairman

PART II

INFORMATION ON THE CHAARAT GOLD PROJECT AND THE KAPAN MINE

PART A: THE CHAARAT GOLD PROJECT

This Part A of this Part II of this document is extracted without amendment from the executive summary of the Chaarat CPR, which is prepared in accordance with the JORC Code.

1. PROPERTY DESCRIPTION

The Chaarat Gold Project is located at latitude 42°1'6.91" north (N) and longitude 71°9'39.04" east (E), in the Sandalash Range of the Alatau Mountains, in the Jalal-Abad Province of north- western Kyrgyz Republic, close to the border with Uzbekistan. The Chaarat Gold Project area is located approximately 300 km southwest of the capital Bishkek, 75 km upstream and northeast of the regional administrative centre of Jany-Bazar in the Chatkal Valley, and 300 km by road from the nearest railway station in Shamaldy-Say (Figure 1).

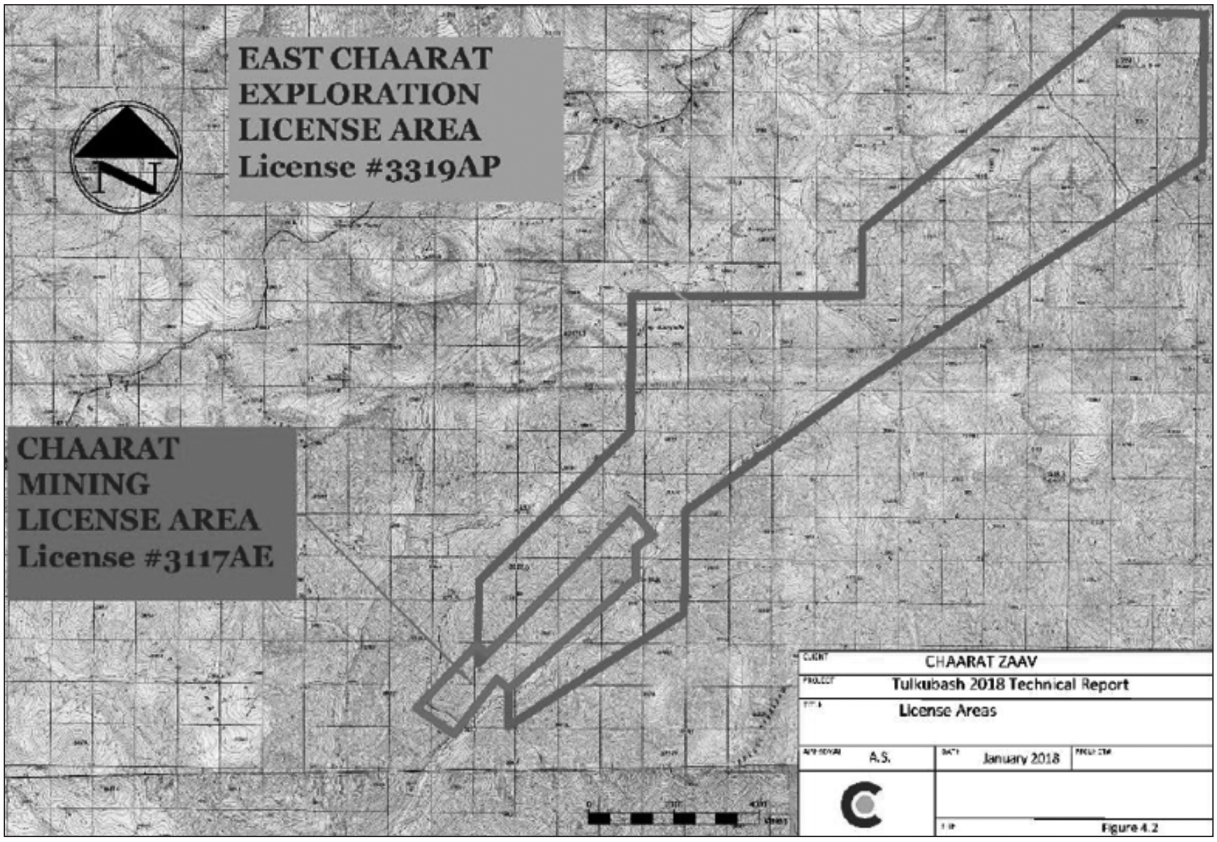
CZ holds two licenses controlling the Chaarat Gold Project: a mining (or production) license of 7.0003 km^2 covering the defined Mineral Resources and an exploration license of 67.7600 km^2 covering prospective ground along trend to the northeast (Table 1; Figure 2).

Figure 1 Chaarat Gold Project Location Map

Table 1 Chaarat Gold Project Mineral Assets

Asset	Holder	Interest (%)	Status	Licence Expiry Date	License Area (km^2)	Comments
Chaarat Gold Project, Kyrgyz Republic	Chaarat Zaav CJSC	100	Mining	25th June 2032	7.0003	Mining License 3117AE
Chaarat Gold Project, Kyrgyz Republic	Chaarat Zaav CJSC	100	Exploration	7th October 2023	67.7600	Exploration License 3319AP

Figure 2 Chaarat Gold Project License Areas



2. GEOLOGICAL SETTING AND MINERALISATION

Regional Geology

The Chaarat Gold Project is located within the Tien Shan Metallogenic Belt, a Hercynian fold and thrust belt spanning Central Asia. The belt extends for 2,500 km between Uzbekistan in the west, passing through Tajikistan and the Kyrgyz Republic into north-western China. The belt contains many significant gold deposits including Muruntau and Kumtor (Porter 2006).

The Chaarat Gold Project is located within the Middle Tian Shan province, which is composed of forearc accretionary Late Devonian-Carboniferous rocks. The province was subsequently subject to intense folding and thrusting during the upper Palaeozoic.

The Chaarat District is located 35 km southwest of the Talas-Fergana Fault (TTF) and movement on the TTF lead to the formation of the sinistral Sandalash Fault Zone (SFZ). The SFZ includes the Irisay Fault, the Tulkubash Structural Zone, the Contact Fault, and the Main Zone Fault. These structures, except the Irisay Fault are all associated with gold mineralisation.

Property Geology

The Sandalash River valley exposes a northeast-trending sequence of Cambro-Ordovician siliciclastic rocks, known as the Chaarat Formation. The Chaarat Formation has been overthrust by Devonian-age quartzites termed the Tulkubash Formation. Mineralisation is located within the north-western limb of an open anticline, striking north-easterly and dipping 40 to 70° northwest. Permo-Triassic-age granodiorites and diorite intrusions are closely associated with the gold mineralisation and in some areas are mineralised.

Mineralisation

The Chaarat Gold Project contains four main zones of mineralisation: the Tulkubash Oxide Zone, the Kyzyltash Sulphide Zone; comprising the Main Zone, and the Contact Zone. The Tulkubash and Kyzyltash zones are summarised below, with all known mineralised zones discussed in Section 3.1.2.

The Tulkubash zone consists of a mineralised structure trending northeast-southwest, dipping 55 to 75° to the northwest. The Tulkubash zone is interpreted to be a brittle shear zone developed from a sinistral strike-slip motion along the SFZ. Mineralisation occurs within zones of intense silicification and quartz flooding, forming individual gold-bearing lodes (5 to 45 m wide true thickness).

The Kyzyltash Zone consists of a series of sulphide-bearing ore bodies situated within two subparallel northeast-trending structural zones (traced of 10 km along strike). The ore consists of gold-arsenopyrite-stibnite-tetrahedrite mineralisation occurring in sheared and altered wall rock. The ore exhibits strong sericitic alteration, with lesser amounts of quartz, quartz vein stockwork, ankerite, and calcite gangue.

3. EXPLORATION

Mineralisation within the Chaarat Gold Project was first identified by Soviet-era soil and stream-sediment sampling. The Chaarat Gold Project forms part of a 40 km long geochemically anomalous zones along the Sandalash Valley. Their work identified 28 separate gold anomalous zones.

Since 2004, CZ has completed multiple exploration campaigns across the Tulkubash area, including: geological mapping, soil sampling, rock sampling, and trenching. These campaigns identified numerous gold geochemical anomalies, leading to the discovery of the Tulkubash deposit.

4. DRILLING

The Tulkubash drilling was initiated in 2007 with varying drill campaigns to date, both at surface and some limited underground drilling. Drilling has been completed by means of inclined diamond coring methods using contractor and CZ-owned equipment.

The multiple drilling campaigns are discussed in Section 3.4 and summarised in Table 2.

Table 2 Tulkubash Zone Drilling Summary

Surface			Underground		
No. of Drillholes	**Total Length (m)**	**No. of Samples**	**No. of Drillholes**	**Total Length (m)**	**No. of Samples**
492	67,667.1	48,752	11	1,091.70	324

Tetra Tech is of the opinion that drilling has been completed using methods and procedures that are consistent with recognised industry practices and that the data is adequate for Mineral Resource estimation of the Tulkubash zone.

5. MINERAL RESOURCE ESTIMATES

Sampling data was used to construct two wireframes in Leapfrog Geo v.4.2 software representing the mineralised structures of the Tulkubash zone. The wireframes were exported and estimated using Ordinary Kriging in Datamine Studio RM software. Variography and exploratory data analysis were completed using Snowden's Supervisor software.

All assay results are from diamond core holes. Samples are shipped from site to the ALS Global Laboratory in Kara-Balta, Kyrgyz Republic for sample preparation and assay. Gold is analysed using a 30 g fire assay with an atomic absorption spectroscopy finish. A quality control/quality assurance protocol is employed in the programme which includes standards and blanks in every batch of assays. Check assays are conducted on every 20th sample by a second independent laboratory.

Table 3 Tulkubash Zone Resource Summary Table (effective date 28th August 2018)

	Mineral Resource		
Classification	**Tonnes**	**Grade Au (g/t)**	**Contained Metal Au (tr oz)**
Measured	4,644,000	1.44	214,000
Indicated	28,010,000	1.33	1,199,000
Measured and Indicated	32,654,000	1.35	1,414,000
Inferred	4,600,000	0.62	91,000

Notes: Numbers are rounded in accordance with disclosure guidelines and may not sum accurately.

The following key assumptions were used to estimate the Tulkubash deposit Mineral Resources:

- The Mineral Resources were estimated using 10.0 m x 10.0 m x 5.0 m (x, y, z) blocks, with minimum sub-block dimensions of 2.0 m x 2.0 m x 1.0 m (x, y, z).
- The estimate was constrained to the mineralised zone using wireframe solid models. The wireframes were sub-domained to isolate the strongly mineralised main zone from the gold mineralisation in the main structural corridor.
- Grade estimates were based on 3.0 m composited assay data.
- The interpolation of the metal grades was undertaken using Ordinary Kriging.
- A cut-off grade of 0.30 g/t gold was applied to report the Mineral Resources.

6. ORE RESERVE ESTIMATES

The Tulkubash Ore Reserves, based on the open pit design, are estimated at 15,993 kt at a grade of 0.91 g/t of gold and 1.13 g/t of silver, with a gold content of 467,909 tr oz and a silver content 581,030 tr oz. The updated Mineral Resource estimate in the Chaarat CPR (effective 28th August 2018) reduces the Mineral Resource tonnage but increases the gold grade considerably from 0.91 g/t to 1.35 g/t (silver content remains the same) and consequentially increases the gold metal content but reduces the silver metal content. The open pit is also likely to increase in size, if not in depth then along strike, with a likely increase in Ore Reserves. A further pit optimisation and design will need to be completed in order to derive a new Ore Reserve.

Ore Reserve and Mineral Resource Statement

			Gross				Net Attributable			
	Classification	Tonnes	Grade Au (g/t)	Grade Ag (g/t)	Contained Metal Au (tr oz)	Contained Metal Ag (tr oz)	Tonnes	Grade (g/t)	Contained Metal (tr oz)	Operator
Ore Reserves Chaarat Gold Project	Proven	12,503,000	0.95	1.17	381,881	470,317	–	–	–	CGHL
	Probable	3,490,000	0.79	1.00	88,642	112,206	–	–	–	CGHL
	Total	15,993,000	0.91	1.13	467,909	581,030	–	–	–	CGHL
Mineral Resources Chaarat Gold Project	Measured	4,644,000	1.44	–	214,000	–	–	–	–	CGHL
	Indicated	28,010,000	1.33	–	1,199,000	–	–	–	–	CGHL
	Measured and Indicated	32,654,000	1.35	–	1,414,000	–	–	–	–	CGHL
	Inferred	4,600,000	0.62	–	91,000	–	–	–	–	CGHL
	Total	37,254,000			1,505,000	–	–	–	–	CGHL

Source: Joseph Hirst, BSc (Hons), MSc, EurGeol, CGeol estimated the Mineral Resources (Section 14.0).

John M. Marek, RM-SME of IMC estimated the Ore Reserves (Tetra Tech 2018).

Note: Mineral Resources that are not Ore Reserves do not have demonstrated economic viability.

Numbers may not add due to rounding.

7. MINING

The Tulkubash open pit forms part of a near-vertical mineralised lode system located in mountainous terrain. A pit optimisation was completed to guide the design of a single open pit that will break into a main pit and several satellite pits at lower gold prices during the life-of-mine. The six-year open pit LOM will include two years of pre-production (Tetra Tech 2018).

A mining contractor will operate the open pit using small-sized equipment suitable for the local terrain and life-of-mine. The excavation equipment will consist primarily of 4.5 m^3 bucket capacity back hoe excavators loading into 30 t nominal capacity road type tipper trucks. The truck selection is typical of contractors in this region as they offer flexibility for the contractor; however, more robust mining articulated dump trucks are recommended, as winter conditions may make it difficult for the selected trucks to negotiate the road. A full complement of ancillary equipment will be utilized for drilling and blasting. A maximum of 113 items of equipment have been estimated for use by the contractor.

A production schedule was developed that allows for two years of mine development during the pre-production period, followed by 3.75 years of mine production at an average of 4.5 Mt/a of ore at a strip ratio of 3.7. The total material to be mined is estimated at 83.3 Mt with an overall strip ratio of 4.2 over a six-year LOM. The updated Tulkubash Mineral Resource estimate (effective 28th of August 2018) may increase the Ore Reserve tonnage. As a result, the LOM will increase if the current production rates are maintained and may be further extended if a reduced production rate proves beneficial.

Labour will consist of local and Turkish manpower with some expatriate management and supervision. The 2018 Internal Feasibility Study (Tetra Tech 2018) estimates a maximum compliment of 521 personnel. While the manpower numbers may not increase, employment longevity may increase owing to the updated Mineral Resource estimate (effective 28th August 2018).

8. METALLURGIAL TESTING AND PROCESSING

Gold mineralization within the Chaarat Gold Project is divided into two styles: the Tulkubash mineralization (the Tulkubash zone), which is oxidized material, and the Kyzyltash mineralization (the Main and Contact zones), which is sulphide-rich, unoxidized refractory material.

The metallurgical studies indicate that the oxide ore is amenable to conventional cyanide heap leaching and can be efficiently processed using a heap-leach- based flowsheet.

Based on the metallurgical test work results, the life-of-mine (LOM) recovery for gold and silver was estimated to be 72.9% and 62.6%, respectively.

Recovery has been estimated in to the block model for a more accurate assessment of recoverable metal during the Ore Reserve process. The recovery has been applied in to four domains, based on logged intensity of oxidation from test-work results for each material type.

It was concluded that the heap leach test work was conducted in sufficient detail and to a level appropriate to support a feasibility study based on a heap-leach process option. There were no "red flag" issues in relation to heap leaching that may raise concern.

Gold mineralization within Kyzyltash occurs within two zones, the Main Zone and the Contact Zone. A total Mineral Resource of 5.4 Moz of gold has been identified within the Kyzyltash mineralization.

Limited metallurgical test work has been conducted on the samples from the Kyzyltash mineralisation. Test work completed to date has indicated that the mineralisation is refractory sulphidic and will require pre-oxidative treatment during processing. Production of concentrates for pre-oxidation has proved problematic and a whole ore treatment scenario is a possibility.

The 2015 Internal Feasibility Study (Nerin 2015) was based on a high-tonnage BIOX concentrate treatment scenario and did not include an evaluation of alternative treatment strategies. The study also did not include an analysis of throughput rates, grade profiles, development plans or optimized production from the Kyzyltash orebody.

Refractory gold projects are technically and commercially more challenging compared with conventional gold projects and require higher tonnages, grades and a longer mine life in order to support the higher operating and capital cost requirements. A comprehensive, systematic and methodical metallurgical test work program is recommended.

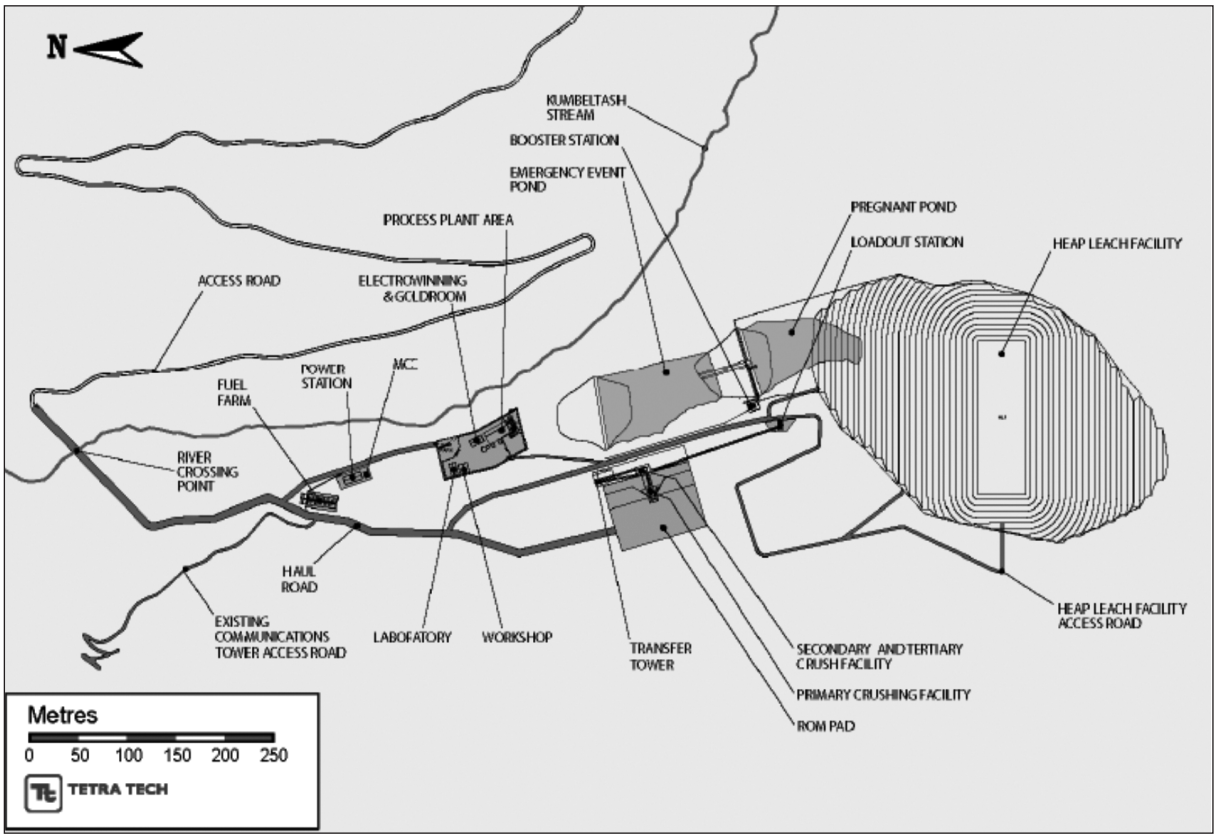
9. PROJECT INFRASTRUCTURE

The Chaarat Gold Project is located at the confluence of the Sandalash and Kumbeltash valleys, in the Alatau Mountains in western Kyrgyz Republic. The valleys have challenging topography with steeply-sloped sides running into the Sandalash River and Kumbeltash Stream below Stage 1 of the Chaarat Gold Project will extend the Tulkubash heap leachable oxide resource base and develop low capital intensity heap leach production. For Stage 1, the Chaarat Gold Project will require the development of the following infrastructure items:

- off-site infrastructure:
  - the Access Road, Chatkal Station and Kumbel Pass check point

- on-site infrastructure:
  - temporary contractor-supplied accommodation, batch plant, and mobile plant
  - water systems to supply, treat, and distribute plant water, fire water, and potable water
  - diesel-generator power station, diesel fuel farm, and power distribution to all facilities via two 10 kV feeder circuits; power generation capacity on site will be 4.8 MW
  - crushing facility, including ROM pad, primary crushing facility, secondary and tertiary crushing facility, and loadout station
  - process area, including ADR plant, electrowinning and gold room, cyanide storage facility, reagent storage facility, laboratory, process maintenance workshop, and administration building
  - HLF, comprising a heap leach pad; liner system with overliner drainage; catchment drains and underliner drainage; and pregnant solution, emergency, and attenuation ponds and dams
  - process controls and instrumentation
  - communications infrastructure
  - additional infrastructure, including gatehouse and weighbridge; explosive storage; ammonium nitrate (AN) storage, emergency response facility; accommodation camp; and mine maintenance workshop.

Figure 3 Chaarat Gold Project Site Layout



10. ENVIRONMENTAL STUDIES

For environmental and social aspects of the Chaarat Gold Project, the CPR review focussed on the draft ESIA report (WAI 2018) and 2018 Internal Feasibility Study (Tetra Tech 2018). Both documents made use of previous studies undertaken for the Chaarat Gold Project and these were also referred during the Chaarat CPR review.

In compliance with Kyrgyz Republic legislation, an environmental and social impact assessment was completed by an in-country consultant (Ken-Too 2015). A review and field surveys of soil, flora and fauna were carried out by Davletbakov and a social review by Leshem Scheffer (2011). Wardell Armstrong International (WAI) has subsequently undertaken a full ESIA with associated stakeholder engagement as per international standards for a Category A project (i.e., a project that has potential significant adverse risks and/or impacts that are diverse, irreversible or unprecedented).

Baseline studies have been carried out in the area of influence for the Chaarat Gold Project by the above-mentioned consultants. The information and data gathered were used along with economic and other information (e.g., the findings of a geohazards assessment) to undertake an analysis of alternatives for the mine and associated activities. Owing to the terrain and prevailing site conditions, the heap leach facility could only be sited in the "dry valley" (which has no perennial stream). Other infrastructure was positioned around this fixed-point taking cognisance of physical and environmental factors. A no-go option was included in the analysis of alternatives; stakeholders were involved in the analysis of alternatives and design processes. Environmental and social risks associated with the overall design and layout have been minimised (in the case of negative impacts or enhances in case of positive impacts) through the application of good international industry practice, particularly the use of the mitigation hierarchy (i.e., avoid-reduce- mitigate-compensate). The ESIA report states there is no economic displacement associated with the HLF site. However, there is a herdsman who grazes his animals and other peoples' animals on land that will be in the Chaarat Gold Project footprint; the herdsman attended a consultation meeting and this information was shared with the attendees. Although he referred to other land being available, and his livelihood would not be affected, it is essential that a formal process takes place and there is a documented agreement. His livelihood is based on the land and this loss of access amounts to small-scale economic resettlement. Without due process, CGHL is exposed to risk if this was challenged at a later date (by the herdsman or other third parties).

Sources of potential impacts include the open pit, heap leach, emergency event pond, ADR plant, WRD, power plant, camp, storage areas (explosives and reagents), waste transfer facility and areas such as roads, all with their associated activities. WAI asserted the only significant impact on hydrology and geohydrology is acid rock drainage (ARD) and metal leaching. However, it should be noted that: (a) there is no current evidence of acidic runoff on site; and (b) analyses indicate that less than 1 per cent. of the material at Tulkubash is potentially acid generating. Mitigation has been proposed to manage the potential impacts (e.g., encapsulation of acid generating rock on the WRD to inhibit chemical reactions). Groundwater studies have been limited so there are gaps in knowledge (e.g., water levels); there may be localised lowering of the water-table in the Kumbeltash Valley where boreholes will be pumped to supply process make-up water. Impacts on surface and groundwater are assessed as being low.

The Tulkubash ore was considered to be a high geochemical risk based on field and high humidity cell testing. Geochemical characterisation needs more work to be done as there is a lack of a fully representative samples. Owing to uncertainty and risks, WAI has taken a conservative approach and developed mitigation and methods that are conservative, and the precautionary principle has been adopted. The actions proposed are practical and should be effective. It is recommended that further studies are undertaken, and it may transpire that some of the mitigation is un-necessary.

Design of the HLF and measures to manage the environmental aspects are adequate.

CGHL aims to become certified with the International Cyanide Monitoring Code (ICMC) which is a country code that focusses on safe management of cyanide to protect human health and the environment. A cyanide management plan has been compiled for CGHL and together with certifying with the ICMC, it is a clear indication that CGHL is committed to good international industry practice which in turn reduces environmental and social risk.

Waste management pertains to mining and non-mining wastes. A framework waste management plan has been compiled that includes management of hazardous and non hazardous waste. It is a generic plan and will need to be developed before construction begins.

Power supply options are limited because the site is remote from the national grid. Diesel generators will be used to produce power. The potential impacts (air emissions and contamination from incidents and accidents) are dealt with in impact assessment for air quality and soil.

Health and safety management will be assigned to a health, safety and environment manager and coordinator. It is recommended that at least one of the persons appointed has experience in environmental and social aspects of complex projects. The CGHL board members are on the Health, Safety, Environment and Community (HSEC) Committee. The make-up of the HSEC Committee will be reviewed when non-executives with relevant safety, health, environment and community skills are appointed.

Decommissioning and closure have been addressed in a Mine Closure and Rehabilitation Plan which is fairly generic at this juncture. Tetra Tech recommends that a strategy for unplanned closure is included in the plan because mines can close in a short period of time due to unforeseen circumstances (e.g., market forces, political changes). Stakeholders, particularly those in proximity to the concession, should be involved in decision-making about post-closure land-use.

Permits and licences that are required for the Chaarat Gold Project have been listed in the ESIA report; some have already been issued but others are outstanding. Timeframes for applying for and obtaining permits and licences should be ascertained so that there are no delays to the Chaarat Gold Project schedule.

Primary and secondary data for baseline social studies were collected through formal and informal interviews, and household surveys (Leshem Scheffer, 2010-2011, and WAI 2016). WAI undertook a site visit and held meetings to verify that existing data remains relevant (up-to-date) and address gaps. A limitation of the baseline studies is that the number of households surveyed is not related to the total number of households (i.e., the statistics have not been presented).

Consultation with communities has been ongoing from the early stages of the Chaarat Gold Project inception. Good relations are being fostered and it is indicated that local communities have seen benefits of mines operating in the area (and the opposite when an operating mine left in 2015).

Local mining companies including CGHL and environmental organisations hold regular meetings to coordinate activities so that impacts on the natural environment are minimised. The Sandalash River flows through the Besh-Aral Nature Reserve which was established for the protection of biodiversity.

A stakeholder engagement plan has been drafted and will be subject to updating. It will assist CGHL in making and implementing plans to reinforce good relationships with communities and other parties. Risks associated with communities are currently managed by initiatives such as meetings, providing a grievance mechanism to deal with complaints, and developing a stakeholder engagement plan.

CGHL will develop and environmental and social management system (ESMS) that will align with legal and administrative requirements of Kyrgyz Republic and international good practice.

A number of framework management plans have been prepared by WAI as a step to enable Chaarat to manage significant impacts identified in the ESIA. The management plans include air quality; biodiversity, mine closure and rehabilitation, noise and vibration, soils, cyanide, water and waste water, waste management plan, chance-find procedure, and an updated stakeholder engagement plan. Current plans need to incorporate SMART mitigation (specific, measurable, achievable, relevant and time-bound) before they can be implemented effectively.

A number of environmental and social risks and opportunities have been identified to assist CGHL as mine planning develops.

11. CAPITAL AND OPERATING COST ESTIMATES

Tetra Tech prepared the capital cost estimate for Stage 1 of the Chaarat Gold Project in the 2018 Internal Feasibility Study. The initial capital cost estimate was calculated as US$121.7 million, excluding Value Added Tax (VAT) and US$131 million including VAT (Table 4). The Kyzyltash Project is not included as it will form part of Stage 3 of this mining property development.

Table 4 Tulkubash Project Initial Capital Cost Summary

Area	Cost* (US$)	VAT (US$)	Import Duty (US$)	Total (US$)
Mining	20,029,375	2,225,046	0	22,254,421
Crushing	25,380,956	1,900,539	477,157	27,758,651
Processing	24,138,904	1,039,332	900,194	26,078,429
Site Infrastructure	9,879,441	1,167,063	5,196	11,051,700
Site Utilities	8,113,658	176,823	512,774	8,803,255
Camp	2,800,000	336,000	0	3,136,000
Temporary Facilities	85,000	10,200	0	95,200
Off-site Infrastructure	3,639,777	436,773	0	4,076,550
Financials(Contingency)	12,256,189	954,853	131,377	16,474,101
Indirect Costs	15,387,871	0	0	12,256,189
Total Initial Capital Cost	**121,711,171**	**8,246,628**	**2,026,698**	**131,984,497**

Notes: *excluding VAT and import duty
Source: Tetra Tech (2018)

This is a Class 3 estimate prepared in accordance with the AACE International cost estimate classification system. The estimate accuracy interval is –10% to +15% and the estimate base date is Q2 2018.

All costs are in US dollars. Quotations received in other currencies were converted to US dollars.

Operating costs consist of mining, process, general and administrative (G&A), refining, and doré transport costs. The LOM operating cost estimate from the 2018 Internal Feasibility Study is US$260 million or US$16.32/t ore (including VAT) (Table 5). Table 5 also shows the adjusted LOM operating costs taking into consideration the increase G&A costs (due to the addition of labour costs) with the LOM operating cost at US$296 million or US$16.82/t ore.

Table 5 Tulkubash Project Operating Cost Estimate

	2018 Feasibility Study		Adjusted G&A*	
Area	Cost Including VAT (US$)	Cost Including VAT (US$/t ore)	Cost Including VAT (US$)	Cost Including VAT (US$/t ore)
Contract Mining Cost	156,800,000	9.80	156,800,000	9.80
Owner Mining Costs	6,429,000	0.40	6,429,000	0.40
Processing Costs	75,898,000	4.75	75,898,000	4.75
G&A Costs	18,365,000	1.15	26,592,000	1.66
Refining Costs	3,257,000		3,257,000	*
Gold Transport Costs	239,000	–	239,000	–
Total LOM Operating Cost	**260,988,000**	**16.32-**	**269,215,000**	**16.82**

Note: *Adjusted G&A increased by 44% from US$1.15/t ore to US$1.66/t ore, with resultant increase of 3% in Operating costs

12. ECONOMIC ANALYSIS

The financial analysis was based on a pre-tax and pre-financing Financial model (inclusive of VAT and import duties, both of which are not recoverable). The base case uses a gold price of US$1,300/tr oz, a 3.75-year LOM, a 16 Mt Ore Reserve, and foreign exchange rate KGS70:US$1. All currency units are in US dollars unless otherwise specified. Table 6 shows the internal rate of return (IRR), net present value (NPV), and payback period from the 2018 Internal Feasibility Study and after the operating cost estimate was adjusted for labour.

Table 6 IRR, NPV and Payback for the Chaarat Gold Project

	Unit	2018 Internal Feasibility Study (including VAT)	Adjusted* (including VAT)
IRR	%	8.2	6.5
Payback	years	3.2	3.3
NPV @ 5% Discounted Rate	US$ million	12.1	5.3

Note: *G&A cost adjusted to $1.66/t ore

Table 7 shows the input parameters used in the financial model.

Table 7 Mine Production from the Tulkubash Project

Description	Unit	Value
Total Tonnes to HLF	kt	15,993
Average Daily Tonnes to HLF	t/d	13,500
Total Waste Tonnes Mined	kt	65,110
LOM	years	3.75
Average Head Grade		
Gold	g/t	0.91
Silver	g/t	1.13
Recoveries		
Gold	%	76.5
Silver	%	61.80
Total Production		
Gold	('000 tr oz)	360
Silver	('000 tr oz)	360

13. SENSITIVITY ANALYSIS

The Chaarat Gold Project's NPV, calculated at a 5% discount rate, is most sensitive to revenue followed by operating costs and capital costs.

The Chaarat Gold Project's IRR is most sensitive to revenue followed by operating costs and capital costs.

The payback period is most sensitive to revenue, followed by operating costs and capital costs.

14. PROJECT EXECUTION PLAN

The project execution plan framework presented by Tetra Tech in the 2018 Internal Feasibility Study is sufficient for this level of study. CGHLs objectives to unlock the long-term value of the Chaarat Gold Project are outlined in the following stages:

- Stage 1 – Extend the Tulkubash heap leachable oxide resource base; develop low capital intensity heap leach production.
- Stage 2 – Ongoing Tulkubash oxide exploration; expand heap leach production capacity.
- Stage 3 – Complete a detailed feasibility study for the refractory Kyzyltash sulphide ore body.
- Stage 4 – Develop parallel sulphide processing facility.

15. RECOMMENDATIONS

The Chaarat Gold Project objective is to generate significant equity reserves through the development of the Tulkubash oxide orebody, to unlock the long-term Kyzyltash deposit.

It is recommended that the 2018 Internal Feasibility study is re-assessed and updated.

The updated Tulkubash Mineral Resource estimate (effective 28 August 2018) shows indications of an improved Ore Reserve, which could increase the financial outlook of the Chaarat Gold Project. With a new Ore Reserve, the mine plan can also be redone.

During a feasibility study update, gaps in the cost estimate (high dependence on Owner and one contractor, gaps in quotations, lack of a basis of estimate) can also be reviewed and updated.

Full recommendations for the Chaarat Gold Project are outlined in Section 13.0 of the Chaarat CPR.

Based on Tetra Tech's expert examination of the evidence at a feasibility level, CGHL would in all probability be able to deliver the Tulkubash oxide mine within the broad framework presented in the 2018 Internal Feasibility Study.

It is still too early to make any predictions for the Kyzyltash sulphide mine as this resource needs to be studied in more detail.

PART B: THE KYRGYZ MINING REGIME

1. THE CHAARAT LICENCE AREA

The Chaarat Licence Area is 74.76 km^2 in size (comprising the licence area under the Exploration Licence of 6776ha and the licence area under the Mining Licence of 700.03ha) and falls within 1:100,000 scale, topo-cadastral map sheet K-42-71. In administrative terms, the Chaarat Licence Area is situated within the Chatkal region of Jalal-Abad Oblast.

The Chaarat Licence Area is located at latitude 42°1'6.91" N and longitude 71°9'39.04" E, in the Sandalash Range of the Alatau Mountains, in the Jalal-Abad Province of north-western Kyrgyzstan, close to the border with Uzbekistan. The Property area is located approximately 300 km southwest of the capital Bishkek, 75 km upstream and northeast of the regional administrative center of Jany-Bazar in the Chatkal Valley, and 300 km by road from the nearest railway station in Shamaldy-Say. The project site is situated adjacent to the Sandalash River, at an elevation of 2,100 to 3,600 masl.

From the capital city of Bishkek, the Chaarat License Area is accessible via 750 km of paved and unpaved roads, 240 km of which are gravel after the city of Ala-Buka. The M39 highway leads westward from Bishkek to Kara-Balta, connecting to the M41 highway south through the Too-Ashu Pass. The route continues westwards through Chichkan, and then around the Toktogul water reservoir along the Naryn River to Kara-Kul and Tash-Kumyr. After Tash-Kumir, the road continues northwest to the city of Ala-Buka and through Chapchima Pass to the village of Jany-Bazar at the intersection of the Chatkal and Sandalash rivers. The final part of the route continues south through the village of Kanysh-Kiya and through the Kumbel Pass to the Chaarat License Area. Travel time from Bishkek is approximately 14 to 18 hours, with an overnight stay in the city of Ala-Buka.

This route provides virtual year-round access to the Chaarat License Area area and, although longer, is the route favoured for future development, as it will be required to move hazardous goods. In addition, Ala-Buka is the nearest town to the Shamaldy-Say train station located approximately 300 km from the Chaarat License Area. The road over the Kumbel Pass is currently being upgraded to ensure all-season access.

There is an alternate access into the Chatkal Valley through Talas and Kyzyl Adyr (Kirovskoye) village. The distance from the capital city of Bishkek is 520 km of paved and unpaved roads, 150 km of which are gravel. The journey after Kyzyl-Adyr is via gravel roads, south through two high mountain passes: the Kara Bura Pass, with flatter areas through the Kara Bura and Chatkal valleys, and over the Sandalash range by the Kumbel Pass. The roads are generally in good condition, and the gravelled sections along the main roads are well maintained. The roads over the mountains are unsuitable for heavy vehicles greater than 10 t and are impassable during the winter and spring unless kept clear of snow. Seasonal access is between June and October. Travel time from Bishkek to the Chaarat License Area using this route takes approximately 10 to 12 hours.

Kyrgyz Mining Licensing Regime

Under Kyrgyz law, mining rights may be granted by way of exploration or mining licences (both of which are issued by the SCIESM), by a concession from the Kyrgyz Government or by entering into a production sharing agreement with the Kyrgyz Government. In addition, rights to conduct individual placer mining activity or development of sand and gravel materials or loam for construction purposes on the areas not granted under auction or tender are granted by way of state registration with the local state authorities.

A brief summary of the key provisions of the Kyrgyz Mining Law

The Kyrgyz Mining Law allows local and foreign companies to explore, develop and mine properties in the Kyrgyz Republic. It contains sections which provide for restrictions on subsoil use in instances where there is a threat to the lives and health of people or which may cause damage to property or the environment. The Kyrgyz Government sets the minimum expenditure to be spent per unit of any licensed area and the maximum size of the licensed area for exploration. Each licensee must submit semi-annual and annual reports to the SCIESM. The licensee must also submit the proposed work programme under the licence to the SCIESM.

Exploration licences are granted for a period up to of four years and may be extended up to a maximum of 3 years. A new licence agreement is generally issued only if the conditions of the previous licence agreement are complied with. A market practice is that a new licence agreement replaces the previous licence agreement.

Should a deposit be discovered, the licence holder has an exclusive right to transform the exploration license into a mining licence for the same metals as were subject of the exploration licence upon recordation of mineral stocks on the State Register of Mineral Reserves. The mining licence to develop mineral deposits grants the licence holder the exclusive right, within the boundaries of the mining allotment, to conduct geological study and develop and mine for a period established by a technical project not longer than 20 years (but with a potential subsequent extension pending the depletion of mineral stocks).

Licences can be extended by the SCIESM subject to fulfilment of the licensing terms. Current practice suggests that the SCIESM is flexible in negotiating the conditions and the term of the licence. The conditions are provided in licence agreement which is an integral part of the licence.

A licence may be suspended for three months if a licensee:

- is in breach of subsoil protection, environmental and technical safety requirements directly threatening the life and health of people working or residing in the areas affected by the works related to subsoil use;
- fails to submit reports on performance of geological, mining works and reports on mineral reserves movement within the established terms;
- submits the reports on performance of geological, mining works and reports on mineral reserves movement with inaccurate data;
- fails to comply with the requirements to accumulate funds for land plots re-cultivation;
- violates the terms for payment of bonus and/or licence retention fees;
- fails to notify the SCIESM about changes in its shareholding, if such change entails payment of bonus pursuant to the tax laws of the Kyrgyz Republic.

A licence may be terminated in the following circumstances:

- in the event the licensee releases the subsoil rights;
- upon expiry of the validity term of the exploration or mining licence, if the licensee fails to file an application for extension or transformation of the respective licence within the established term;
- if the licensee performs works without a technical design with all required positive expert opinions and/or licence agreement to perform works;
- if the licensee fails to eliminate causes for suspension of the subsoil use right;
- if the licensee performs subsoil use works during the suspension period;
- in the event the licensee fails to submit accurate data about beneficiaries of the licensee or if the fact of submission of inaccurate data about beneficiaries of the licensee has been identified.

On 14 December August 2012, the Kyrgyz government approved a new Regulation on subsoil use licensing. The Regulation entered into force on 9 January 2013.

The SCIESM may grant exploration and mining licences in respect of the same area but for different ores or minerals. There are no legal or regulatory provisions or precedents as to which licensee enjoys priority if two licensees' activities are in conflict. At the same time no publicly accessible register of mining licences exists, therefore it is not possible to assess how many licences are granted, and in respect of what minerals, in any given area. Should either of the licensees identify minerals not specified in its respective licence at the same area, such licensee has the right to offer the other licensee holding a licence for the identified minerals to buy the information about these identified minerals.

Relinquishment

A licensee has the right to reduce a licence area provided a relevant application is filed with the SCIESM together with a report on performed works on the licence area to be reduced upon re-cultivation of such area.

Protection of foreign investment

The Law of the Kyrgyz Republic "On Investments in the Kyrgyz Republic" dated 27 March 2003 ("**Kyrgyz Investments Law**") grants to foreign investors certain guarantees and protections of their rights and interests. Article 6 of the Kyrgyz Investments Law provides that investments shall be guaranteed against expropriation (nationalization, requisition, or other equivalent measures, including acts or failure to act by the authorised government agencies of the Kyrgyz Republic, which result in coercive taking of the investor's property or depriving him of the possibility to use the results of the investments) except for the cases provided by legislation of the Kyrgyz Republic when such expropriation is undertaken in the interests of the public on a non-discriminatory basis with the observance of the proper legitimate procedure and shall be made with payment of timely, proper and real compensation of damage including lost profit. Further, under Article 5 of the Kyrgyz Investments Law foreign entities are guaranteed the right to repatriation of capital and profits received pursuant to investments in the Kyrgyz Republic in freely convertible currency.

Environmental

A summary of applicable environmental permit requirements in the Kyrgyz Republic is contained in section 8.2 and Table 8.1 of the Chaarat CPR.

PART C: THE KAPAN MINE

This Part C of this Part II of this document is extracted without amendment from the executive summary of the Kapan CPR (which is prepared in accordance with the JORC Code).

1. TENURE

The ground held by Kapan Mining and Processing CJSC in the Kapan area comprises one Mining Licence and one Exploration Licence. The Kapan exploration License covers 90.7 km^2 with some 12.5 km^2 excised to cover existing populated areas, mine concession, and related infrastructure.

Dundee Precious Metals Kapan operated the Shahumyan Mine concessions under a special mining licence, from 2006 until 2016. In an agreement reached in November 2012, DPMK's Shahumyan mine licence was renewed under the Mining Code adopted in late 2011. The licence term remained unchanged until 2020.

In 2016 Polymetal International Inc. completed purchase of the Kapan project.

The licence was extended to 01 April 2050 together with a mine allotment, based on Order No 381-A of 25 August 2015, issued by Minister of Energy and Natural Resources.

Table 1 Summary Table of Asset

Asset	Holder	Interest (%)	Status	Lease expiry date	Lease area	Comments
Shahumyan Polymetallic Mine	Kapan Mining and Processing CJSC	100	Production	1 April 2050	90.7 km^2	None

2. PROJECT LOCATION, ACCESS AND CLIMATE

The Kapan project is located 320km by road to the south east of the capital Yerevan in Armenia in the immediate vicinity of Kapan City, with the population of about 36000 people.

Kapan is accessed by bitumen road and is open all year and is the main cargo route. Kapan has an airport with an asphalt airstrip, but currently it is not operating. Kapan City has a road connecting it to the Islamic Republic of Iran.

The region is typical mountainous ranging from 700m to 3,200m above the sea level. The deposit is located at the south-east end of the Khotarkasar-Arachatzor ridge, between the Vokhchi River and its left tributary, the Khaladge River. The deposit elevations range from 700m to 1,100 m above sea level.

The Kapan district is dominated by the mining industry. As well as the Shahumyan deposit and processing facilities there is the Kajaran copper-molybdenum mine and process plant operating in the area and a number of smaller production facilities.

3. REGIONAL AND LOCAL GEOLOGY

The Kapan project is located within the Lesser Caucasus part of the extensive Tethyan orogenic belt (approx. 150 Ma). The Kapan mineral field is located, in the north-western middle Jurassic volcanic belt which are host to the three main mineral occurrences in the district. These include the Central-West copper (Cu) deposit, Central-East gold-copper (Au-Cu) deposit and Shahumyan gold-base metals (Cu-Au-Ag-Zn-Pb) deposit.

The Shahumyan mineralised field is considered to represent a large hydrothermal sulphidation system. Observation of the core from the site visit suggests that the mineralisation may be a structurally controlled carbonate base metal epithermal system in connection with the intrusion of an underlying felsic intrusive body. The middle Jurassic host rocks comprises of a suite of intermediate tuffs, flows, breccias and sub-volcanic intrusions.

Mineralisation is hosted by a suite of sub-parallel veins with up to one hundred and eighty veins. Observation of mineralisation underground and associated mapping demonstrates small scale structural complexity however with a general predictability at the mining scale. Ongoing definition drilling is used to confirm the position of mineralisation.

The Shahumyan mineralization is characterized by narrow sub vertical veins between 0.2m and 2.0 m wide, with a steep dipping and E-W orientation, which contain gold-base metals (Cu-Zn-Pb-Au-Ag) mineralization. The veins are frequently associated with sericite alteration and disseminated mineralization. These zones of altered rocks can reach 25m but usually they are 10-15m thick and occur in the upper deposit horizons.

Ore mineralization is mainly represented by sphalerite, pyrite, chalcopyrite, galena and bornite. Minor assemblages of tennantite, tetrahedrite, enargite, chalcocite, covelline, tellurides, native gold and silver have been identified. The vein gangue minerals include quartz, calcite, gypsum, anhydrite and rhodochrosite. The veins are represented by numerous texture varieties, related to the mineralization stages and tectonic movements.

4. DRILLING

The focus at the Kapan project by Polymetal has been underground resource definition drilling since 2016. Drilling since Polymetal ownership is as follows.

- 2016 – 403 diamond drill holes for 47,334.2m.
- 2017 – 659 diamond drill holes for 61,670.5 m.

In 2018, 65km of underground drilling has been budgeted. As of September 2018, 41.5km of drilling has been completed in 463 drill holes. There are currently 5 drill rigs underground producing NQ core. The primary purpose of the current underground drilling is to confirm the position of interpreted mineralised veins and to convert inferred resources to indicated resources for modelling and mine design purposes. Drilling is typically located on 20m spaced section lines and drilled perpendicular to the interpreted vein position. In 2016 downhole surveys were completed with an IMNN_32A Russian tool and Reflex tool. From 2017 only the IMNN_32A Russian tool was used.

5. SAMPLING AND ASSAYING

All samples from underground drilling are analysed at the Polymetal owned and operated laboratory on the outskirts of Kapan. The building was originally an electronics factory that was converted to an assay lab by SGS for DPMK as a preparation and analytical lab. Polymetal has operated the lab since ownership in 2016. Many of the operating systems from SGS are still being used.

Samples provided to the lab include underground channel samples, underground drill samples and grade control channel samples. The lab provides Fire Assay with AAS for gold and ICP AES analysis for Ag, Cu, Pb and Zn. AAS is used for high-grade Ag, Cu, Pb and Zn.

There are 3 drying ovens with capacity for 115 samples each. Samples are dried at 105 degrees for a minimum of 12 hours, depending on the size and type of samples. Moisture is checked irregularly. The lab dries approximately 250-300 samples per day.

Fire assay is undertaken in a dust free area with extractor fans. Flux and pulp is mixed in a fume cupboard with a range of weights from 10-50g. Below 10g the samples are considered too small. The flux and sample are mixed using a scoop into a crucible, which are re-used.

The AAS instrument is an Agilent Technology 200 series unit which is 6 months old and can read from 11 samples. There are procedures in place for samples over detection limit which involve dilution of samples and re analysing.

6. MINERAL RESOURCES

The effective date for the current Mineral Resource Estimate is 01 January 2018 and was prepared and disclosed by Polymetal Engineering JSC in accordance with the JORC Code, 2012 Edition. The current Mineral Resource statement is set out in Table 1.

The Mineral Resources set out in the table below are reported at a cut-off grade of 2.5g/t Au Eq.

Table 2 Mineral Resources of the Shahumyan deposit as of 1 January 2018 (Polymetal Engineering JSC)

Mineral Resource Summary (as of January 1, 2018)	Tonnage kt	Grade Au (g/t)	Ag (g/t)	Cu (%)	Zn (%)	AuEq (g/t)	Metal Au (koz)	Ag (koz)	Cu (kt)	Zn (kt)	AuEq (koz)
Measured											
Underground mining	180	6.2	95	1.07	4.2	11.6	36	559	1.9	7.8	68
Stockpiles	10	1.8	34	0.41	1.5	3.8	0	6	0	0.1	1
Total Measured Resources	**190**	**6**	**93**	**1.05**	**4.2**	**11.4**	**36**	**565**	**2**	**7.8**	**69**
Indicated											
Underground mining	2180	3.8	73	0.79	3	7.7	265	5094	17.2	65.1	542
Total Indicated Resources	**2180**	**3.8**	**73**	**0.79**	**3**	**7.7**	**265**	**5094**	**17.2**	**65.1**	**542**
Measured+Indicated											
Underground mining	2360	4	74	0.81	3.1	8	301	5653	19.2	72.9	610
Stockpiles	10	1.8	34	0.41	1.5	3.8	0	6	0	0.1	1
Total Measured+Indicated Resources	**2370**	**4**	**74**	**0.81**	**3.1**	**8**	**301**	**5653**	**19.2**	**72.9**	**610**
Inferred											
Underground mining	8220	2.9	63	0.67	2.3	6.1	764	16522	54.7	189.1	1614
Total Inferred Resources	**8220**	**2.9**	**63**	**0.67**	**2.3**	**6.1**	**764**	**16522**	**54.7**	**189.1**	**1614**
Measured+Indicated+Inferred											
Underground mining	10580	3.1	65	0.7	2.5	6.5	1065	22175	73.9	262	2223
Stockpiles	10	1.8	34	0.41	1.5	3.8	0	6	0	0.1	1
Total Measured+Indicated Resources+Inferred Resources	**10590**	**3.1**	**65**	**0.7**	**2.5**	**6.5**	**1065**	**22181**	**73.9**	**262.1**	**2224**

* Discrepancies in the calculations are due to rounding.

The figures presented above are both gross and net attributable.

The operator is Kapan Mining and Processing CJSC.

7. MINERAL RESERVES

The effective date for the Mineral Reserve estimate contained in this report is 1st January 2018 and prepared by Polymetal Engineering JSC.

All Reserves in Table 2 are Proven and Probable Mineral Reserves.

Ore Reserves for underground mining were estimated based on Measured and Indicated Mineral Resources, using 2.5 g/t AuEq cut-off grade.

The MSO stope wireframes form the basis of stope ore reserve in conjunction with the ore development considering the selected mining method and equipment size. Mineral Resources were converted to Ore Reserves using MSO stope optimiser and consider the assumed losses, dilution and ore drive development.

Table 3 Ore Reserves of the Shahumyan Deposit as of 1 January 2018 (Polymetal Engineering JSC)

		Grade					Metal				
Ore Reserves	Tonnage kt	Au (g/t)	Ag (g/t)	Cu (%)	Zn (%)	AuEq (g/t)	Au (koz)	Ag (koz)	Cu (kt)	Zn (kt)	AuEq (koz)
Proved	**220**	**2.9**	**42**	**0.52**	**2.46**	**5.8**	**20**	**289**	**1.1**	**5.3**	**40**
Underground mining	210	3.0	42	0.53	2.48	5.8	20	283	1.1	5.2	39
Stockpiles	10	1.8	34	0.41	1.53	3.8	0	6	0	0.1	1
Probable	3 850	2.1	40	0.42	1.62	4.2	254	4 905	16.3	62.4	518
Underground mining	3 850	2.1	40	0.42	1.62	4.2	254	4 905	16.3	62.4	518
Total Proved + Probable	4 070	2.1	40	0.44	1.67	4.3	274	5 194	17.4	67.7	558
Underground mining	4 060	2.1	40	0.44	1.67	4.3	274	5 189	17.4	67.6	557
Stockpiles	10	1.8	34	0.41	1.53	3.8	0	6	0	0.1	1

* Discrepancies in the calculations are due to rounding.

The figures presented above are both gross and net attributable.

The operator is Kapan Mining and Processing CJSC.

8. METALLURGY AND PROCESSING

There are two main ore types:

- Pb-Cu-Zn; relatively rich lead content (42%)
- Cu-Zn; with low content of lead (58%).

Main ore minerals are sphalerite, chalcopyrite, galena, and pyrite. Ore-bearing rocks are andesite-dacite and quartz porphyrites.

Chalcopyrite-sphalerite assemblage generates coarse-grained aggregates of these minerals and forms the larger portion of polymetallic veins. Sphalerite is dark brown, black, and light yellow. Main components of the chalcopyrite-sphalerite assemblage are: Zn, Cu, Fe, Sb. Mn, Cd, Ga, Ge, Ag, Bi impurities are observed. Fe, Mn, Cd, Ga, Ge impurities are idiomorphic and typomorphic for sphalerite.

Calcite-tennantite-chalcopyrite-galena assemblage forms growth lines and veinlet-like aggregates, cutting the chalcopyrite-sphalerite assemblage. Main components of this assemblage are Cu, Pb, Ag, S, Fe, Ca. Telluride assemblage comprises the following minerals: altaite, hessite, tellurobismuthite, petzite, native gold, tellurium, tennantite, tetrahedrite, chalcopyrite, sphalerite, and galena. The upper levels of the deposit show an increase in tellurides. Main components of this assemblage are Bi, Fe, Ag, Au, Pb, Cu, Sb, As.

Mineralogical and metallurgical testwork demonstrated that the deposit contains practically only sulphide ore. According to Vniitsvetmet Research Institute, sulphide ores contain zinc (97.5% sphalerite), lead (85% galena), and copper (85% primary sulphides and 11% secondary sulphides).

According to mineralogical and metallurgical testwork, the main ore-forming minerals form four ore varieties (subtypes), namely copper-zinc, copper-lead-zinc, copper-pyrite and zinc-pyrite. In these ore varieties (subtypes), gold tellurides are mainly associated with sphalerite, and silver tellurides are associated with sphalerite, galena and fahl ore.

Due to multiple alternations of various mineral assemblages and aggregates in the ores, it does not appear possible to isolate commercial (metallurgical) ore grades.

The main commercial components in the ores are gold, zinc, copper, silver and lead. The amount of these components in the ores varies within the following ranges (typical distribution):

Schedule 1Gold – from 1–2 to 10–20 g/t;
Schedule 2Zinc – from 2–3 to 10–12%;
Schedule 3Copper – from 0.2–0.5 to 2.0%;
Schedule 4Silver – from 20–30 to 200 g/t; and more
Schedule 5Lead – from 0.05 to 0.5–0.7%.

According to the testwork data, native gold predominantly occurs in pyrite, chalcopyrite and galena, and fine-dispersed gold commonly occurs in sulphides, tellurides and quartz. Gold and silver are represented as tellurides as free gold on boundaries of the sulphide minerals. Gold is found in free form as well as tellurides. Main gold-bearing minerals are chalcopyrite, galena, sphaleriteand pyrite; and silver is present as tellurides and as isomorphous mixtures in sulphides.

Based on testwork, the preferred process flowsheet for treating underground ore from the Kapan veins is selective flotation to produce separate saleable copper and zinc concentrates with gold and silver credits.

The lead grade in the ore is too low to enable a saleable lead concentrate to be produced. The presence of copper arsenic minerals such as tennantite will likely result in high arsenic grades in the copper concentrate.

Given the high gold and silver recoveries to the copper and zinc concentrates, it does not warrant including a gravity circuit in the flowsheet when treating the Kapan ore types.

Based on testwork the following predicted metallurgical recoveries for the different metals are:

- Copper recoveries of approximately 83–87% to a copper concentrate of 19–23% Cu.
- Gold recoveries to a copper concentrate ranging from 68% to 76%. The grade of gold in the copper concentrate was 200–400 g/t Au, although in practice this will depend on the ratio of copper to gold in the ore.
- Zinc concentrate grades in excess of 60% Zn at recoveries of between 80% and 87% should be achievable.

9. MINING METHOD

The Shahumyan mineralization is characterized by narrow veins (0.2-2.0 m), steeply dipping (70°-85°), east-west orientation, and contain gold-base metals (Cu-Zn-Pb-Au-Ag) mineralization. The veins are frequently identified within the areas and zones of sericite alterations and disseminated mineralization.

The mining method used is narrow vein longhole open stoping, utilising a single vein 'ore drive' for drilling, blasting and loading. Two variations of long hole stoping are undertaken at Kapan, 'bottom up' and 'top down'. Top down mining occurs below the 780-access level as mining advance declines down lower into the orebody and is approximately 90% of ore production. Bottom up mining occurs above the 780-access level as mining progresses towards surface and accounts for 10% of ore production. Future mining comprises 60% bottom up and 40% top down mining.

Level nomenclature is in metres elevation above sea level. The natural ground elevation above the mine varies between 900 and 1,000m above sea level.

The Kapan deposit lodes average 0.2m in width with a stope minimum mining width of 2.2m. Dilution occurs by two means, primary dilution, the waste contained within the mineralized zone and, secondary dilution, the additional waste created from blast over break. A third factor influencing dilution at Kapan is the material self-mining from the void above the active stope in a top-down mining scenario. Onsite it was reported that this third form of dilution was their largest production issue.

Assumed losses due to loading and transportation of 3% are based on historical mining data – resulting in a recovery of 97% of the stope shape.

10. ECONOMIC MODEL

Capital Expenses – General Description

All dollar amounts quoted in this analysis are US$.

Total estimated project capital expenses were $21.4 million ex VAT. Expenses included $7.3 million for investment projects, $6.2 million for retrofitting and upgrading of mining equipment, $2.6 million for other expenses and $5.3 million and closure and liquidation. The capital expenses are given in the table below.

Table 4 Capital Expenses Plan – Polymetal Case

	Units	Total	2018	2019	2020	2021	2022	2023
Capital costs	mln $	**21.4**	12.4	0.4	0.4	2.0	0.4	5.7
New construction/liquidation	mln $	**12.6**	7.3	0.0	0.0	0.0	0.0	5.3
Mining equipment	mln $	**6.2**	4.6	0.0	0.0	1.6	0.0	0.0
Others capital costs	mln $	**2.6**	0.4	0.4	0.4	0.4	0.4	0.4

Operating Expenses Estimation

Operating expenses were estimate for work stages and activities (sheet Cash_costs in TEM). The average specific indicators were calculated based on the 2018 budget. The average specific costs at the main processes per unit of semi-finished product sent to processing are shown in the table below.

Table 5 Average Unit Cost – Polymetal Case

Development and access workings	$/t	26.68
Ore production — UG mining	$/t	16.76
Ore processing	$/t	15.6
Flotation concentrate treatment (sales expenses)	$/t	117.7
Flotation concentrate transportation (sales expenses)	$/t	110.3
Refining	$/g	0.8
Administrative expenses	’000 $	4 688
Other expenses	’000 $	1 284

Ore Production Costs – Underground Mining

Ore underground mining cost was estimated taking into account drifting and stopping activities during 6 years from 2018 till 2023.

Cumulative annual mining/ore production costs can be found in the table below.

Table 6 Cumulative Annualised Mining Cost – Polymetal Case

	Units	Total	2018	2019	2020	2021	2022	2023
Ore production — UG mining	mln $	128.5	25.1	23.5	25.4	26.2	17.3	11.1

Ore Processing Costs

Ore processing cost was estimated over six project years and is presented in the table below.

Table 7 Annualised Processing Cost – Polymetal Case

	Units	Total	2018	2019	2020	2021	2022	2023
Ore processing	mln $	63.3	9.8	10.9	10.9	10.9	10.9	9.8

Ore processing cost includes material costs estimated based on specific consumption of materials, reagents, spare parts per tonne of processed ore, as well as on material prices (including delivery to the site), power tariffs and process plant payroll expenses.

Cash Costs per Ounce of Metal Equivalent

The table below shows cash costs per ounce of gold equivalent, less processing cost and non-payable metal when concentrates are sold to a third party.

Table 8 Cash Cost per Ounce of Gold Equivalent – Polymetal Case

	Units	Total
Total cash cost per oz	–	558.0
Ore production – UG mining	$/oz	230.3
Ore processing	$/oz	113.5
Royalty	$/oz	40.2
Administrative expenses	$/oz	50.4
Deductions	$/oz	168.3
Total cash cost per oz	**$/oz**	**602.8**

Project NPV and Sensitivities – Polymetal Case

Polymetal estimated NPV of the Kapan mine based on the mine schedule and other production parameters, and cost estimations stated above. Table 9 shows sensitivity of the project NPV to gold price fluctuations.

Table 9 Kapan Project NPV – Polymetal Case

Gold Price	NPV, '000 $
1 000	117.7
1 050	125.5
1 100	133.3
1 200	148.9
1 250	156.7
1 300	164.4
1 350	172.2

Weighted Average Cost of Capital (WACC) of 8% per annum was used as a discount rate.

11. ENVIRONMENTAL

The main law regulating mining in Armenia is the Subsoil Code, which determines:

- Special rights of subsoil use and how to obtain them
- Rights and obligations of the engaged parties and government authorities.

Environmental aspects are dealt with in the Law on Environmental Impact Assessment. Tax Code and Law on Wastes are also applicable, and the Land Code and Water Code regulate surface rights and use of water resources.

The mining industry is regulated by the Ministry of Energy Infrastructures and Natural Resources (MEINR), which grants permissions and supervises mining activity; and the Ministry of Natural Protection, which oversees environmental issues and supervises closure and rehabilitation works.

The mining licence entitles the holder to extract and manage the mineral resources with payment of state fees; nature usage fees; and royalties to the state budget. The mining licence can be granted for a period of up to 50 years, with extension on application to the MEINR.

Deposits of mineral resources are subject to state registration and mined resources must be removed from the state register. The subsoil is exclusively owned by the state, but while the subsoil resources is always state property, the land surface can only be used under land purchase-, usage-, lease- or servitude agreement.

A mining licence is issued only after application for a preliminary environmental impact assessment, which must be obtained before applying for the licence. The mining licence application must also include:

- Receipt demonstrating payment of the state fee for the EIA (Category A - AMD500,000)
- A Waste Management Plan and financial guarantees for implementing the plan
- Mine Closure Plan

- Financial references and guarantees.

The application is then subject to assessment of the impact on the environment, before decision based on review conclusions and an agreement between the Ministry and applicant is concluded.

Polymetal has a Subsoil and Mining Licence "No EKSRA (ՇԱԹՎ)-29/183", valid until 2050, for the Kapan operation. The licence is for production of 17.8 Mt (C1 reserves of 7,390,600 t and C2 reserves 10,468,400 t) and the licensed mining lease has an area of 378.6 hectares (ha) but is limited to 400 m absolute elevation at depth. The licence conditions provide for mandatory environmental protection measures. As an active mining operation, it has all the necessary additional permits

An Environmental Management System (EMS) was developed and implemented at all Polymetal operations which establishes corporate standards and determines all mandatory environmental requirements. The EMS has been introduced at Kapan to ensure compliance with national legislation, international standards and effective environmental management requirements, and is certified for compliance with ISO 14001 (2006). Update to ISO 14001 (2015) was scheduled in 2018.

The mine is a legacy site from Soviet times and is an intrinsic part of life in Kapan town, with around 933 people employed at the operation. The mine site is on the edge of the town with apparently low environmental impact to local residents, with little noise pollution, few noxious emissions and a favourable dominant wind direction away from the town.

12. CONCLUSIONS

Geological Understanding

- There is a general understanding of the local geology and vein behaviour within the mine department and the local mineralisation controls are well understood. There is limited focus on the regional geological and near mine environment with day to day activities focussed on short term production orientated activities.

Underground Procedures

- The process of integrating the underground mapping and data through Leapfrog and Surpac software are fit for purpose and follow a logical process. The procedures associated with data collection in the underground environment are reasonable.

Core Processing Procedures

- The core processing procedures have undergone some modification from the original procedures developed by DPMK. Information is well recorded and the work flow from the underground drilling through to integration into mine planning and metallurgy is well structured and well organised.

QAQC Review

- QAQC procedures and practises relating to geological data collection for downstream use in Mineral Resource Estimation are considered fit for purpose.

Mineral Resource Estimate

- The Mineral Resource estimate workflows are considered reasonable and been systematically reviewed for the Kapan deposit in terms of both global model validation checks, and with respect to the top 10 veins (contributing to gold equivalent (AuEq) total contained metal) where detailed review of domain parameters for each of the 246 individual veins would not have been possible.
- The review of the subsets of input data, and of the model parameters, associated with these individual veins are considered representative of the resource, where such assumptions have been made on the robustness of the model from them.
- However, CSA Global considers there are some risks with respect to Mineral Resources, and these are set out below:
    - The Mineral Resources were depleted with the latest Mined to Date (MTD) solid provided by the client, dated 1 June 2018. CSA Global then compared these figures to those quoted in literature received. CSA Global was not able to reproduce the figures as outlined in the

report provided. However, CSA Global was able to confirm Metal that forms the basis of the five-year mine plan, to within acceptable confidence limits (±10%).

- CSA Global finds no issues with the classification method undertaken, and the values assigned in the CLASS field in the block model. Classification was reviewed for the material within the five-year mine plan.
- Validation of the block model presents a significant risk. The output model histograms show a distinct bimodal distribution for Au, Ag, Cu and Zn where no such trend exists within the input composite data, which is broadly lognormal in distribution. This presents a risk in the ability to plan underground mine development from the model. Grades anticipated from the model may be highly variable on a more localised scale, and at risk within areas impacted by this bimodality in the model. This is further highlighted when reviewing the broad trends in each vein from an overall visual qualitative perspective. However, visual checks, de-clustered mean statistics and swath plots, indicate a reasonable confidence in the model as a broad predictive tool and show good validation results when comparing the input composite data to the output model blocks, and trends in composite data are mirrored by trends in the block models in sectional review.
- CSA Global considers the input composite data for Kapan as representative of the raw assay data, and reasonable for use in the Mineral Resource estimate.
- CSA Global reviewed the modelled vein mineralisation volumes in cross and plan sections against the raw un-composited sample data. AuEq mineralisation above the 1.5 g/t cut-off grade are incorporated in the respective modelled wireframes when possible and in line with the mineralisation trends. CSA Global reviewed Au, Ag, Cu and Zn raw grades against the wireframe as well and found that overall there appear to be no issues with the approach undertaken.
- The assignment of density to the model based on a regression formula from the estimated sulphur grade in the model presents a moderate risk to the Mineral Resource. Even though using sulphur grade within the regression formula is reasonable for this type of deposit, the underlying assumption is that the sulphur estimate is robust. However, model validation for sulphur was poor, in part due to 60% of the composites having no sulphur data. It would be more appropriate to link density to the AuEq grade, as it is supported by more data and the input variables validate well. CSA Global cannot comment on the appropriateness of the regression formula used as no density data was provided for review.
- Some areas of upside and opportunity may exist at these deposits, but for the most part additional review and sensitivity analysis would be required to confidently convey project upside.

Mining and Reserve Estimation

The following conclusions are made following the technical review of the mine design and production planning:

- CSA Global has concerns over the level of detail presented in the mine design, schedule (development specifically) and sequencing, and considers that the level of accuracy is not commensurate with the requirements of an operating mine requiring short to medium term mine planning.
- The Kapan mine appears to be adequately resourced in terms of personnel and equipment for the sustainable exploitation rate of 700kt/a.
- The Kapan mine appears to employ modern techniques to mine planning and survey, however, refinements and best practices appear to be required.
- Underground engineering planning and equipping appears to be well understood with good practices and modern techniques employed.
- Execution, monitoring, feedback, risk analysis of the engineering, mining and technical support departments is not fully understood at time of writing the report.

- CSA Global has concerns that the EPS scheduling output data is not representative of the Polymetal financial model. The tonnes and grade have reasonably small variances (specifically 2018/2019); however, the ore development to stoping ratio is materially different.
- Survey "as-built" 3D CAD files (stoping specifically) do not appear to be complete for a mature mine like Kapan. It is imperative that an accurate "as-built" plans exist to ensure accurate planning and safety of planned mining activities.
- Mining equipment replacement presented in the Polymetal financial model will not ensure sustainable safe production based on existing equipment age and OEM specification for rebuild and replacement.
- Detail of operating costs for mining presented in the Polymetal financial model is not commensurate for an operating mine (when considering detail presented in the model).
- Plant feed grade and metal recovery are highly interdependent, and a lowering of head grade has a negative compounding effect on cashflows. Unplanned dilution realised during the mining operation can have a material effect on the profitability of the operation.
- Inferred material as presented in the resource block model shows significant potential for the future of Kapan (albeit in limited quantities) and it appears to be easily assessable from current development. Continued, accelerated exploration and access of these areas does not present in the electronic mine plan.

Geotechnical

The following conclusions are drawn from the review of geotechnical information:

- Although the style of deposition is complicated, characterised by stockwork and anastomosing veins, CSA Global acknowledges that adequate consideration of the geological setting of the ore zones and host rocks has been incorporated into geotechnical designs.
- Geotechnical data is collected through drill core logging and scan line mapping of underground development ends. CSA Global considers these methods as typical industry practise.
- CSA Global views the extraction ratio (estimated at 85–90%) to be too aggressive for the rock mass quality reported. Extraction ratios between 70% and 75% appear plausible.
- CSA Global considers the stope sizes adopted and extraction ratios as overly aggressive for the rock mass quality and HR reported. The stope sizes planned may be a large contributor to unplanned dilutions of between 20% and 25%. Based on empirical design guidelines used by Kapan, for unsupported stable stope sizing with sporadic rather than systematic post filling, CSA Global views the designs adopted to be flawed and disconnected from the HR numbers reported. The designed stope sizes do not support the stable HRs reported (<6.1 for 70° veins and 5.2 for 50° veins).
- CSA Global concludes that if production process procedures are strictly adhered to, the proposed operation will have a minor environmental impact and does not pose any hazards in terms of environmental pollution outside the sanitary protection /buffer zone.
- Analyses of both the North and South walls' performance under seismic conditions showed them to have Factor of Safety (FoS) less than the required value of 1.1 for the adverse condition of a MCE as a "High" consequence dam. The analyses indicate that both the North and South embankments of the facility will require stabilisation (buttressing) in order to meet performance requirements during an MCE seismic event.
- It is a risk that the future tailings expansion has not been adequately planned (conceptual level studies) and not properly costed in the five-year plan. The risk is the possibility of inadequate tailings disposal volume to meet production requirements and inadequate capital allowed for the required construction.
- CSA Global's observations from the site visit showed work being undertaken during the visit with significant earthworks, delivery of truck loads of rock and sand and spreading by bulldozer. CSA Global has not seen the design plans for this remedial work. At the time of the visit, no work had started at the south TSF wall.

Metallurgy and Processing

- The mineralogical and metallurgical testwork completed on Kapan ore appears robust and there is a significant number of years production at the mine.
- The plant produces two concentrates using sequential flotation. Following conventional two-stage crushing and grinding by a rod mill/ball mill circuit, the first is a copper/pyrite concentrate containing gold and silver. Next roughing, scavenging and concentrate re-grinding, cleaning is completed in three stages. The scavenger tails are then conditioned prior to zinc rougher and scavenger flotation, with the zinc scavenger tails being the final process tails. Rougher concentrate is cleaned in three stages, with the cleaner tails being recirculated to the previous stage.
- The equipment installed at the process plant is suitable to achieve the design ore processing rate and productivity, as well as specified metal grades in the concentrates and metal recovery rates.

Environmental

The following conclusions are drawn from a review of environmental and social aspects:

- CSA Global comments that while it was stated that there is good management support for environmental work at Kapan, some training is needed to use equipment and for reactive investigation outside the prescribed monitoring requirements.
- The mine is a legacy site from Soviet times and is an intrinsic part of life in Kapan town, with around 933 people employed at the operation. The mine site is on the edge of the town with apparently low environmental impact to local residents, with little noise pollution, few noxious emissions and a favourable dominant wind direction away from the town.
- The lack of definitive ARD and metal leaching testwork is a concern. Comprehensive geochemical characterisation studies allow ARD/ML understanding and prediction and thus implementation of suitable design and mitigation measures, especially if new deposits/ore targets are brought online.
- Recycling of water within the operations is important as the operation has to pay for all abstractions and discharges by volume, and improvement should be a priority.
- The previous Kapan mine owners were exempted from historic mining liabilities, from the old Centralni open pit mine (closed prior to 2004, with rehabilitation activities completed and approved); and from the old waste rock dumps (which have not been rehabilitated and may be a potential source of continuing pollution). The licence and remaining liabilities for these have apparently been returned back the Government of Armenia. There should therefore be no environmental liability beyond closure of the current operation, however full implications of the legal closure requirement should be part of any future permit conditions and negotiations.
- CSA Global comments that the 2013 updated estimate of US$12 million (±30%) for the TSF closure seems reasonable for the proposed capacity increase and final TSF configuration. Similarly the approximate US$10 million (or AMD 4.1 billion in 2014 prices based on the report exchange rate of AMD414.04/US$) for the rest of the mine closure and rehabilitation is also appropriate, although it is not clear if this includes any provision for employee retraining, livelihood restoration or other social mitigations. These estimates result in a total closure cost estimate in the range of US$19 million to US$22 million or AMD7.9 billion to AMD 9.1 billion in 2014 prices at AMD414.04/US$.

Economic Model

CSA Global draws the following conclusions relating to the economic model:

- The economic model reviewed was provided to CSA Global by Kapan GOK and includes mining, processing and cost parameters provided by Kapan GOK. The modelling appears reasonable, with no significant emissions or errors.
- CSA Global considers the unit operational cost for mining in 2018 period to be in line with the mechanised narrow vein long-hole stoping method. The reduction in unit costs of production as a result of a) a reduction in development requirement in the mine plan for the Ore Reserve portion, and b) the extrapolation of the Inferred Resource that appears to have a significantly reduced cost

related to development activities, is a concern, especially given reliance on low-confidence Inferred Mineral Resources.

- CSA Global notes that the ore development to stoping ratio as contained in the Polymetal financial model is not in line with the EPS production report.
- CSA Global considers the plant maintenance capital allowance of <2% is forecasted low and when benchmarked against other concentrator operations, typically should be in the range of 4–8% of operational cost.
- The capital provision for mining equipment replacement is calculated at 4.9% over a five-year forecasted period. CSA Global concludes that this is significantly lower than benchmarked and that calculations indicate 16% is required for the replacement and rebuilding of equipment.
- CSA Global notes that the three-year trailing price average for gold (US$1,240/oz), silver (US$16.60/oz), copper (US$1,240/oz) and zinc (US$2,500/oz) appears reasonable.
- CSA Global considers the on-mine additional costs reasonable for the size of the planned operation.
- CSA Global considers the off-mine costs for concentrate treatment and transport to be in line with operations producing a copper and zinc concentrate.
- CSA Global has not specifically tested the validity of the blended smelting and refining charge and its equivalency to the individual element smelting and reefing terms, however CSA Global recognises that the cost is indicative of determining the smelting and refining costs on the individual elements.

13. RECOMMENDATIONS

Geological Understanding

- Whilst the local controls are well understood in terms of short term mine planning there is little longer-term evaluation of the deposit type, structural evaluation and broader geological context. A holistic approach to the geology, structure and deposit type based on a mineral systems approach is recommended by CSA Global. This approach taking the geodynamic, structural architecture, fluid flow and fluid trap into account may provide a longer-term guide to the prospectivity of the project.

Underground Procedures

- There are no significant risks and the underground geological practices are fit for purpose and provide appropriate guidance for the mining department. Consideration of moving to 1:100 scale mapping to include more detail is recommended by CSA Global.

Core Processing Procedures

- Currently core is assayed on a full core basis. CSA Global recommend moving to half core analysis to ensure representative core is maintained for future review. Drill core is currently photographed on a wet core basis. CSA Global recommend moving to photographing core on a dry basis so that future geotechnical evaluation can be considered.
- Density and point load testwork are currently on an irregular basis and CSA Global recommend developing a standard procedure which includes regular measurements.

QAQC Review

- QAQC procedures are fit for purpose though some minor changes to the work flow are recommended. CSA Global recommend the use of crusher blanks in the crushing and pulverising sequence as a means to test for contamination at this point in the analytical process. The use of barcoding is common in the mining industry and is recommended for sample numbering and monitoring.

Resource Estimate

CSA Global sets out the following recommendations relating to the Mineral Resource Estimate:

- Variography should be reviewed and updated for veins where a large amount of new data is available.

- Based on CSA Global's investigation, the overall metal within the portion of the resource that supports the mine schedule is within 10% of that stated in the Polymetal financial model. Bimodality in the model, when compared to input data, can be used to identify areas of potential grade variability in the short-term plan. In these areas, development can be planned to access alternative stopes, either within the defined reserve or by proving-up inferred stopes in the immediate mining area, mined grade presents as lower than planned.
- The density regression requires update and review, CSA Global recommends that a regression using AuEq would be more appropriate as the AuEq grades are supported by well validated estimate variables. Further work, drawing upon historic data, production data and possible regressions with AuEq or other metals should be undertaken to improve how density is informed in the with resource model.
- Proper documentation of all steps within the Mineral Resource estimation should be recorded in the report, so that the estimation is transparent and can be easily reviewed by a third party.

Mining and Reserve Estimation

The following recommendations are made after the technical review of the mine design and production planning:

- CSA suggests that additional sill pillars be inserted into high stopes reducing the maximum height from 50 m to 25 m. This would eliminate the potential for additional dilution but reduce the extraction ratio from 90% to 75% and arguably reduce the reserve.
- Test MSO (and Ore Reserve) sensitivity to far and near wall dilution factors.
- Mining costs are modelled and/or presented in greater detail in conjunction with key driving metric taken from the mining production plan.
- Mine design and scheduling undergo an "overhaul" to correct tie-in with existing development, correct design directions, ensure predecessor linking, apply appropriate resources, levelling and targets and develop a timeframe reporting suitable to an operating mine.
- Build a forecasting operational cost model with sufficient detail to accurately predict costs based on key driving metrics.
- Plan underground exploration drilling "cubbies" to performed infill drilling programme on the Inferred Mineral Resource.
- Commence a "tie-in" modification of the electronic mine plan of the Inferred Resource to increase accuracy of the economic potential of the Inferred Mineral Resources.
- Ensure that electronic conversion of historical development and stoping is available in 3D CAD electronic environment for mine planning and safety purposes.
- Ensure surveying system has the capability and technology to update electronic 3D mine plans for development and stoping activities, this will aid in "mine-to-plan" reconciliation and dilution control.

Tailings Management Facility

CSA Global's recommendations for the tailings management facility (TMF) are as follows:

- An engineering review of the TMF by Golder Associates recommended that the dams be stabilized by constructing rock-fill buttresses. This work has only just begun on the North Embankment. The South embankment has not been started. This work needs to be conducted with an appropriate sense of urgency. Resources need to be allocated so that stabilization can be completed as soon as possible.
- The Kapan Inferred resource is only a potential source of tailings for the TMF. The priority has to be to stabilize the facility such that it can safely accommodate the tailings from the 4 Mt reserve which is the basis for the project value. This work should be conducted under rigorous engineering control. That standard of management should be extended to the ongoing operation of the TMF.

Mineral Processing and Metallurgy

CSA Global's recommendations for mineral processing and metallurgy are as follows:

- Carry out further mineralogy and optimisation of the regrind size to replace some of the zinc and lead units with copper units in the final copper concentrate produced.
- Conduct further cyanidation leach testwork be carried out to determine whether it is economically viable to recover gold and silver reporting to the zinc concentrate ahead of selling a saleable zinc concentrate to the smelter.

PART D: THE ARMENIAN MINING REGIME

Armenia's subsoil is rich with ore natural resources. Non-ferrous and ferrous metal ores, rock salt, bentonitic clay, perlite, fire clay, diatomite, travertine, pumice stone, tufa, tufflava, basalt, granite, andesite, andesite-basalt, marble, marble limestone, etc., are the minerals having industrial importance. Armenia has also industrial deposits of semiprecious stones (agate, amethyst, turquoise, jasper, obsidian). Armenia has no oil or gas deposits approved but some companies had recently made efforts to prospect such deposits.

Iron-ore deposits are located in the central, northern and south-eastern regions of the country, i.e. Abovyan (Kaputan) deposit, Hrazdan deposit, Svarants deposit, and the Akhtal deposit on the north.

Copper and molybdenum. Armenia is rich with copper and molybdenum ore. It owns 5.1% of overall and 7.6% of proven world reserves of molybdenum. The copper ore mined in Kapan, Kajaran, Agarak and Akhtal is processed at the copper-smelting metallurgy plant in Alaverdi. Armenia's non-ferrous metallurgy is also engaged in the production of aluminum and molybdenum.

Gold and non-ferrous metals. The biggest gold deposit in Armenia is the Sotq gold mine currently being exploited, with the gold reserve totaling 120 tons. Among others, Amulsar gold mine and Shahumyan gold polymetallic mines are most famous.

Aluminum, barite. The country owns industrial reserves of nepheline syenite and barite with gold and silver admixture, lead, zinc, manganese, gold, platinum, antimony, mercury and arsenic deposits.

Diamonds. Armenia has deposits of cuttable diamonds on the Khosrov Woods territory.

Semiprecious stones. The most common semiprecious stones in Armenia are agate, jasper, amethyst, beryl, obsidian, onyx, turquoise and andesite.

Building stones. The following natural stones are widespread on the territory of Armenia: volcanic, petrosilex and limestone tufa, granitoid rock and carbonates, basalt, shell rock and marble.

Sources of mineral and fresh water. There are about 7,500 known springs of fresh and 1,300 springs of mineral water in Armenia. Many of them are currently used for balneal purposes (Jermouk, Arzni, Dilijan, Bjni, Hankavan, Sevan, etc.).

1. STATUS OF SUBSOIL

The subsoil in the Republic of Armenia is the exclusive property of the state. It may be leased to use but it may not be privatized. The tracts of subsoil may not be bought, sold, pledged or otherwise alienated. The Republic of Armenia applicable legislation is based on the Armenian Constitution and includes the Republic of Armenia Code on the Subsoil (hereafter the "**Code**") and other related laws, bylaws and regulations. The most notable of them is the Republic of Armenia Decree N 437-Ն as of March 22, 2012, on approval of the subsoil use-related template agreements. The subsoil might be used: i) for geological exploration purposes; and ii) for mining purposes.

The right to use subsoil is granted by the relevant state authority pursuant to the procedure stipulated in the Code and other legal acts, by means of permission or agreement on using the subsoil, mining allocation act, as well by means of concluding with the subsoil user a contract on the subsoil use. The subsoil use right is indivisible and might belong only to one legal person (including a foreign commercial organization). Free and indefinite use of subsoil is performed for non-profit seeking purposes by mining non-metallic minerals for personal needs, on the land plots belonging with the ownership right to the subsoil user. Mine allocation for mining the minerals (excluding the sweet and mineral underground water) is granted simultaneously with the right to use the subsoil and is deemed an integral part of the right of subsoil use. Mining allocation is performed in accordance with the mining project. The subsoil user has the exclusive right on conducting activities within the boundaries of the allocated mine. The subsoil user has the right of carrying out activities relating to the use of subsoil only within the boundaries of the allocated mine. The entity possessing the mining right has the right to conduct geological exploration within the boundaries of the mine defined by the mine allocation act by notifying to that effect the relevant state authority.

The subsoil right is granted for a certain time period (excluding the indefinite and free use of the subsoil, the mining of non-metallic minerals for non-profit seeking purpose for personal needs, on the land plots belonging with the ownership right to the subsoil user):

1. for geological exploration of subsoil – for no more than 3 years, which may be prolonged pursuant the procedure specified in the Code;
2. for mineral mining purposes – for the full period of the exploitation of the mine in accordance to the project, which passed the expertise according to the procedure prescribed under the law, but no more than for 50 years, which may be prolonged pursuant the procedure specified in the Code.

The national administration of the subsoil use and protection is exercised by the Republic of Armenia Government and the state agencies authorized by the Republic of Armenia Government, in particular, the Ministry of Energy Infrastructures and Natural Resources and the State Subsoil Inspectorate.

Currently, all state mining companies in Armenia are privatized. In Armenia, the rights to use subsoil must be acquired in accordance with the approved procedures. Such rights may be acquired both for geological investigations and mineral resources mining. The entity which has been granted a subsoil use right shall have the right to:

1. exclusively conduct geological exploration within the boundaries of the allocated mine and mine minerals from the allocated parts of the subsoil;
2. enter the specified parts of the subsoil and perform all necessary works specified in the project for the purposes of exploration of mineral resources;
3. construct necessary buildings and other communications, install equipment, transport, enrich, minerals mined during the mining works for mineral mining proposes;
4. dispose of the mined minerals;
5. use, by complying with the requirements of the Code, the mining dump generated in the process of implementation of its subsoil use right.

In Armenia, any legal person (including foreign legal persons) who has acquired the right to use subsoil pursuant to the Republic of Armenia legislation is entitled to conduct geological investigations and mineral resources mining.

2. ACQUIRING RIGHTS TO USE SUBSOIL FROM THE STATE

The key precondition for acquiring rights to use subsoil from the state is approval of the authorized bodies and execution of the agreement to use subsoil.

Any person wishing to acquire such a right should file a relevant application with the authorized bodies. The application should contain information on:

- the person wishing to acquire the right to use subsoil;
- the object to be prospected or mined;
- the required time frames;
- the draft project of the works to be carried out, etc.

Upon approval by the authorized bodies, the soil user and the authorized body enter into a subsoil use agreement for reserve deposit exploitation with geological investigation purposes. Such agreement is a legally binding document specifying relations between the parties and containing provisions in relation to:

- period for the use of subsoil;
- boundaries of the leased subsoil tracts;
- agreement validity period;
- reporting requirements, requirements to the report contents and submission deadlines.

For deposit exploitation with mining purposes, the soil user and the authorized body enter into a subsoil use agreement, defining, inter alia, the list of mineral resources, mining of which is permitted, the operations schedule per stages, etc.

The agreement template is envisaged under the Republic of Armenia Decree N 437-Ն as of March 22, 2012, on approval of the subsoil use-related template agreements.

Acquiring Rights to Use Subsoil from other Subsoil Users

The right to use subsoil in the Republic of Armenia is transferable. Granting of the right by the subsoil-users to the third parties is prohibited. The transfer of the right is subject to approval by the authorized bodies, based on which the right is re-registered.

In case of reorganization of the legal entity entitled to use subsoil, the right to use subsoil is transferred and assigned to its successors and assigns pursuant to the succession procedure and separation balance sheet.

The Armenian Law on Natural Resources ("Natural Resources Law"), Art. 28, provides that mining rights can be pledged by their holders. Pledges of mining rights are subject to prior written notice to the Armenian Ministry of Energy and Natural Resources. The pledge is also subject to registration in the register of natural resources rights maintained by ministry and perfected by registering with Special Registrar Authority of Ministry of Justice pursuant to the law on as in case of movables based on Law On Registration of Security Interest over Movable Assets. At the same time it has to be noted some gaps in law that may imply pledge of mining rights separately, without taking security over the other components of a given project, make separate pledge of mining rights a limited security. In particular any sale of mining rights in enforcement of security requires the buyer to undergo a permission procedure equal to obtaining the mining permission which complicates the process by the fact that without having proper equipment, finance and rights over surface land one cannot exploit mining permission.

1. **State's Priority right on acquisition of subsoil use**

   Non applicable

2. **Requirements relating to the local content**

   Non applicable

3. **Environmental Requirements**

   The right to use subsoil may be conferred on the condition of nature and environment, human health and safety protection.

   Use and protection of natural resources, as well as issues related to the nature protection and ecology during mining and prospecting activities fall within the scope of the Republic of Armenia Government and other authorized body authorities.

   In consideration of issues concerning national security, human life and health, as well as environment and cultural values, mining and prospecting activities are prohibited on the territories used as:

   - Cemetery,
   - Nature, historic and cultural monuments,
   - Habitat of endangered plants and animals listed in the Republic of Armenia Red Book of Endangered Species.

In such cases, the subsoil may be used only upon consent of the authorized bodies.

Tax regime of subsoil use

On the subsoil using company, the general taxation regime is being applied, in particular:

1. Profit Tax;
2. Tax on dividends of non resident companies, if the subsoil user is not an Armenian resident.

Besides that, the company using subsoil must make the following payments:

1) Ecological payments;
2) Nature use payments;
3) Royalty (applicable only to metal mining);
4) Annual state duty for the license (permission) on subsoil use;
5) Other fees stipulated under Armenian law.

Subsoil Use Right Termination

A Subsoil Use right shall be terminated if:

1. The term of Use expires;
2. The subsoil User has been liquidated (in cases of legal persons);
3. Within 90 days after the warning of the relevant state authority, the user has not abolished the basis for such warning;
4. The subsoil has been used contrary to the purpose it had been provided for;
5. The Subsoil user has discovered and has not within 14 days notified the relevant authority about:
   a) the discovery of mineral resources not provided in the Use Right;
   b) the existence of rare cultural-scientific objects;
   c) the unanticipated ecological risks.

In all the above mentioned cases the relevant state authority has the right to unilaterally terminate the Subsoil Use Contract.

The Subsoil use may also be terminated for the State needs and necessity in accordance with the provisions of the Armenian legislation.

Protection of subsoil users' rights

There are numbers of mechanisms available for the protection of subsoil users. In particular, the judicial system of Armenia is designed in a way to address disputes both with state bodies and private parties. Local courts are available for the purposes of the protection of rights against the state bodies (administrative courts) and against non-administrative bodies (general jurisdiction courts). In addition to local remedies the Republic of Armenia is a signatory to a number of international conventions, the aims of which are protection of the rights of foreign investors. In particular Armenia has ratified Washington Convention 1965 on the Settlement of Investment Disputes between States and Nationals of Other States – International Centre for Settlement Of Investment Disputes and New York Convention 1958 on the Recognition and Enforcement of Foreign Arbitral awards. Both Conventions ensure investors' rights protection on local and international levels. In addition to recently drafted legislative instruments (Subsoil Code), Armenia has signed and ratified more than 35 Bilateral Investment Treaties, which form an indivisible part of the investors' rights protection system.

PART III

RISK FACTORS

An investment in the Ordinary Shares involves a high degree of risk, should be considered speculative because of the nature of the Group's business and should only be made by those with the necessary expertise to appraise the investment. Prospective investors should carefully consider the risks described below (which are considered by the Directors to be the risks specific to the Group and its industry and which are material to taking an investment decision in the Ordinary Shares and does not purport to be an exhaustive summary of the risks affecting the Group) in conjunction with all other information contained in this document (including, in particular, the CPRs in Part IV and the Accountant's Reports in Part V) and their own personal investment objectives and financial circumstances before deciding whether to invest in the Ordinary Shares. If in doubt as to whether to invest in the Ordinary Shares, investors should consult with an independent financial adviser who specialises in advising on the acquisition of shares and other securities.

The following risks have the potential to materially and adversely affect the Group's business, financial condition and results of operations and/or the Company's share price. In such case, an investor may lose all or part of his or her investment. Additional risks and uncertainties not currently known to the Directors, or which the Directors currently believe to be immaterial, may also have an adverse effect on the Group. An investment in the Company is only suitable for financially sophisticated investors who are capable of evaluating the merits and risks of such an investment and who have sufficient resources to be able to bear any losses which may arise therefrom (which may be equal to the whole amount invested). **There can be no certainty that the Company will be able to implement successfully the strategy set out in this document.** Neither the Company nor the Directors provide any assurances or guarantees of future profitability, distributions, payment of dividends, return of capital or the performance of the Company or its Ordinary Shares and there can be no assurance that the Company will achieve its objectives.

1. SPECIFIC RISK FACTORS RELATING TO THE CHAARAT GOLD PROJECT

Specific risks relating to the Chaarat Gold Project which may affect the Group include the following:

Chaarat Gold Project Licences

The main mining law in the Kyrgyz Republic has changed four times during the last 26 years (1992, 1997, 2012 and the last mining law was adopted on 19 May 2018). Changes of legislation happen due to the developing nature of the Kyrgyz Republic and its legislation. Based on this, there is no guarantee that rules applicable to prolongation, suspension and termination of the Chaarat Gold Project Licences currently in force will be the same in the future and this could have a material adverse effect on the Group.

Title to Chaarat Licence Area

There can be no assurance that the legal and/or contractual rights granted by the Chaarat Gold Project Licences will be respected, or not disputed, at any time or during the contemplated period of usage by CZ, thereby potentially reducing the present value of the Group's investments and operations.

Reporting Obligations

A 5-GR report (regarding mineral reserves stock) was submitted by CZ to the SCIESM on 5 December 2018 in respect of the year 2018, however, no 5-GR report was submitted by CZ in respect of the year 2017, as required by the Mining Licence. CZ confirmed that it is intended for the 5-GR report to be submitted in 2020, when it is anticipated that mining works will commence, as it can be assumed that, until mining works commence, no changes will be made to the mineral reserves stock. However, it may be deemed that CZ should have submitted a 5-GR report confirming no-changes to the mineral reserves stock, in accordance with the Mining Licence. Under Kyrgyz law, failure to submit the 5-GR report constitutes grounds for suspending the Mining Licence and, therefore, CZ's failure to submit a

5-GR report for the year 2017 poses a risk that the Mining Licence may be suspended, which could have a material adverse effect on the Group.

Land use consents and approvals

CZ has obtained a number of land plots related to the Chaarat Gold Project Licences and is believed to have all material land rights necessary for exercising its rights under these licences. However, there are some uncertainties in Kyrgyz laws and regulations regulating procedure for obtaining land rights for mining works on the deposit and construction of the related mining infrastructure. Land obtained for the said purposes usually does not belong to the category of lands of industry, but rather falls under the categories of agricultural lands or lands of forestry. Therefore, prior to granting the respective land rights through the competent authorities, the government has to transform them into the category of lands of industry by issuing an appropriate resolution. At the same time, starting from 18 September 2012, a new category of lands was established, notably lands of the state reserve of lands of mineral deposits ("lands of state reserve"). Such lands of state reserve do not include lands for construction of the related mining infrastructure and are granted by the SCIESM to subsoil users jointly with the respective mining licences. However, this relatively new procedure for obtaining of rights to the lands of state reserve has not been implemented in practice. Moreover, since June 24, 2017, the government has approved a new procedure for granting land plots for subsoil use, pursuant to which land plots (except for two categories of lands: valuable agricultural lands and specially protected natural territories) to be obtained for mining works and construction of related mining infrastructure are granted without a need to transform them into another category of land. These uncertainties in Kyrgyz laws and regulations may affect the validity of the lands rights held by CZ.

On 24 April 2006, the Kyrgyz government issued a resolution of the government "On Creation of Sandalash Preserve within Besharal State Preserve in Chatkal region of Jalal-Abad region of the Kyrgyz Republic" whereby a portion of about 20 per cent. of the Chaarat Licence Area was included in the Sandalash Preserve. Under Kyrgyz Laws, exploration or mining works are prohibited within the territories of state preserves. The SCIESM by error included a part of the area declared as Sandalash Preserve created under the said resolution of the Kyrgyz government into Chaarat License Area granted for exploration under the Exploration Licence.

These uncertainties may result in the Group encountering issues in future which may have a material adverse effect on the Group.

Constraints on the infrastructure for the Chaarat Gold Project

The area of the Kyrgyz Republic which is the subject of the Chaarat Gold Project Licences is remote and rugged with limited infrastructure. There can be no assurance that such remoteness will not create unforeseen difficulties and expenses presently not contemplated by the Group. Adequate road access, access to the rail network and access to a power supply will require expenditure of significant resources by the Group to facilitate transition to an operational phase. Furthermore, general access to the Chaarat Licence Area is precluded by snowfalls for several months of the year. There can be no guarantee that the requisite consents (national, regional or local) will be forthcoming when the process to transition from exploration to operation is embarked on.

The following constraints apply to the infrastructure for the Chaarat Gold Project:

- all power will be self-generated;
- all consumables, personnel, and spares will be transported over mountainous terrain to the Chaarat Gold Project site;
- extreme winter conditions prevail for approximately three months of the year. Between November and April, it may be too cold to install certain elements of the Chaarat Gold Project infrastructure;
- Chaarat Gold Project access for large and heavy loads is limited. The maximum container size will be 20 feet long;
- personnel and small, incidental loads can be flown in by chartered helicopter; and
- the Chaarat Gold Project needs to be self-reliant as there is no logistical or infrastructure support in the region.

Section 12.5 of the Chaarat CPR notes other risks relating to the Chaarat Gold Project infrastructure, including the risk of geohazards and that access to the Chaarat Gold Project is easier during the summer than in the winter, although the addition of the road constructed between the Chatkal Station, over the Kimbel Pass to the Chaarat Gold Project site will make winter access more reliable.

Section 13.3 of the Chaarat CPR notes the following concerns:

- the lack of detailed ground investigation, geohazard assessment and mitigation plan;
- the seismic design parameters used for the Tulkubash heap leach facility are below code for the area without an on-site seismic survey; and
- the absence of a detailed hydrology report and the absence of monitoring wells, which may affect the sustainability of the ground water to support the Chaarat Gold Project's water requirement.

Although the Group has addressed, or intends to address, these risks, there can be no assurance that the Group will be able to manage all such risks successfully or at all. Any failure to do so could have a material adverse effect on the Group.

Social and Community Risks

The Company has developed good relations with stakeholders in the Kyrgyz Republic and has made efforts to engage and inform them about the Tulkubash Project. However, there is no guarantee that the Group will continue to have good relations with all relevant stakeholders in the future.

In accordance with the requirements of Kyrgyz mining law, CZ is obliged to invest in local community development (personnel training, employment of local residents and construction of infrastructure facilities) through an agreement with the local self-government authority in relation to a package of social measures to be implemented by CZ. However, Kyrgyz mining law requirements as regards this social package are general and do not contain specific requirements, for example, as to the maximum/minimum size of the investments which are required to be contributed to local community development. The concept of the social package is relatively new in the Kyrgyz Republic, therefore not many precedents are available from which CZ can draw guidance as to how to implement the required investments. Moreover, this social package agreement must be agreed with the local self-government authority, and so the position as regards the size and main conditions of the agreement on the social package are unpredictable. As a result, there can be no guarantee that CZ will be able to comply fully with its obligations in relation to local community investment.

If the Group fails to maintain good community relations or to meet its related obligations, this could have a material adverse effect on the Group.

Environmental Impact

Section 12.4 of the Chaarat CPR notes the following environmental risks in relation to the Tulkubash Project:

- Gaps exist in data for surface and groundwater which should be addressed by developing an action that guides additional data collection and monitoring. An overall water balance based on existing and new data would enhance the quality of the impact assessment.
- Acid rock damage and metal leaching are regarded as amongst the most significant impacts but, due to a lack of data, a precautionary approach has been taken in the impact assessment and developing management plans. Additional data collection and monitoring may prove that less stringent measures are required to manage potential impacts.
- A comprehensive review of Kyrgyz Republic legislation and permit requirements has been presented in the environment and social impact assessment report. Timeframes have not been given for how long permit applications take to be processed. Timeframes should be confirmed by the Group as there is a risk that Tulkubash Project activities and schedules could be affected by processing times.
- Land-take has been modest for the Tulkubash Project and the need for resettlement has not been identified. However, some land that will be incorporated into the project footprint is used for animal grazing and, although the local community appears amenable, there is a risk of economic resettlement unless there is an agreement that follows due process.

- It should be verified if the letter from the Kanysh-Kiya Rural Council stating that land shall be allocated for temporary land use under lease for a period of validity of the licence for subsoil use (No. 3117 AE, 25.06.2012) has standing if challenged by higher levels of government.
- CZ's health, safety and environment manager and coordinator will need appropriate experience to manage health, safety environment, and community matters.

Although the Group has addressed, or intends to address, these risks, there can be no assurance that the Group will be able to manage all such risks successfully or at all. Any failure to do so could have a material adverse effect on the Group.

Operational risks

Section 12.2 of the Chaarat CPR states that there are always risks associated with operating in mountainous terrain, but with adequate planning and the implementation of risk mitigation measures, these risks should be surmountable. Avalanches are a particular risk that has been addressed in the pit design for the Chaarat Gold Project, which CZ intends to adhere to.

Section 12.3 of the Chaarat CPR outlines risks relating to the design of the Tulkubash process plant, including that the location of the Chaarat Gold Project has a wide range of temperature variations ranging from +38ºC to –35ºC. Heap leach kinetics slow down significantly below 7ºC, as a result of which production may be affected during the winter months.

Section 12.3 also notes operational risks relating to Kyzyltash, and states that "Kyzyltash test work completed to date on the Contact Zone of the mineralisation is limited and scoping level in nature. No test work has been done on the Main Zone mineralisation. The conceptual processing methods are based on the available test work however, the tested sample is not representative of the ore zones. The potential risk associated with this approach is the likelihood that the Main and Contact zones will exhibit different metallurgical processing characteristics".

There are various geohazards that pose a risk to successful development of the Chaarat Gold Project. In particular, section 7.7.4 of the Chaarat CPR identifies the following key geohazards in the local area:

- rock fall from upper mountain slopes (rock crags) as isolated block fall events;
- rock avalanche;
- large-scale active/seasonal debris flows;
- snow avalanches, which include dry avalanches, wet snow avalanches, and slush flow; and
- seasonal snow melt and storm water runoff.

Although the Group has addressed, or intends to address, these risks, through a series of risk mitigation measures, there can be no assurance that the Group will be able to manage all such risks successfully or at all.

The occurrence of any of these risks or geohazards, whether on a one-off or ongoing basis, could have a material adverse effect on the Group.

Economic Risks

Section 10.6 of the Chaarat CPR notes that the results of the economic analyses discussed in section 10 of the Chaarat CPR represent forward looking information. The results depend on inputs that are subject to a number of known and unknown risks, uncertainties and other factors that may cause actual results to differ materially from those presented in the Chaarat CPR. Information that is forward-looking includes:

- Mineral Resource and Ore Reserve estimates;
- assumed commodity prices and exchange rates;
- mine production plans;
- projected recovery rates;

- sustaining and operating cost estimates;
- assumptions as to closure costs and closure requirements; and
- assumptions as to environmental, permitting and social risks.

Additional risks to the forward-looking information include:

- changes to costs of production from what is assumed;
- unrecognized environmental risks;
- unanticipated reclamation expenses;
- unexpected variations in quantity of mineralised material, grade, or recovery rates;
- geotechnical and hydrogeological considerations during mining being different from what was assumed;
- failure of plant, equipment, or processes to operate as anticipated; and
- accidents, labour disputes and other risks of the mining industry.

Section 12.6 of the Chaarat CPR notes that the capital cost estimate for the Feasibility Study was completed as an internal estimate and recommends that capital cost numbers should be confirmed with budget quotes from more than one independent vendor.

Section 13 of the Chaarat CPR makes certain recommendations as regards the Chaarat Gold Project, including that the Feasibility Study is re-assessed and updated including as to capital and operating costs and gaps in cost estimates and quotations. Section 9.1.5 of the Chaarat CPR also notes that freight and logistics are a major concern for Tulkubash due to the remoteness of the site and the mountain passes on the way to the Tulkubash site. The Chaarat CPR recommends that an independent logistics study should be completed and the costs for freight and logistics should be reconfirmed as part of an updated capital cost estimate.

Although the Group has addressed, or intends to address, these risks, there can be no assurance that the Group will be able to manage all such risks successfully or at all. Any failure to do so could have a material adverse effect on the Group.

Reserve/Resource Estimate

The Mineral Resource estimates for the Mining Licence have been estimated by Tetra Tech and reported in accordance with the JORC standards in the Chaarat CPR. The key assumptions used for this estimate are set out in the Executive Summary of the Chaarat CPR.

The estimating of Ore Reserves and Mineral Resources is a subjective process and the accuracy of Ore Reserve and Mineral Resource estimates is a function of the quantity and quality of available data and the assumptions used and judgements made in interpreting engineering and geological information. There can, therefore, be no certainty that these estimates will be achieved as anticipated or at all, which could have a material adverse effect on the Group.

As noted in the Executive Summary of the Chaarat CPR, it is still too early to make any predictions for Kyzyltash as this resource needs to be studied in more detail.

Kyrgyz government priority purchase right regarding refined gold

The Government of the Kyrgyz Republic represented by the Department of Precious Metals of the Ministry of Finance of the Kyrgyz Republic and the National Bank has a priority right to buy part or all of the refined gold at the first auctions. Kyrgyz laws do not establish a mechanism or timeframe for exercise of such right. It is understood that this takes place at world prices less transportation and sale costs and that, when purchasing refined gold, the National Bank of the Kyrgyz Republic follows the London Bullion Market Association gold fixing price in US dollars converted to Kyrgyz Som pursuant to the official exchange rate as of the date of the transaction. However, if the Group is forced to comply with the priority right requirement, it may have a material adverse impact on the business, operations and financial performance of the Group where the gold could have been sold at a better price or on terms more beneficial to the Group or where the decision of the offeree authority is delayed

for whatever reason. In addition, the Government of the Kyrgyz Republic may within its general powers establish limits on exportation of gold (in a form of ore, concentrate, refined gold, etc.), which may have an adverse effect on the business of the Group.

Kyrgyz Republic laws and regulations

The laws and regulations of the Kyrgyz Republic relating to, among other things, foreign investment, subsoil use, licensing, companies, tax, customs, currency, capital markets, pensions, insurance, banking and competition are still developing. Many such laws provide regulators and officials with substantial discretion in their application, interpretation and enforcement. Furthermore, the judicial system in the Kyrgyz Republic may not be fully independent of social, economic and political forces. Court decisions can be difficult to predict and enforce, and the Group's best efforts to comply with applicable law may not always result in compliance.

Article 6 of the Law of the Kyrgyz Republic "On Investments in the Kyrgyz Republic" dated 27 March 2003 provides that investments made by foreign companies in the Kyrgyz Republic are guaranteed against expropriation, that is, nationalization, requisition, or other equivalent measures, including acts or failure to act by the authorised government agencies of the Kyrgyz Republic, which result in coercive taking of the investor's property or depriving him of the possibility to use the results of the investments. However, expropriation can be lawfully undertaken by the government of the Kyrgyz Republic in certain circumstances prescribed in the legislation of the Kyrgyz Republic, provided that such expropriation is undertaken in the interests of the public on a non-discriminatory basis, in accordance with the proper legitimate procedure and with payment to the relevant investor of timely, proper and real compensation of damage including for any loss of profit. However, there can be no assurance that such non-expropriation guarantees will be met in full or at all.

On 12 August 2015 the Kyrgyz Republic became part of the Eurasian Economic Union together with Russia, Kazakhstan, Belarus and Armenia. Since then, the Kyrgyz Republic has been in a transition period and is currently changing its domestic legislation and regulations so as to comply with the legislation of the Eurasian Economic Union.

No assurance can be given that the uncertainties associated with the existing and future laws and regulations in the Kyrgyz Republic, and its integration into the Eurasian Economic Union, will not have a material adverse effect on the Group's investments or operations.

Tax in the Kyrgyz Republic

Kyrgyz tax legislation is at a developing stage. Although tax regulations in the Kyrgyz Republic have become more uniform and clear in recent years, differing opinions regarding the correct legal interpretation of relevant tax rules exist both among and within Government ministries and organisations of the Kyrgyz Republic, creating uncertainties and conflicts as to the uniform application of taxes. Tax declarations, together with other similar areas of legal compliance (for example, customs matters) are subject to review and investigation by governmental authorities, who are enabled by law to impose fines, penalties and interest charges. The developing and uncertain nature of the tax system in the Kyrgyz Republic creates tax risks which are more significant than those typically found in countries with more developed tax systems. As a result, the Group may be subject to an increase in its tax liabilities.

Kyrgyz Republic country risk

The Kyrgyz Republic's existence as an independent state resulted from the break-up of the Soviet Union. As such, it has a relatively short history as an independent nation and there remains potential for social, political, economic, legal and fiscal instability. These risks include, among other things, the fact that the Kyrgyz government has not yet fully implemented the reforms necessary to create banking, judicial, taxation and regulatory systems that usually exist in more developed markets, local currency devaluation, civil disturbances, changes in exchange controls or lack of availability of hard currency, constitutional changes, changes in energy prices, changes to tariffs applicable to the Group and its products, changes with respect to taxes, royalty rates, or withholding taxes on distributions to foreign investors, changes in anti-monopoly legislation, interruption or blockage of hydrocarbons or other strategic materials exports, and, in particular, nationalisation or expropriation of property.

Historically, presidents frequently changed the make-up of the government, which led to instability in the government system as a whole. Although the Kyrgyz Republic has been a parliamentary republic since 2010, the president and his office influence the decisions of the government and its ministries. The occurrence of any of the above factors could have a material adverse effect on the business, financial condition and results of operations of the Group, the recoverability of the Group's assets and the ability of the Group to maintain or meet its obligations as they mature.

There is some disagreement between the former president of the Kyrgyz Republic and his successor. This led to various indictments, arrests and prosecutions under an anticorruption campaign. As a result of this campaign, there is uncertainty among high-level officers of the government and members of the government are generally reluctant to take proactive positions and promote reforms or solicit new investments in the Kyrgyz Republic. Moreover, Kyrgyz governments tend to revise the decisions of their predecessors which can create uncertainty for investors who had negotiated investment terms with previous governments.

The occurrence of any one or more of these risks could have a material adverse effect on the Group.

2. SPECIFIC RISK FACTORS RELATING TO THE KAPAN ACQUISITION

Risk that Admission does not become effective

Admission will only become effective following completion of the Kapan Acquisition Agreement and with the approval of the London Stock Exchange. If completion of the Kapan Acquisition Agreement occurs but Admission does not, there is a risk that the Ordinary Shares will be suspended from trading on AIM until such time that the London Stock Exchange approves the restoration of the Ordinary Shares to trading. If restoration does not take place within the time periods permitted by AIM, admission of the Ordinary Shares to AIM may be cancelled.

The Kapan Acquisition is subject to various conditions and requirements which may not be satisfied or waived

Completion of the Kapan Acquisition is conditional upon, amongst other things:

- the approval of the Kapan Acquisition by Shareholders at the General Meeting (notice of which is set out at the end of this document);
- approval by the SCPEC; and
- the Company obtaining financing in relation to the Kapan Acquisition and related conditions precedent to drawdown of that financing being satisfied.

There can be no guarantee that all conditions for the Kapan Acquisition (including receipt of the Kapan Acquisition Financing and of the necessary regulatory approval) will be satisfied on terms satisfactory to the Group or at all, or that all other completion requirements will be met, and therefore no guarantee that the Kapan Acquisition will complete or that Re-Admission will take place.

In particular, although the Company has signed a term sheet and received a letter for the Kapan Acquisition Financing as set out in paragraph 7.24 of Part VI of this document, legally binding documents for the Kapan Acquisition Financing remain to be prepared, negotiated and executed and any and all conditions precedent to drawdown of the financing thereunder will also need to be satisfied. Unless the Kapan Acquisition Financing is completed on the terms expected, or replacement financing is obtained on acceptable terms, the Kapan Acquisition will not complete and Re-Admission will not take place. Your attention is drawn to the working capital statement at paragraph 11 of Part I and paragraph 18 of Part VI of this document.

If the Kapan Acquisition does not complete, the Company would nonetheless incur significant expenses, including a termination fee of US$10 million and advisory fees, in connection with the Kapan Acquisition.

There may be unforeseen integration difficulties which may distract or overstretch management

The integration of Kapan into the Group will require significant time and effort on the part of the Group's management. If such integration difficulties are significant, this could adversely affect the

business, financial condition, results of operations or prospects of the Group. The process of integrating operations could, amongst other things, divert management's attention away from the activities of one or more of the existing operations, as well as interrupt business momentum, and could result in a loss of key personnel.

Although regulatory and operational decision making will often be undertaken by each of the businesses locally, coordinating its decision making across all of the businesses in the Group will present challenges within the Group's management team. In particular, following completion of the Kapan Acquisition, the financial complexity of the Group will increase significantly and the Group's forecasting, budgeting and financial reporting processes will need to change. There is a risk that the challenges associated with integrating Kapan and managing the Group will distract or overstretch the management team or that the integration of the underlying businesses is delayed or takes materially longer than management anticipate and that consequently the underlying businesses will not perform in line with management or Shareholder expectations. The Group's future prospects will, in part, be dependent on the ability of the Group's management team to successfully integrate Kapan into the Group without material disruption. A failure to successfully manage the integration may have a material adverse effect on the Group's results of operations and financial condition.

Limited warranties and indemnities are being given in respect of the Kapan Acquisition

PMTL has given limited warranties and indemnities to the Group in the Kapan Acquisition Agreement. Such warranties and indemnities are subject to limitations on liability including monetary and time limits. In particular, a number of the indemnities are subject to an aggregate cap on liability equal to the consideration payable by CGIL under the Kapan Acquisition Agreement, meaning that the Group may not be able to claim against PTML for all losses that may arise in relation to such matters. For example, if the Group makes a claim under one such indemnity that is equal to the aggregate liability cap, any further claims for other matters would be barred. Accordingly, the Company will have limited, if any, rights of redress against PMTL should there prove to be any undisclosed liabilities or other matters adversely affecting Kapan which the Company was not aware of at the time of entry into such agreement or should the indemnities be insufficient to cover the relevant losses. Further details of the Kapan Acquisition Agreement are set out in paragraph 7.20(a) of Part VI of this document.

Material facts or circumstances may not be revealed in the due diligence process in relation to the Kapan Acquisition

The Company has conducted such due diligence as it deems practicable and appropriate in the context of the Kapan Acquisition, and risk factors relating to certain matters identified during the due diligence process are set out in this Part III of this document. The objective of the due diligence process is to identify material issues which might affect the decision to proceed with the Kapan Acquisition or the consideration payable for the Kapan Acquisition. Whilst conducting due diligence and assessing the Kapan Acquisition, the Company has relied on publicly available information and information provided by PMTL, subject to the limitations imposed by PMTL or third parties for reasons of confidentiality, business disruption or otherwise. There can be no assurance that the due diligence undertaken with respect to the Kapan Acquisition has revealed all relevant facts and/or material issues that may be necessary to evaluate the Group's decision to proceed with, and the agreed terms of, the Kapan Acquisition, including the determination of the price the Company has agreed to pay, the operations at the Kapan Mine or to formulate a business strategy for the Group.

Whilst due diligence has been conducted on Kapan, some of the documentation maintained by or on behalf of Kapan or PMTL may be incomplete or inconclusive. As part of the due diligence process, the Company has also made subjective judgments regarding the results of operations, financial condition and prospects of Kapan. If the due diligence investigation has failed to identify correctly issues and liabilities that may be present in Kapan, or if the Company has concluded such risks (whether or not material) are commercially acceptable relative to the opportunity, the Company may subsequently incur substantial impairment charges or other losses. In addition, following the Kapan Acquisition, the Group may be subject to significant, previously undisclosed liabilities or technical difficulties of Kapan that were not identified during due diligence.

All of these risks could have a material adverse effect on the Group's financial condition and results of operations.

Performance by PMTL of its obligations under the Kapan Acquisition documents

PMTL has significant obligations under the Kapan Acquisition Agreement, the ROFR Agreement and related documents and the Group will be relying on PMTL to perform its obligations thereunder. These obligations include indemnities in respect of losses arising out of the matters referred to in paragraph 7.20(a)(xiv) of Part VI of this document including:

a) the potential invalidation of an increase in share capital in Kapan by means of the issue of shares in Kapan to a previous shareholder and related repayment of amounts owed to a related party of that shareholder;

b) employment claims by certain previous senior management of Kapan;

c) the poisoning and other medical complaints of three employees by toxic and other gases present at the Kapan Mine (and any related breach of applicable law and regulations);

d) the risk that a third party might make a claim requesting a court to hold that a particular licence or permit was invalid because it did not have a compliant environmental impact expertise opinion;

e) a potentially missing water use permit and an unregistered easement; and

f) certain potential breaches of Armenian currency laws in relation to commercial contracts denominated or priced in United States Dollars rather than Armenian currency.

The Group is reliant on the creditworthiness of PMTL to satisfy these indemnities and certain of its other obligations under the Kapan Acquisition Agreement. If PMTL does not perform its obligations in full or when due to be performed or at all, this could have a material adverse effect on the Group's financial condition and results of operations. As noted above, these indemnities are also subject to limitations on liability including monetary and time limits and there can be no assurance that these indemnities will be sufficient to cover any liabilities or other losses which the Group may suffer or incur in future arising from these matters.

Transitional services

The Group will need PMTL to provide certain transitional services to Kapan or the Group for certain periods of time from completion of the Kapan Acquisition. The services needed by or desirable for Kapan include: continued availability at the Kapan Mine of certain Polymetal group expatriate personnel, retention by Kapan of certain personnel whose services might otherwise no longer have been required, the continuing benefit and use (until transfer, licensing or other migration) of certain software currently used by Kapan through the Polymetal group, availability of Polymetal group personnel engaged in various project management services, availability of certain legal and tax functions provided by the Polymetal group and completion of the design for and ongoing technical support regarding the Geghanush tailings facility. Negotiations are ongoing regarding these matters, but no agreement has to date been signed regarding the provision of such services and there is no guarantee that such an agreement will be signed on terms satisfactory to the Group or at all. Failure to obtain the required assistance on satisfactory terms or for the required duration or at all could significantly hinder the successful integration of Kapan into the Group and have a material adverse effect on the operations at the Kapan Mine and on the Group's results of operations and business.

Risk that the desired benefits may not be achieved by the Group

The value of an investment in the Group is dependent on the Group achieving its strategic aims. The Group is targeting significant benefits from the Kapan Acquisition and the Group's financial planning and funding strategies are based in part on realising these benefits. There is a risk that benefits from the Kapan Acquisition may fail to materialise, may take longer than anticipated or may be lower than have been estimated. In addition, the cost of funding these benefits may exceed expectations and such eventualities may have a material adverse effect on the financial position of the Group. As a result of taking some of the action required to achieve the desired benefits, some employees of the Group may choose to leave the Group. There is no guarantee that the Group will be able to replace these employees with sufficiently experienced and skilful staff.

The integration costs related to the Kapan Acquisition may exceed the Board's expectations

The Group expects to incur a number of costs in relation to the Kapan Acquisition, including integration and post completion costs in order to successfully combine the operations of Kapan with the rest of the Group. The actual costs of the integration process may exceed those estimated and there may be further additional and unforeseen expenses incurred in connection with the Kapan Acquisition. In addition, the Group and Kapan will incur legal, accounting, transaction fees and other costs relating to the integration and implementation of the Kapan Acquisition, some of which are payable regardless of whether or not the Kapan Acquisition completes. Although the Directors believe that the integration and acquisition costs will be more than offset by the realisation of the synergies resulting from the Kapan Acquisition, this net benefit may not be achieved in the short-term or at all, particularly if the Kapan Acquisition is delayed or does not complete. These factors could adversely affect the Group's operations and/or financial condition.

3. SPECIFIC RISK FACTORS RELATING TO KAPAN AND THE KAPAN MINE

Specific risks relating to Kapan and the Kapan Mine which may affect the Group following Re-Admission include the following:

Kapan Licence

Changes of legislation happen due to the developing nature of the Armenian Republic and its legislation. Based on this, there is no guarantee that rules applicable to prolongation, suspension and termination of the Kapan Licence currently in force will be the same in the future. Any failure to maintain the Kapan Licence on its current terms or at all may have a material adverse effect on the Group's results of operations and business.

Title to Kapan Licence Area

There can be no assurance that the legal and/or contractual rights granted by the Kapan Licence will be respected, or not disputed, at any time or during the contemplated period of usage by Kapan, thereby potentially reducing the anticipated value of the Group's investments and operations in Kapan.

Certain of the permits and mining licences held by Kapan were issued with incomplete environmental impact assessment ("**EIA**") expertise opinions, which may result in an invalidation of the relevant EIA and subsequently the relevant mining permits. These opinions were issued in this format by the relevant Armenian government authority, however there remains a risk that a third party might make a claim requesting a court to hold that a particular licence or permit was invalid because it did not have a compliant environmental impact expertise opinion. As noted above *(see Performance by PMTL of its obligations under the Kapan Acquisition documents)*, the Group has received an indemnity from PMTL in respect of losses that might arise out of this matter although there can be no assurance that such indemnity would be adequate to satisfy all losses that may arise from this matter.

Land use consents, permits and approvals

Kapan has obtained a number of land plots related to the Kapan Licence and is believed to have all material land rights necessary for exercising its rights under this licence. However, the Company has not been able to ascertain that these are all rights which Kapan needs for its current operations. Further, there can be no certainty that Kapan has or will be able to obtain all rights which it may need from to time for its mining operations at the Kapan Mine or otherwise.

In addition, there are some uncertainties in Armenian laws and regulations regulating the procedure for obtaining land rights for mining works at the Kapan Mine and construction of the related mining infrastructure. These uncertainties may adversely affect land rights and, if not properly followed, procedural irregularities could potentially result in termination of certain land rights.

Kapan also requires various permits to operate, including a water use permit. The water use permit has been applied for but not yet granted. Should this permit not be granted, this could prevent all operations at the Kapan Mine and may also result in fines for operations conducted while the permit was outstanding.

All of these risks could affect the ability of Kapan to continue operations at the Kapan Mine as currently operated or intended to be operated or at all and my therefore have a material adverse effect on the Group.

Social and community risks

A number of foreign companies operating in Armenia have encountered significant issues with local communities within the sphere of their operations. There is no guarantee that Kapan or the Group will have or be able to maintain good relations with relevant stakeholders in the region surrounding the Kapan Mine, and the Group's operations could be subject to delays or disruptions as a result of the actions of local communities and other stakeholders, which could have a material adverse effect on the Group.

Reserve/Resource estimate

Sections 1.3.5 and 1.3.6 of the Kapan CPR summarise various risks with respect to the mineral resources at the Kapan Mine, and these are set out below:

- The Mineral Resources were depleted with the latest Mined to Date (MTD) solid provided. CSA Global then compared these figures to those quoted in literature received. CSA Global was not able to reproduce the figures as outlined in the report provided. However, CSA Global was able to confirm metal that forms the basis of the five year mine plan, to within acceptable confidence limits (±10%).
- Validation of the block model presents a significant risk. The output model histograms show a distinct bimodal distribution for Au, Ag, Cu and Zn where no such trend exists within the input composite data, which is broadly lognormal in distribution. This presents a risk in the ability to plan underground mine development from the model. Grades anticipated from the model may be highly variable on a more localised scale, and at risk within areas impacted by this bimodality in the model. This is further highlighted when reviewing the broad trends in each vein from an overall visual qualitative perspective.
- The assignment of density to the model based on a regression formula from the estimated sulphur grade in the model presents a moderate risk to the Mineral Resource. Model validation for sulphur was poor, in part due to 60% of the composites having no sulphur data. CSA Global cannot comment on the appropriateness of the regression formula used as no density data was provided for review.
- Additional review and sensitivity analysis would be required to confidently convey project upside.
- CSA Global has concerns over the level of detail presented in the mine design, schedule (development specifically) and sequencing, and considers that the level of accuracy is not commensurate with the requirements of an operating mine requiring short to medium term mine planning.
- The Kapan Mine appears to employ modern techniques to mine planning and survey, however, refinements and best practices appear to be required.
- Execution monitoring, feedback, risk analysis of the engineering, mining and technical support departments is not fully understood at time of writing the Kapan CPR.
- CSA Global has concerns that the EPS scheduling output data is not representative of the financial model. The tonnes and grade have reasonably small variances (specifically 2018/2019); however, the ore development to stoping ratio is materially different.
- Survey "as-built" 3D CAD files (stoping specifically) do not appear to be complete for a mature mine like Kapan. It is imperative that an accurate "as-built" plan exists to ensure accurate planning and safety of planned mining activities.
- Mining equipment replacement presented in the financial model will not ensure sustainable safe production based on existing equipment age and OEM specification for rebuild and replacement.
- Detail of operating costs for mining presented in the financial model is not commensurate for an operating mine (when considering detail presented in the model).

- Plant feed grade and metal recovery are highly interdependent, and a lowering of head grade has a negative e-compounding effect on cashflows. Unplanned dilution realised during the mining operation can have a material effect on the profitability of the operation.

If the Group does not address these risks adequately or at all following completion of the Kapan Acquisition, this may have a material adverse effect on the Group's results of operations and business.

Labour and health & safety issues at Kapan

The former CEO, CFO and former Head of Mining of Kapan each submitted claims against Kapan in 2016 regarding the termination of their employment, demanding to invalidate the termination of their employment contracts, to reinstate them in former positions and to charge the salary and average salary for the whole period of forced idleness. The combined value of these claims is approximately US$1,026,212. The court of first instance has yet to issue its ruling on these claims. As a result, there can be no assurance that such claims will not be successful or that they will not affect the operations of Kapan or the Kapan Mine.

On 3 March 2018 three Kapan employees were poisoned by toxic gases present in the Kapan Mine. All three employees were hospitalized and one employee died as a result of his exposure to these toxic gases. An investigation and subsequent report by the health and labour authorities in Armenia found that Kapan had breached certain health and safety regulations. This incident gives rise to penalties for breach of health and safety regulations by Kapan, potential criminal liability for the responsible officers of Kapan, possible civil claims by the estate of the deceased employee and the possible suspension of mining activity by the relevant Armenian government authority until any failure of the ventilation system in the Kapan Mine is addressed so as to ensure compliance with applicable law and regulations. Furthermore, negative sentiment towards the Group and reputational damage as a result of this incident may develop or persist within the local community, which could result in a lack of willingness of the relevant governmental authorities to grant or renew the necessary licences and permits which the Group requires to continue carrying on business at Kapan.

A section of the Kapan Mine was additionally closed in March 2018 as the result of a fatal accident and has not yet reopened. This has consequentially led to the mining of poorer ore bodies and the grades in respect of the key metals, gold and silver, have been worse. There can be no assurance that this closure will not continue to affect the operations of Kapan or the Kapan Mine or their financial results.

In addition, production at the Kapan Mine was stopped for approximately one week in May 2018 as a result of a hunger strike and mass absenteeism by local mine employees demanding pay increases, including for night work and hazardous work. A compromise agreement was reached between Kapan and the relevant employees, resulting in 10% salary increases for all employees of Kapan, and mine operations resumed. Although it is considered that this labour incident has now been settled, there remains a risk of further spontaneous protests by Kapan employees.

There can be no assurance that these or similar health and safety and/or labour related incidents or issues at Kapan will not re-occur or that such existing and/or future issues will be resolved satisfactorily or will not have a material adverse effect on the Kapan Mine or Kapan or the Group generally.

Geotechnical risks

Section 1.3.7 of the Kapan CPR summarise the following geotechnical risks:

- CSA Global views the extraction ratio (estimated at 85–90%) to be too aggressive for the rock mass quality reported. Extraction ratios between 70% and 75% appear plausible.
- CSA Global considers the stope sizes adopted and extraction ratios as overly aggressive for the rock mass quality and HR reported. The stope sizes planned may be a large contributor to unplanned dilutions of between 20% and 25%. Based on empirical design guidelines used by Kapan, for unsupported stable stope sizing with sporadic rather than systematic post filling CSA Global views the designs adopted to be flawed and disconnected from the HR numbers reported. The designed stope sizes do not support the stable HRs reported (<6.1 for 70° veins and 5.2 for 50° veins).
- Analyses of both the North and South walls' performance under seismic conditions showed them to have Factor of Safety (FoS) less than the required value of 1.1 for the adverse condition of a MCE

as a "High" consequence dam. The analyses indicate that both the North and South embankments of the facility will require stabilisation (buttressing) in order to meet performance requirements during an MCE seismic event.

- It is a risk that the future tailings expansion has not been adequately planned (conceptual level studies) and not properly costed in the five year plan. The risk is the possibility of inadequate tailings disposal volume to meet production requirements and inadequate capital allowed for the required construction.

If the Group does not address these risks adequately or at all following completion of the Kapan Acquisition, this may have a material adverse effect on the Group's results of operations and business.

Environmental impact

Section 1.3.9 of the Kapan CPR summarises the following potential environmental risks:

- While it was stated that there is good management support for environmental work at Kapan, some training is needed to use equipment and for reactive investigation outside the prescribed monitoring requirements.
- The lack of definitive acid rock drainage and metal leaching (ARD/ML) testwork is a concern. Comprehensive geochemical characterisation studies allow ARD/ML understanding and prediction and thus implementation of suitable design and mitigation measures, especially if new deposits/ore targets are brought online.
- Recycling of water within the operations is important as the project has to pay for all abstractions and discharges by volume, and improvement should be a priority.
- The previous Kapan mine owners were exempted from historic mining liabilities from the old Centralni open pit mine (closed prior to 2004, with rehabilitation activities completed and approved); and from the old waste rock dumps (which have not been rehabilitated and may be a potential source of continuing pollution). The licence and remaining liabilities for these have apparently been returned back the Government of Armenia, however full implications of the legal closure requirement should be part of any future permit conditions sand negotiation.
- While the 2015 estimate of US$12 million for closure costs seems reasonable given the scale of the current underground operations, limited requirement for demolition, use of local rates and assuming that there are indeed no legacy liabilities it is not clear if this includes any provision for employee retraining, livelihood restoration nor other social mitigation. Moreover, as there may be further requirements to ensure long-term TSF structural integrity, TSF closure and rehabilitation costs may be significantly higher.

If the Group does not address these risks adequately or at all following completion of the Kapan Acquisition, this may have a material adverse effect on the Group's results of operations and business.

Economic model

Section 1.13.10 of the Kapan CPR summarises the following risks regarding the economic model:

- The reduction in unit costs of production as a result of: a) a reduction in development requirement in the mine plan for the Ore Reserve portion; and b) the extrapolation of the Inferred Resource that appears to have a significantly reduced cost related to development activities, is a concern, especially given reliance on low-confidence Inferred Mineral Resources.
- The ore development to stoping ratio as contained in the financial model is not in line with the EPS production report.
- The plant maintenance capital allowance of <2% is forecasted low and when benchmarked against other concentrator operations typically should be in the range of 4–8% of operational cost.
- The capital provision for mining equipment replacement is calculated at 4.9% over a five year forecasted period. This is significantly lower than benchmarked and calculations indicate 16% is required for the replacement and rebuilding of equipment.

- CSA Global has not specifically tested the validity of the blended smelting and refining charge and its equivalency to the individual element smelting and reefing terms.

If the Group does not address these risks adequately or at all following completion of the Kapan Acquisition, this may have a material adverse effect on the Group's results of operations and business.

Offtake agreements

Kapan is party to certain offtake agreements as described at paragraph 7.21 of Part VI of this document. These agreements will require renewal or extension prior to, or with effect from, 1 January 2019. If Kapan is unable to renew or extend these agreements, or to enter into replacement agreements, on terms which are at least as favourable as current terms, this could materially adversely affect the financial position of Kapan and, consequently, the Group.

Armenian Republic laws and regulations

The laws and regulations of the Armenian Republic relating to, among other things, foreign investment, subsoil use, licensing, companies, tax, customs, currency, capital markets, pensions, insurance, banking and competition are still developing. Many such laws provide regulators and officials with substantial discretion in their application, interpretation and enforcement. Furthermore, the judicial system in the Armenian Republic may not be fully independent of social, economic and political forces. Court decisions can be difficult to predict and enforce, and the Group's best efforts to comply with applicable law may not always result in compliance.

Armenian law provides that investments by foreign companies are guaranteed against expropriation, nationalization, requisition, or other equivalent measures by state authorities. However, there can be no assurance that such non-expropriation guarantees will be met in full or at all.

On 2 January 2015, the Armenian Republic became part of the Eurasian Economic Union together with Russia, Kazakhstan, Belarus and the Kyrgyz Republic. Since then, the Armenian Republic has been in a transition period and is currently changing its domestic legislation and regulations so as to comply with the legislation of the Eurasian Economic Union. No assurance can be given that the uncertainties associated with the existing and future laws and regulations in the Armenian Republic, and its integration into the Eurasian Economic Union, will not have a material adverse effect on the Group's investments or operations.

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Currency laws in the Armenian Republic

Currency laws in the Armenian Republic do not permit contracts between Armenian companies to provide for payment to be made in foreign currency and this may also affect foreign currency related pricing provisions in such contracts. Any breach of these laws may result in the invalidation of the pricing provisions within these contracts, and the imposition of penalties up to the whole value of the relevant contract, which could have a material adverse effect on the Group.

Tax in the Armenian Republic

Armenian tax legislation is at a developing stage. Differing opinions regarding the correct legal interpretation of tax legislation may exist both among and within Government ministries and organisations; thus creating uncertainties and conflicts. Tax declarations, together with other similar areas of legal compliance (for example, customs matters) are subject to review and investigation by authorities, who are enabled by law to impose fines, penalties and interest charges. These facts create tax risks in the Armenian Republic which are more significant than typically found in countries with more developed tax systems and could have a material adverse effect on the Group.

Armenian Republic country risk

The Armenian Republic's existence as an independent state resulted from the break-up of the Soviet Union. As such, it has a relatively short history as an independent nation and there remains potential for social, political, economic, legal and fiscal instability. These risks include, among other things, the fact that the Armenian government has not yet fully implemented the reforms necessary to create

banking, judicial, taxation and regulatory systems that usually exist in more developed markets, local currency devaluation, civil disturbances, changes in exchange controls or lack of availability of hard currency, constitutional changes, changes in energy prices, changes to tariffs applicable to the Group and its products, changes with respect to taxes, royalty rates, or withholding taxes on distributions to foreign investors, changes in anti-monopoly legislation, interruption or blockage of hydrocarbons or other strategic materials exports, and, in particular, nationalisation or expropriation of property.

The occurrence of any one or more of these risks could have a material adverse effect on the Group.

4. SPECIFIC RISK FACTORS REGARDING THE GROUP

The Group

The Group has to date focussed its efforts on the exploration and development of the Chaarat Gold Project and has not previously owned or managed an operating mine. The Company therefore has no history of owning or managing operating mines upon which prospective investors may base an evaluation of its likely performance.

Future financing

As noted in paragraph 11 of Part 1 and paragraph 18 of Part VI of this document, the Company does not have sufficient working capital to proceed with the Kapan Acquisition without negotiating, executing and drawing down in full the expected proceeds of the Kapan Acquisition Financing and without having available to it the additional loan available under the Labro Loan Agreement. The working capital projections of the Company for these purposes assume a significant reduction in activity at the Chaarat Gold Project and in corporate overheads.

The Company's planned exploration at the Chaarat Gold Project will require further funding to be available to the Group in addition to that available or anticipated to be available under the Kapan Acquisition Financing and the Labro Loan Agreement. In addition, the Executive Summary of the Chaarat CPR sets out the initial capital cost estimate for stage 1 of the Chaarat Gold Project as US$121.7 million excluding value added tax and US$131 million including value added tax. Moreover, the Group has plans for further acquisitions.

The Group will, therefore, require significant additional financing in the future. There can be no assurance that additional financing will be available, or, if available, that it will be on terms acceptable or favourable to the Group or the Shareholders. The failure to obtain additional financing on reasonable terms or at all may have a material adverse effect on the Group. If the Group is unable to obtain additional financing as needed, it may be required further to reduce the scope of its operations or anticipated expansion, dispose of or forfeit its interest in some or all of its properties and licences, incur financial penalties or reduce or terminate its operations.

Future acquisitions

An important part of the Group's longer-term business strategy involves expansion through the acquisition of mining assets which may be at exploration, development or production stages. There is a risk related to the Group's ability to accurately identify suitable targets and successfully execute transactions for such a strategy or that any business acquired may not develop or succeed as anticipated or at all. As consideration for such acquisitions, the Company may seek to issue Ordinary Shares. There can be no guarantee that sellers of target companies, businesses or assets will be prepared to accept shares traded on AIM as consideration, and this may limit the Group's ability to grow its activities and pursue its strategy. The difficulties involved in integrating any companies, businesses or assets acquired by the Group may divert financial and management resources from the Group's core business, which could adversely affect the Group's business, financial condition, operating results and prospects.

Dilution

As referred to in paragraphs 5 and 16 of Part I and paragraph 2.8 of Part VI of this document, the Company has or will have a significant number of Options, Warrants and Convertible Loan Notes in issue. The Company also plans to put in place a new incentive scheme providing for significant grants of Ordinary Shares or Options as referred to in those paragraphs. In addition, the Labro Loan

Agreement provides for the issue of further Ordinary Shares in commitment and drawdown fees thereunder. Furthermore, the Company's acquisition strategy will require the issue of further Ordinary Shares, or rights to subscribe or convert securities into Ordinary Shares, either in consideration for acquisitions or to fund the same or to fund future working capital requirements resulting therefrom or to reward management for their work thereon (as referred to in paragraph 13.2 of Part VI of this document). Each of these events could result in significant dilution of the shareholdings of other Shareholders who do not participate in such issues.

The Articles provide for the automatic annual renewal of the authority of the Board to issue shares and to do so free of pre-emption rights, as further described at paragraph 2.1 of Part VI of this document (subject, unless the same is increased or removed, to the total authorised share capital of 600,000,000 Ordinary Shares). Shareholders who do not participate in future offerings of Ordinary Shares, or are not given the opportunity to do so, will find that their holdings in the Company will be diluted.

Absence of certain statutory regulation

The Company is not an entity subject to any regulatory supervision by the BVI Financial Services Commission and there is no securities legislation in the BVI to which the Company may be subject. As a result, shareholders of the Company are not protected by any regulatory supervision or inspections by any BVI regulatory authorities or agencies.

Currency and exchange rate risks

Some of the Group's operational expenses are denominated in currencies other than the US dollar and therefore changes in currency exchange rates may affect the value of the Group's investments and cash flow.

Dividends

The Company does not anticipate paying dividends or making any other distributions to any Shareholders for the foreseeable future and anticipates that any cash surpluses will be reinvested into the Group's business. Any determination in the future to pay dividends or make other distributions will be dependent upon the Company's consolidated results of its operations, financial condition, cash requirements, future prospects, compliance with all applicable law and such other factors as the Company deems appropriate at the time.

Group Taxation

The Company is currently intended to be managed so as to be treated as resident outside the United Kingdom for tax purposes. Such treatment may be subject to challenge and, if challenged, there can be no assurance that it would be upheld. It is possible that, in the future, the Company may migrate to the UK. No such migration would, however, be undertaken without first seeking tax advice on the impact of such a migration from both a group-level and shareholder-level perspective.

No Takeover Protection

The City Code does not apply to the Company (as the Company is incorporated in the BVI) and BVI law does not contain provisions similar to those contained in the City Code. As a result, any takeover offer for the Company or consolidation of control in the Company will not be regulated by the City Code or any other takeover regime. The Articles contain certain limited takeover protections but do not provide the full protections afforded by the City Code.

Economic Conditions

Market conditions, particularly those affecting resource companies, may affect the ultimate value of the Company's share price regardless of operating performance. The Group could be affected by unforeseen events outside its control, including natural disasters, war, terrorist attacks and political/civil unrest and/or Government legislation or policy. Market perception of resource companies may change which could impact on the value of investors' holdings and impact on the ability of the Company to raise further funds by an issue of further shares in the Company. General economic conditions may affect exchange rates, interest rates and inflation rates. Movements in these rates will have an impact on the Group's cost of raising and maintaining debt financing.

Commodity price volatility

The profitability of the Chaarat Gold Project and its long-term viability are dependent to a large extent on the market price of the commodities it will produce. Market prices of commodities fluctuate widely and are affected by various factors beyond the Group's control, including inflation, interest rates, speculative activities, currency exchange fluctuations, supply and demand, political and economic conditions and production costs in the relevant mining regions. The aggregate effect of these factors on the price of commodities is impossible for the Group to predict. The price of commodities has fluctuated in recent years and future significant price falls could cause commercial production to be uneconomic and have a material adverse impact on the business, operations and financial performance of the Group.

Dependence on key executives and personnel

The future performance of the Group will to a significant extent be dependent on its ability to retain the services and personal connections or contacts of key executives and to attract, recruit, motivate and retain other suitably skilled, qualified and industry experienced personnel to form a high calibre management team. Such key executives are expected to play an important role in the development and growth of the Group, in particular by maintaining good business relationships with regulatory and governmental departments and essential partners, contractors and suppliers.

There is a risk that the Group will struggle to recruit the key personnel required for its operations. Shortages of labour, or of skilled workers, may cause delays or other stoppages during operations. There can be no assurance that the Group will retain the services of any key executives, advisers or personnel who have entered, or will subject to Admission enter, into service agreements or letters of appointment with the Group. The loss of the services of any of the key executives, advisers or personnel may have a material adverse effect on the business, operations, relationships and/or prospects of the Group.

The Group currently has no key-man insurance policy in place and, therefore, there is a risk that the unexpected departure or loss of a key individual could have a material adverse effect on the business, financial condition and results of operations of the Group and there can be no assurance that the Group will be able to attract or retain a suitable replacement.

Related parties

The Group has various agreements or arrangements with directors and shareholders, including in particular the Relationship Agreement and Labro Loan Agreement, which are both with Labro (a related party of Martin Andersson), as further described at paragraph 13.1 and 7.26 of Part VI of this document and the arrangements with ACG Eurasia and ACG (related to Artem Volynets and Dmitry Yudin) further described at paragraphs 5.3(b), 5.3(c) and 13.2 of Part VI of this document. The Directors are of the view that, currently, no conflict arises as a result of these relationships. Whilst they intend to review this situation regularly, there can be no guarantee that conflicts will not arise in the future whether in relation to these relationships or otherwise. Any conflicts that do arise may have a material adverse effect on the Group or the Shareholders.

External contractors

The success of the Group's operations is dependent to a significant extent on the efforts and abilities of outside contractors, joint venture partners, experts and other advisers. Investors must be willing to rely to a significant extent on management's discretion and judgement as well as the expertise and competence of outside contractors, joint venture partners, experts and other advisers. Any contractual protection the Group may receive from such parties may be difficult to enforce, including if such parties lack adequate resources, which may have a material adverse effect on the Group.

Speculative business of mineral exploration

Mineral exploration is highly speculative, involves many risks and may be unproductive.

There can be no guarantee that the estimates of quantities and grades of minerals disclosed will be proven or available to extract. This may result in unprofitable efforts and may not result in profitable commercial mining operations.

Major expenses may be required to establish ore reserves and/or to develop metallurgical processes.

The commercial viability of a mineral deposit is dependent upon a number of factors. These include attributes such as size, grade and proximity to infrastructure, current and future mineral prices (which are volatile) and government regulations, including those relating to prices, taxes, royalties, land tenure, land use, importing and exporting of minerals and environmental protection.

The effect of these factors either alone or in combination cannot be predicted and their impact may adversely affect the Group's return on invested capital.

Natural risks

The business of mining and mineral exploration is subject to a number of risks and hazards including adverse weather conditions, environmental hazards, industrial accidents, mechanical factors, labour disputes, unexpected geological formations, rock falls, flooding and other conditions involved in the drilling and removal of material. Such risks could result in damage to, or destruction of production/processing facilities, death, personal injury, environmental damage, delays and monetary losses.

Any interest held by the Group is subject to the impact of any natural disaster such as earthquakes, epidemics, fires and floods etc. In particular, the Kapan Mine is in an earthquake zone and the Chaarat Gold Project is situated in remote and rugged terrain as noted in paragraphs 3 and 1 of this Part III of this document. No assurance can be given that the Group will not be affected by future natural disasters, which may have a material adverse effect on the Group.

Labour and health & safety

Mining involves a high degree of risk. The Group's operations are subject to all the risks common in its industry. These hazards and risks include encountering unusual or unexpected rock formations or geological pressures, geological uncertainties, seismic shifts, explosions, fires, improper installation or operation of equipment and equipment damage or failure. If any of these types of events were to occur, they could result in loss of production, environmental damage, injury to persons and loss of life. They could also result in significant delays to drilling programmes, a partial or total shutdown of operations, significant damage to equipment owned or used by the Group and claims for personal injury, wrongful death or other losses being brought against the Group. These events could result in the Group being required to take corrective measures, incurring significant civil liability claims, significant fines or penalties as well as criminal sanctions potentially being enforced against the Group and/or its officers. The Group may also be required to curtail or cease operations on the occurrence of such events. Were any of the above to materialise, they could have a material adverse effect on the Group's business, prospects, financial condition or results of operations. While the Group intends to implement certain policies and procedures to identify and mitigate such hazards, develop appropriate work plans and approvals for high-risk activities and prevent accidents from occurring, these procedures may not be sufficiently robust or followed to a sufficient extent by the Group's staff or third-party contractors to prevent accidents.

Environmental regulation

The Group's operations are subject to existing and possible future environmental and health and safety legislation, regulations and actions which could impose significant costs and burdens on the Group (the extent of which cannot be predicted) both in terms of compliance and potential penalties, liabilities and remediation. Breach of any environmental obligations could result in penalties and civil liabilities and/or suspension of operations, any of which could adversely affect the Group.

Risks associated with the need to maintain an effective system of internal controls

The Group's future growth and prospects will depend on its ability to manage growth and to continue to maintain, expand and improve operational, financial and management information systems on a timely basis, whilst at the same time maintaining effective cost controls. Any damage to, failure of or inability to maintain, expand and upgrade effective operational, financial and management information systems and internal controls in line with the Group's growth could have a material adverse effect on the Group's business, financial condition and results of operations.

Foreign subsidiaries

The Company conducts and expects to conduct its operations through various subsidiaries including CZ and, following Admission, Kapan. Therefore, the success of the Group in the near term will be dependent on repayments of loans or payment of distributions from such subsidiaries to the Group in order that it may meet its obligations. The ability of such subsidiaries to make payments to the Company may be constrained by, among other things, the level of taxation, particularly in relation to corporate profits and withholding taxes, and the existence or introduction of exchange controls or repatriation restrictions or the availability of hard currency to be repatriated.

Insurance coverage and uninsured risks

While the Board intends to determine appropriate insurance coverage, it may elect not to have insurance for certain risks due to the high premium costs associated with insuring those risks or for other reasons, including an assessment in some cases that the risks are remote or that cover is not available or is not required by applicable local law. No assurance can be given that the Group will be able to obtain insurance coverage at reasonable rates (or at all), or that any coverage it or the relevant contractor obtains and proceeds of insurance will be adequate and available to cover any claims arising. The Group may become subject to liability for pollution or other hazards against which it has not insured or cannot insure, including those in respect of past activities for which it was not responsible. The Group intends to exercise due care in the conduct of its business and obtain insurance prior to commencing operations in accordance with industry standards, as applicable locally, to cover certain of these risks and hazards. However, insurance is subject to limitations on liability and, as a result, may not be sufficient to cover all of the Group's losses. The occurrence of a significant event against which the Group is not fully insured, or the insolvency of the insurer of such event, could have a material adverse effect on the Group's business, financial condition, results of operations and prospects. Any indemnities the Group may receive from contractors or joint venture partners may be difficult to enforce, including if such parties lack adequate resources. In the event that insurance coverage is not available or the Group's insurance is insufficient to fully cover any losses, claims and/or liabilities incurred, or indemnities are difficult to enforce, the Group's business and operations, financial results or financial position may be disrupted and adversely affected. Further, even where the Group is insured, its contractors or joint venture partners may themselves be insufficiently insured, or uninsured, in respect of damage they may cause to the Group's property or operations. In such cases, the Group may be required to incur additional costs to extend its cover to its contractors or joint venture partners, from whom it may be unsuccessful in recovering such costs in full or at all. The payment by the Group's insurers of any insurance claims may result in increases in the premiums payable by the Group for its insurance cover and adversely affect the Group's financial performance. In the future, some or all of the Group's insurance coverage may become unavailable or prohibitively expensive.

Decommissioning costs may be greater than initially estimated

The Group, through its licence interests, expects to assume certain obligations in respect of the decommissioning of its projects and related infrastructure. These liabilities are derived from legislative and regulatory requirements concerning the decommissioning of mining operations and require the Group to make provisions for and/or underwrite the liabilities relating to such decommissioning. It is difficult to forecast accurately the costs that the Group will incur in satisfying its decommissioning obligations. When its decommissioning liabilities crystallise, the Group will be liable either on its own or jointly and severally liable for them with any other former or current owners or partners. In the event that it is jointly and severally liable with other parties and such parties default on their obligations, the Group will remain liable and its decommissioning liabilities could be magnified significantly through such default. Any significant increase in the actual or estimated decommissioning costs that the Group incurs may adversely affect its financial condition.

5. GENERAL RISK FACTORS

AIM

The Ordinary Shares will be admitted to AIM. Shares held on AIM are perceived to involve higher risks and an investment in shares quoted on AIM may be less liquid and may carry a higher risk than an investment in shares quoted on the Official List. The rules of AIM are less demanding than those

of the Official List of the UK Listing Authority. The price of publicly traded securities can be highly volatile.

Further, the London Stock Exchange has not itself examined or approved the contents of this document. A prospective investor should be aware of the risks of investing in such companies and should make the decision to invest only after careful consideration and, if appropriate, consultation with an independent financial adviser.

Shareholder taxation

The tax consequences to each Shareholder of owning Ordinary Shares will depend, *inter alia*, on tax laws in the jurisdiction in which that Shareholder is resident or domiciled. Potential investors should consult their professional advisers on the possible tax consequences of subscribing for, buying, holding, selling, transferring or redeeming Ordinary Shares under the laws of their country of citizenship, residence or domicile.

Volatility and liquidity of Ordinary Shares

Although the Company is applying for its Ordinary Shares to be admitted to trading on AIM, there can be no assurance that an active or liquid trading market for the Ordinary Shares will develop or, if developed, that it will be maintained. AIM is a market designed primarily for emerging or smaller growing companies which carry a higher than normal financial risk and tend to experience lower levels of liquidity than larger companies. Accordingly, AIM may not provide the liquidity normally associated with the Official List or some other stock exchanges. The Ordinary Shares may therefore be difficult to sell compared to the shares of companies listed on the Official List and the share price may be subject to greater fluctuations than might be the case for companies listed on the Official List. An investment in shares traded on AIM carries a higher risk than those listed on the Official List.

The Company is principally aiming to achieve capital growth and, therefore, Ordinary Shares may not be suitable as a short-term investment. The share price of Ordinary Shares may be subject to substantial fluctuation on small volumes of shares traded, and thus the Ordinary Shares may be difficult to sell at a particular price. Prospective investors should be aware that the value of an investment in the Company may go down as well as up and that the market price of the Ordinary Shares may not reflect the underlying value of the Company. There can be no guarantee that the value of an investment in the Company will increase. Investors may therefore realise less than, or lose all of, their original investment. An investment in Ordinary Shares should only be considered by sophisticated investors who are financially able to maintain their investment and who can afford a total loss of such investment.

The share prices of publicly quoted companies can be highly volatile and shareholdings illiquid. The price at which the Ordinary Shares are quoted and the price which investors may realise for their Ordinary Shares may be influenced by a large number of factors, some of which are general or market specific, others which are sector specific and others which are specific to the Group and its operations. These factors include, without limitation: (i) the performance of the Group and the overall stockmarket; (ii) large purchases or sales of Ordinary Shares by other investors; (iii) results of exploration, development and appraisal programmes and production operations; (iv) changes in analysts' recommendations and any failure by the Group to meet the expectations of the research analysts; (v) changes in legislation or regulations and changes in general economic, political or regulatory conditions; and (vi) other factors which are outside of the control of the Group.

Sales of substantial amounts of Ordinary Shares following Re-Admission and/or termination of thelock-in and/or orderly market arrangements (the terms of which are summarised in paragraph 12 of Part I and paragraph 7.26 of Part VI of this document), or the perception that such sales could occur, could materially adversely affect the market price of the Ordinary Shares. Such sales may also make it more difficult for the Company to sell equity securities in the future at a time and price that is deemed appropriate.

There can be no guarantee that the price of the Ordinary Shares will reflect their actual or potential market value or the underlying value of the Company's net assets.

Forward-looking statements

Any forward looking statements in this document are based on current expectations and are subject to risks and uncertainties that could cause actual results to differ materially from those expressed or implied by those statements. Investors are cautioned not to place undue reliance on forward-looking information. To the extent lawfully permitted, the Company disclaims any obligations to update any such forward looking statements in this document to reflect future events or developments.

Future litigation

From time to time, the Group may be subject, directly or indirectly, to litigation arising out of its operations. Damages claimed under such litigation may be material or may be indeterminate, and the outcome of such litigation may materially impact the Group's business, results of operations or financial condition. While the Group assesses the merits of each lawsuit and defends itself accordingly, it may be required to incur significant expenses or devote significant resources to defending itself against such litigation. In addition, the adverse publicity surrounding such claims may have a material adverse effect on the Group's business.

PART IV

PART A: CHAARAT COMPETENT PERSON'S REPORT

Report to:

Chaarat Gold Holdings Ltd.

CHAARAT

Numis Securities Ltd.

Numis

Competent Persons Report for the Chaarat Gold Project, Kyrgyz Republic

Document No. 03106-000-RPT-X-001E

TETRA TECH

Report to:

CHAARAT GOLD HOLDINGS LTD. NUMIS SECURITIES LTD.

CHAARAT Numis

COMPETENT PERSONS REPORT FOR THE CHAARAT GOLD PROJECT, KYRGYZ REPUBLIC

EFFECTIVE DATE: 7TH DECEMBER 2018

"Original document signed by EurIng Andrew Carter, CEng, MIMMM, MSAIMM, SME"	7th December 2018
EurIng Andrew Carter, CEng, MIMMM, MSAIMM, SME	Date
"Original document signed by Joseph Hirst, BSc (Hons), MSc, EurGeol, CGeol"	7th December 2018
Joseph Hirst, BSc (Hons), MSc, EurGeol, CGeol	Date
"Original document signed by Johan Steenkamp, BSc (Eng), MBA, PMP"	7th December 2018
Johan Steenkamp, BSc (Eng), MBA, PMP	Date
"Original document signed by Richard Hope, BSc, CEng, MIMMM"	7th December 2018
Richard Hope, BSc, CEng, MIMMM	Date
"Original document signed by Marion Thomas, BSc, MSc"	7th December 2018
Marion Thomas, BSc, MSc	Date

JS/vc

TETRA TECH

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Registered Address: 1 Northfield Road, Reading Berks, RG1 8AH, United Kingdom
Registered in England: 06328315

REVISION HISTORY

REV. NO	ISSUE DATE	PREPARED BY AND DATE	REVIEWED BY AND DATE	APPROVED BY AND DATE	DESCRIPTION OF REVISION
A	13Sep18	All CPs	All CPs	Johan Steenkamp	Draft to Client
B	14Sep18	All CPs	All CPs	Johan Steenkamp	Draft to Client
C	16Oct18	All CPs	All CPs	Johan Steenkamp	Draft to Client
D	7Dec18	All CPs	All CPs	Johan Steenkamp	Final Report
E	13Dec18	All CPs	All CPs	Johan Steenkamp	Final Report - Amended

EXECUTIVE SUMMARY

Chaarat Zaav CJSC (CZ), a wholly-owned subsidiary of Chaarat Gold Holdings Ltd. (CGHL), requested Tetra Tech undertake a Competent Persons Report (CPR) for the Chaarat Gold Project in accordance with the London Stock Exchange (LSE) *AIM Rules for Companies* (March 2018) and the *AIM Note for Mining and Oil & Gas Companies* (June 2009). This CPR, in support of ongoing finance activities for CGHL, summarises the status of the Project and relies on information from the internal feasibility studies completed in October 2015 (Nerin 2015) and May 2018 (Tetra Tech 2018).

This report also includes an updated Mineral Resource estimate for the Tulkubash zone as defined by the Joint Ore Reserves Committee (JORC) of the Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists, and Minerals Council of Australia (JORC 2012).

The work for this CPR was led by Tetra Tech's Swindon, United Kingdom (UK) office through Tetra Tech's wholly-owned subsidiary, Coffey Geotechnics Limited (Coffey UK).

The effective date of this CPR is 14th September 2018 and the effective date of the Tulkubash Project Mineral Resource estimate is 28th August 2018.

PROPERTY DESCRIPTION

The Chaarat Gold Project is located at latitude 42°1'6.91" north (N) and longitude 71°9'39.04" east (E), in the Sandalash Range of the Alatau Mountains, in the Jalal-Abad Province of north-western Kyrgyz Republic, close to the border with Uzbekistan. The Chaarat Gold Project area is located approximately 300 km southwest of the capital Bishkek, 75 km upstream and northeast of the regional administrative centre of Jany-Bazar in the Chatkal Valley, and 300 km by road from the nearest railway station in Shamaldy-Say (Figure 1).

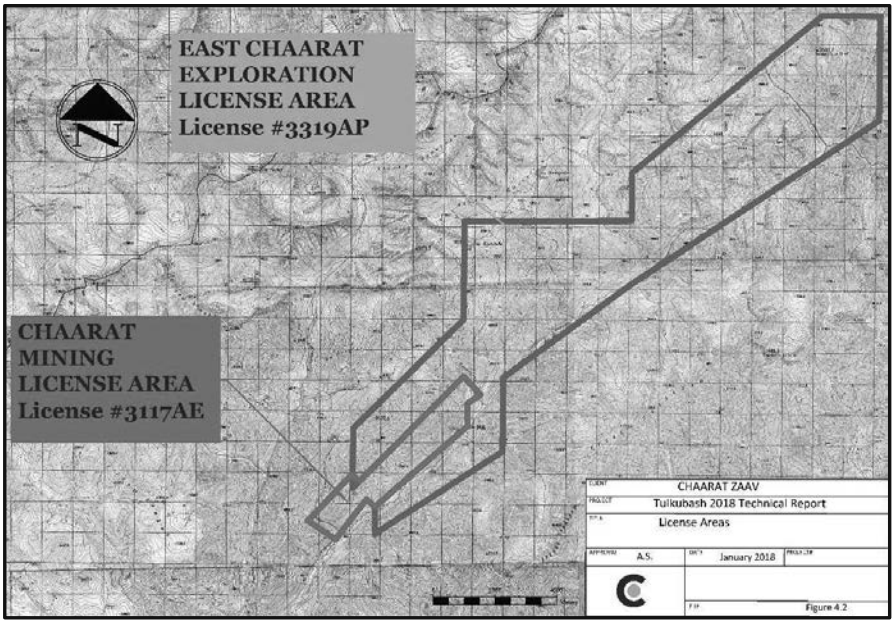
CZ holds two licenses controlling the Chaarat Gold Project: a mining (or production) license of 7.0003 km^2 covering the defined Mineral Resources and an exploration license of 67.7600 km^2 covering prospective ground along trend to the northeast (Table 1; Figure 2).

Figure 1 **Chaarat Gold Project Location Map**

Table 1 **Chaarat Gold Project Mineral Assets**

Asset	Holder	Interest (%)	Status	Licence Expiry Date	License Area (km²)	Comments
Chaarat Gold Project, Kyrgyz Republic	Chaarat Zaav CJSC	100	Mining	25th June 2032	7.0003	Mining License 3117AE
Chaarat Gold Project, Kyrgyz Republic	Chaarat Zaav CJSC	100	Exploration	7th October 2023	67.7600	Exploration License 3319AP

Figure 2 **Chaarat Gold Project License Areas**



GEOLOGICAL SETTING AND MINERALISATION

REGIONAL GEOLOGY

The Chaarat Gold Project is located within the Tien Shan Metallogenic Belt, a Hercynian fold and thrust belt spanning Central Asia. The belt extends for 2,500 km between Uzbekistan in the west, passing through Tajikistan and the Kyrgyz Republic into north-western China. The belt contains many significant gold deposits including Muruntau and Kumtor (Porter 2006).

The Chaarat Gold Project is located within the Middle Tian Shan province, which is composed of forearc accretionary Late Devonian-Carboniferous rocks. The province was subsequently subject to intense folding and thrusting during the upper Palaeozoic.

The Chaarat District is located 35 km southwest of the Talas-Fergana Fault (TTF) and movement on the TTF lead to the formation of the sinistral Sandalash Fault Zone (SFZ). The SFZ includes the Irisay Fault, the Tulkubash Structural Zone, the Contact Fault, and the Main Zone Fault. These structures, except the Irisay Fault are all associated with gold mineralisation.

PROPERTY GEOLOGY

The Sandalash River valley exposes a northeast-trending sequence of Cambro-Ordovician siliciclastic rocks, known as the Chaarat Formation. The Chaarat Formation has been overthrust by Devonian-age quartzites termed the Tulkubash Formation. Mineralisation is located within the north-western limb of an open anticline, striking north-easterly and dipping 40 to 70° northwest. Permo-Triassic-age granodiorites and diorite intrusions are closely associated with the gold mineralisation and in some areas are mineralised.

MINERALISATION

The Chaarat Gold Project contains four main zones of mineralisation: the Tulkubash Oxide Zone, the Kyzyltash Sulphide Zone; comprising the Main Zone, and the Contact Zone. The Tulkubash and Kyzyltash zones are summarised below, with all known mineralised zones discussed in Section 3.1.2.

The Tulkubash zone consists of a mineralised structure trending northeast-southwest, dipping 55 to 75° to the northwest. The Tulkubash zone is interpreted to be a brittle shear zone developed from a sinistral strike-slip motion along the SFZ. Mineralisation occurs within zones of intense silicification and quartz flooding, forming individual gold-bearing lodes (5 to 45 m wide true thickness).

The Kyzyltash Zone consists of a series of sulphide-bearing ore bodies situated within two subparallel northeast-trending structural zones (traced of 10 km along strike). The ore consists of gold-arsenopyrite-stibnite-tetrahedrite mineralisation occurring in sheared and altered wall rock. The ore exhibits strong sericitic alteration, with lesser amounts of quartz, quartz vein stockwork, ankerite, and calcite gangue

EXPLORATION

Mineralisation within the Chaarat Gold Project was first identified by Soviet-era soil and stream-sediment sampling. The Chaarat Gold Project forms part of a 40 km long geochemically anomalous zones along the Sandalash Valley. Their work identified 28 separate gold anomalous zones.

Since 2004, CZ has completed multiple exploration campaigns across the Tulkubash zone, including: geological mapping, soil sampling, rock sampling, and trenching. These campaigns identified numerous gold geochemical anomalies, leading to the discovery of the Tulkubash zone.

DRILLING

The Tulkubash drilling was initiated in 2007 with varying drill campaigns to date, both at surface and some limited underground drilling. Drilling has been completed by means of inclined diamond coring methods using contractor and CZ-owned equipment.

The multiple drilling campaigns are discussed in Section 3.4 and summarised in Table 2.

Table 2 Tulkubash Zone Drilling Summary

Surface			Underground		
No. of Drillholes	Total Length (m)	No. of Samples	No. of Drillholes	Total Length (m)	No. of Samples
492	67,667.1	48,752	11	1,091.70	324

Tetra Tech is of the opinion that drilling has been completed using methods and procedures that are consistent with recognised industry practices and that the data is adequate for Mineral Resource estimation of the Tulkubash zone.

MINERAL RESOURCE ESTIMATES

Sampling data was used to construct two wireframes in Leapfrog Geo v.4.2 software representing the mineralised structures of the Tulkubash zone. The wireframes were exported and estimated using Ordinary Kriging in Datamine Studio RM software. Variography and exploratory data analysis were completed using Snowden's Supervisor software.

All assay results are from diamond core holes. Samples are shipped from site to the ALS Global Laboratory in Kara-Balta, Kyrgyz Republic for sample preparation and assay. Gold is analysed using a 30 g fire assay with an atomic absorption spectroscopy finish. A quality control/quality assurance protocol is employed in the programme which includes standards and blanks in every batch of assays. Check assays are conducted on every 20th sample by a second independent laboratory.

Table 3 Tulkubash Zone Resource Summary Table (effective date 28th August 2018)

	Mineral Resource		
Classification	Tonnes	Grade Au (g/t)	Contained Metal Au (tr oz)
Measured	4,644,000	1.44	214,000
Indicated	28,010,000	1.33	1,199,000
Measured and Indicated	**32,654,000**	**1.35**	**1,414,000**
Inferred	4,600,000	0.62	91,000

Notes: Numbers are rounded in accordance with disclosure guidelines and may not sum accurately.

The following key assumptions were used to estimate the Tulkubash zone Mineral Resources:

- The Mineral Resources were estimated using 10.0 m x 10.0 m x 5.0 m (x, y, z) blocks, with minimum sub-block dimensions of 2.0 m x 2.0 m x 1.0 m (x, y, z).
- The estimate was constrained to the mineralised zone using wireframe solid models. The wireframes were sub-domained to isolate the strongly mineralised main zone from the gold mineralisation in the main structural corridor.
- Grade estimates were based on 3.0 m composited assay data.
- The interpolation of the metal grades was undertaken using Ordinary Kriging.
- A cut-off grade of 0.30 g/t gold was applied to report the Mineral Resources.

ORE RESERVE ESTIMATES

The Tulkubash Ore Reserves, based on the open pit design, are estimated at 15,993 kt at a grade of 0.91 g/t of gold and 1.13 g/t of silver, with a gold content of 467,909 tr oz and a silver content 581,030 tr oz. The updated Mineral Resource estimate in this report (effective 28th August 2018) reduces the Mineral Resource tonnage but increases the gold grade considerably from 0.91 g/t to 1.35 g/t (silver content remains the same) and consequentially increases the gold metal content but reduces the silver metal content. The open pit is also likely to increase in size, if not in depth then along strike, with a likely increase in Ore Reserves. A further pit optimisation and design will need to be completed in order to derive a new Ore Reserve.

ORE RESERVE AND MINERAL RESOURCE STATEMENT

		Gross					Net Attributable			
	Classification	Tonnes	Grade Au (g/t)	Grade Ag (g/t)	Contained Metal Au (tr oz)	Contained Metal Ag (tr oz)	Tonnes	Grade (g/t)	Contained Metal (tr oz)	Operator
Ore Reserves Chaarat Gold Project	Proven	12,503,000	0.95	1.17	381,881	470,317	-	-	-	CGHL
	Probable	3,490,000	0.79	1.00	88,642	112,206	-	-	-	CGHL
	Total	**15,993,000**	**0.91**	**1.13**	**467,909**	**581,030**	**-**	**-**	**-**	CGHL
Mineral Resources Chaarat Gold Project	Measured	4,644,000	1.44	-	214,000	-	-	-	-	CGHL
	Indicated	28,010,000	1.33	-	1,199,000	-	-	-	-	CGHL
	Measured and Indicated	**32,654,000**	**1.35**	**-**	**1,414,000**	**-**	**-**	**-**	**-**	CGHL
	Inferred	4,600,000	0.62	-	91,000	-	-	-	-	CGHL
	Total	**37,254,000**			**1,505,000**	**-**	**-**	**-**	**-**	CGHL

Source: Joseph Hirst, BSc (Hons), MSc, EurGeol, CGeol estimated the Mineral Resources (Section 14.0).
John M. Marek, RM-SME of IMC estimated the Ore Reserves (Tetra Tech 2018).

Note: Mineral Resources that are not Ore Reserves do not have demonstrated economic viability.
Numbers may not add due to rounding.

MINING

The Tulkubash open pit forms part of a near-vertical mineralised lode system located in mountainous terrain. A pit optimisation was completed to guide the design of a single open pit that will break into a main pit and several satellite pits at lower gold prices during the life-of-mine. The six-year open pit LOM will include two years of pre-production (Tetra Tech 2018).

A mining contractor will operate the open pit using small-sized equipment suitable for the local terrain and life-of-mine. The excavation equipment will consist primarily of 4.5 m^3 bucket capacity back hoe excavators loading into 30 t nominal capacity road type tipper trucks. The truck selection is typical of contractors in this region as they offer flexibility for the contractor; however, more robust mining articulated dump trucks are recommended, as winter conditions may make it difficult for the selected trucks to negotiate the road. A full complement of ancillary equipment will be utilized for drilling and blasting. A maximum of 113 items of equipment have been estimated for use by the contractor.

A production schedule was developed that allows for two years of mine development during the pre-production period, followed by 3.75 years of mine production at an average of 4.5 Mt/a of ore at a strip ratio of 3.7. The total material to be mined is estimated at 83.3 Mt with an overall strip ratio of 4.2 over a six-year LOM. The updated Tulkubash Mineral Resource estimate (effective 28th of August 2018) may increase the Ore Reserve tonnage. As a result, the LOM will increase if the current production rates are maintained and may be further extended if a reduced production rate proves beneficial.

Labour will consist of local and Turkish manpower with some expatriate management and supervision. The 2018 Internal Feasibility Study (Tetra Tech 2018) estimates a maximum compliment of 521 personnel. While the manpower numbers may not increase, employment longevity may increase owing to the updated Mineral Resource estimate (effective 28th August 2018).

METALLURGICAL TESTING AND PROCESSING

Gold mineralization within the Chaarat Gold Project is divided into two styles: the Tulkubash mineralization (the Tulkubash zone), which is oxidized material, and the Kyzyltash mineralization (the Main and Contact zones), which is sulphide-rich, unoxidized refractory material.

The metallurgical studies indicate that the oxide ore is amenable to conventional cyanide heap leaching and can be efficiently processed using a heap-leach- based flowsheet.

Based on the metallurgical test work results, the life-of-mine (LOM) recovery for gold and silver was estimated to be 72.9% and 62.6%, respectively.

Recovery has been estimated in to the block model for a more accurate assessment of recoverable metal during the Ore Reserve process. The recovery has been applied in to four domains, based on logged intensity of oxidation from test-work results for each material type.

It was concluded that the heap leach test work was conducted in sufficient detail and to a level appropriate to support a feasibility study based on a heap-leach process option. There were no “red flag” issues in relation to heap leaching that may raise concern.

Gold mineralization within Kyzyltash occurs within two zones, the Main Zone and the Contact Zone. A total Mineral Resource of 5.4 Moz of gold has been identified within the Kyzyltash mineralization.

Limited metallurgical test work has been conducted on the samples from the Kyzyltash mineralisation. Test work completed to date has indicated that the mineralisation is refractory sulphidic and will require pre-oxidative treatment during processing. Production of concentrates for pre-oxidation has proved problematic and a whole ore treatment scenario is a possibility.

The 2015 Internal Feasibility Study (Nerin 2015) was based on a high-tonnage BIOX concentrate treatment scenario and did not include an evaluation of alternative treatment strategies. The study also did not include an analysis of throughput rates, grade profiles, development plans or optimized production from the Kyzyltash orebody.

Refractory gold projects are technically and commercially more challenging compared with conventional gold projects and require higher tonnages, grades and a longer mine life in order to support the higher operating and capital cost requirements. A comprehensive, systematic and methodical metallurgical test work program is recommended.

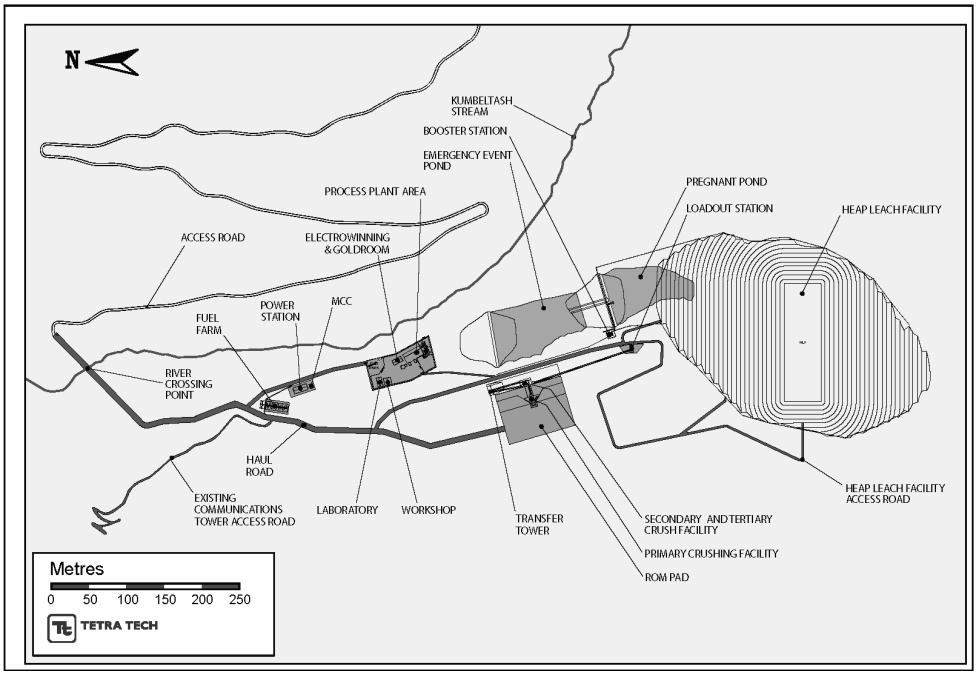
PROJECT INFRASTRUCTURE

The Chaarat Gold Project is located at the confluence of the Sandalash and Kumbeltash valleys, in the Alatau Mountains in western Kyrgyz Republic. The valleys have challenging topography with steeply-sloped sides running into the Sandalash River and Kumbeltash Stream below

Stage 1 of the Chaarat Gold Project will extend the Tulkubash heap leachable oxide resource base and develop low capital intensity heap leach production. For Stage 1, the Chaarat Gold Project will require the development of the following infrastructure items

- off-site infrastructure:
  - the Access Road, Chatkal Station and Kumbel Pass check point
- on-site infrastructure:
  - temporary contractor-supplied accommodation, batch plant, and mobile plant
  - water systems to supply, treat, and distribute plant water, fire water, and potable water
  - diesel-generator power station, diesel fuel farm, and power distribution to all facilities via two 10 kV feeder circuits; power generation capacity on site will be 4.8 MW
  - crushing facility, including ROM pad, primary crushing facility, secondary and tertiary crushing facility, and loadout station
  - process area, including ADR plant, electrowinning and gold room, cyanide storage facility, reagent storage facility, laboratory, process maintenance workshop, and administration building
  - HLF, comprising a heap leach pad; liner system with overliner drainage; catchment drains and underliner drainage; and pregnant solution, emergency, and attenuation ponds and dams
  - process controls and instrumentation
  - communications infrastructure
  - additional infrastructure, including gatehouse and weighbridge; explosive storage; ammonium nitrate (AN) storage, emergency response facility; accommodation camp; and mine maintenance workshop.

Figure 3 **Chaarat Gold Project Site Layout**



ENVIRONMENTAL STUDIES

For environmental and social aspects of the Chaarat Gold Project, the CPR review focussed on the draft ESIA report (WAI 2018) and 2018 Internal Feasibility Study (Tetra Tech 2018). Both documents made use of previous studies undertaken for the Chaarat Gold Project and these were also referred during the CPR review.

In compliance with Kyrgyz Republic legislation, an environmental and social impact assessment was completed by an in-country consultant (Ken-Too 2015). A review and field surveys of soil, flora and fauna were carried out by Davletbakov and a social review by Leshem Scheffer (2011). Wardell Armstrong International (WAI) has subsequently undertaken a full ESIA with associated stakeholder engagement as per international standards for a Category A project (i.e., a project that has potential significant adverse risks and/or impacts that are diverse, irreversible or unprecedented).

Baseline studies have been carried out in the area of influence for the Chaarat Gold Project by the above-mentioned consultants. The information and data gathered were used along with economic and other information (e.g., the findings of a geohazards assessment) to undertake an analysis of alternatives for the mine and associated activities. Owing to the terrain and prevailing site conditions, the heap leach facility could only be sited in the “dry valley” (which has no perennial stream). Other infrastructure was positioned around this fixed-point taking cognisance of physical and environmental factors. A no-go option was included in the analysis of alternatives; stakeholders were involved in the analysis of alternatives and design processes. Environmental and social risks associated with the overall design and layout have been minimised (in the case of negative impacts or enhances in case of positive impacts) through the application of good

international industry practice, particularly the use of the mitigation hierarchy (i.e., avoid-reduce-mitigate-compensate). The ESIA report states there is no economic displacement associated with the HLF site. However, there is a herdsman who grazes his animals and other peoples' animals on land that will be in the Chaarat Gold Project footprint; the herdsman attended a consultation meeting and this information was shared with the attendees. Although he referred to other land being available, and his livelihood would not be affected, it is essential that a formal process takes place and there is a documented agreement. His livelihood is based on the land and this loss of access amounts to small-scale economic resettlement. Without due process, CGHL is exposed to risk if this was challenged at a later date (by the herdsman or other third parties).

Sources of potential impacts include the open pit, heap leach, emergency event pond, ADR plant, WRD, power plant, camp, storage areas (explosives and reagents), waste transfer facility and areas such as roads, all with their associated activities. WAI asserted the only significant impact on hydrology and geohydrology is acid rock drainage (ARD) and metal leaching. However, it should be noted that (a) there is no current evidence of acidic runoff on site and (b) analyses indicate that less than 1% of the material at Tulkubash is potentially acid generating. Mitigation has been proposed to manage the potential impacts (e.g., encapsulation of acid generating rock on the WRD to inhibit chemical reactions). Groundwater studies have been limited so there are gaps in knowledge (e.g., water levels); there may be localised lowering of the water-table in the Kumbeltash Valley where boreholes will be pumped to supply process make-up water. Impacts on surface and groundwater are assessed as being low.

The Tulkubash ore was considered to be a high geochemical risk based on field and high humidity cell testing. Geochemical characterisation needs more work to be done as there is a lack of a fully representative samples. Owing to uncertainty and risks, WAI has taken a conservative approach and developed mitigation and methods that are conservative, and the precautionary principle has been adopted. The actions proposed are practical and should be effective. It is recommended that further studies are undertaken, and it may transpire that some of the mitigation is un-necessary.

Design of the HLF and measures to manage the environmental aspects are adequate.

CGHL aims to become certified with the International Cyanide Monitoring Code (ICMC) which is a country code that focusses on safe management of cyanide to protect human health and the environment. A cyanide management plan has been compiled for CGHL and together with certifying with the ICMC, it is a clear indication that CGHL is committed to good international industry practice which in turn reduces environmental and social risk.

Waste management pertains to mining and non-mining wastes. A framework waste management plan has been compiled that includes management of hazardous and non-hazardous waste. It is a generic plan and will need to be developed before construction begins.

Power supply options are limited because the site is remote from the national grid. Diesel generators will be used to produce power. The potential impacts (air emissions and contamination from incidents and accidents) are dealt with in impact assessment for air quality and soil.

Health and safety management will be assigned to a health, safety and environment manager and coordinator. It is recommended that at least one of the persons appointed has experience in environmental and social aspects of complex projects. The CGHL board members are on the Health, Safety, Environment and Community (HSEC) Committee. The make-up of the HSEC Committee will be reviewed when non-executives with relevant safety, health, environment and community skills are appointed.

Decommissioning and closure have been addressed in a Mine Closure and Rehabilitation Plan which is fairly generic at this juncture. Tetra Tech recommends that a strategy for unplanned closure is included in the plan because mines can close in a short period of time due to unforeseen circumstances (e.g., market forces, political changes). Stakeholders, particularly those in proximity to the concession, should be involved in decision-making about post-closure land-use.

Permits and licences that are required for the Chaarat Gold Project have been listed in the ESIA report; some have already been issued but others are outstanding. Timeframes for applying for and obtaining permits and licences should be ascertained so that there are no delays to the Chaarat Gold Project schedule.

Primary and secondary data for baseline social studies were collected through formal and informal interviews, and household surveys (Leshem Scheffer, 2010-2011, and WAI 2016). WAI undertook a site visit and held meetings to verify that existing data remains relevant (up-to-date) and address gaps. A limitation of the baseline studies is that the number of households surveyed is not related to the total number of households (i.e., the statistics have not been presented).

Consultation with communities has been ongoing from the early stages of the Chaarat Gold Project inception. Good relations are being fostered and it is indicated that local communities have seen benefits of mines operating in the area (and the opposite when an operating mine left in 2015).

Local mining companies including CGHL and environmental organisations hold regular meetings to coordinate activities so that impacts on the natural environment are minimised. The Sandalash River flows through the Besh-Aral Nature Reserve which was established for the protection of biodiversity.

A stakeholder engagement plan has been drafted and will be subject to updating. It will assist CGHL in making and implementing plans to reinforce good relationships with communities and other parties. Risks associated with communities are currently managed by initiatives such as meetings, providing a grievance mechanism to deal with complaints, and developing a stakeholder engagement plan.

CGHL will develop and environmental and social management system (ESMS) that will align with legal and administrative requirements of Kyrgyz Republic and international good practice.

A number of framework management plans have been prepared by WAI as a step to enable Chaarat to manage significant impacts identified in the ESIA. The management plans include air quality; biodiversity, mine closure and rehabilitation, noise and vibration, soils, cyanide, water and waste water, waste management plan, chance-find procedure, and an updated stakeholder engagement plan. Current plans need to incorporate SMART mitigation (**s**pecific, **m**easurable, **a**chievable, **r**elevant and **t**ime-bound) before they can be implemented effectively.

A number of environmental and social risks and opportunities have been identified to assist CGHL as mine planning develops.

CAPITAL AND OPERATING COST ESTIMATES

Tetra Tech prepared the capital cost estimate for Stage 1 of the Chaarat Gold Project in the 2018 Internal Feasibility Study. The initial capital cost estimate was calculated as US$121.7 million, excluding Value Added Tax (VAT) and US$131 million including VAT (Table 4). The Kyzyltash Project is not included as it will form part of Stage 3 of this mining property development.

Table 4 Tulkubash Project Initial Capital Cost Summary

Area	Cost* (US$)	VAT (US$)	Import Duty (US$)	Total (US$)
Mining	20,029,375	2,225,046	0	22,254,421
Crushing	25,380,956	1,900,539	477,157	27,758,651
Processing	24,138,904	1,039,332	900,194	26,078,429
Site Infrastructure	9,879,441	1,167,063	5,196	11,051,700
Site Utilities	8,113,658	176,823	512,774	8,803,255
Camp	2,800,000	336,000	0	3,136,000
Temporary Facilities	85,000	10,200	0	95,200
Off-site Infrastructure	3,639,777	436,773	0	4,076,550
Financials (Contingency)	12,256,189	954,853	131,377	16,474,101
Indirect Costs	15,387,871	0	0	12,256,189
Total Initial Capital Cost	**121,711,171**	**8,246,628**	**2,026,698**	**131,984,497**

Notes: *excluding VAT and import duty
Source: Tetra Tech (2018)

This is a Class 3 estimate prepared in accordance with the AACE International cost estimate classification system. The estimate accuracy interval is –10% to +15% and the estimate base date is Q2 2018.

All costs are in US dollars. Quotations received in other currencies were converted to US dollars.

Operating costs consist of mining, process, general and administrative (G&A), refining, and doré transport costs. The LOM operating cost estimate from the 2018 Internal Feasibility Study is US$260 million or US$16.32/t ore (including VAT) (Table 5). Table 5 also shows the adjusted LOM operating costs taking into consideration the increase G&A costs (due to the addition of labour costs) with the LOM operating cost at US$296 million or US$16.82/t ore.

Table 5 Tulkubash Project Operating Cost Estimate

Area	2018 Feasibility Study		Adjusted G&A*	
	Cost Including VAT (US$)	Cost Including VAT (US$/t ore)	Cost Including VAT (US$)	Cost Including VAT (US$/t ore)
Contract Mining Cost	156,800,000	9.80	156,800,000	9.80
Owner Mining Costs	6,429,000	0.40	6,429,000	0.40
Processing Costs	75,898,000	4.75	75,898,000	4.75
G&A Costs	18,365,000	1.15	26,592,000	1.66
Refining Costs	3,257,000		3,257,000	*
Gold Transport Costs	239,000	-	239,000	-
Total LOM Operating Cost	**260,988,000**	16.32-	**269,215,000**	16.82

Note: *Adjusted G&A increased by 44% from US$1.15/t ore to US$1.66/t ore, with resultant increase of 3% in Operating costs

ECONOMIC ANALYSIS

The financial analysis was based on a pre-tax and pre-financing Financial model (inclusive of VAT and import duties, both of which are not recoverable). The base case uses a gold price of

US$1,300/tr oz, a 3.75-year LOM, a 16 Mt Ore Reserve, and foreign exchange rate KGS70:US$1. All currency units are in US dollars unless otherwise specified. Table 6 shows the internal rate of return (IRR), net present value (NPV), and payback period from the 2018 Internal Feasibility Study and after the operating cost estimate was adjusted for labour.

Table 6 IRR, NPV and Payback for the Chaarat Gold Project

	Unit	2018 Internal Feasibility Study (including VAT)	Adjusted* (including VAT)
IRR	%	8.2	6.5
Payback	years	3.2	3.3
NPV @ 5% Discounted Rate	US$ million	12.1	5.3

Note: *G&A cost adjusted to $1.66/t ore

Table 7 shows the input parameters used in the financial model.

Table 7 Mine Production from the Tulkubash Project

Description	Unit	Value
Total Tonnes to HLF	kt	15,993
Average Daily Tonnes to HLF	t/d	13,500
Total Waste Tonnes Mined	kt	65,110
LOM	years	3.75
Average Head Grade		
Gold	g/t	0.91
Silver	g/t	1.13
Recoveries		
Gold	%	76.5
Silver	%	61.80
Total Production		
Gold	('000 tr oz)	360
Silver	('000 tr oz)	360

SENSITIVITY ANALYSIS

The Chaarat Gold Project's NPV, calculated at a 5% discount rate, is most sensitive to revenue followed by operating costs and capital costs.

The Chaarat Gold Project's IRR is most sensitive to revenue followed by operating costs and capital costs.

The payback period is most sensitive to revenue, followed by operating costs and capital costs.

PROJECT EXECUTION PLAN

The project execution plan framework presented by Tetra Tech in the 2018 Internal Feasibility Study is sufficient for this level of study. CGHLs objectives to unlock the long-term value of the Chaarat Gold Project are outlined in the following stages:

- Stage 1 – Extend the Tulkubash heap leachable oxide resource base; develop low capital intensity heap leach production.
- Stage 2 – Ongoing Tulkubash oxide exploration; expand heap leach production capacity.
- Stage 3 – Complete a detailed feasibility study for the refractory Kyzyltash sulphide ore body.
- Stage 4 – Develop parallel sulphide processing facility.

The Chaarat Gold Project objective is to generate significant equity reserves through the development of the Tulkubash oxide orebody, to unlock the long-term Kyzyltash deposit.

RECOMMENDATIONS

It is recommended that the 2018 Internal Feasibility study is re-assessed and updated.

The updated Tulkubash Mineral Resource estimate (effective 28th August 2018) shows indications of an improved Ore Reserve, which could increase the financial outlook of the Chaarat Gold Project. With a new Ore Reserve, the mine plan can also be redone.

During a feasibility study update, gaps in the cost estimate (high dependence on Owner and one contractor, gaps in quotations, lack of a basis of estimate) can also be reviewed and updated.

Full recommendations for the Chaarat Gold Project are outlined in Section 13.0.

Based on Tetra Tech's expert examination of the evidence at a feasibility level, CGHL would in all probability be able to deliver the Tulkubash oxide mine within the broad framework presented in the 2018 Internal Feasibility Study.

It is still too early to make any predictions for the Kyzyltash sulphide mine as this resource needs to be studied in more detail.

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GLOSSARY

UNITS OF MEASURE

bank cubic metres	bcm
centimetre	cm
cubic centimetre	cm^3
day	d
degree	°
degrees Celsius	°C
grams per tonne	g/t
grams	g
greater than or equal to	≥
greater than	>
hectare	ha
hertz	Hz
hour	h
kilogram per tonne	kg/t
kilogram	kg
kilometre	km
kiloton	kt
kilovolt	kV
Kyrgyzstani Som	KGS
less than or equal to	≤
less than	<

litre	L
metre above sea level	masl
metre	m
metres below ground level	mbgl
metres per year	m/a
metres reduced level	mRL
microns	µm
millimetre	mm
millimetre	mm
million ounces	Moz
million tonnes	Mt
month	mo
parts per million	ppm
percentage	%
square kilometre	km^2
square metre	m^2
tonne	t
tonnes per cubic metre	t/m^3
tonnes per day	t/d
troy ounce	tr oz
US dollars	US$
volt	V
second arc	'
minute arc	"
year (annum)	a

ABBREVIATIONS AND ACRONYMS

acid rock drainage	ARD
adsorption-desorption-recovery	ADR
ALS Global Laboratory	ALS Global
Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves	JORC Code
Stewart Assay and Environmental Laboratories, a subsidiary of ALS	ALS-Stewart
ammonium nitrate	AN
antimony	Sb
Apex Asia	Apex
arsenic	As
Beijing General Research Institute of Mining and Metallurgy, China	BGRIMM
bio-oxidation	BIOX
carbon-in-column	CIC
carbon-in-leach	CIL
carbon-in-pulp	CIP
Caterpillar	CAT
Central Scientific Research Laboratory	CSRL
Chaarat Gold Holdings Ltd.	CGHL
Chaarat Zaav CJSC	CZ
Chinese Nerin Engineering Co., Ltd	Nerin
Ciftay Insaat Tashhut TIC AS	Ciftay

copper	Co
distribution board	DB
east	E
engineering, procurement, and construction management	EPCM
environmental and social impact assessment	ESIA
environmental and social management system	ESMS
Environmental Impact Assessment	EIA or OVOS
European Bank for Reconstruction and Development	EBRD
factors of safety	FOS
Free Carrier	FCA
Genalysis Laboratory Services Pty Ltd	Genalysis
general and administrative	G&A
gold	Au
global positioning system	GPS
Hazen Research Inc.	Hazen
Health, Safety, Environment and Community	HSEC
heap leach facility	HLF
Information Research Centre Laboratories	IRC
Internal Cyanide Monitoring Code	ICMC
internal rate of return	IRR
International Finance Corporation	IFC
International Mining Consultants	IMC
Inverse Distance Weighted Squared	IDW^2
Joint Ore Reserves Committee	JORC
Key performance indicator	KPI
Kriging Neighbourhood Analysis	KNA
Krygyz National Academy of Science	KNAS
lead	Pb
life-of-mine	LOM
liquefied petroleum gas	LPG
London Stock Exchange	LSE
MaClelland Laboratories Inc	MCL
MINTEK Johannesburg, SA	MINTEK
molybdenum	Mo
motor control centre	MCC
National Instrument 43-101	NI 43-101
net present value	NPV
Newmont Overseas Exploration Limited	Newmont
non-acid generating	NAG
north	N
Ordinary Kriging	OK
peak maximum flood	PMF
Performance Standards	PS
potentially acid generating	PAG
pressure oxidation	POX
Quantitative Kriging Neighbourhood Analysis	QKNA
quality assurance	QA
quality control	QC

Resource Development Inc.	RDI
Rock Quality Designation	RQD
run-of-mine	ROM
Sandalash Fault Zone	SFZ
SGS South Africa Pty. Ltd.	SGS-SA
SGS Vostok Limited	SGS Vostok
silver	Ag
south	S
Standard Reference Material	SRM
State Committee for Industry, Energy and Subsoil Use	SCIES
Stewart Assay and Environmental Laboratories, a subsidiary of ALS	ALS-Stewart
Talas-Fergana Fault	TTF
the Chaarat Gold Project	the Project
the JORC Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves	the JORC code
tungsten	W
Value Added Tax	VAT
Wardell Armstrong International	WAI
waste rock dump	WRD
west	W
work breakdown structure	WBS
zinc	Zn

DEFINITIONS

ankerite	calcium, iron, magnesium, manganese carbonate mineral ($Ca(Fe,Mg,Mn)(Co_3)_2$)
ankeritization	alteration into ankerite
arkosic	arkose bearing
arsenopyrite	iron arsenic sulphide (FeAsS)
breccia	rock consisting of angular fragments cemented together
Cambro-Ordovician	541.0 to 443.8 million years ago
chert	microcrystalline quartz
diorite	intrusive igneous rock composed of plagioclase feldspar, biotite, hornblende, and/or pyroxene.
dolomite	anhydrous carbonate minera, composed of calcium magnesium carbonate ($CaMg(Co_3)_2$)
ESTDOM 1	Estimation Domain 1
ESTDOM 2	Estimation Domain 2
galena	natural mineral from lead sulphide (PbS)
gangue mineral	minerals with no commercial value
granodiorite	phaneritic-textured intrusive igneous rock similar to granite, greater than 20% quartz, and 65 to 90% of plagioclase feldspar
greywackes	type of argillaceous sandstone
hematitic	hematite bearing
Hercynian	380 to 280 million years ago

HQ	47.6 mm core diameter
hypogene	formed beneath the earth's surface, forming primary mineral deposits
jarosite	hydrous sulfate of potassium and iron ($KFe^{3+}_3(OH)_6(SO_4)_2$)
laminae	small-scale sequence of fine layers
Late Devonian	382.7 to 358.9 million years ago
lenticular	lens shaped
limonite	hydrated iron oxide-hydroxides ($FeO(OH)\ nH_2O$)
Lower to Upper Palaeozoic	541.0 to 251.9 million years ago
mesozonal	251.9 to 66.0 million years ago
mica	sheet silicate (pyllosilicate) minerals
molybdenite	molybdenum disulphide (MoS_2)
N+2	a form of resilience to ensure system availability in the event of component failure; components (N) have at least two independent backup components (+2)
OVOS	the Russian equivalent of an environmental and social impact assessment
NQ	63.5 mm core diameter
Palaeozoic	541.0 to 251.9 million years ago
Permian	298.9 to 251.9 million years ago
Permo-Triassic	298.9 to 201.3 million years ago
Petrographic	description and classification of rocks, especially by microscopic examination
Proterozoic	2,500 to 541 million years ago
pyritic	pyrite bearing
quartzites	metamorphosed quartz sandstone
riedel shears	right-lateral faults, generally inclined to the strike of the main fault
sericitization	hydrothermal alteration into sericite
siliciclastic	silica bearing clastic noncarbonate sedimentary rocks
spalerite	zinc sulphide mineral ((ZnFe)S)
stibiconite	antimony oxide mineral ($Sb_3O_6(OH)$)
syenite	coarse-grained intrusive igneous rock, similar to granite but deficient in quartz
zone	mineralised geology with reasonable prospects for eventual economic extraction

1.0 INTRODUCTION

Chaarat Gold Holdings Ltd. (CGHL), through its wholly-owned subsidiary Chaarat Zaav CJSC (CZ) is the 100% owner of the Chaarat Gold Project located in Kyrgyz Republic. CGHL asked Tetra Tech to undertake the execution of a Competent Persons Report (CPR) in support of ongoing financing activities for the Chaarat Gold Project.

The effective date of this CPR is 7th December 2018 and the effective date of the Tulkubash deposit Mineral Resource estimate is 28th August 2018.

To the knowledge of Tetra Tech, and as informed by CGHL, there has been no material change in respect of the Chaarat Gold Project since completion of the report on 14th September 2018 and the issuing thereof.

1.1 REPORTING STANDARDS AND COMPLIANCE

This CPR has been written in accordance with the London Stock Exchange (LSE) *AIM Rules for Companies* (March 2018) and the *AIM Note for Mining and Oil & Gas Companies* (June 2009) (including the content requirements of Appendix 2 and the summaries set out in Appendices 1 and 3). In addition, the Tulkubash gold deposit Mineral Resource estimate has been prepared in accordance with *Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves* (JORC Code) by the Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists, and Minerals Council of Australia Competent Persons Joint Ore Reserves Committee (JORC) and the standard adopted for the reporting of the Tulkubash gold deposit Mineral Resource estimate is that defined by the terms and definitions given in the JORC Code.

Tetra Tech accepts responsibility for the CPR and confirms that, to the best of its knowledge and belief having taken all reasonable care to ensure that such is the case, the information contained in the CPR is in accordance with the facts and contains no omission likely to affect its import for the purpose of paragraphs 1.1 and 1.2 of Annex 1 and paragraph 1.1 and 1.2 of Annex III of the AIM Rules.

1.2 COMPETENT PERSONS

The Competent Persons involved in the preparation of this report hold the relevant and appropriate qualifications, experience and technical knowledge to professionally and independently appraise the Chaarat Gold Project for this report.

Mr. Johan Steenkamp is the overall project manager, preparer, and reviewer of the CPR. Mr. Andrew Carter is the overall authorizing Competent Person for the CPR.

Table 1.1 shows the Competent Persons and experts and the areas contributed to this report.

Table 1.1 Competent Person and Expert Responsibilities

Report Section		Expert	Competent Person
Executive Summary		-	All
1.0	Introduction	Johan Steenkamp, BSc (Eng), MBA, PMP	EurIng Andrew Carter CEng, MIMMM, MSAIMM, SME
2.0	Property Description	Johan Steenkamp, BSc (Eng), MBA, PMP	EurIng Andrew Carter CEng, MIMMM, MSAIMM, SME
3.0	Geology	-	Joseph Hirst, BSc (Hons), MSc, EurGeol, CGeol
4.0	Mineral Resource and Ore Reserve Estimates	-	Joseph Hirst, BSc (Hons), MSc, EurGeol, CGeol Richard Hope, CEng
5.0	Metallurgical Testing and Mineral Processing	-	EurIng Andrew Carter CEng, MIMMM, MSAIMM, SME
6.0	Mining	-	Richard Hope, CEng
7.0	Project Infrastructure	Johan Steenkamp, BSc (Eng), MBA, PMP	EurIng Andrew Carter CEng, MIMMM, MSAIMM, SME
8.0	Environmental Studies	Marion Thomas, BSc, MSc	EurIng Andrew Carter CEng, MIMMM, MSAIMM, SME
9.0	Capital and Operating Cost Estimates	Johan Steenkamp, BSc (Eng), MBA, PMP	EurIng Andrew Carter CEng, MIMMM, MSAIMM, SME
10.0	Economic Analysis	Johan Steenkamp, BSc (Eng), MBA, PMP	EurIng Andrew Carter CEng, MIMMM, MSAIMM, SME
11.0	Project Execution Plan	Johan Steenkamp, BSc (Eng), MBA, PMP	EurIng Andrew Carter CEng, MIMMM, MSAIMM, SME
12.0	Risks and Opportunities	-	All
13.0	Conclusions and Recommendations	-	All
14.0	References	-	All

1.2.1 QUALIFICATIONS AND REQUIREMENTS

Tetra Tech, it's employees and associates can confirm that:

- we are professionally qualified and members in good standing of a self-regulatory organisation of engineers and/or geoscientists
- we have at least five years relevant experience in the estimation, assessment and evaluation of mineral assets
- we are independent of CGHL, it's directors, senior management, and advisers
- we have not been remunerated by way of a fee that is linked to the admission or value of the applicant
- we are not a sole practitioner.

TETRA TECH AND AUTHOR CREDENTIALS

Tetra Tech

Tetra Tech is a large, multi-national engineering consultancy with 17,000 employees worldwide located in over 400 offices. Our technical knowledge and hands-on site work is broad and deep.

Tetra Tech is a leading provider of highly specialised geological, mine engineering, metallurgical, tailings, geotechnical, and environmental services to the mining industry. Our expertise encompasses the complete mine life cycle from exploration geology and resource classification to front-end studies, engineering design, construction management, operations support, site reclamation and closure.

EurIng Andrew Carter, CEng, MIMMM, MSAIMM, SME

Andrew is a practical operations and engineering manager with broad experience in base and precious metals - extractive, pyro-metallurgical and hydrometallurgical practice - acquired in over 35 years of operations line management, engineering and consulting practice. He also has a demonstrated track record in corporate financing and restructuring, business start-up and organisation building, technological innovation and problem solving, intellectual property management and patenting, project development and project management, environmental permitting, and business development and marketing. Andrew has worked on numerous projects throughout the world in countries such as Australia, Brazil, Bulgaria, Canada, Chile, China, Ghana, India, Peru, Russia, Sierra Leone, South Africa, USA, Zambia, and Zimbabwe.

Johan Steenkamp, BSc (Eng), MBA, PMP

Johan Steenkamp brings 24 years of consulting and operations experience in infrastructure, mining, banking, and manufacturing industries. He is registered as a Project Management Professional (PMP) ® with the Project Management Institute(PMI)®, an accredited Prince2® Practitioner, and is a Member of the International Institute for Industrial Engineering. He has received many commendations from clients for the high quality of services that he provides and the successful completion of projects. Johan has overseen the successful completion of small and multi-billion-dollar projects, balancing project constraints against client demands and professional standards. As Director of Projects (Studies) for Tetra Tech he managed numerous front-end studies. As Assistant Director of Capital Projects for the City of Burnaby, he managed a portfolio of CAD 83 million in infrastructure projects.

Joseph Hirst, BSc (Hons), MSc, EurGeol, CGeol

Joe is a Chartered Geologist with the Geological Society of London with the required experience and qualifications to sign off as a Competent (Qualified) Person for a range of commodities and mineralisation styles.

His responsibilities include exploration and data management, procedures audit, 3D modelling and Mineral Resource Estimation for reports under both JORC and NI 43-101 guidelines. He has worked on a wide range of projects from Due Diligence, Competent Persons Reports, technical disclosure (Resource Estimation Reports) to

Prefeasibility and Feasibility studies. He has worked on a wide range of commodities and mineralisation styles, noted below.

Marion Thomas, BSc, MSc

Ms. Thomas is an independent environmental and social consultant with over 20 years of experience in environmental and social impact assessments, as well as environmental due diligence assessments, high conservation value assessments, and environmental audits. Her background includes environmental assessments for mining, oil and gas, land development and water resources.

Richard Hope, BSc, CEng, MIMMM

UK based Chartered Mining Engineer with 40 years of varied experience working around the world in operations, contracting and consultancy, with 150 studies completed. Specialist in open pit and open cast mining. Underground mining experience. Potash, Phosphate, Coal, Iron Ore, Copper, Gold, Diamonds, Industrial and many other minerals. Skilled user of Whittle and other software for strategic planning. Feasibility, Pre-Feasibility and Scoping studies, due diligence, lenders and owners engineer, strategic advice. Fluent in English and Spanish, proficient in French. British and Australian citizen.

1.2.2 CONSENT AND CONFIRMATIONS

Tetra Tech and the authors of this report hereby consent to:

- the public filing of this report, or any extracts or a summary of this report, with any stock exchange or other regulatory authority
- the inclusion of this report, or any extracts or a summary of this report, in documents prepared by CGHL and its advisers, including the re-admission document of CGHL (Admission Document) and to the references to this report therein in the form and context in which they appear and authorising the contents of this report for the purposes of Schedule II of the AIM Rules
- the inclusion of our name in documents prepared in connection to commercial or financial activities.

Tetra Tech and the authors of this report confirm that we have reviewed the information contained elsewhere in the Admission Document which relates to the information contained in the CPR, and we confirm that the information presented is accurate, balanced, and complete and not inconsistent with the CPR.

1.2.3 SITE VISITS

Joseph Hirst, BSc (Hons), MSc, EurGeol, CGeol visited the Chaarat Gold Project from 7th to 13th of August 2018.

1.3 SOURCES OF INFORMATION

The following internal reports were the main sources of information for this Competent Persons Report:

- Chinese Nerin Engineering Co., Ltd (Nerin) (2016). Chaarat Gold Mine Chinese Feasibility Study Report. Internal report prepared for Chaarat Gold Holdings Ltd.
- Tetra Tech (2018). Bankable Feasibility Study for the Tulkubash Gold Project, Kyrgyz Republic. Internal report prepared for Chaarat Gold Holdings Ltd. Document No. 782-SWIN03008AA_R_002B_VIC. 25th April 2018.

References for additional sources of information used in this report are provided in Section 14.0.

1.4 RELIANCE ON OTHER EXPERTS

The Competent Persons followed standard professional procedures in preparing the contents of this report. Data used in this report has been verified where possible and the Competent Persons have no reason to believe that the data was not collected in a professional manner.

Technical data provided by CZ or CGHL for use by the authors in this CPR is the result of work conducted, supervised, and/or verified by CZ or CGHL professional staff or their consultants.

2.0 PROPERTY DESCRIPTION AND LOCATION

The Chaarat Gold Project is located at latitude 42°1'6.91" N and longitude 71°9'39.04" E, in the Sandalash Range of the Alatau Mountains, in the Jalal-Abad Province of north-western Kyrgyz Republic, close to the border with Uzbekistan (Figure 2.1). The Chaarat Gold Project area is located approximately 300 km southwest of the capital Bishkek, 75 km upstream and northeast of the regional administrative centre of Jany-Bazar in the Chatkal Valley, and 300 km by road from the nearest railway station in Shamaldy-Say.

Figure 2.1 Chaarat Gold Project Location Map

Source: Tetra Tech (2018)

The Chaarat Gold Project area is characterised by extreme topography ranging from the Sandalash Valley at an elevation of 2,000 masl, to the mountain ranges, which peak at an elevation of 4,200 masl. The Sandalash Valley is between 100 and 300 m wide, between steep slopes on either side. The Sandalash River follows a linear south-westerly trend, with a moderate gradient in the Chaarat Gold Project area, and intermittent rapids between swiftly flowing segments. The Sandalash River flows into the Chatkal River south of the Chaarat Gold Project area near the village of Jany-Bazar. These rivers normally flood in spring with snow melt and are intermittently impassable.

The climate is classified as semi-arid to temperate-humid in the lower part of the Chaarat Gold Project area. The high-alpine zones are subject to long severe winters, with frequent snow storms and avalanches.

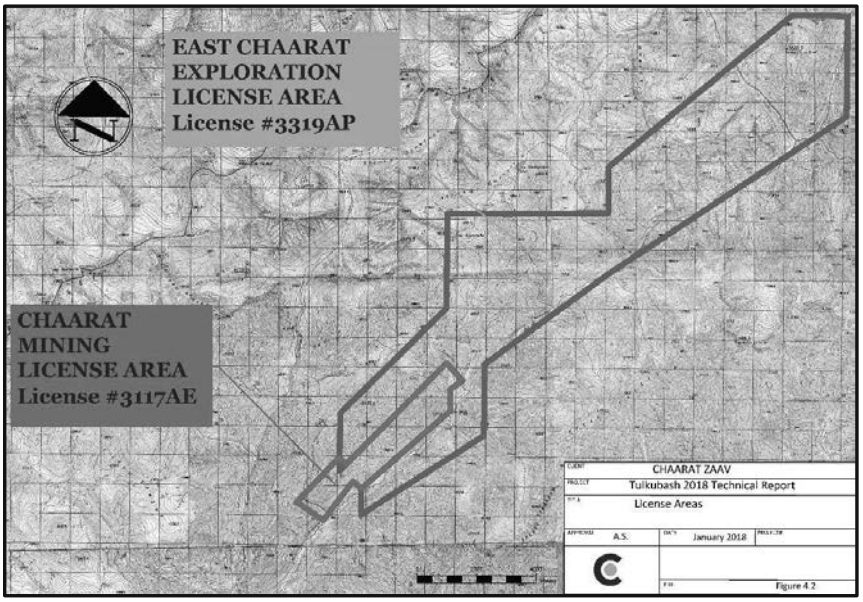
At lower elevations, the snow-free period lasts from March to December, and at higher elevations, from June to October, although the mountain peaks are covered by snow throughout the year. The average annual precipitation is 460 mm, with snow

falling between October and February and rain between March and May. The dry season takes place from June to September. Temperatures in the Jalal-Abad Province range from an average high of +26°C in the summer months, to an average low of -20°C in the winter months (Anon. Chatkal weather data report 2012). Daily and seasonal temperatures are highly variable. The prevailing winds are north-westerly.

2.1 LICENSING AND OWNERSHIP

CZ, a wholly-owned subsidiary of CGHL established in the Kyrgyz Republic, currently holds two licenses controlling the Chaarat Gold Project: mining (or production) license 3117AE of 7.0003 km^2 covering the defined Mineral Resources, and exploration license 3319AP of 67.7600 km^2 covering prospective ground along trend to the northeast (Figure 2.2).

Figure 2.2 Chaarat Gold Project License Areas



Source: Tetra Tech (2018)

Table 2.1 Chaarat Gold Project Mineral Assets

Asset	Holder	Interest (%)	Status	Licence Expiry Date	License Area (km^2)	Comments
Chaarat Gold Project, Kyrgyz Republic	Chaarat Zaav CJSC	100	Mining	25th June 2032	7.0003	Mining License 3117AE
Chaarat Gold Project, Kyrgyz Republic	Chaarat Zaav CJSC	100	Exploration	7th October 2023	67.7600	Exploration License 3319AP

Mining license 3117AE was renewed on 7th September 2017 and is valid until 25th June 2032; the license coordinates are listed in Table 2.2.

Table 2.2 Mining License No. 3117AE Coordinates

Point No.	X	Y	Point No.	X	Y
1	126 77 600	46 55 400	6	126 82 728	46 59 261
2	126 79 000	46 56 900	7	126 82 757	46 58 554
3	126 79 264	46 56 711	8	126 79 776	46 55 887
4	126 82 604	46 60 152	9	126 79 487	46 56 116
5	126 83 150	46 59 556	10	126 78 500	46 54 800

Source: Tetra Tech (2018)

Certain conditions need to be met to hold Mining License 3117AE, which include:

- deposit development according to the *Technical Project for the Chaarat Gold Deposit Development* (Ken-Too 2015), which was approved by the State Committee for Industry, Energy and Subsoil Use of the Kyrgyz Republic (SCIES)
- continuous work on development, detailed design and cost estimate documentation
- paying taxes on the right to use subsoil within the terms stipulated by Kyrgyz Republic legislation
- submitting a social package to SCIES, including an investment program for improving conditions for local community development, which consists of training, providing jobs for residents of the local communities, and infrastructure development
- opening a disturbed land rehabilitation account and accumulating funds defined by the Technical Project Report (Ken-Too 2015) for the Chaarat Gold Deposit Development.

Exploration license 3319AP was renewed on 21st April 2016 and is valid until 21st April 2023; the license coordinates are listed in Table 2.3.

Table 2.3 Exploration License 3319AP Coordinates

Point No.	X	Y	Point No.	X	Y
1	12679775.83	4655000.00	10	12682571.49	4665177.33
2	12679775.83	4655886.65	11	12687993.31	4665260.71
3	12682757.12	4658554.26	12	12687993.31	4666816.98
4	12682728.12	4659260.70	13	12694125.98	4672000.00
5	12683149.87	4659555.94	14	12696000.00	4672000.00
6	12682604.22	4660151.66	15	12696000.00	4668607.81
7	12679035.11	4656474.48	16	12688029.05	4663211.98
8	12679035.11	4658418.95	17	12683893.61	4660127.56
9	12682571.49	4661982.42	18	12683893.61	4657717.98

Source: Tetra Tech (2018)

The main conditions to hold Exploration License 3319AP include:

- paying taxes and other payments for subsoil use per Kyrgyz Republic legislation
- informing SCIES on a quarterly basis about license retention fee payments and provide copies of all payment documents
- providing geological reports to the State Geological Fund, as required under Kyrgyz Republic legislation
- opening a disturbed land rehabilitation account and accumulate the amount of funds as defined by the Technical Project Report (Ken-Too 2015) for the Chaarat Gold Deposit Development.

2.2 PROPERTY HISTORY

2.2.1 EARLY EXPLORATION

Antimony mineralisation in the Chaarat area was originally identified by Soviet-era geologists conducting a reconnaissance exploration program prior to 1992. The North Kyrgyz Geological Expedition subsequently completed a regional stream sediment sampling program, which identified antimony, arsenic, gold, silver, and tungsten anomalies in the Chaarat region. They identified significant antimony mineralisation in the Tulkubash and Main zone areas and developed three drifts totalling 660 m (Anon. 2004).

Following the breakup of the Soviet Union, Apex Asia (Apex) acquired control of the license in 1996, and subsequently formed a joint venture with Newmont Overseas Exploration Limited (Newmont). Newmont completed a geophysical survey and drilled seven holes totalling 1,803 m in the Shir Canyon area. Newmont terminated the joint venture in 2000, after which Apex sold its interest.

At the end of 2002, CZ was formed and acquired a predecessor license to what is now known as the Chaarat Mining License. In 2003, CZ compiled historic data into a digital database and conducted mapping and sampling in the Shir Canyon area (Diner, pers. comm. 2017). This work identified targets that were followed up with mapping, trenching, and sampling in 2004. Five core holes totalling 857 m were completed during the 2004 field season. All the holes intersected significant gold mineralisation with hole CCH003 returning 8.3 m of 7.0 g/t of gold.

2.2.2 EXPLORATION AND DEVELOPMENT

Building on the success of the 2004 program, drilling continued through 2006 to develop the Main and Contact zone mineralisation. In addition, in 2006 CZ collared an exploration adit to develop the C54 (now called the CP Zone) area of the Contact Zone. The purpose of this adit was to provide drill platforms to develop this zone down dip and to collect bulk samples for metallurgical test work.

Concurrent with this work, soil sampling in the Tulkubash Formation was initiated in 2004. Soil samples were collected along spurs descending from the top of the ridge to the Sandalash River. The results of the soil survey exceeded expectations,

generating large and extensive anomalies over 1 ppm of gold in the Tulkubash quartzite, with gold assays reaching up to 73 g/t of gold. Follow up trenches and detailed rock chip profiles were collected over what is now the Tulkubash zone (variously called the T0700 and the Normat zone), which defined a large, coherent geochemical anomaly. In 2005, a single initial hole was drilled in this area which intersected 17.1 m that assayed 4.61 g/t of gold.

Systematic development drilling of the Main and Contact zones (also called the Kyzyltash mineralisation) continued through 2013, with underground Mineral Resources defined within nine ore bodies (the M2400, M3000, M3400, M3900, M4400, M5000, CP, C4000 and M6000) along the Main and Contact zones. Surface and underground drilling in the CP Zone identified continuous mineralisation between the surface exposure at an elevation of 2,790 masl, to a depth of 1,740 masl, a vertical distance of over 1 km.

In 2010, early metallurgical test work indicated that much of the Tulkubash mineralisation was free milling and could potentially develop into a low-cost, open pit, heap leach operation. This sparked an extensive development drilling program concurrent with continued development of the refractory ores of the Kyzyltash mineralisation. This culminated with the completion of 128 holes totalling nearly 16,000 m in 2011.

Exploration and development programs were modest from 2013 through 2016, with no drilling occurring in 2015. In 2017, there was a renewed focus on the Tulkubash zone as a potential starter mine for CZ, with over 17,400 m of drilling completed during the year.

Further discussion regarding exploration activities and drilling completed on the Chaarat Gold Project to date are shown in Section 3.3 and 3.4.

2.3 RESOURCE AND RESERVE DEVELOPMENT

Over the course of developing the various deposits at the Chaarat Gold Project, CZ released a series of updated Mineral Resource reports, along with various scoping studies, prefeasibility studies, and definitive feasibility studies (Table 2.4). This work was completed by various international consulting companies and were generally stated as JORC compliant. As the level of detail of the work increased, CZ built a foundation of studies (geotechnical, hydrology, metallurgy, social, etc.) completed by international consultants.

Table 2.4 Resource Development History

	Press Release Date	Source	Au Cut-off (g/t)	Tonnes ('000)	Measured			Indicated			Inferred			Total Measured + Indicated		Notes
					Grade (g/t Au)	Ounces ('000 tr oz)	Tonnes ('000 t)	Grade (g/t Au)	Ounces ('000 tr oz)	Tonnes ('000 t)	Grade (g/t Au)	Ounces ('000 tr oz)	Tonnes ('000 t)	Grade (g/t Au)	Ounces ('000 tr oz)	
Main Zone	4/22/2008	Behre Dolbear	2.0	-	-	-	8,446	4.39	1,193	2,762	4.22	374	8,446	4.39	1,193	Cut-off not stated in press release
Contact Zone			2.0	-	-	-	5,286	4.48	761	3,503	4.33	488	5,286	4.48	761	
Tulkubash Zone			2.0	-	-	-	1,642	4.70	248	473	4.66	71	1,642	4.70	248	
Total			**-**	**-**	**-**	**-**	**15,374**	**4.45**	**2,202**	**6,738**	**4.31**	**933**	**15,374**	**4.45**	**2,202**	
Main Zone	3/30/2009	SRK	3.0	-	-	-	6,531	4.30	904	4,992	4.33	693	6,531	4.30	904	
Contact Zone			3.0	-	-	-	3,673	4.18	493	6,831	4.23	928	3,673	4.18	493	
Tulkubash Zone			2.0	-	-	-	1,642	4.70	248	473	4.67	71	1,642	4.70	248	
Total			**-**	**-**	**-**	**-**	**11,846**	**4.32**	**1,644**	**12,294**	**4.29**	**1,694**	**11,846**	**4.32**	**1,644**	
Main Zone	3/9/2010	SRK	2.0	-	-	-	8,600	4.05	1,127	5,400	4.28	744	8,600	4.05	1,127	
Contact Zone			2.0	-	-	-	8,000	4.12	1,061	5,600	4.13	741	8,000	4.12	1,061	
Tulkubash Zone			2.0	-	-	-	-	-	-	2,500	4.18	338	-	-	-	
Total			**-**	**-**	**-**	**-**	**16,600**	**4.09**	**2,188**	**13,500**	**4.20**	**1,821**	**16,600**	**4.09**	**2,188**	
Main Zone	2/7/2011	WAI	2.0	-	-	-	5,155	4.40	731	9,239	4.20	1,261	5,155	4.40	731	Cut-off not stated in press release
Contact Zone			2.0	-	-	-	7,864	4.30	1,078	7,671	4.10	1,015	7,864	4.30	1,078	Contact zone restated 7/7/2011
Tulkubash Zone			2.0	-	-	-	219	4.60	32	2,280	3.90	289	219	4.60	32	
Total			-	-	-	-	13,238	4.30	1,841	19,190	4.20	2,565	13,238	4.30	1,841	
Main Zone	3/5/2012	WAI	2.0	-	-	-	7,136	4.23	971	9,051	4.26	1,240	7,136	4.23	971	
Contact Zone			2.0	-	-	-	12,463	4.30	1,721	8,045	4.25	1,109	12,463	4.30	1,721	
Tulkubash Zone			1.0	180	3.07	18	2,145	2.80	196	2,987	2.99	287	2,325	2.84	214	
Total			**-**	**180**	**3.07**	**18**	**21,744**	**4.13**	**2,888**	**20,083**	**4.08**	**2,636**	**21,924**	**4.12**	**2,906**	
Main Zone	3/18/2013	Internal	-	-	-	-	-	-	-	-	-	-	-	-	-	
Contact Zone			-	-	-	-	-	-	-	-	-	-	-	-	-	
Tulkubash Zone			-	-	-	-	-	-	-	-	-	-	-	-	-	
Total			**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
Main Zone	4/1/2014	Gustavson	2.0	-	-	-	-	-	-	-	-	-	-	-	-	
Contact Zone			2.0	3,200	3.89	401	27,400	3.24	2,857	11,360	3.49	1,274	30,600	3.31	3,258	Main & Contact zones combined
Tulkubash Zone			2.0	3,700	2.17	257	6,300	1.87	382	1,890	1.90	116	10,000	1.98	639	
Total			**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
Main Zone	11/11/2014	GSI	2.0	-	-	-	-	-	-	-	-	-	-	-	-	
Contact Zone			2.0	6,629	3.15	671	32,794	3.67	3,864	6,611	3.92	832	39,423	3.58	4,535	Main & Contact zones combined
Tulkubash Zone			1.0	7,646	1.90	466	3,224	1.77	184	2,384	1.81	79	10,870	1.86	650	
Total			**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
Main Zone	6/23/2016	Internal based on GSI	1.0 OP	9,172	2.13	630	15,361	2.54	1,253	2,478	2.26	180	24,533	2.39	1,883	Main Zone open pit
Contact Zone			1.8 UG	3,215	3.05	315	25,844	3.63	3,013	6,068	3.79	740	29,059	3.56	3,328	Underground combined zones
Tulkubash Zone			0.5	12,902	1.41	583	5,911	1.24	236	2,124	1.36	93	18,813	1.35	819	
Total			**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	

Source: Tetra Tech (2018)

3.0 GEOLOGY

3.1 GEOLOGICAL SETTING AND MINERALISATION

3.1.1 GEOLOGIC SETTING

The Chaarat Gold Project is located within the Tien Shan Metallogenic Belt, a Hercynian fold and thrust belt that crosses Central Asia, from western Uzbekistan in the west through Tajikistan and the Kyrgyz Republic into north-western China, a distance of more than 2,500 km (Figure 3.1). This belt contains many important gold deposits including the Muruntau (one of the largest gold deposits in the world), Zarmitan, Jilau, and Kumtor (Porter 2006). The Tien Shan Belt is divided into three, east-west-trending tectono-stratigraphic units: the Northern, the Middle, and the Southern Tien Shan. Each is separated by a major structural zone and are thought to represent accretionary prisms on the margin of the proto-Eurasian continent that was active from the Proterozoic to the end of the Permian.

The Chaarat Gold Project is located within the Middle Tien Shan province, which is made up of fragments of Late Devonian-Carboniferous rocks deposited in a forearc accretionary complex that was subsequently subjected to intense folding and thrusting during the upper Palaeozoic. The Middle Tien Shan hosts some of the largest orogenic gold deposits in the world with ages that range from Lower to Upper Palaeozoic. These deposits are typically associated with Permian-age magmatism in carbon-rich sedimentary rocks (Cole and Seltmann 2000).

The structural evolution within the Chaarat District is closely linked to the tectonic history of the Talas-Fergana Fault (TTF). The TTF extends over a distance of 2,000 km and exhibits a maximum dextral offset of approximately 200 km from the late Palaeozoic to the present (Rolland et al. 2013). The Chaarat District is located 35 km southwest of the TTF and movement on the TTF lead to the formation of the sinistral Sandalash Fault Zone (SFZ) (Figure 3.2) which includes the Irisay Fault, the Tulkubash Structural Zone, the Contact Fault, and the Main Zone Fault. These structures, except the Irisay Fault, are all associated with gold mineralisation.

Figure 3.1 Chaarat Gold Project Geological Setting

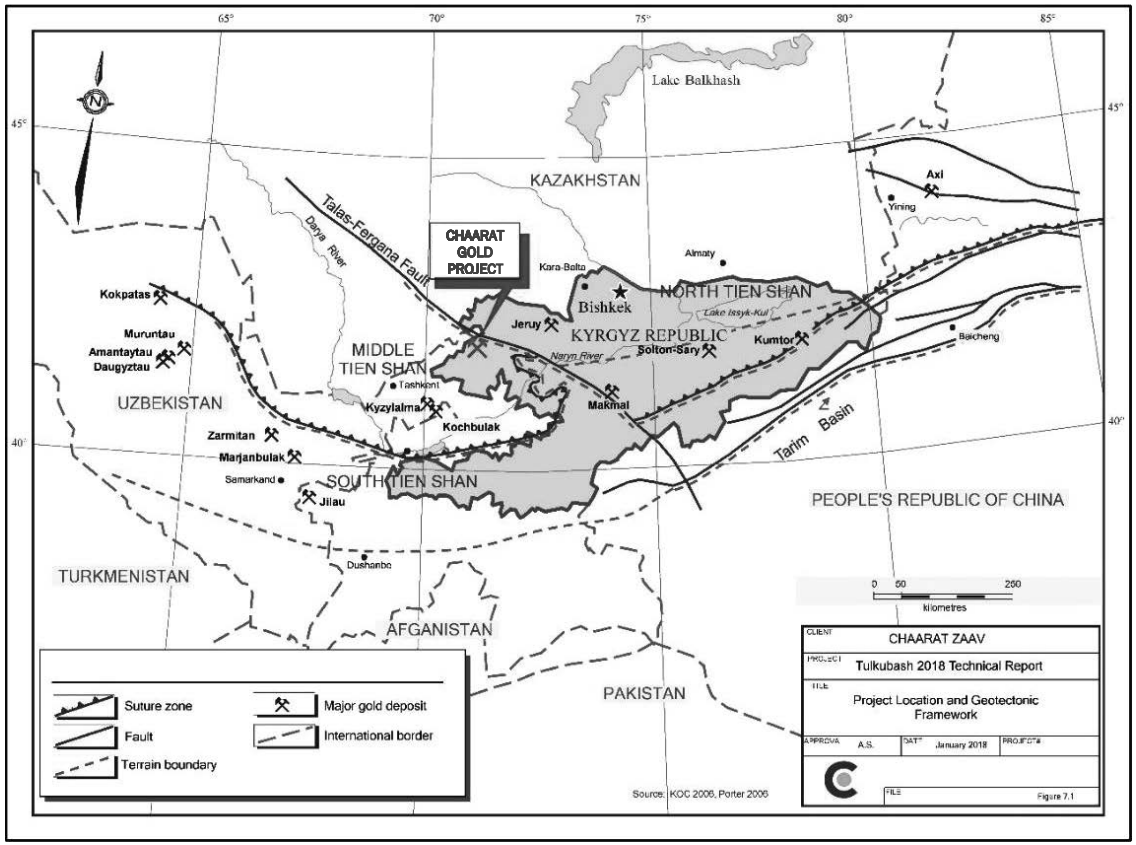
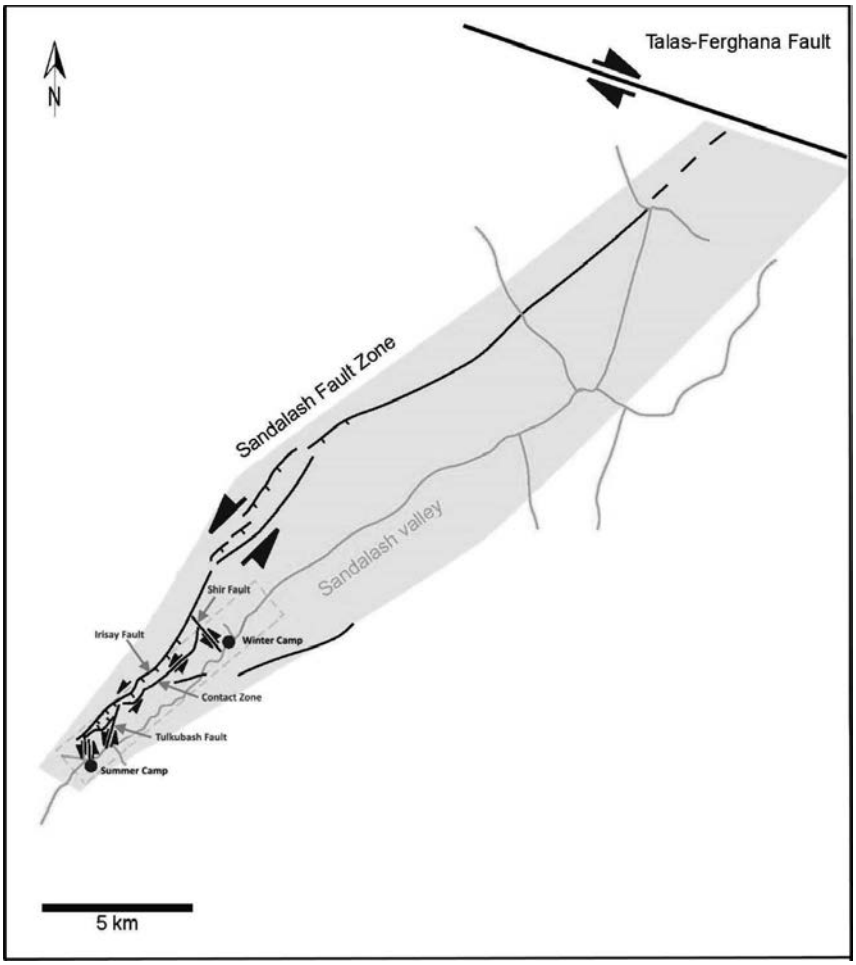


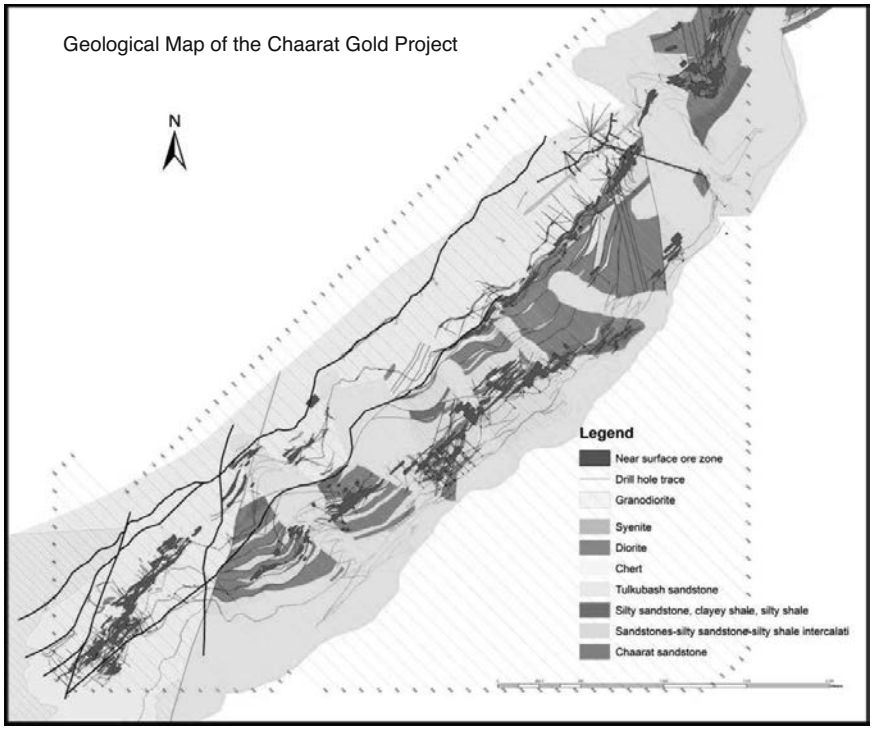
Figure 3.2 Sandalash Fault Zone Schematic Map



CHAARAT GOLD PROJECT GEOLOGY

The Sandalash River valley exposes a northeast-trending sequence of Cambro-Ordovician siliciclastic rocks (the Chaarat Formation), which have been overthrust by Devonian-age quartzites (the Tulkubash Formation) (Figure 3.3). The river roughly follows the hinge line of an open anticline with the Chaarat mineralisation occurring on the northwest limb. The sedimentary rocks hosting mineralisation strike north-easterly and dip 40 to 75° northwest. Permo-Triassic-age granodiorite and diorite intrusive rocks are closely associated with the gold mineralisation and, in some areas, are mineralised.

Figure 3.3 Chaarat Gold Project Area Geological Map



CHAARAT FORMATION

The Chaarat Formation consists of a monotonous sequence of moderately- to well-bedded, dark coloured siltstones, shales, quartzites, and greywackes, with minor limestone interbeds. Three members make up the formation (Cats et al. 2012):

- The lower member consists of grey siliceous siltstone interbedded with minor dark siltstone and shale. Bedding ranges from 3 to 20 m. The unit is up to 170 m in thickness.
- The middle member consists of interbedded fine- and medium-grained sandstones, greywackes, and siltstones, with a basal zone consisting of lenticular beds of polymictic gravely conglomerates and sandstones. This unit is approximately 300 m thick.
- The upper member is dominated by shales and rhythmically interbedded siltstones and fine-grained sandstones. The sandstones commonly exhibit graded bedding. The thickness of individual beds is usually between 1 to 2 m, and the member is 70 to 90 m in thickness.

TULKUBASH FORMATION

The Tulkubash Formation consists of medium- to fine-grained quartzites and medium- to coarse-grained arkosic sandstones, with occasional thin interbeds of dark pyritic shales and siltstones. Quartzite beds range from 10 cm to 1 m in thickness, with thicker beds predominating. Individual quartzite beds are generally massive and

internally homogenous, with the occasional compositional layering of dark laminae alternating with lighter quartz-rich layers. Elsewhere, the lower part of the units is conglomeratic. In the Chaarat Gold Project area, the upper and lower contacts are faulted contacts. The thickness of the formation can reach up to 1,000 m.

STRUCTURE

Mineralisation in the Chaarat District is controlled by a series of subparallel brittle shear zones that are the result of a predominantly sinistral strike-slip motion of the SFZ. Gold mineralisation occurs in clusters along various extensional structures related to releasing bends (Kramer 2009; Jakubiak 2017).

3.1.2 MINERAL DEPOSITS

Gold mineralisation within the Chaarat Gold Project is divided into two styles of mineralisation: the Kyzyltash mineralisation (the Main and Contact zones) is sulphide-rich and refractory, while the Tulkubash mineralisation is oxidised and can be processed by conventional heap leach methods.

TULKUBASH ZONE

The Tulkubash zone (Figure 3.4) is a mineralised structural zone that trends northeast-southwest and dips steeply 55 to 75° to the northwest. The Tulkubash zone is interpreted to be a brittle shear zone that developed as the result of predominately sinistral strike-slip motion within the SFZ. Gold mineralisation within the Tulkubash zone occurs within zones of intense silicification and quartz flooding, which form individual gold-bearing lodes that can range from 5 to 45 m in true thickness. Where multiple lodes are present, the Tulkubash zone can be up to 250 m in width with the individual lodes separated by barren rock (Figure 3.5). Development drilling of the Tulkubash zone indicates that the zone is remarkably continuous, but blossoms and thins along its defined length.

Figure 3.4 Tulkubash Zone Geology

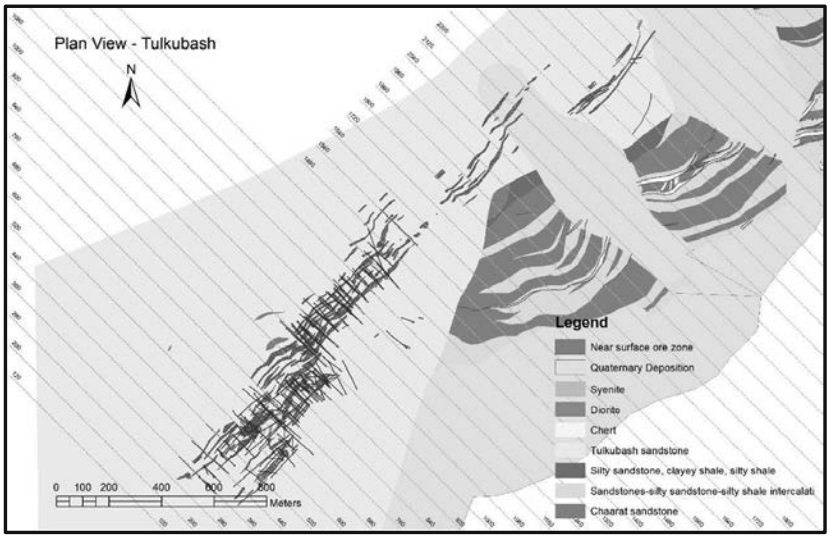
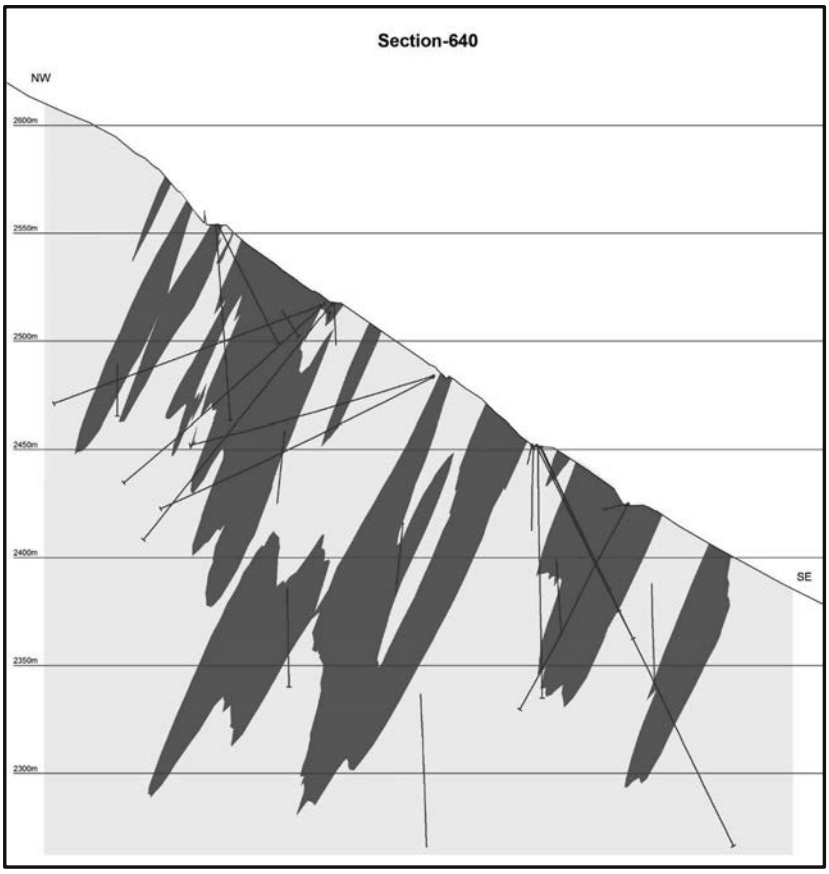


Figure 3.5 Section 640 Illustrating Multiple Lodes +0.25 g/t Gold (Wireframes in Red)



A distinctive feature present in areas of strong mineralisation is ovoid shaped hydrothermal breccias that form resistant spires up to 10 m high and 5 to 10 m in cross section. The breccias are clast-supported with less than 5% carbonate cement. The preferential growth of lichens on the carbonate cement is a distinctive feature of these breccias. The breccias are typically barren but occur within areas of strong gold mineralisation. These breccias are interpreted as fossil steam vents.

Most of the Tulkubash zone is oxidised, and the gold-bearing lodes are characterised by red and red-brown hematitic iron oxides, with minor yellow-brown limonite, and rare jarosite and stibiconite. Metallurgical testing and cyanide soluble gold assays indicate that most of the developed mineralisation is amenable to heap leach.

Sulphide mineralisation tends to occur at depth and near the diorite contact at the south end of the Tulkubash zone. The contact between sulphide ore and oxidised ore can be gradational but is often observed with knife-edge contacts, suggesting at least some of the oxidation is hypogene. Bulk flotation test work of Tulkubash sulphide ores indicates that the main sulphide mineral is pyrite with subordinate arsenopyrite. All other sulphides occur in trace amounts and consist primarily of stibnite, molybdenite, sphalerite, and galena (Sehlotho and Bryson 2012). The predominant gangue mineral is quartz with subordinate mica, dolomite, and ankerite.

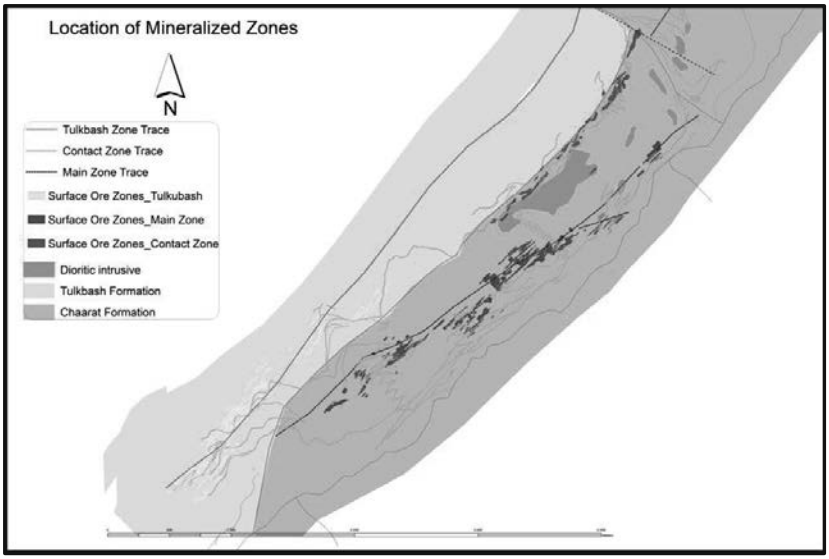
Gold particles have been identified in heavy liquid separates (Kirchner and Coetzee 2011) from Tulkubash composites. The gold occurs as electrum containing variable amounts of silver. The silver content is low (4 to 8%), with only a few grains containing up to 16% silver. Silver was also observed as silver-rich tetrahedrite and within a silver-rich lead-antimony-sulfosalt.

The widespread silicification and deep oxidation is in distinct contrast to the Kyzyltash Zone, where there is only minor quartz, mostly in thin veinlets and occasional veins with no significant oxidation.

KYZYLTASH ZONE

The Kyzyltash Zone is a series of sulphide-bearing ore bodies made up of the Main Zone and Contact Zone mineralisation (Figure 3.6). The mineralised zones occur within two subparallel northeast-trending structural zones that have been traced for 10 km along strike. The ore consists of gold-arsenopyrite-stibnite-tetrahedrite mineralisation occurring in sheared and altered wall rock. The ore exhibits strong sericitic alteration, with lesser amounts of quartz, quartz vein stockwork, ankerite, and calcite gangue. In some areas, antimony and silver are significant constituents of mineralisation, the latter particularly in the Contact zone (about 21 g/t silver average) and in the M7000 orebody. Antimony, in stibnite and various sulfosalts, can locally reach values of 10% or more over 1 to 2 m thick zones. Trace amounts of copper and molybdenum are present in some of the ore.

Figure 3.6 Location of Kyzyltash (Main Zone and Contact Zone) Ore Bodies



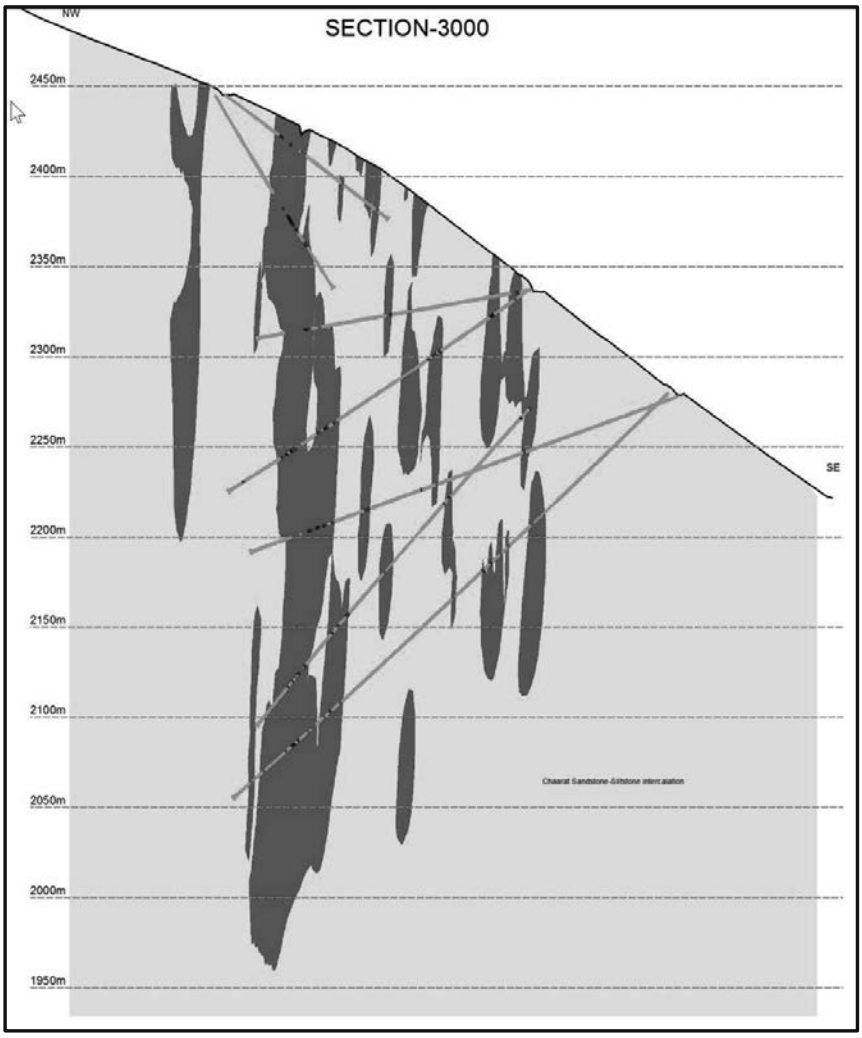
Petrographic work completed by CZ on more than 50 thin sections showed that free gold is present in the ore and occurs as inclusions in quartz and arsenopyrite. The gold mineralisation is, to some extent, correlated with arsenic, which mostly occurs as arsenopyrite. In some localised zones, there are very high silver values (greater than 400 g/t silver). The distribution of silver values is not fully understood, and transitions

from silver-rich areas to silver-deficient areas can occur over distances of less than 20 m along strike.

Main Zone

Main Zone mineralisation occurs within the N50°E trending Main Zone Fault, which exhibits sinistral, oblique slip movement. The Main zone structure is developed within the siltstones and greywackes of the Chaarat Formation (Figure 3.7) and includes seven discrete ore bodies discovered to date. Mineralisation is preferentially located at the intersections of conjugate N30°E-trending tensional fractures and riedel shears with the Main Zone Fault (Kramer 2009).

Figure 3.7 Cross Section of Main Zone with +2.0 g/t Gold (Wireframes in Red)



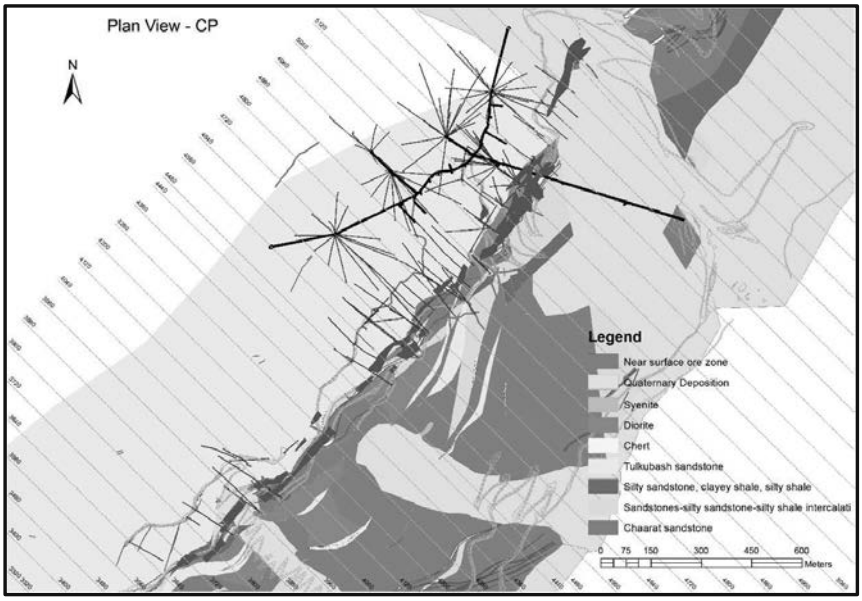
Contact Zone

The Contact Zone is a major fault zone with a moderate (50 to 60°) dip to the northwest, which separates the Devonian Tulkubash Formation in the hanging wall from the Ordovician Chaarat greywackes and siltstones in the footwall. The shear zone can be up to 20 m wide and is intruded by various lenticular igneous dykes emplaced along the fault. In other places, particularly in areas of the softer shale wall rocks, the shear zone may be as little as 2 m wide.

In 2008–2009, a 3 m by 3 m adit was driven into the Contact Zone CP orebody (Figure 3.8). The adit passed through a succession of sandstones, siltstones, and carbonaceous shales of the Chaarat Formation, which are locally sheared and faulted and, in some areas, tightly folded. Where the adit intersected the Contact Zone, it was channel-sampled over 1 m intervals with the following results:

- northeast sidewall: 24.0 m at 6.10 g/t gold and 14.39 g/t silver (20.7 m true width, corrected for dip)
- southwest sidewall: 27.0 m at 5.41 g/t gold and 12.00 g/t silver (24.2 m true width, corrected for dip).

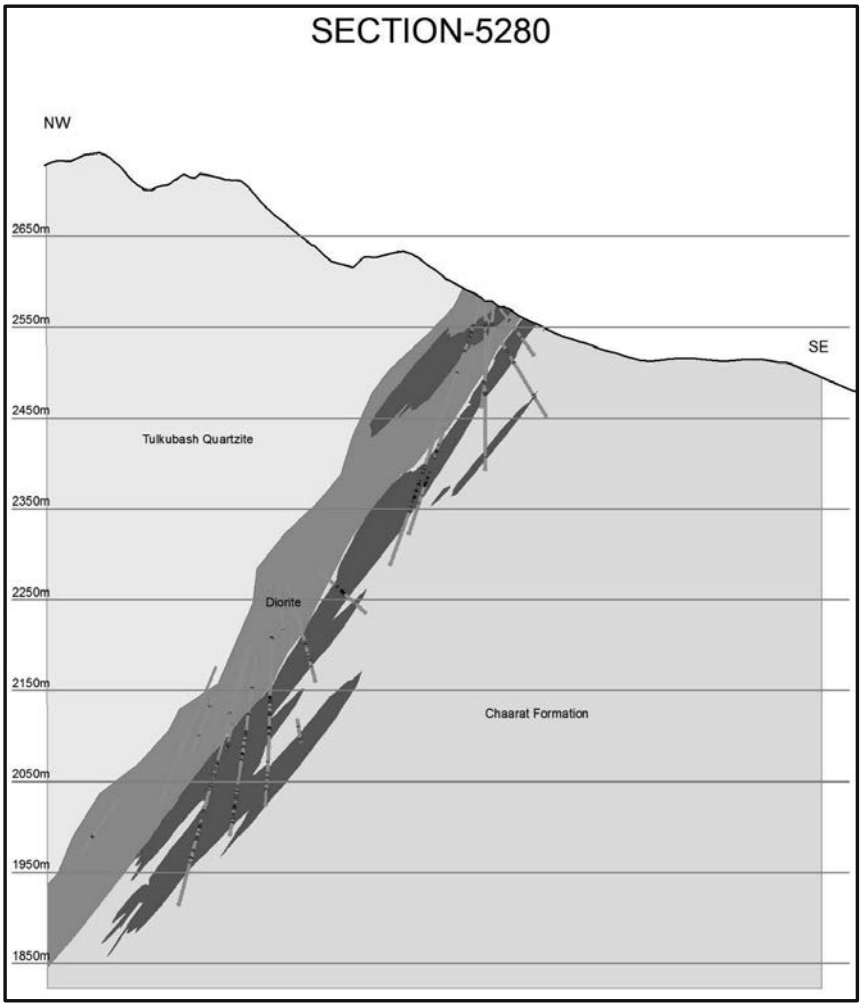
Figure 3.8 Contact Zone Ore Bodies Geological Map (Exploration Drift in Black)



Surface and underground drilling has defined a consistent zone of mineralisation that has been developed over a vertical distance of 750 to 1,050 m (Figure 3.9) and is open at depth.

The Contact Zone has been exposed in trenches and drillholes over a strike length of 10 km, of which drilling has explored only 1.8 km.

Figure 3.9 **Cross Section through the Contact Zone with +2.0 g/t Gold (Wireframes in Red)**



3.2 DEPOSIT TYPES

Mineralisation and associated hydrothermal alteration at the Chaarat Gold Project are genetically associated with igneous intrusive rocks along a system of regional-scale, sinistral, oblique-slip faults. Within this setting, there are two distinct types of mineralisation: the Tulkubash-type and the Kyzyltash-type. However, the proximity of the two types of mineralisation and the common structural controls suggest that both were the result of a common hydrothermal event.

Boiling textures in the Tulkubash zone, along with widespread oxidation, silicification, and the geochemical association of gold with antimony and arsenic, indicate a shallow epithermal setting analogous to sediment-hosted deposits. In the terminology

of Groves et al. (1998), the Tulkubash zone is classified as an epizonal orogenic gold deposit.

The Kyzyltash mineralisation formed in a much deeper environment. The pervasive sericitization, disseminated sulphides and ankeritization within mineralised lodes, and the relative paucity of quartz veins (usually less than 5% of volume), indicate the prevalent mode of deposition was controlled by the reaction of reduced hydrothermal fluids with wall rocks. These zones are classified as mesozonal orogenic gold deposits. These deposits are formed in nearly isothermal conditions and can extend to great depths. Mineralisation in the Contact Zone has been drilled over a vertical range of 1.3 km and is open at depth and along strike.

If the two types of mineralisation are related by a common hydrothermal system, then the Contact Fault has a significant component of normal movement that down dropped the Tulkubash block relative to the Kyzyltash mineralisation. It also implies that the Tulkubash zone transitions to mesozonal-style mineralisation at depth and represents a deep, underground exploration target.

3.3 EXPLORATION

Mineralisation within the Chaarat Gold Project area was first identified by Soviet-era soil and stream-sediment sampling, as part of a geochemically anomalous zone that extends for more than 40 km along the Sandalash Valley. Their work identified 28 separate gold anomalous zones and a similar number of tungsten (W), molybdenum (Mo), copper (Cu), lead (Pb), zinc (Zn), silver (Ag), arsenic (As), and antimony (Sb) anomalies, most of which have not yet been investigated.

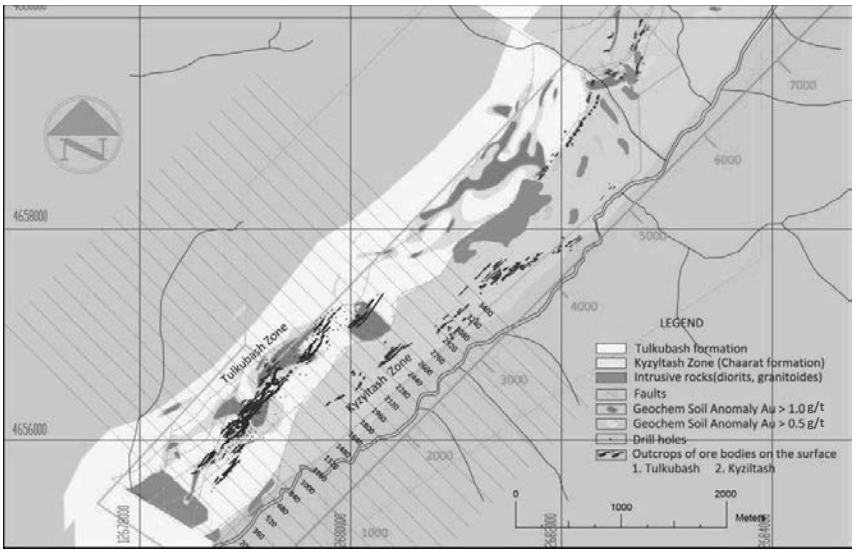
3.3.1 TULKUBASH ZONE EXPLORATION

In 2004, CZ completed a soil sampling program along the strike of the Tulkubash zone. The survey consisted of soils collected every 40 m along irregularly spaced traverse lines that extended down the ridge. The results of the soil survey outlined numerous gold anomalies of greater than 1 g/t gold over a 4 km strike length, with the maximum value of 73 g/t in one sample (Figure 3.10). These anomalies range from 100 to 800 m in length (along trend) and 50 to 150 m in width. They all occur along the projection of the Tulkubash zone, parallel to, and approximately 300 m above, the Contact zone (Figure 3.10).

In the Tulkubash zone, follow up trenches, and detailed rock chip profiles were collected, which defined a large, coherent geochemical anomaly. Subsequent drilling within the anomaly led to the discovery of the Tulkubash zone.

Over the following years, additional rock chip, trench sampling, and some drilling have been completed along this trend. This work continued to return positive results with numerous anomalous values in gold and arsenic. Exploration along the Tulkubash zone continued in 2017 with the contract geology firm of SherSGB conducting geologic mapping and surface sampling under CZ supervision. This exploration work included geologic mapping along traverses and the collection of 438 rock chip samples and 158 samples collected from hand-dug trenches. The trench samples were collected using a saw with a diamond blade to ensure representative sampling.

Figure 3.10 Geologic Map with Soil and Rock Geochemical Data



In addition, 1,427 dozer cut samples were collected during the 2018 exploration campaign.

The exploration potential of these geochemical anomalies along the Tulkubash zone is considerable and may be equal to, or larger than, the currently known resources in the district. The historical exploration and new data collected in 2017 and 2018 is currently under detailed review; however, the initial evaluation has identified many potential drill targets over a 10 km strike length of the trend of the Tulkubash zone.

The following subsections briefly describe the targets identified to date. The target names are based on the cross-section centred on the target area (i.e., target T2800 is located on section 2800).

TARGET T2800

Assay results from two trenches and new road cuts in this area returned very encouraging gold values. All sampling was from 1 m channels cut with a power saw to ensure high-quality samples.

A total of 81 samples were collected from the area. The average grade of the samples was 2.02 g/t gold, and 27 samples contained greater than 2.0 g/t gold. In addition, a single 2014 drillhole in the area (T07-178) intersected 15 m of anomalous mineralisation, with several 1.5 m intervals exceeding 1.0 g/t gold (a high value of 1.69 g/t gold).

This area is of immediate interest because of the proximity to the Tulkubash zone, and the anomalous values are exactly on trend from the known mineralisation. A significant discovery in this area could add new reserves to the deposit.

TARGET T3600

The T3600 target is centred on a cluster of highly-anomalous geochemical samples collected in the Tulkubash quartzite, stratigraphically above the M30 Main Zone ore body. An examination of the ore body outlines and anomalous surface samples suggest an apparent flexure in the Main Zone mineralisation. This flexure may propagate into the Tulkubash quartzites resulting in dilatant zones favourable for mineralisation. Numerous multigram gold assays have been returned from soils, rock chip samples, and trenches with values up to 16.5 g/t.

On section 3720, located within the area, trench 637 cut 9 m of 3.36 g/t gold. This anomaly has not been drill tested.

TARGET T4800

The T4800 target area is located along the Tulkubash zone, stratigraphically and topographically above the Contact Zone where it was developed in Adit No. 4. The target area contains a large, greater than 1.0 g/t gold soil anomaly that extends along trend for a distance of 750 m in length by 300 m in width. The target area is located above a large diorite body adjacent to the Contact Zone. The intrusion of this body may have provided the ground preparation and heat source for the intense mineralisation in this area.

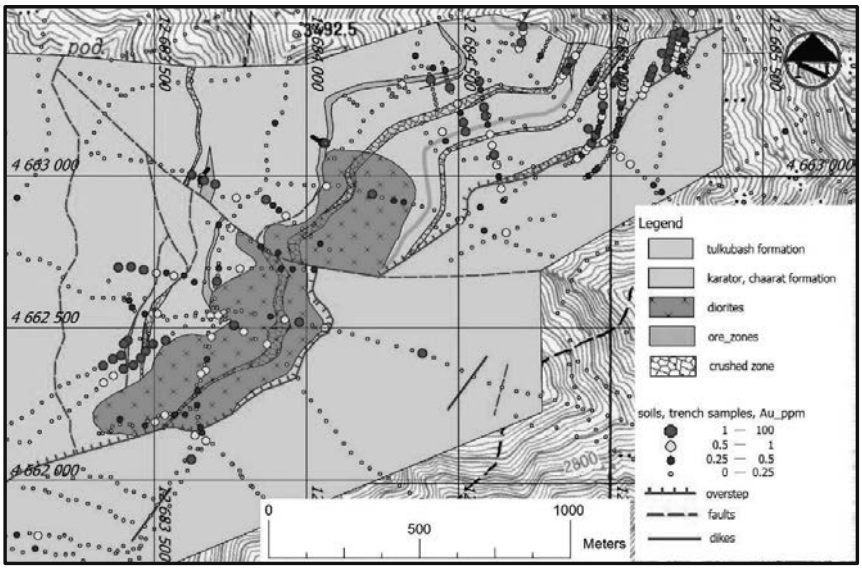
3.3.2 ISHAKULDY EXPLORATION

The Ishakuldy Zone is located 4 km northeast of the Shir Canyon Adit, close to the top of the ridge, approximately 1,000 m above the Sandalash River. Mineralisation was exposed by trenching and soil sampling over a strike length of approximately 2.5 km, with the highest gold values concentrated at the northeast and southwest ends of a tabular body of diorite, intruded along the contact between siltstones of the Chaarat Formation and quartzites of the Tulkubash Formation (Figure 3.11). Following these encouraging prospecting results, additional soil samples were collected over the northern end of the Ishakuldy zone, where the gold-in-soil anomaly, in excess of 0.5 g/t gold (up to 6.2 g/t), extends for more than 600 m along strike and 300 m across the strike. Reconnaissance soil sampling profiles along ridge-crest lines established the continuation of significant gold-in-soil anomalies (greater than 1 g/t gold) for a further 3 km north of Ishakuldy.

At Ishakuldy, gold mineralisation is associated with a 1,700 m by 500 m diorite stock intruded along the Contact zone, with the soil anomalies forming preferentially at the eastern and western ends of the diorite within the hanging wall of the Tulkubash Formation. Near the diorite contact, Trench 730-I contained 3.0 m at 16 g/t gold and 3.35% antimony, and Trench No.624 contained 3.0 m at 6.5 g/t gold, including 1 m at 15.8 g/t gold. The antimony and silver values in the rock samples are mostly very low (average 100 ppm antimony and 1 ppm silver), but the arsenic values were strongly anomalous (average 1,000 ppm arsenic) and showed a good correlation with the gold values.

Additional exploration is planned in this area during the 2018 field season.

Figure 3.11 Geologic Map of the Ishakuldy Area



3.3.3 RECONNAISSANCE EXPLORATION

The Tulkubash and Kyzyltash zones that project to the northeast have not been adequately explored. A regional reconnaissance exploration program is planned for 2018, to evaluate the potential of this remote area.

3.4 DRILLING

Multiple sampling programs have been completed across the Tulkubash zone between 2005 and 2018, both surface drilling and some limited underground and surface sampling. The majority of drilling is inclined, attempting to cut the mineralisation at a closest-to-normal angle to the strike orientation as possible. Drilling from underground stations is orientated normal to the strike of the structure.

Drilling campaigns for the entire Chaarat Gold Project have been undertaken using various contractors and CZ-owned equipment. Table 3.1 provides a summary of the Tulkubash zone drilling to date.

Table 3.1 Summary of Tulkubash Zone Drilling on the Chaarat Gold Project

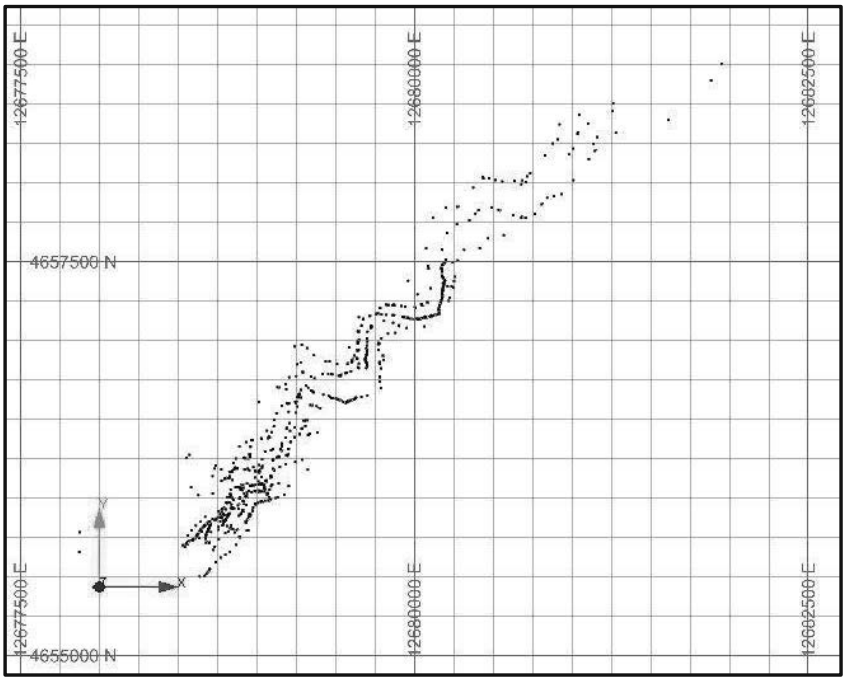
Surface			Underground		
No. of Drillholes	Total Length (m)	No. of Samples	No. of Drillholes	Total Length (m)	No. of Samples
492	67,667.1	48,752	11	1,091.70	324

Drilling is generally inclined at between 35 and 90° and orientated towards the southeast (with a strike of 126 to 147°).

In order to provide representative mineralised samples of sufficient quality, metallurgical testing drillholes were drilled at 90°, resulting in a greater intersection of mineralisation.

Figure 3.12 presents a collar location map across the Tulkubash zone.

Figure 3.12 Tulkubash Collar Location Map



3.4.1 DRILLING METHODS

All the recent Tulkubash drilling has been completed using diamond coring techniques, using various contractor and CZ-owned equipment. Figure 3.13 shows typical drill setups.

Figure 3.13 Drilling at Tulkubash, 2018

Core is typically collared at HQ, reducing to NQ in areas that encounter refusal.

Core recovery is measured and recorded by CZ geologists with an average recovery of 95%. In areas of loose and unstable quaternary deposits triple-tube drilling was utilised to improve recoveries.

For drilling programmes at Tulkubash, mineralised core intersections are split by core saw and then sampled. Sample preparation is done at the assay laboratory

3.4.2 DOWNHOLE DIRECTIONAL SURVEY METHODOLOGY

Drillholes surveys were undertaken using a Reflex 'EZ-shot'™ electronic single-shot downhole survey tool (Figure 3.14). The tools are owned by CZ, with the equipment serviced and factory set for declination annually. Surveys are typically taken at 15 m, and then every 50 m downhole.

Figure 3.14 Survey Tool

3.4.3 Drillhole Collar Survey Methodology

All Chaarat Gold Project surveys use the coordinate system Gauss Kruger Pulkovo 1942 Zone 12. Drillhole collars are surveyed by Leica total station with accuracy stated to be within centimetres.

3.4.4 Geotechnical Core Sample Logging

Geotechnical core logging takes place on site, consisting of the following information:

- Core Recovery: The total length of core recovered (including broken zones).
- Rock Quality Designation (RQD): The total length of solid core cylinders of greater than 100 mm in length, expressed as a percentage:

$$RQD = \frac{\text{sum of core peices} > 100 \text{ mm in length}}{\text{core run length}} \; x \; 100$$

- Orientation of fracture
- Fracture Type
- General Comments.

3.4.5 Core Photography

CZ geologists photograph all drill core wet, with all photographs stored within the database for reference purposes.

3.4.6 GEOLOGICAL LOGGING

Core is logged into standard hard copy logging sheets and then transcribed into Microsoft® Excel. In general, logging is performed at nominal 1.5 m intervals, however this is reduced to shorter intervals when required. Logging does cross obvious mineralised boundaries, due to the mineralisation style being fracture controlled in a brittle unit, there are few obvious contacts to adhere to. Figure 3.15 shows a geologist at work.

Logging is completed using standardised legend codes including:

- lithology
- alteration intensity
- alteration type
- degree of disturbance
- intensity of mineralisation
- silicification
- oxidation.

Figure 3.15 Logging Geologist at Work

3.4.7 SAMPLING

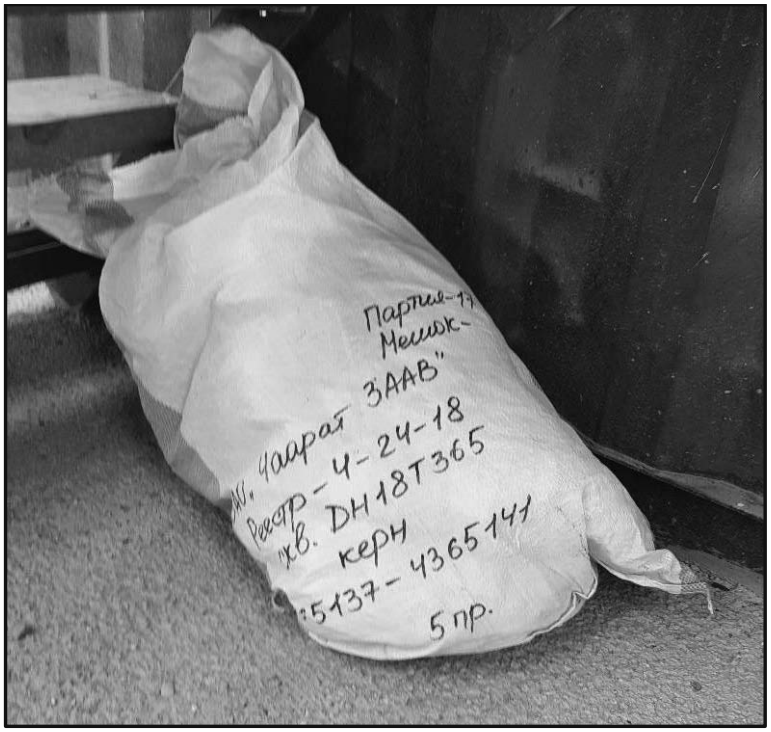
Prior to sampling, CZ geologists designate and mark sample intervals. Samples are taken at 1.5 m intervals, with interval lengths altered according to structures, alteration, and lithological boundaries. Competent core samples are split on site with

a core saw (Figure 3.16). In highly fractures intervals the rubble is recovered by trowel. Half core samples are selected and placed in labelled polyethylene sample bags (Figure 3.17). Sample bags are then securely sealed prior to weighing and packing into batches for transportation to the laboratory. Samples are transported in heavy duty sacks, each holding between five to six samples (Figure 3.18). The sacks are labelled and tied with wire before awaiting shipment to ALS Global Laboratory (ALS Global) in Kara Balta (Stewart Assay and Environmental Laboratory).

Figure 3.16 Core Saw

Figure 3.17 Sample Bags

Figure 3.18 Sample Sacks



The remaining half core is retained by CZ in labelled and numbered wooded core boxes for future reference. Theses core boxes are then transported to the CZ core storage facility in Bishkek (Figure 3.19).

Figure 3.19 Core Facility in Bishkek

3.4.8 DENSITY DETERMINATIONS

Density is determined regularly on samples of competent greater than ten centimetres in length. The density is by usual wet dry method with a paraffin wax coating. Figure 3.20 shows samples prepared for density determination.

Figure 3.20 Samples for Density Determination

3.4.9 TETRA TECH'S OPINION

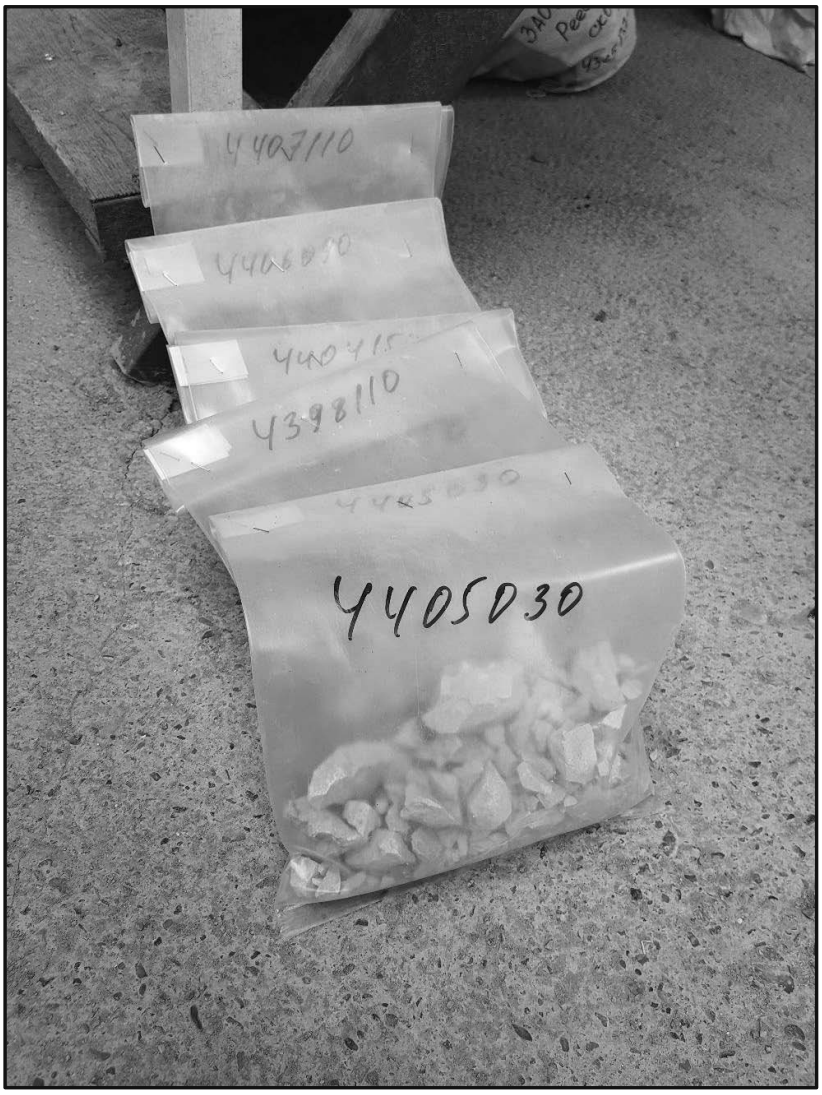
Tetra Tech is of the opinion that the drilling has been completed using methods and procedures that are consistent with recognised industry practices and that the data is suitable for Mineral Resource estimation.

3.5 SAMPLE PREPARATION, ANALYSIS AND SECURITY

This section summaries the sample preparation, analysis and security methodologies adopted by CZ during their multiple exploration campaigns.

All sample preparation is done by the laboratory, but standards and limestone blanks (Figure 3.21) are inserted in to the sample stream by the staff at the site logging camp.

Figure 3.21 Blank Material for Insertion in to the Sample Stream



3.5.1 LABORATORIES

Five laboratories have been used across the multiple exploration campaigns at Tulkubash. The laboratories used include;

- Information Research Centre Laboratories (IRC) in Kara Balta
- Stewart Assay and Environmental Laboratories, a subsidiary of ALS (ALS-Stewart), in Kara Balta
- Genalysis Laboratory Services Pty Ltd (Genalysis), Perth
- Central Scientific Research Laboratory (CSRL), Kara Balta

- SGS Vostok Limited (SGS Vostok), Chita, Russia.

Prior to 2017, sample preparation and analysis were undertaken at the IRC laboratory in Kara Balta. Samples retuning gold grades greater than 0.3 g/t were re-assayed at ALS. Genalysis was used as the referee laboratory during this time.

As of 2017 all sample preparation and analysis are undertaken by ALS, with selected pulps sent to SGS for referee analysis.

The CSRL laboratory has not been used since 2007.

All the laboratories currently being used are internationally accredited.

3.5.2 Sample Preparation and Analyses

Currently sample preparation is undertaken at ALS Global's laboratory in Kara Balta. The sample is crushed to 90% passing 2 mm followed by pulverising to 85% passing 0.075 mm. The pulp material is split with one sample analyses and the other returned to CZs core storage facility in Bishkek.

3.5.3 Quality Assurance/Quality Control

2008 to 2013 Quality Assurance/Quality Control

Between 2008 and 2013 samples were prepared in the IRC Kara Balta laboratory. Samples were dried, crushed to 100% passing 2 mm and two, 120 to 150 g manual splits were taken. The subsamples were pulverised to 0.075 mm and stored in numbered paper packets. One sample is analysed for gold by aqua regia digestion followed by atomic absorption at IRC. The second subsample along with coarse reject material was shipped to the CZ's core storage facility in Bishkek.

Samples returning grades over 0.3 g/t gold from IRC were transported to ALS-Stewart laboratory in Kara Balta for re-testing. These samples were assayed for gold using a 30 g charge fire assay, aqua regia digestion, with atomic absorption finish.

Selected mineralised intervals and pulps were sent for referee analysis at Genalysis.

2014 Quality Assurance/Quality Control

CZ inserted blanks at a rate of one blank per eighteen normal samples, with a total of 2,201 blanks submitted. The blank material is composed of non-mineralised limestone. Only a single sample returning a gold grade greater than two times detection limit.

Standard Reference Materials (SRMs) sample were inserted into the sample stream at a rate of one per eighteen samples upon transportation from the IRC preparation facility to ALS Global. SRMs were sourced from Geostats Pty Ltd, Malcolm Smith Reference Materials, and Rocklabs.

Standards are reported to have performed well.

2017 QUALITY ASSURANCE/QUALITY CONTROL

Two laboratories were utilised for the 2017 exploration campaign, ALS Global for primary analysis and SGS Vostok for referee samples.

ALS Global

A total of 3,002 control samples were sent to ALS Global, consisting of:

- 657 standard reference material samples
- 725 blanks
- 811 pulp duplicates
- 809 coarse reject duplicates.

The blanks performed well with all samples returning gold values less than two times the detection limit (0.05 g/t gold).

Seven different SRMs from Rocklabs and Geostats Pty Ltd were utilised during the 2017 campaign (STD_SG84, STD_SJ80, STD_SE86, STD_SK93, STD_SJ53, STD_OREAS 504 and STD_SL51). Only the first four SRMs had significant numbers of submissions, each of which performed well.

Pulp and coarse duplicates generally performed well.

SGS Vostok

Eight-five samples were sent to SGS Vokstok to independently check the ALS Global results. Four samples were SRMs and 81 were duplicates (73 pulps and 8 coarse rejects), representing approximately 3% of the total quality assurance (QA)/quality control (QC) samples. No blanks were sent to SGS Vostok.

The SRMs and duplicates performed well when compared with the ALS Global results.

2018 QUALITY ASSURANCE/QUALITY CONTROL

Blanks

The 2018 Tulkubash exploration program consisted of 586 blank samples, representing 5% of the total sample numbers. Of those 586 samples, three returned gold values greater than two times detection limit (Appendix B).

Standards

Throughout the 2018 Tulkubash exploration program 527 SRMs were submitted for analysis. All SRMs are sourced from Rocklabs.

The SRMs used and the number of time they were submitted are outline in Table 3.2, with SRM plots shown in Appendix B.

Table 3.2 SRMs used in the 2018 Tulkubash Exploration Program

Standard	No. of Submissions	Au Value (g/t)	95% Confidence Interval	Standard Deviation	No. of Failures	Pass Rate (%)
SE86	100	0.595	0.005	0.015	0	100.0
OxD127	142	0.459	0.004	0.012	11	92.3
OxH139	140	1.312	0.007	0.024	15	89.3
OxF142	142	0.805	0.006	0.019	37	73.9
SN50	1	8.685	0.062	0.180	0	100.0
SJ53	2	2.637	0.016	0.048	0	100.0
Total	**527**	-	-	-	**63**	-

Note: *failure defined as assay result falling outside of two standard deviations.

No failures were reported for the following standards:

- SE86
- SN50
- SJ53.

Good standard performance was reported for the following standards:

- OxD127.

Standards OxH139 and OxF142 reported higher failure rates than industry standard.

Eleven OxD127 standards fall above two standard deviations of the mean vale, representing a 7.7% failure rate. However, all these vales fall within three standard deviations of the mean certified value.

It is noted that OxH139 has a 10.7% failure rate above two standard deviations of the certified mean value. However, of these 15 samples only three fall above three standard deviations of the mean certified value.

OxF142 has a failure rate of 26.1%, this high failure rate is above acceptable industry practice. Out of the 37 high failures, 31 fall within three standard deviations of the certified mean SRM value. These samples should be investigated as all failures are “high failures”, suggesting a positive drift during analysis.

SRM SN50 and SJ53 contain very low sample numbers. It is recommended that their frequency be increased to ensure the high-grade samples are performing to industry be practice.

Tetra Tech notes that all failures across the differing SRMs are classed as “high failures” and, as such, further investigation with the laboratory should be undertaken to ensure that any positive drift or sample contamination is reduced in further sample batches.

Duplicates

Throughout the 2018 Tulkubash exploration program 287 pulp duplicates (Appendix B) and 308 coarse duplicates were submitted for analysis, corresponding to a 5% insertion rate.

Pulp duplicates had a 14% failure rate with 39 samples falling outside of ±20% of the original sample. Out of these failures 25 failed high and 14 failed low. This failure rate is higher than expected for pulp material and should be investigated further.

Coarse duplicates had a 32% failure rate (Figure 11.9), 66 failing high and 33 failing low. This high-coarse duplicate failure rate could be explained by the uneven gold distribution seen across gold deposits (nugget effect).

3.5.4 SECURITY

Prior to 2017 samples were transported directly to the IRC preparation laboratory in Kara Balta by CZ logistics personnel. CZ logistics personnel also collect and transport the core boxes from site to the CZ core storage facility in Bishkek.

Laboratory personnel transport samples between IRC and ALS-Stewart laboratories. Chaarat Gold Project personnel also collect and transport samples from IRC and/or ALS-Stewart to the core storage facility. Samples remain under direct control of CZ staff from drilling through delivery and collection to and from the assay laboratory until delivery to the core storage facility.

As of 2017 all samples are transported directly to the ALS Global laboratory by CZ personnel.

3.5.5 TETRA TECH OPINION

Tetra Tech considers that the Tulkubash exploration QA/QC programmes are suitable to support Mineral Resource estimation. The number of samples assessed for QA/QC purposes is to industry best practice. Tetra Tech recommends CZ liaise with the laboratory to ensure that further standard results do not consistently drift above two standard deviations and that results are not above three standard deviations.

3.6 DATA VERIFICATION

3.6.1 TETRA TECH SITE VISIT

Tetra Tech conducted a site inspection as part of this report. Mr. Joseph Hirst, BSc (Hons), MSc, CGeol, EurGeol, Resource Geologist for Tetra Tech, visited the Chaarat Gold Project site between the 7th and 13th of August 2018.

The site visit also included an inspection of the core storage yard in Bishkek, the base camp, the one site core logging, and core storage facilities.

3.6.2 DRILLHOLE LOCATIONS

The locations of several drillholes were measured for comparison with coordinates provided by CZ. Drillhole collar locations were verified using a hand-held global positioning system (GPS). The collar locations were found to be consistent with the drillhole database survey data, given GPS unit accuracy, the X and Y coordinates are within ±6 m in X and Y.

Drillholes were typically unmarked by an identification plate as the steep terrain dictates that the drilling has to be conducted from a drill pad prepared in the drill road cut. As the winters are harsh, and the ground conditions are generally unstable, the roads are recut each spring after the melt and precise collar is lost to fill.

However, 6 drill rigs were seen in operation, and a number of recent collar holes were observed and cross referenced against the database.

Tetra Tech consider that the collar locations for the drilling is within acceptable limits as tested by handheld equipment. All holes are surveyed with a Leica instrument.

Figure 3.22 Drillhole Collar Example

3.6.3 INDEPENDENT CHECK SAMPLES

Independent check samples of the drill core were not collected by Tetra Tech on the site visit.

3.6.4 CORE LOGGING AND SAMPLING

The core boxes were brought in and laid out on the core logging tables. Drill core was then aligned; the core is marked up for fracture counts and oxide state, geological logging was carried out first. Logging procedures are described in Section 3.4.6.

The logging facility was kept clean and tidy with sufficient lighting ().

Figure 3.23 On site logging facility

3.6.5 OUTCROP

During the site visit, Tetra Tech observed surface outcrops at the Tulkubash zone. The outcrops comprise of heavily fractured and oxide stained metaquartzite, known as the Tulkubash Sandstone unit. (Figure 3.24 and Figure 3.25). Hand specimens from the outcrop (Figure 3.26) are shown with heavy oxide staining and stibiconite mineralisation.

Figure 3.24 Tulkubash Outcrops in Road Cuts

Figure 3.25 Outcrop with Heavy Iron Staining

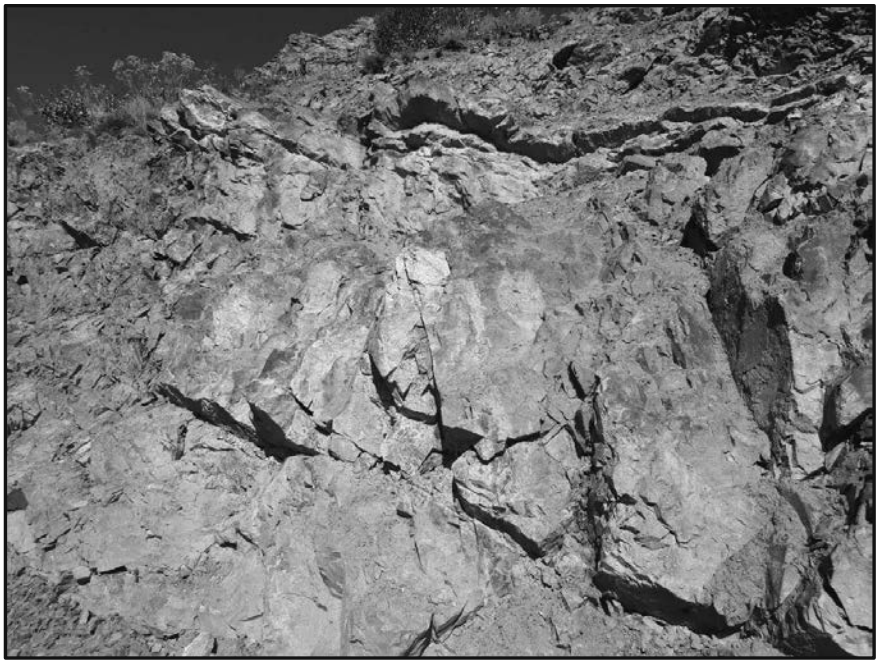


Figure 3.26 Hand Specimens

3.6.6 TETRA TECH OPINION

It is Tetra Tech's opinion that the current drill program, logging and sampling procedures are consistent with recognised industry best practice and are considered robust for the support of a compliant Mineral Resource estimate.

4.0 MINERAL RESOURCE AND ORE RESERVE ESTIMATES

4.1 MINERAL RESOURCE ESTIMATES

Tetra Tech completed a new interim (mid-season exploration) Mineral Resource estimate for the Tulkubash zone, with an effective date of 28th August 2018. The most recent data included in the estimate was received on 28th August 2018. Mr. Joseph Hirst, BSc (Hons), MSc, EurGeol, CGeol, an independent Competent Person as defined by the JORC Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (the JORC code) estimated the Mineral Resources.

4.1.1 SUMMARY OF ESTIMATION TECHNIQUES

Tetra Tech created wireframe models using Leapfrog Geo (version 4.2) software. Wireframes were created to represent two mineralised domains. Block modelling and Mineral Resource estimation were completed in Datamine Studio RM (version 1.3) software.

The metal grades for the Tulkubash zone were estimated using the Ordinary Kriging (OK) interpolation method. Density was estimated using the Inverse Distance Weighted Squared (IDW^2) interpolation methodology.

Statistical and grade continuity analyses were completed in order to characterise the mineralisation and were subsequently used to develop grade interpolation parameters. The search ellipsoid dimensions and orientations were chosen to reflect the continuity revealed by geostatistical studies. Block size, discretisation, search size, and sample numbers were optimised using Quantitative Kriging Neighbourhood Analysis (QKNA).

Tetra Tech adopted the definition of Mineral Resources as outlined within the JORC code (2012) in order to classify the Mineral Resources.

In order to demonstrate that the deposit has reasonable prospects for eventual economic extraction, a cut-off grade of 0.3 g/t gold was applied for Mineral Resources.

4.1.2 DATABASE

CGHL provided Tetra Tech with its exploration databases, in the form of two Microsoft® Excel spreadsheets. The first contained all collar, assay, survey, and lithological information for the sampling campaigns between 2007 and 2017. The second was an updated dataset for the 2018 campaign.

The updated interim Mineral Resource for the Tulkubash zone is based on additional drilling ongoing in the 2018 season to explore the strike extent of the mineralisation

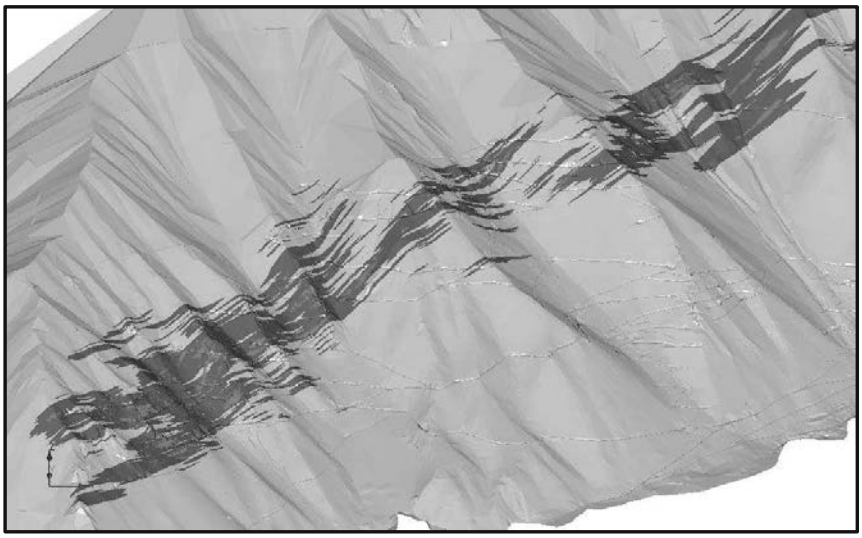
to the northeast and to infill some areas where additional mineralised structures were identified. No additional surface trenches were cut and sampled in 2018.

4.1.3 GEOLOGICAL INTERPRETATION

The Tulkubash zone is interpreted to have formed in a shallow epithermal setting and has been classified as an epizonal orogenic gold deposit. The deposit is thought to be a brittle shear zone formed through sinistral strike-slip motion within the SFZ.

Figure 4.1 illustrates the surface expression of mineralised domain wireframes that have been modelled for Tulkubash.

Figure 4.1 Isometric View of Mineralised Domains at Tulkubash – Looking Northwest



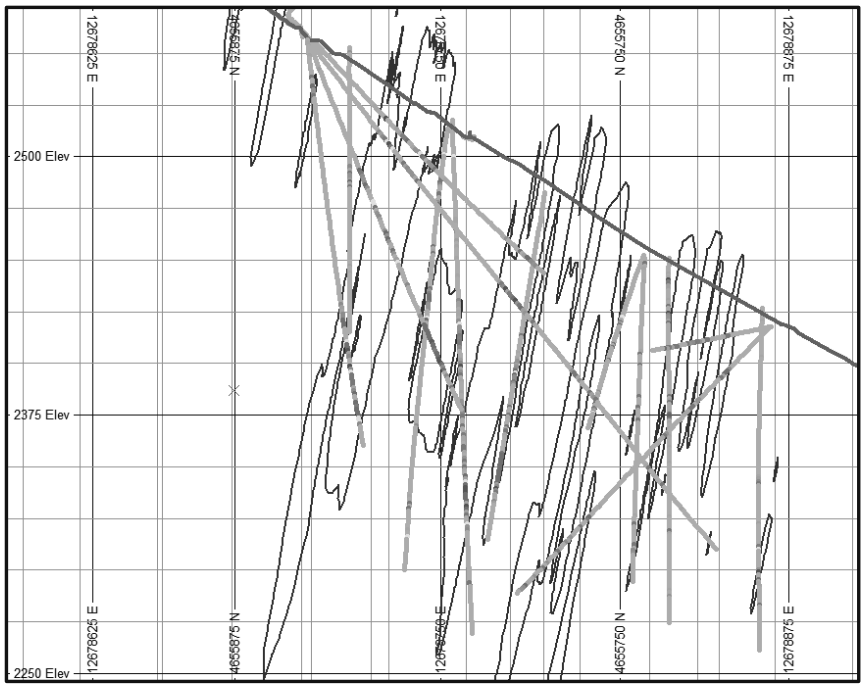
Note: Not to scale
Source: Tetra Tech

4.1.4 WIREFRAME MODELLING

Wireframe models were created by Indicator shells in Leapfrog software, creating high- and low-grade mineralised zones.

The continuity of the various structures is reflected in the Mineral Resource classification. Figure 4.2 shows a typical cross section of the mineralisation.

Figure 4.2 Cross Section through Tulkubash Mineralisation



Source: Tetra Tech

4.1.5 EXPLORATORY DATA ANALYSIS/DOMAINING

The mineralisation at Tulkubash has been treated as a structurally controlled mineralised domain sitting in a weakly mineralised fault bound corridor, relating to the shear zone. There are some cross-cutting structures, which have led to local thickening of the mineralisation. The more weakly mineralised corridor has some areas of higher grade which could not be correlated into cohesive structures along strike to be included in the main mineralised domain.

The more strongly mineralised domain has a high degree of continuity of structure along strike, formed usually in a series of sheeted parallel structures along a regional trend.

The exploratory data analysis indicated that all the mineralisation is hosted in a metaquartzite unit, known as the Tulkubash sandstone. There are zones of differences in alteration, or degrees of silicification encountered in the mineralisation zones, but these have no apparent control on the grade populations. The mineralisation is controlled by the amount of fracturing that has occurred during a brittle deformation phase in unit.

Various statistical analyses of the data were performed and are documented in this section.

RAW DRILLHOLE STATISTICS

Tetra Tech received a total of 57,038 metal assay results from a series of drilling and trenching campaigns between 2007 and 28th of August 2018 when the cut-off for new data was applied.

Analysis for silver, arsenic, antimony, and total sulphur was also completed for many of the samples, as well as some ICP-36 for the 2018 data. The additional metals have been estimated into the block model for information but are not currently included within the Mineral Resource as they do not have reasonable prospects for economic extraction, as required for compliant disclosure.

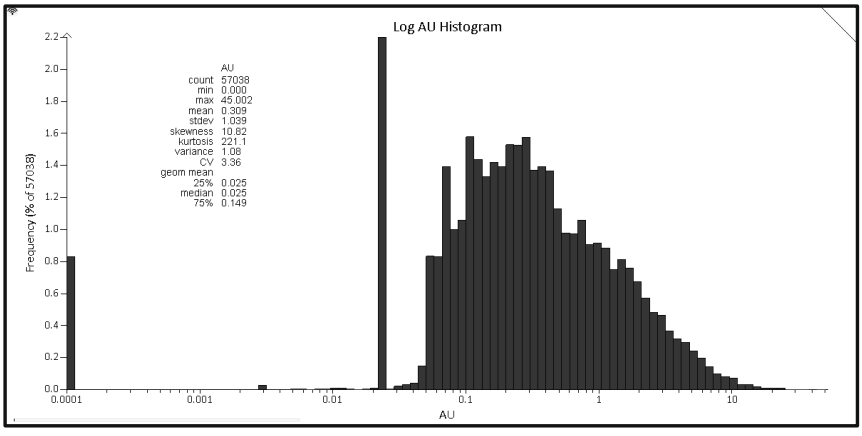
Table 4.1 presents the statistics for all raw gold assays.

Table 4.1 Raw Drillhole Statistics

Field	Au Grade (g/t)
Count	57,038
Minimum	0
Maximum	45
Mean	0.309
Variance	1.08
Standard Deviation	1.039
Coefficient of Variation	3.36
Skewness	10.82
Kurtosis	221.1
Geometric Mean	N/A

Statistical analysis of raw samples presents multiple grade populations (Figure 4.3). For robust grade interpolation the populations need to be differentiated and estimated independently.

Figure 4.3 Log Histogram of all Raw Samples



Note: Below detection limit samples are recorded as 0.025 g/t gold (62% of data). Tetra Tech changed all absent records to 0.0001 g/t gold to differentiate from below detection limit samples.

Exploratory data analysis determined that the Tulkubash zone is hosted in metaquartzite. Logging demonstrates that over 96% of the drilling samples are metaquartzite (Tulkubash Sandstone unit); therefore, lithology was determined not to be a control on the mineralisation.

Further analysis was run for domain control on:

- secondary alteration
- type of alteration
- silicification
- intensity of mineralisation,

Using mean grade analysis and the number of logged samples Tetra Tech concluded that there was no case for domaining on these logged parameters as mean grades were all near the total mean.

Two domains constrained by grade continuity interpretation were defined. The domains are described in Table 4.2.

The wireframe models successfully differentiate the high-grade (Domain 2 – “ESTDOM2”), low-grade (Domain 1-“ESTDOM1”), and waste populations. Statistics for the Tulkubash domains are presented in Table 4.2.

The grade distribution in the log histograms for the selected raw data are well developed log-normal populations. Figure 4.4 and Figure 4.5 present log histograms for all of the selected raw gold assays.

Table 4.2 Descriptive Statistics for Selected Samples

Domain	Count	Minimum	Maximum	Mean	Variance	Standard Deviation	Coefficient of Variance	Skewness	Kurtosis	Geometric Mean	Median
All	30,615	0	35.30	0.45	1.40	1.18	2.65	8.00	118.30	n/a	0.05
1	23,313	0	24.17	0.13	0.16	0.40	3.17	26.29	1,283.00	n/a	0.03
2	7,302	0	35.30	1.47	3.99	2.00	1.36	4.72	42.40	n/a	0.85

Figure 4.4 Log Histogram of Selected Raw Samples (Domain 1)

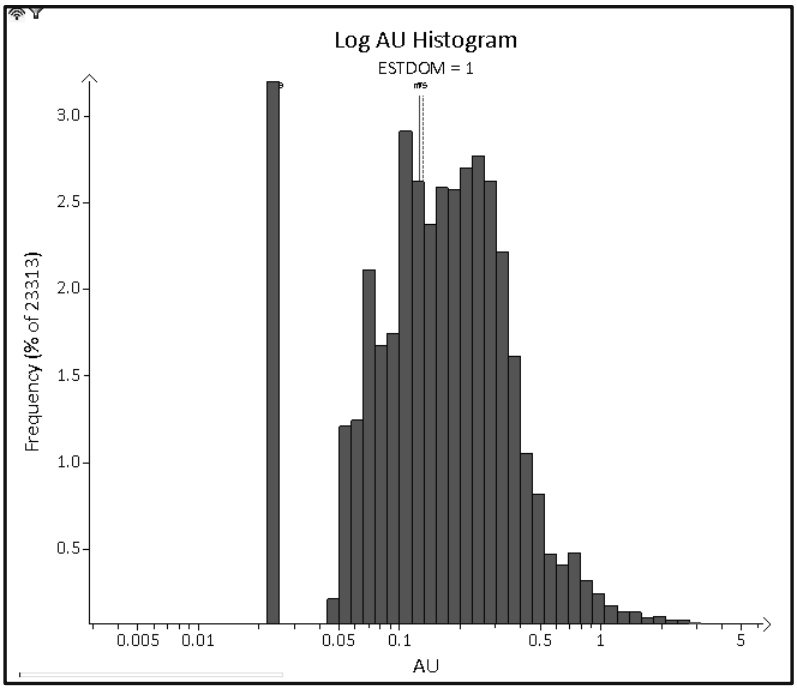
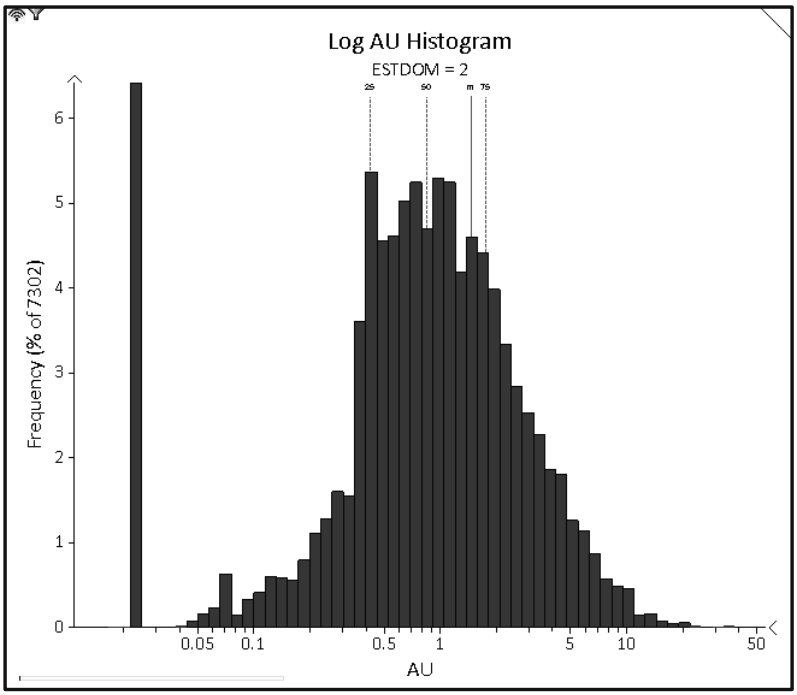


Figure 4.5 Log Histogram of Selected Raw Samples (Domain 2)



SAMPLE LENGTH AND COMPOSITING

Statistics on the sample lengths were analysed using histograms. The mineralisation has been sampled on 1.5 m lengths and the mean length was very close to 1.5 m.

Composites were created at a range of lengths from 0.5 to 5 m in 0.5 m increments.

A 3 m composite length was selected as having a reasonable statistical relationship to the mean sample length statistics. As very high sample numbers are present, the slight reduction in coefficient of variance was not considered detrimental as the estimation performance was tested to perform better with the 3 m composite in terms of the QKNA performed post-estimate.

Compositing was completed in Datamine software using a 3 m best fit routine, applying hard domain boundaries.

Table 4.3 describes the comparative statistics for the domains.

Table 4.3 Table Statistics of Selected Raw Samples and 0.4 m Composites

Data	Domain	Count	Minimum	Maximum	Mean	Variance	Standard Deviation	Coefficient of Variation	Skewness	Kurtosis	Geometric Mean	Median
Selected	All	30,615	0	35.300	0.450	1.40	1.180	2.65	8.00	118.30	n/a	0.050
Composites	All	15856	0	21.636	0.409	0.91	0.955	2.34	6.25	66.90	n/a	0.090
Selected	1	23,313	0	24.170	0.130	0.16	0.400	3.17	26.29	1,283.00	n/a	0.030
Composites	1	12207	0	12.541	0.115	0.06	0.251	2.18	17.35	600.00	n/a	0.047
Selected	2	7,302	0	35.300	1.470	3.99	2.000	1.36	4.72	42.40	n/a	0.850
Composites	2	3,649	0	21.636	1.391	2.50	1.580	1.14	3.72	24.67	n/a	0.884

TOP CUTS

The Parrish method of quantile analysis was performed on the composited samples to assess what proportion of the total metal was represented in the top 10% of the data. Once the Parrish method was completed, a top-cut of the data was applied as appropriate reduce the potential bias of the over-representation of the highest-grade samples.

The Tulkubash Domain 1 data set had slight over-representation in the highest centiles; therefore, a top-cut of 10 g/t was applied.

The Tulkubash Domain 2 data set had no undue over-representation; therefore, no top-cut was applied.

Figure 4.6 and Figure 4.7 show the analysis for both domains.

Figure 4.6 Domain 1 Decile Analysis

From-To	No. of Samples	Mean	Minimum	Maximum	Metal	Percent
D 0 - 10	1,190	0.017	0.000	0.025	58.258	1.516
D 10 - 20	1,232	0.025	0.025	0.025	83.669	2.177
D 20 - 30	1,274	0.025	0.025	0.025	83.661	2.176
D 30 - 40	1,275	0.025	0.025	0.025	83.654	2.176
D 40 - 50	1,202	0.033	0.025	0.048	109.919	2.859
D 50 - 60	1,200	0.063	0.048	0.078	211.042	5.490
D 60 - 70	1,186	0.096	0.078	0.115	322.475	8.389
D 70 - 80	1,198	0.138	0.115	0.162	461.444	12.004
D 80 - 90	1,205	0.202	0.162	0.252	674.911	17.557
D 90 - 100	1,245	0.524	0.252	12.540	1,755.047	45.656
P 90 - 91	127	0.260	0.252	0.268	86.954	2.262
P 91 - 92	121	0.275	0.268	0.282	92.237	2.399
P 92 - 93	125	0.291	0.282	0.301	96.632	2.514
P 93 - 94	127	0.311	0.301	0.323	104.602	2.721
P 94 - 95	128	0.333	0.323	0.347	112.079	2.916
P 95 - 96	126	0.365	0.348	0.388	121.726	3.167
P 96 - 97	121	0.413	0.388	0.441	137.766	3.584
P 97 - 98	121	0.488	0.441	0.542	163.618	4.256
P 98 - 99	122	0.681	0.543	0.870	228.488	5.944
P 99 - 100	127	1.820	0.876	12.540	610.944	15.893
T 0 - 100	12,207	0.115	0.000	12.540	3844.079	100.000

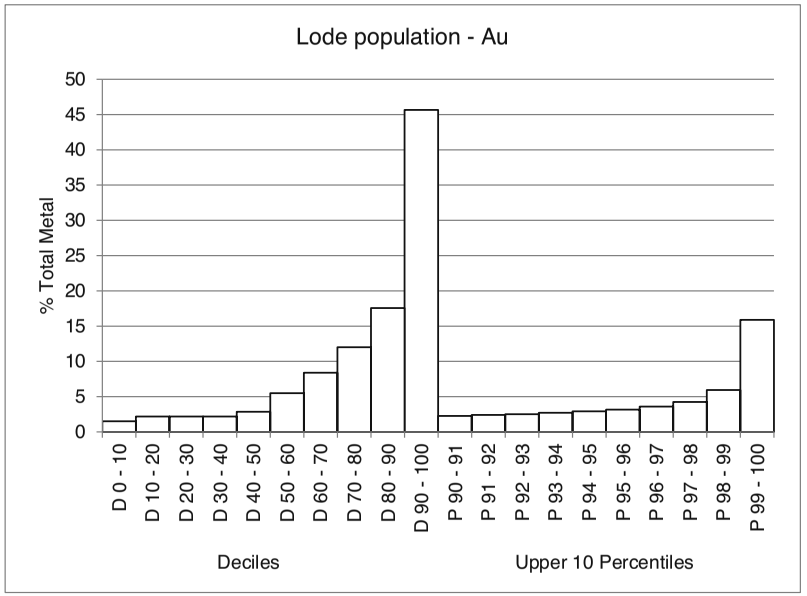
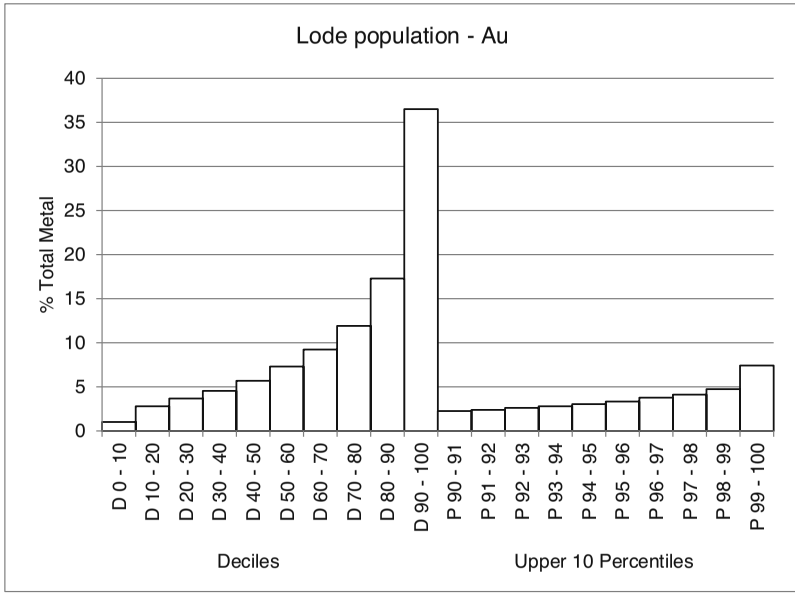


Figure 4.7 Domain 2 Decile Analysis

From-To	No. of Samples	Mean	Minimum	Maximum	Metal	Percent
D 0 - 10	366	0.146	0.000	0.316	138.832	1.017
D 10 - 20	414	0.400	0.316	0.465	381.437	2.795
D 20 - 30	379	0.528	0.466	0.586	502.140	3.680
D 30 - 40	366	0.651	0.586	0.726	621.255	4.553
D 40 - 50	360	0.815	0.726	0.918	777.271	5.696
D 50 - 60	363	1.047	0.919	1.176	998.349	7.316
D 60 - 70	348	1.321	1.176	1.483	1,261.297	9.243
D 70 - 80	355	1.711	1.486	1.989	1,625.163	11.909
D 80 - 90	352	2.469	1.990	3.172	2,358.956	17.287
D 90 - 100	346	5.215	3.172	21.64	4,981.446	36.504
P 90 - 91	33	3.262	3.172	3.334	308.006	2.257
P 91 - 92	34	3.457	3.347	3.600	326.266	2.391
P 92 - 93	35	3.720	3.600	3.859	357.312	2.618
P 93 - 94	34	3.987	3.872	4.103	382.297	2.802
P 94 - 95	36	4.310	4.105	4.533	414.206	3.035
P 95 - 96	33	4.810	4.538	5.002	454.508	3.331
P 96 - 97	35	5.312	5.080	5.578	515.664	3.779
P 97 - 98	35	5.901	5.621	6.308	563.325	4.128
P 98 - 99	34	6.879	6.313	7.547	646.825	4.740
P 99 - 100	37	10.409	7.616	21.640	1,013.036	7.424
T 0 - 100	3,649	1.431	0.000	21.640	13,646.144	100.000



4.1.6 DENSITY

CGHL provided 1,125 specific gravity measurements for the Tulkubash zone. The density was interpolated into the block model using the IDW^2 method for four oxide domains, distinct from the estimation domains. A mean value of 2.64 g/cm^3 was used for all mineralised blocks that did not received an estimate density due to the sample numbers or spacing.

4.1.7 VARIOGRAPHY

Tetra Tech completed variography for the Tulkubash data. The most reliable model fit was achieved by modelling the entire corridor (Domain 1 and Domain 2 together).

A good variogram model fit was achieved for downhole, major, semi-major, and minor directions.

The models are shown in Figure 4.8 to Figure 4.11.

Figure 4.8 Downhole Direction Variogram Model Fit

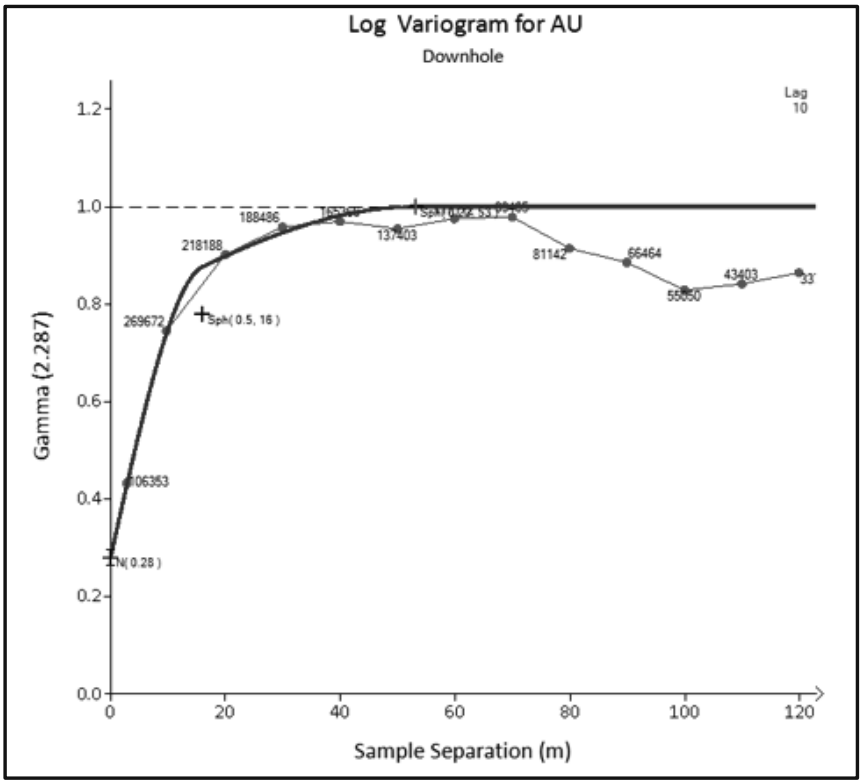


Figure 4.9 Major Direction Variogram Model Fit

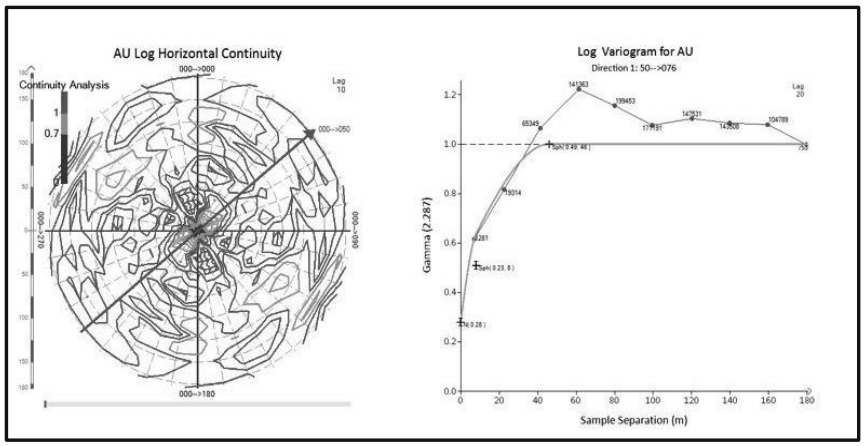


Figure 4.10 Semi-Major Direction Variogram Model Fit

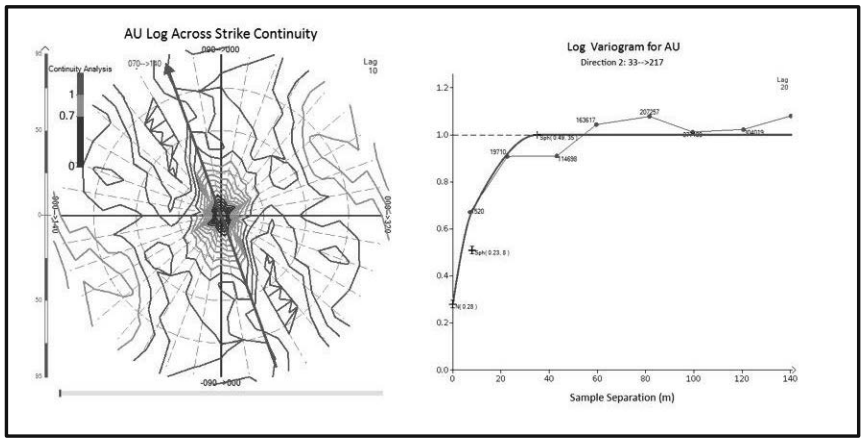
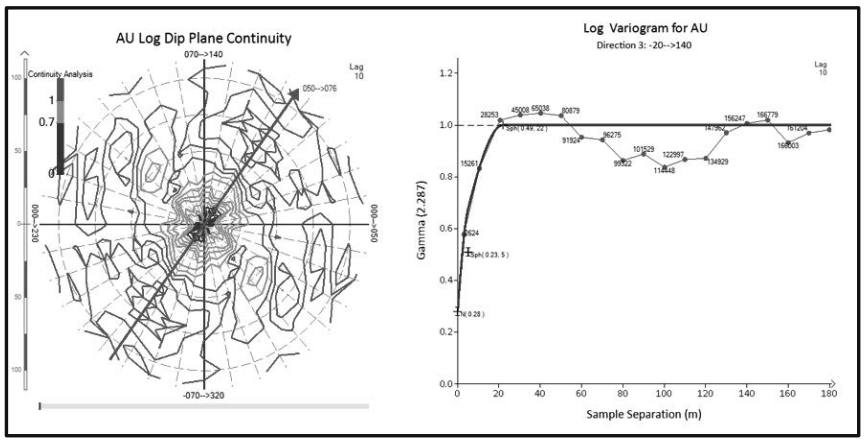


Figure 4.11 Minor Direction Variogram Model Fit



The variogram parameters for the model grade interpolation are shown in Table 4.4.

Table 4.4 Variogram Parameters

Parameter	Value
Angle 1	140
Angle 2	110
Angle 3	125
Axis 1	Z
Axis 2	Y
Axis 3	Z
Nugget	0.28
Structure	Spherical
Structure 1	
Range X	8
Range Y	8
Range Z	5
C	0.2
Structure 2	
Range X	46
Range Y	35
Range Z	22
C	0.52

4.1.8 RESOURCE BLOCK MODELS

The block model was constructed in Datamine software. The rotated block model parameters are given in Table 4.5. The grid system for all data is GK-Pulkovo42.

Table 4.5 Tulkubash North Block Model Parameters

Type	Unit	X	Y	Z
Minimum Coordinates	-	12675000	4654300	1600
User Block Size	m	10	10	5
Minimum Block Size	m	2	2	1
Rotation	degrees	n/a	n/a	042 (azimuth)

Standardised sub-cell splitting to the minimum block sizes presented in Table 4.5 was employed. Sub-cells received parent cell grades during estimation. The parent cell was selected by Kriging Neighbourhood Analysis (KNA) for best kriging performance during the grade interpolation, whilst the smaller sub-cell allows the narrow wireframes to fill with blocks and help to maintain consistency between the final block volumes and the wireframe volume.

INTERPOLATION STRATEGY

Grades were estimated using OK, adopting a multi-pass methodology. Primary ranges and orientations set to the variogram model. A summary of the estimation strategy is show in Table 4.6.

Table 4.6 Estimation Parameters

Distance Axis 1	Distance Axis 2	Distance Axis 2	Angle Axis 1	Angle Axis 2	Angle Axis 3	Axis 1	Axis 2	Axis 3	Minimum Samples	Maximum Samples	Expansion Factor	Minimum Samples	Maximum Samples	Expansion Factor	Minimum Samples	Maximum Samples	Maximum per Drillhole
50	40	25	140	110	125	Z	X	Z	18	36	2	6	36	12	3	36	6

4.1.9 BLOCK MODEL VALIDATION

Block model validation was completed using visual, graphical, and statistical methods to confirm the estimated block model grades appropriately reflect the local composite grades. This is completed primarily by statistical and swath plot methods.

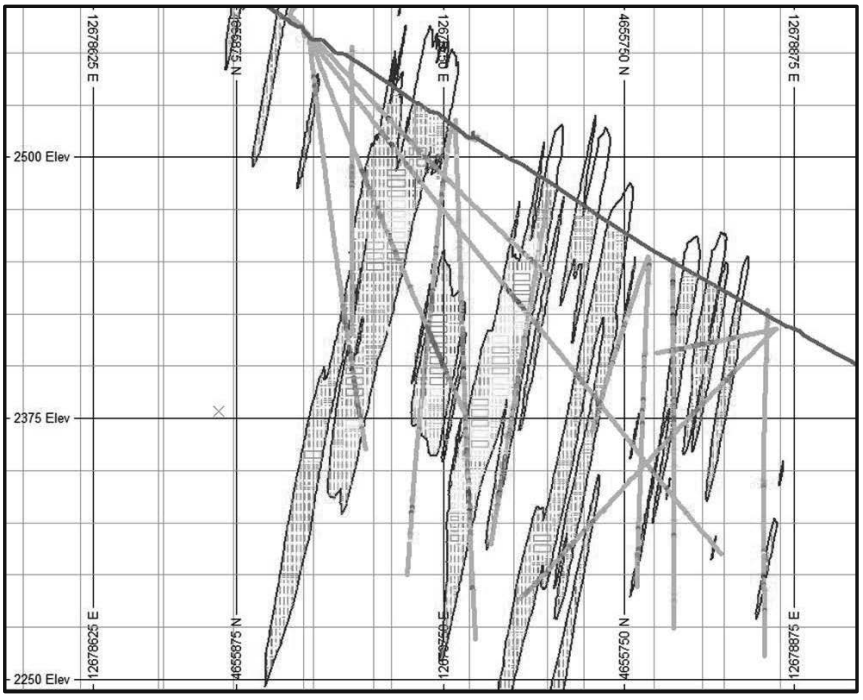
QKNA methods were employed for the kriged parts of the model estimate to test parameters such as block size, discretisation, and informing sample numbers.

The visual inspection demonstrated reasonable correlation between composite and block grades. Table 4.7 presents table statistics comparing the informing composites with the block.

A number of the measures indicate a reduction in variance. This is a result of the change of support associated with the estimation process and the kriging interpolation. There is a reduction in the mean gold grade from composites to block estimate due to the skewness in the data, as the composite data does not conform to a log-normal distribution. Overall, for all zones combined, the statistics present reasonable conformance for the stage of the Chaarat Gold Project.

Figure 4.12 displays a typical cross section through block filled wireframes and corresponding samples.

Figure 4.12 Cross Section Tulkubash Wireframes Filled with Blocks



Source: Tetra Tech

Table 4.7 Statistics Comparing Block Estimate and Composite Grades

Data	Domain	Count	Minimum	Maximum	Mean	Variance	Standard Deviation	Coefficient of Variation	Skewness	Kurtosis	Geometric Mean	Median
Composites	All	15,856	0.0	21.64	0.41	0.91	0.96	2.34	6.25	66.90	n/a	0.09
Block Model	All	230,476	0.0	7.55	0.24	0.20	0.45	1.88	4.27	24.65	n/a	0.10
Composites	1	12,207	0.0	12.54	0.12	0.06	0.25	2.18	17.35	600.00	n/a	0.05
Block Model	1	205,023	0.0	1.56	0.10	0.00	0.07	0.64	6.17	65.60	n/a	0.09
Composites	2	3,649	0.0	21.64	1.39	2.50	1.58	1.14	3.72	24.67	n/a	0.88
Block Model	2	25,453	0.3	7.55	1.34	0.44	0.66	0.50	2.60	8.70	1.229	1.17

SWATH PLOTS

Swath plots have been used to assess the differences and similarities between the block estimate silver grade and the informing composite grades (Figure 4.13 to Figure 4.18).

Figure 4.13 Northing Swath Plot Comparing the Informing Composite and the OK Estimated Gold Grades for Tulkubash ESTDOM 2

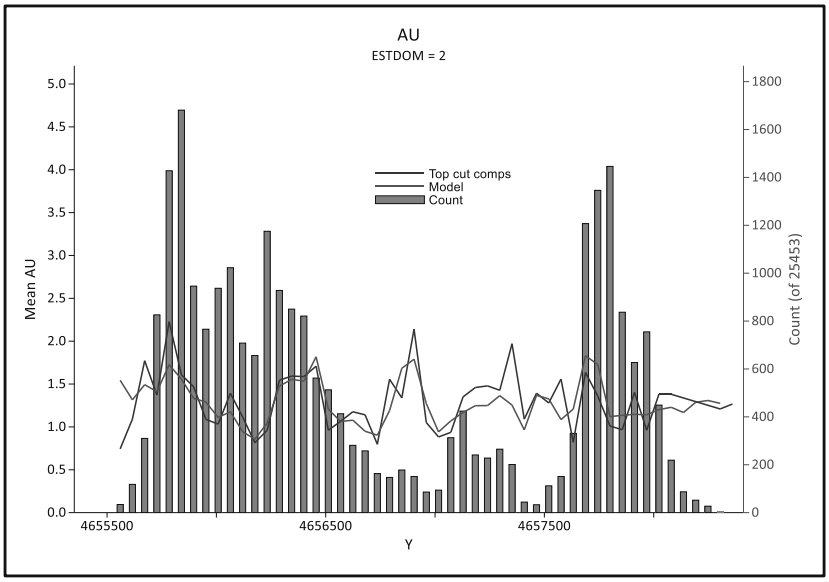


Figure 4.14 Easting Swath Plot Comparing the Informing Composite and the OK Estimated Gold Grades for Tulkubash ESTDOM 2

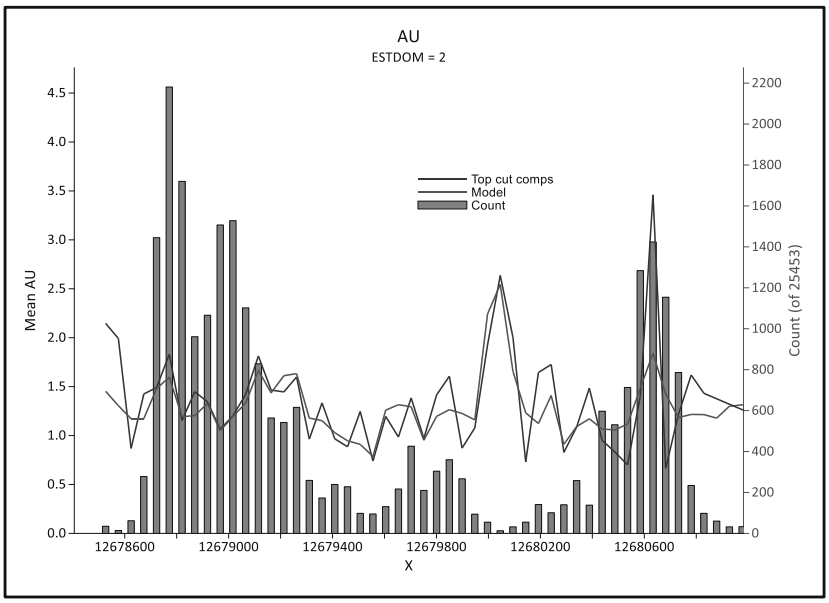


Figure 4.15 Elevation Swath Plot Comparing the Informing Composites and the OK Estimated Gold Grades for Tulkubash ESTDOM 2

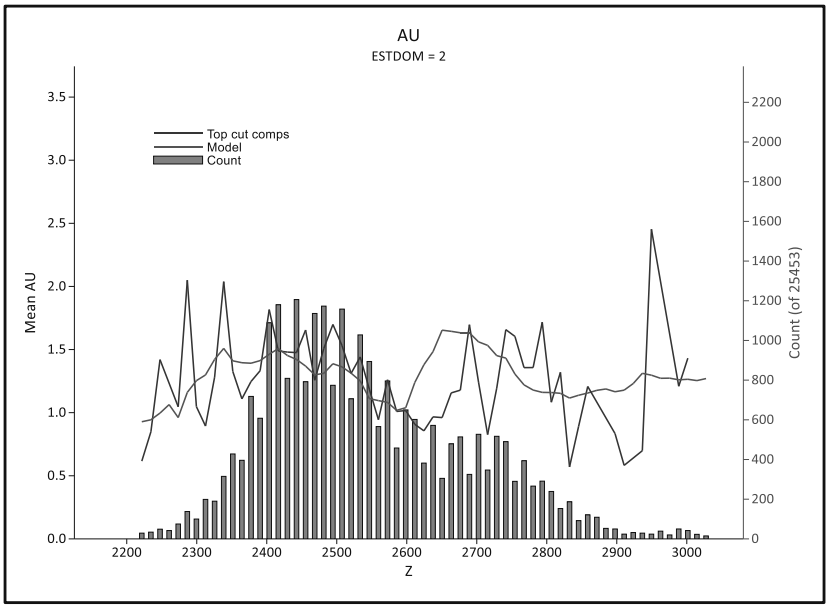


Figure 4.16 Easting Swath Plot Comparing the Informing Composite and the OK Estimated Gold Grades for Tulkubash ESTDOM 1

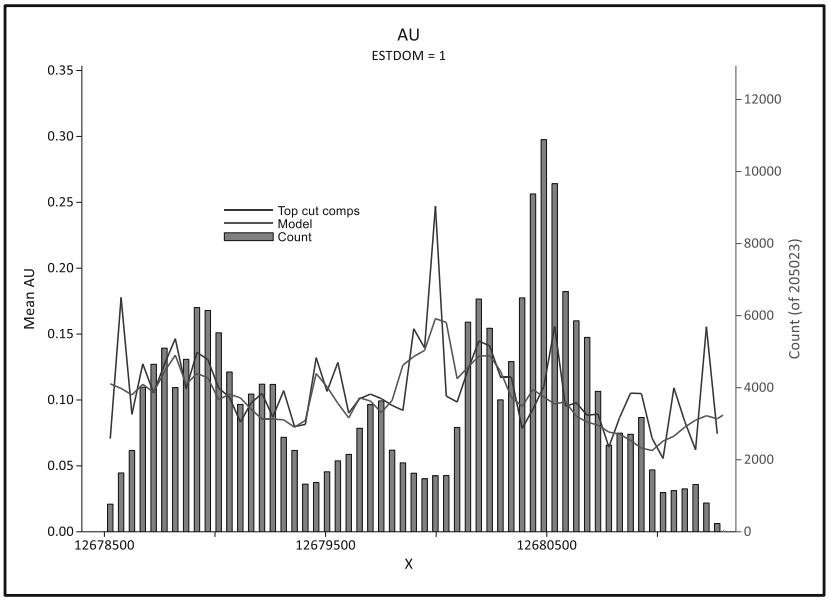


Figure 4.17 **Northing Swath Plot Comparing the Informing Composite and the OK Estimated Gold Grades for Tulkubash ESTDOM 1**

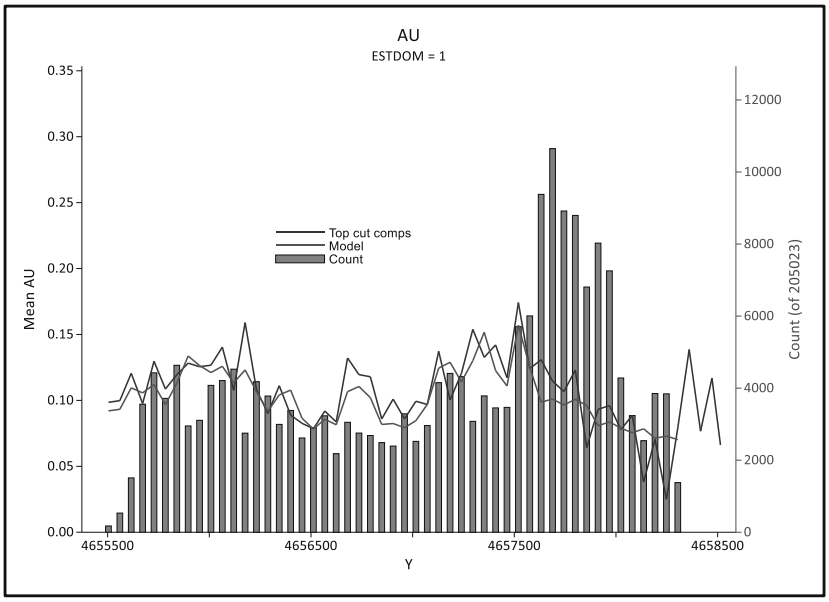
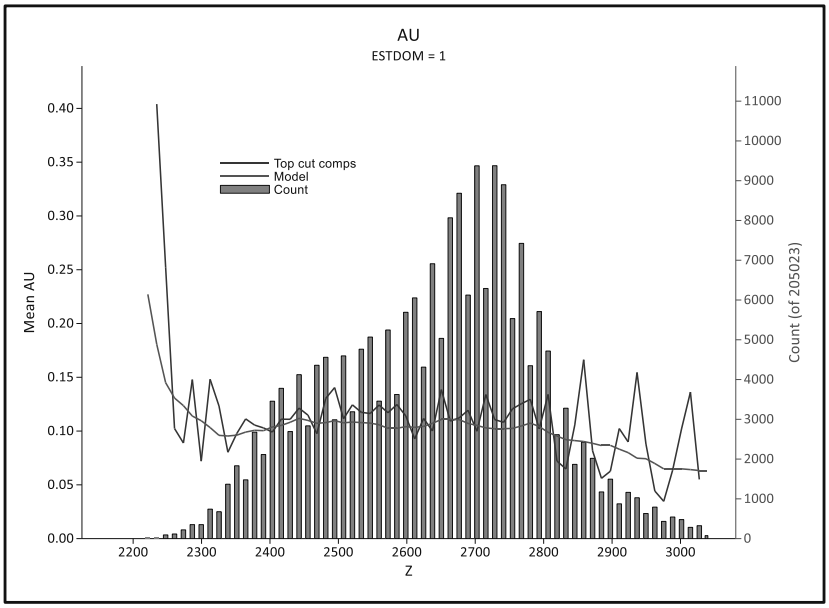


Figure 4.18 **Elevation Swath Plot Comparing the Informing Composite and the OK Estimated Gold Grades for Tulkubash ESTDOM 1**



The swath plots for Tulkubash present good conformance between informing composites and estimated block grades. Several iterations of the interpolation were run to achieve optimal conformance for the amount of data available.

CONCLUSION

The various comparators described in the foregoing subsections serve to illustrate that the block model estimates are robust and satisfactorily models the distribution and variability of the informing sample grades without undue bias or smoothing. The models are suitable for the current level of development.

4.1.10 MINERAL RESOURCE CLASSIFICATION

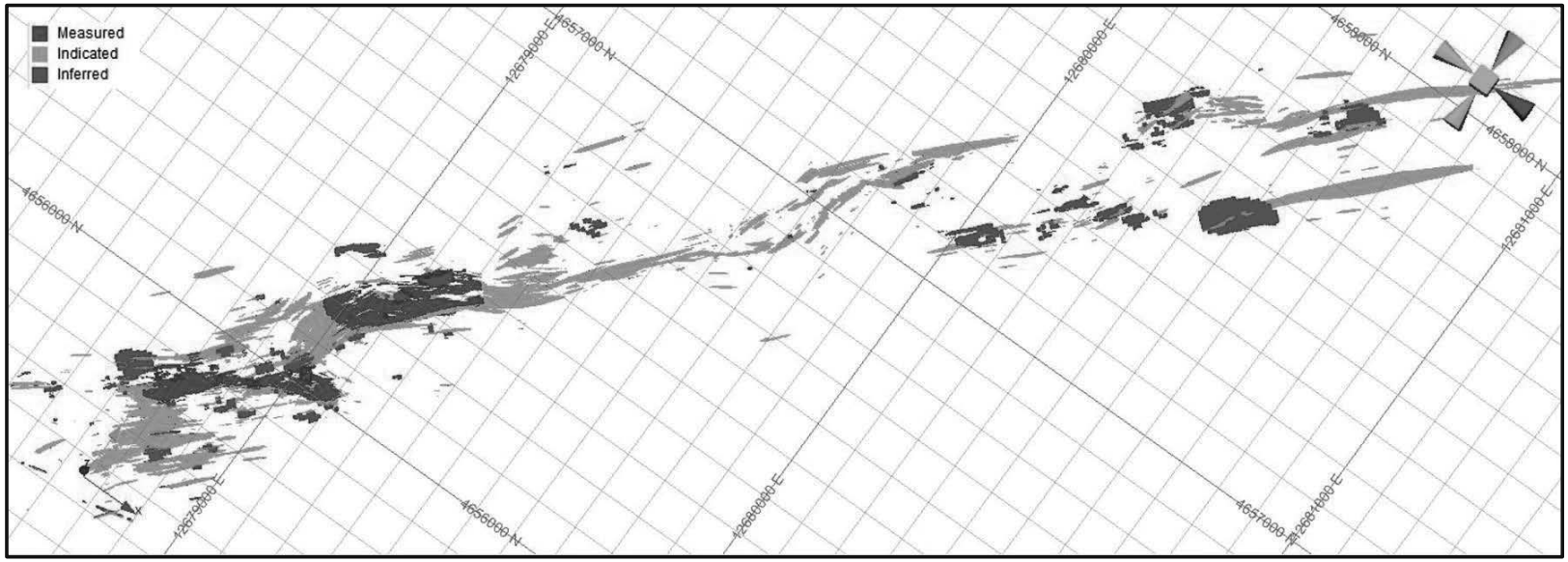
The Mineral Resource model was classified according to JORC Code (2012) guidelines.

The Mineral Resource classification for the Tulkubash zone considers the following criteria:

- confidence in the sampling data and geological interpretation
- analysis of variogram parameters
- data distribution (based upon graphical analysis and average distance to informing composites)
- analysis of the quantitative measures of kriging performance.

Whilst considering the confidence in the sampling and geological interpretations, along with the knowledge of the variogram parameters, wireframe models were generated to define the Indicated and Measured Mineral Resources. The models reflect the trends in the quantitative measures of kriging performance, whilst ensuring that the classification resulted in appropriately coherent units. Figure 4.19 presents a view of the block model illustrating Mineral Resource classification.

Figure 4.19 Oblique view of the Tulkubash Zone Block Model Classification



4.1.11 MINERAL RESOURCE TABULATION

CUT-OFF GRADES

In order to demonstrate that the deposits have reasonable prospects for economic extraction a cut-off grade of 0.3 g/t gold was applied for Mineral Resources at Tulkubash.

The parameters considered for cut-off grade derivation are based in part on the 2018 Internal Feasibility Study (Tetra Tech 2018), using the following assumptions:

- gold price of US$1,500/tr oz
- gold recovery of 72%
- mining cost of US$1.80/t
- processing and general and administrative (G&A) cost of US$ 7.33/t
- discount rate of 5%.

MINERAL RESOURCE TABULATION

The updated Mineral Resource for Tulkubash is summarised in Table 4.8. The effective date of the updated Mineral Resource is 28th August 2018.

Table 4.8 Tulkubash Zone Resource Summary (effective 28th August 2018)

Classification	Mineral Resource		
	Tonnes	Grade Au (g/t)	Contained Metal Au (tr oz)
Measured	4,644,000	1.44	214,000
Indicated	28,010,000	1.33	1,199,000
Measured and Indicated	**32,654,000**	**1.35**	**1,414,000**
Inferred	4,600,000	0.62	91,000

Notes: Numbers are rounded in accordance with disclosure guidelines and may not sum accurately.
The Mineral Resource has been estimated using 10.0 m x 10.0 m x 5.0 m (x, y, z) blocks, with minimum sub-block dimensions of 2.0 m x 2.0 m x 1.0 m (x, y, z).
The estimate was constrained to the mineralised zone using wireframe solid models.
The wireframes were sub-domained to isolate the strongly mineralised main zone from the gold mineralisation in the main structural corridor.
Grade estimates were based on 3.0 m composited assay data.
The interpolation of the metal grades was undertaken using OK.
A cut-off grade of 0.30 g/t gold was applied to report the Mineral Resources.

GRADE TONNAGE SENSITIVITY

The Tulkubash block model has been reported at a range of cut-offs to provide an indication of the grade-tonnage sensitivity. Table 4.9 shows the sensitivity for the combined Measured and Indicated Inferred Mineral Resources.

Table 4.9 Tulkubash Grade-Tonnage Sensitivity

Cut-off Au Grade (g/t)	Tonnage (kt)	Au Grade (g/t)	Contained Metal Au (tr oz)
0.25	32,657	1.35	1,414,000
0.30	**32,656**	**1.35**	**1,414,000**
0.35	32,655	1.35	1,414,000
0.40	32,652	1.35	1,414,000
0.45	32,626	1.35	1,413,000
0.50	32,571	1.35	1,413,000
0.55	32,336	1.36	1,409,000
0.60	32,104	1.36	1,404,000

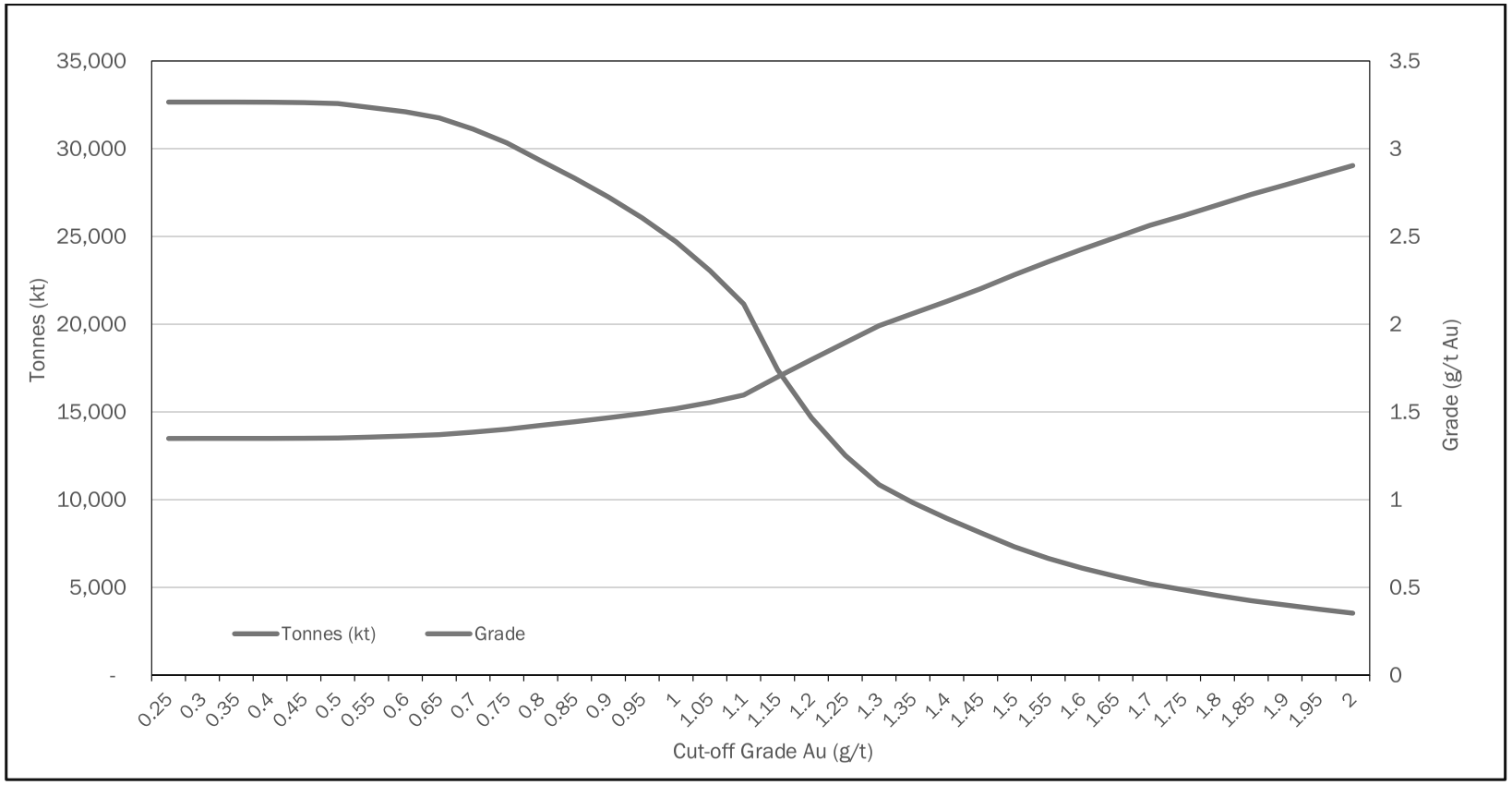
Note: Numbers are rounded in accordance with disclosure guidelines and may not sum accurately.

GRADE-TONNAGE CURVES

Figure 4.20 depicts the grade-tonnage curve for the Tulkubash zone's Measured and Indicated Mineral Resources.

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

Figure 4.20 Grade-Tonnage Curve for Indicated and Inferred Resources for the Tulkubash Zone



4.1.12 PREVIOUS MINERAL RESOURCE ESTIMATES

This report presents an interim Mineral Resource for the Tulkubash zone, with an effective date of 28th August 2018. The previous Mineral Resource was estimated by Geosystems International, Inc (GSI), with an effective date of 31st January 2018. The previous Mineral Resource was estimated with a 0.30 g/t gold cut-off and is summarised in Table 4.10.

Table 4.10 GSI Tulkubash Resource Summary (31st January 2018)

Classification	Tonnes (kt)	Au (g/t)	Au Metal ('000 tr oz)	Ag (g/t)	Ag Metal ('000 tr oz)
Measured	22,915	0.88	647	1.20	884
Indicated	12,329	0.82	324	1.11	440
Total Measured and Indicated	**35,244**	**0.86**	**971**	**1.17**	**1,324**
Inferred	3,782	0.68	83	1.16	141

4.2 ORE RESERVE ESTIMATES

4.2.1 TULKUBASH ORE RESERVE

To derive an Ore Reserve, it is necessary to design an open pit using an optimised pit shell as a guide. The optimised pit shell is generated using software with block model, costs, prices, and technical data derived from quotes and studies used as inputs. The block model is developed by a geologist.

OPTIMISATION

Independent Mining Consultants Inc. (IMC) conducted an optimisation using a block model developed in January 2018 by GSI. Information from the 2018 Internal Feasibility Study (Tetra Tech 2018) does not specify which software was used for the optimisation.

Table 4.11 shows the inputs used in the optimisation.

Table 4.11 Optimisation Inputs

Parameter	Unit	Value
Base Case Metal Prices		
Gold	US$/tr oz	1,250
Silver	US$/tr oz	15
Operating Costs		
Mining Based on Contractor Mining Budget Quotes		
Ore Mining Costs	US$/t	2.59
Waste Mining Cost	US$/t	1.75
Processing and G&A		
Processing Cost	US$/t ore	5.14
G&A Cost	US$/t ore	2.19
Processing and G&A Total	US$/t ore	7.33

Parameter	Unit	Value
Processing Recoveries		
Gold Recovery (Fixed)	%	70.0
Silver Recovery (Fixed)	%	48.0
Royalties		
Royalty	%	0
Cut-off Grades		
Internal	g/t Au	0.26
Breakeven	g/t Au	0.35
Slope Parameters*		
Inter-ramp Slope Angles (by Area)		
South	degrees	51
West (South)	degrees	51
West (Centre)	degrees	51
West (North)	degrees	51
North	degrees	58
Southeast	degrees	58
East (South)	degrees	58
Overall Slope Angle* for Design Software (by Area)		
South	degrees	49
West (South)	degrees	47
West (Centre)	degrees	46
West (North)	degrees	48
North	degrees	52
Southeast	degrees	49
East (South)	degrees	45

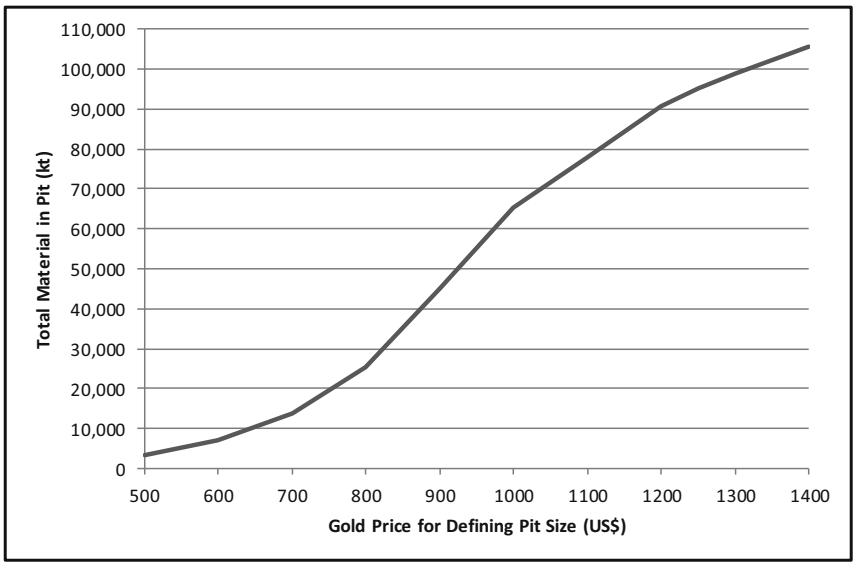
Source: Tetra Tech (2018)

The mining costs in Table 4.11 were quoted by mining contractor Ciftay Insaat Tashhut TIC AS (Ciftay) in US dollars per cubic metre and were converted to US dollars per tonne using the density. A check calculation using the Ciftay quote from 16th April 2018 and an average specific gravity of 2.66, as described in Tetra Tech (2018), indicates a waste cost of US$1.74/t and an ore cost of US$2.50/t. Both costs are within an acceptable tolerance of the inputs from Table 4.11 given that optimisation is not normally overly sensitive to the mining cost.

Dilution and mining recovery factors are not shown in Table 4.11. Tetra Tech (2018) describes a dilution factor of 5% applied to each block of the re-blocked model, and no further dilution applied again in the optimisation inputs. Tetra Tech considers 5% a generic figure and a dilution exercise should be completed. Typically, a dilution exercise would reveal an overall dilution of 7 to 10% but depends on the orebody.

The results shown in Tetra Tech (2018) describe the pit value and total material mined for each pit, where the pit is defined by the gold price. The optimum pit for the base case of US$1,250/tr oz indicates total material of approximately 95 Mt, as shown in Figure 4.21.

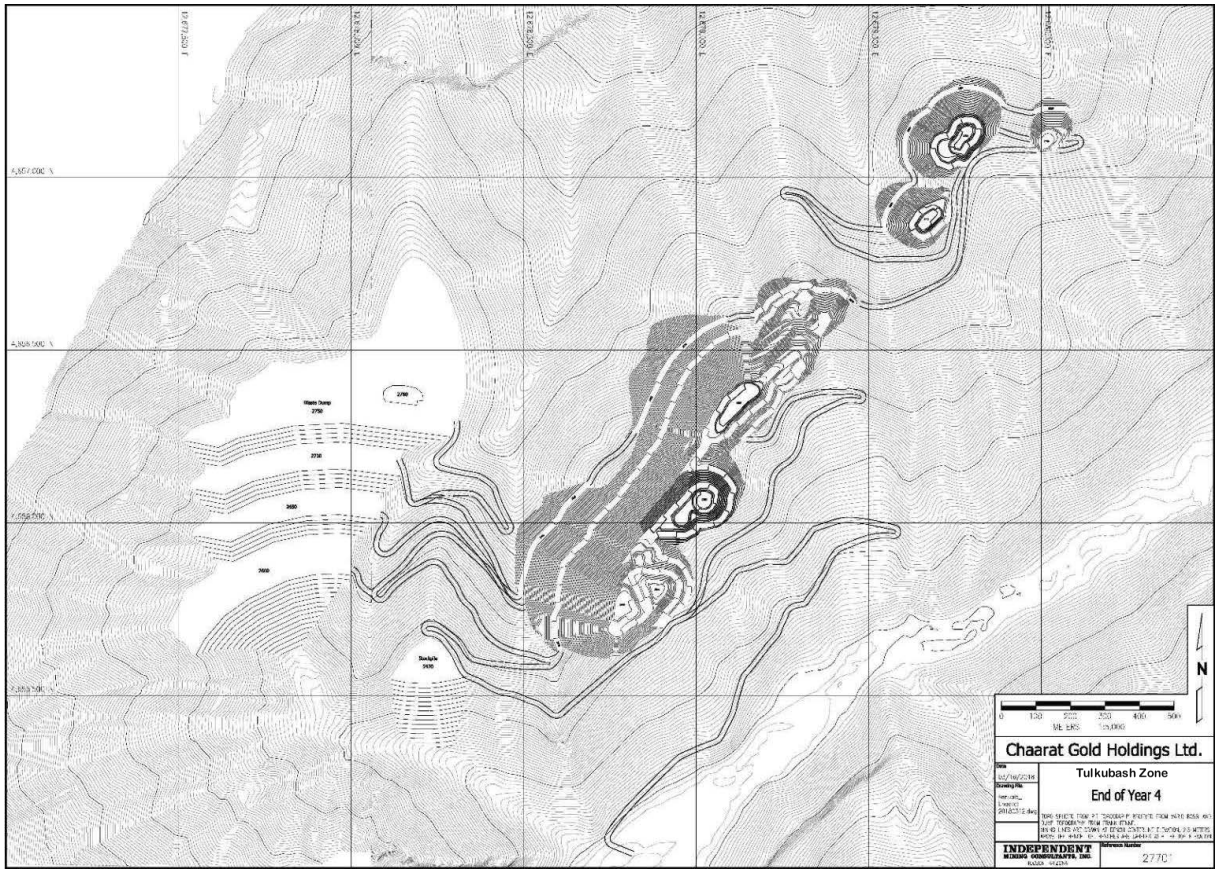
Figure 4.21 Optimisation Results



PIT DESIGN

IMC completed a pit design using the optimum pit shell, designed slopes, haul ramps, and avalanche safety benches. The total material to be mined from this pit is 83.305 Mt as defined in the Ore Reserves. The total designed pit material is consequently 88% of the pit shell total material, although this may not convert to the Ore Reserve. The pit design is shown in Figure 4.22.

Figure 4.22 Final Pit Design



Source: Tetra Tech (2018)

MINERAL RESERVE

The Ore Reserve completed by IMC (Table 4.12) was based on the pit design described in Section 4.2.2.

Table 4.12 Ore Reserve at 1st April 2018

Material Classification	Ore to Crusher					
	Cut-off Grade (g/t)	Ore (kt)	Gold (g/t)	Silver (g/t)	Gold Content (tr oz)	Silver Content (tr oz)
Proven	0.40-0.37	12,503	0.95	1.17	381,881	470,317
Probable	0.40-0.37	3,490	0.79	1.00	88,642	112,206
Proven + Probable	0.40-0.37	15,993	0.91	1.13	467,909	581,030

Notes: John M. Marek, RM-SME of IMC is the Competent Person.
Tonnages are in metric tonnes, grades are in grams per metric tonne = parts per million
Ore Reserves are reported with appropriate modifying factors of dilution and recovery.
A gold price of US$1,250/tr oz and a silver price of US$15.00/tr oz were applied.
Numbers may not match exactly due to rounding.

The updated Tulkubash Mineral Resource estimate (effective 28th of August 2018) may increase the Ore Reserve tonnage. As a result, the LOM will increase if the current production rates are maintained and may be further extended if a reduced production rate proves beneficial.

WASTE QUANTITIES

The total waste quantity relating to this Ore Reserve is 67,312 kt, which includes 2,151 kt of low grade material (i.e., material below the cut-off grade) and 51 kt of potentially acid generating (PAG) material.

4.2.2 UNDERGROUND ORE RESERVES

The 2015 Feasibility Study (Nerin 2015) estimates an Ore Reserve of 28,914 kt at a grade of 3.54 g/t gold and 13.26 g/t silver based on a cut-off grade of 1.8 g/t gold. These Ore Reserves were converted to a production schedule using mining recovery and dilution.

PRODUCTION SCHEDULE

The 2015 Feasibility Study shows an underground mining production schedule of 1,360 kt/a from Years 3 to 11, 2,720 kt/a from Years 12 to 16, and 1,363 kt/a in the final Year 17. The total ore mined will be 27,203 kt at a grade of 3.18 g/t gold and 11.97 g/t silver. Mining recoveries of 15 to 20% and dilutions of 10 to 12% were estimated.

Years 1 and 2 have been allocated for initial development of the mine in order to gain access to the orebody.

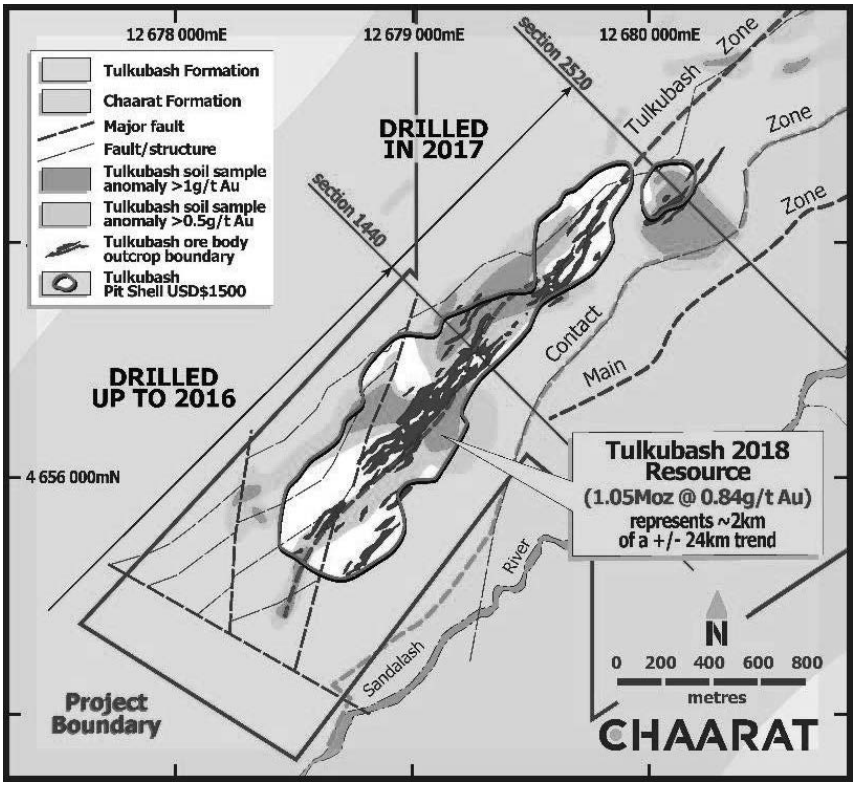
5.0 METALLURGICAL TESTING AND MINERAL PROCESSING

Gold mineralization within the Chaarat Gold Project is divided into two styles: the Tulkubash mineralization (the Tulkubash zone), which is oxidized material, and the Kyzyltash mineralization (the Main and Contact zones), which is sulfide-rich, unoxidized refractory material.

5.1 TULKUBASH MINERALISATION

The Chaarat Gold Project oxide ore comprises a single metallurgical domain referred to as the Tulkubash zone (Figure 5.1).

Figure 5.1 Tulkubash Zone Location



5.1.1 TULKUBASH METALLURGICAL TEST WORK

Since 2011, several metallurgical test work programs have been undertaken on samples of the Tulkubash mineralogical materials. Test work has been conducted by the following organisations:

- SGS South Africa Pty. Ltd. (SGS-SA) (2011)
- MINTEK Johannesburg, SA (MINTEK) (2011/2012)
- Wardell Armstrong International (WAI), UK (2012)
- Beijing General Research Institute of Mining and Metallurgy, China (BGRIMM) (2013)
- Hazen Research Inc. (Hazen), USA (2013)
- Resource Development Inc. (RDI), USA (2014).

A review of the test work reports shows that different samples have been collected at different times with different test work objectives in mind. Although there has been a certain lack of structure in terms of metallurgical test work and development, the historical test work provides a broad view as to the metallurgical characteristics of the ore and its response to different types of treatment.

More recently, two large-scale metallurgical test work programs were implemented in support of the 2018 Internal Feasibility Study (Tetra Tech 2018) and further project development, completed by:

- WAI, UK (2017)
- MaClelland Laboratories Inc, (MCL), Reno, NV, USA (2018).

For the purposes of these tests oxide ore was defined as having a total sulphur content (S_{TOTAL}) of 0.5% or less ($S_{TOTAL} \leq 0.5\%$) and the samples were selected from multiple bore core intervals from within the 2018 Internal Feasibility Study pit shell.

The WAI and MCL metallurgical studies indicate that the oxide ore is amenable to conventional cyanide heap leaching and can be efficiently processed using a heap-leach-based flowsheet.

Based on the recent WAI and MCL metallurgical test work results, the life-of-mine (LOM) recovery for gold and silver was estimated to be 72.9% and 62.6%, respectively.

It was concluded that the heap leach test work was conducted in sufficient detail and to a level appropriate to support a feasibility study based on a heap-leach process option. There were no “red flag” issues in relation to heap leaching that may raise concern.

Although the 2018 Internal Feasibility Study test work investigated heap leach processing in detail, other potential treatment options such as carbon-in-leach (CIL) and carbon-in-pulp (CIP) were not evaluated. The decision to adopt a heap leaching process was made on the basis of local geography and site constraints as opposed to a detailed process economic trade-off study. This decision is understandable bearing

in mind the location and that the incremental benefits of any process alternatives are likely to be limited owing to grade and throughput considerations.

Crushing variability test work was also not undertaken. The heap leach process design was based on the laboratory columns performance and stacking without agglomeration. However, agglomeration may be required during operations if ore crushability is shown to be a significant variable.

Of further note was that the historical test work indicated mild preg-robbing characteristics in relation to some samples of oxide ore; however, this was not evaluated during the 2018 Internal Feasibility Study test work programs. The possibility of preg-robbing behaviour being exhibited during future heap leach operations cannot be ruled out unless eliminated by further test work.

5.1.2 Recovery Model

The test work results have been incorporated in to the geological block model. The results were back flagged to the drillholes and four domains were created. The four oxide zones, based on logged intensity of oxidation, were then estimated based on those samples which related to any given oxide zone. As the oxidation state is logged, it can be considered a qualitative assessment. The metallurgical recovery percentage value is present in the block model as a parameter that could be used during the Ore Reserve process so that each oxidation state will recover according to the test work results for that material. The average recovery for the model, and its sub-domains, reflect the results of the test work programme.

It is believed that this will be a beneficial step to the Ore Reserve process as each block has its own recovery estimate. In practical terms, this could allow for high-grade but low-grade recovery blocks to be added to the heap for their metal contribution, or for lower grade but very recoverable material to also be added, allowing for greater flexibility in the selection than considering block grades in isolation, or applying a global average recovery that might not accurately reflect the oxidation state and potential recovery.

5.1.3 Tulkubash Process Design

A standard heap leach design will be used to process the oxide ore.

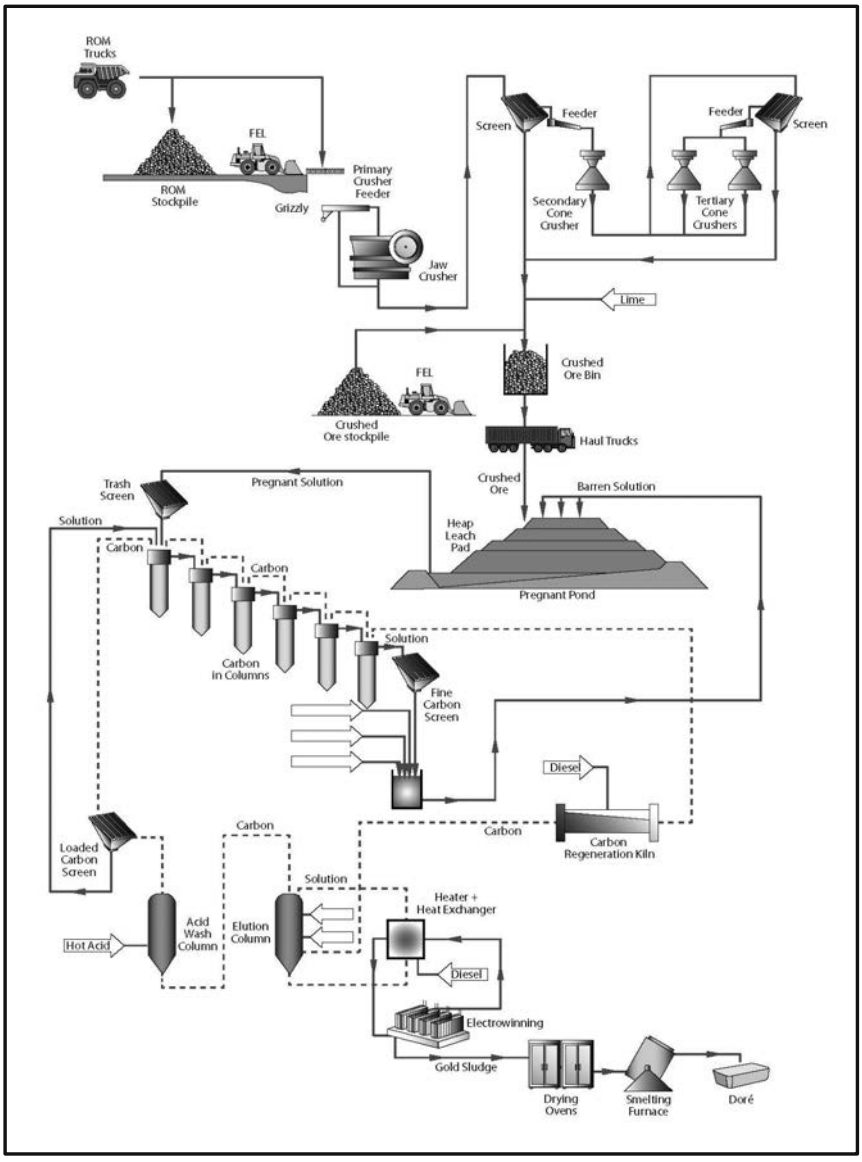
A conventional three-stage crushing circuit will crush the run-of-mine (ROM) ore to a characteristic size of P_{100} = 12.5 mm. Trucks will haul the crushed ore to the heap leach pad, where it will be stacked in a permanent multi-lift heap leach pad with a 7 m per lift stack height.

Diluted cyanide solution will irrigate the lifts at a rate of 10 L/m^2/h to dissolve the gold and silver from the ore into the solution. Once the solution reaches the base of the heap, it will flow to the pregnant solution pond. From there it will be pumped to the adsorption-desorption-recovery (ADR) plant for gold and silver recovery. The precious metals from the pregnant solution will adsorb into granular activated carbon in the carbon columns of the ADR plant. The barren solution leaving the carbon columns will recirculate back to the heap leach pad once it has been dosed with the cyanide.

The loaded carbon will be pressure stripped with a hot caustic solution to re-dissolve the precious metals into a pregnant solution, which will then be treated using conventional electrowinning to produce a gold sludge suitable for direct smelting on site into gold doré. Gold doré bars can be easily transported off site to a suitable refinery.

A conceptual block flow diagram of the processing operation is shown in Figure 5.2.

Figure 5.2 Conceptual Process Block Flow Diagram



The proposed process design is appropriate for the Tulkubash oxide ore and has been utilized in the mining industry since the 1970s. A potential bottleneck in the

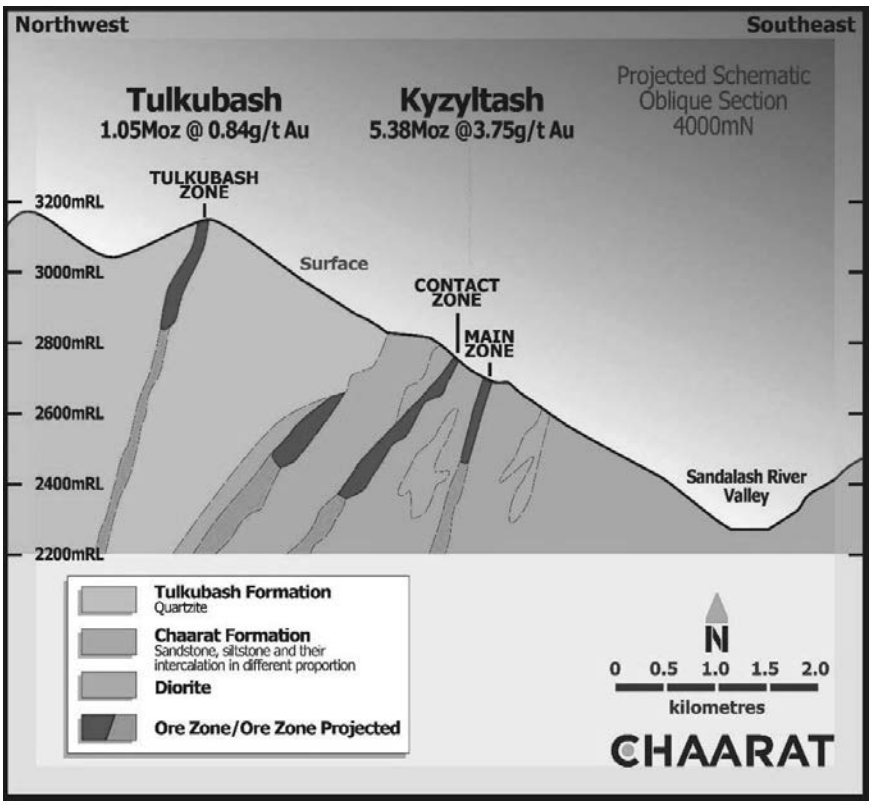
design is the screen used in the crushing circuit; however, this could be easily overcome by installing additional screening capacity if required.

The deleterious elements in the ore are mercury and arsenic. Most of the deleterious elements will be left in the heap leach tails and will not require any additional treatment. However, the very small amounts of mercury and arsenic that are carried forward in the process as minor contaminants are eventually captured together with the smelt house bag-house dust and are disposed of by a specialist contractor.

5.2 KYZYLTASH MINERALISATION

Gold mineralization within Kyzyltash occurs within two zones: the Main Zone and the Contact Zone. A total Mineral Resource of 5.4 Moz of gold has been identified within the Kyzyltash mineralization. The Tulkubash oxide material represents an additional Mineral Resource of 1 Moz.

Figure 5.3 Section Showing Relationship between Tulkubash and Kyzyltash Zones



5.2.1 KYZYLTASH METALLURGICAL TEST WORK

Limited metallurgical test work has been conducted on the samples from the Contact Zone at two different laboratories:

- MINTEK, SA (2010)
- RDI, USA (2014)

The reported test work was based on material from the Contact Zone. This material comprised 54% quartz, 20% mica, 10% pyrite, 10% dolomite, 5% arsenopyrite, and 1% stibnite. Sulphide particles typically ranged from 1 to 300 µm. Free gold was described as very fine, with some native silver and argentite observed. It is not clear from the available data why the Contact Zone was selected for testing as opposed to the Main Zone. It is understood that both Main and Contact zones represent different lithologies. It is anticipated that the Main Zone is the dominant lithology. Selection of the Contact Zone material for metallurgical testing may have been related to sample availability.

Pre-concentration by flotation produced poor precious metals recovery but sulphide recovery was not reported; thus, the reasons for poor recovery are not clear. Quantitative mineralogy on flotation tails will explain the reasons for the poor recovery. However, it is important to note that refractory treatment economics is not one dimensional and recovery alone cannot be used as the sole criterion for process acceptance or rejection. There are many other factors associated with pre-oxidative treatment that must be assessed, such as oxidation duty, power requirements, acid generation, and neutralisation requirements.

Test work results indicated poor roaster recoveries but the reasons for poor roaster recoveries are not adequately explained. Also, it is not clear whether the head assays on which gold extractions were based were concentrate assays or roaster calcine assays. Poor recoveries may be due to losses owing to sublimation of arsenic and antimony, partial sintering of calcine, or activation of preg-robbers present in the ore or concentrate.

In summary, all existing test work was based on Contact Zone samples, but most of the gold is within the Main Zone. Thus, the test work completed to date may only be taken as an initial indication of how the sulphide orebody responds to treatment. Further comprehensive test work is required.

5.2.2 EXISTING KYZYLTASH STUDIES

The most recent study in relation to the Kyzyltash deposit is the 2015 Internal Feasibility Study conducted by Chinese Nerin Engineering Co., Ltd (Nerin 2015). The 2015 Internal Feasibility Study was conducted according to Chinese standards and is not directly comparable to Western study standards such as the Australasian JORC Code or National Instrument 43-101 (NI 43-101) and is not compliant with these standards. The 2015 Internal Feasibility Study envisaged a mixture of underground and open pit mining. Key points of the study include:

- total ore reserve of 58.1 Mt at 2.79 g/t gold, for 4.7 Moz of gold
- sulphide ore totalling 46.9 Mt at 2.8 g/t gold was processed via a BIOX plant with 77% average recovery
- a mining and processing rate of 8,000 t/d from open pit sources and 4,000 t/d from underground sources
- initial up-front capital cost of US$470 million

- average annual steady state production of 211,000 oz at an all-in sustaining cost of US$605/oz.

The 2015 Internal Feasibility Study represents the most recent and complete estimate of likely project development costs and returns.

The study was based on a high-tonnage BIOX concentrate treatment scenario and does not include an evaluation of alternative treatment scenarios. The study also does not include an analysis of throughput rates, grade profiles available from the Kyzyltash orebody, or optimised production and development plans.

It is important to note that the Kyzyltash mineral resource grade is higher than the ore reserve grade reported in the 2015 Internal Feasibility Study; this means a higher-grade development scenario should be considered as part of the project development plan.

Alternative processing routes should be evaluated, especially if concentrate production proves problematic. A smaller throughput, higher grade process plant, similar to the sulphide project at the Çöpler Gold Project in Turkey, could be considered.

6.0 MINING

6.1 TULKUBASH DEPOSIT

6.1.1 DRILLING AND BLASTING

The 2018 Tulkubash Gold Project Feasibility Study (Tetra Tech 2018) describes drilling and blasting the Tulkubash zone in 10 m lifts and excavating in 5 m benches, which is an appropriate approach. Mining contractor Ciftay quoted Atlas Copco D65 and T35 model drill rigs for production and pre-split drilling, respectively, which are adequate for their purposes.

Blast design was not considered in any detail in the 2018 Feasibility Study (Tetra Tech 2018) as this was included in the Ciftay quotation and will be subject to trials once operations commence. It is assumed that Ciftay have or will be able to obtain the necessary blasting permits from the local authorities. In some jurisdictions it is a requirement that local police are on hand while charging and blasting are done, and this may be a requirement in the Kyrgyz Republic.

6.1.2 LOADING

The Ciftay quote shows Caterpillar (CAT) 374 excavators, CAT 980 front-end loaders, and other utility excavators for loading. The 2018 Feasibility Study indicates that the CAT 374 excavators will have a bucket capacity of 4.5 m^3, which is the primary excavator. This is an appropriate machine for this type of multi-pit operation located in mountainous terrain and for the production requirements envisaged. Whilst many mining operations use larger mining excavators, contractors often prefer equipment that offers flexibility of application, so it may be used for civil engineering as well as other earthwork projects. Maintenance knowledge and availability of spare parts are also a major consideration for operations in former Soviet Union countries. Given that the Tulkubash Project will only be in full production for five years, it is unlikely that larger excavators would be cost effective if there will be no further application for them.

6.1.3 HAULING

The Ciftay quote shows Mercedes 3342 trucks to be used for hauling; however, the 2018 Feasibility Study discussed the use of Mercedes 3340 trucks and indicates that these have a capacity of 30 t. In practice this is likely to be 25 t. Whilst many mining operations use considerably larger rigid dump trucks, these also require larger excavators. The 2018 Feasibility Study outlines the use of articulated dump trucks, although the Ciftay quote does not. It is likely that articulated dump trucks will be required, particularly during the winter months. As with the excavators discussed in Section 6.1.2, equipment flexibility and cost effectiveness also apply to trucks.

6.1.4 EQUIPMENT

A full range of equipment is specified in the 2018 Internal Feasibility Study and the Ciftay quote that includes utility excavators, front-end loaders, dozers, graders, water trucks, maintenance trucks, fuel and lube trucks, blasting truck, lights, pick-up trucks, etc., all of which are appropriate for this operation. Table 6.1 shows the equipment inventory to be used during mine operations.

Table 6.1 Equipment Inventory

Equipment	Maximum Quantity)
Mercedes 3342 Truck	54
VOLVO A40 G	4
CAT 347 Excavator	6
CAT 980 Wheel Loader	4
CAT 349 Excavator	1
CAT D8 Dozer	3
CAT D9 Dozer	1
CAT 336 Excavator with Hydraulic Breaker Attachment	2
CAT 14 M Grader	1
CAT 16 M Grader	1
CAT CS76 Compactor	2
Atlas Copco D65 Drilling Machine	3
Atlas Copco T35 Drilling Machine	1
CAT 950 Wheel Loader	1
Truck for Blasting	1
Hi-up	1
Forklift	1
Maintenance Truck	1
Water Truck	4
Fuel Truck	2
Lowbed	1
Personnel Service Bus	2
Pick-up 4x4	9
Light Tower	8

Source: Tetra Tech (2018)

A check calculation was completed to confirm the number of primary excavators and trucks required to satisfy the production schedule. The check broadly confirms the maximum numbers indicated by Ciftay and calculates the numbers required for each year (Table 6.2). The check calculation is based on excavator productivity, truck cycle times, productive hours, and machine capacities described in Sections 6.1.1 to 6.1.3. The full calculation is available in Appendix C.

Table 6.2 Annual and Average Equipment Numbers (Including Total Bucket Capacities)

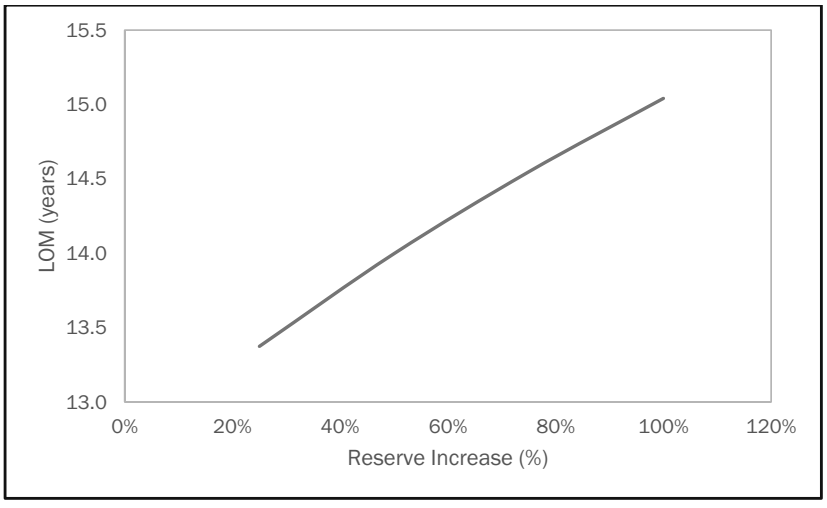
Year	No. of Excavators	No. of Trucks	Excavators (bcm)	Material (kt)	No. of Truck/ Excavators
-2	1.0	3.0	2.5	1,928	3.0
-1	4.0	18.0	15.5	11,623	4.5
1	7.0	47.0	30.5	21,485	6.7
2	7.0	51.0	33.1	23,000	7.3
3	6.0	45.0	28.8	19,646	7.5
4	2.0	14.0	8.4	5,623	7.0
Average/Sum	5.9	40.3	26.6	83,305	6.9

6.1.5 PRODUCTION SCHEDULE

Taylor's rule is often used as a starting point for estimating the LOM. For an Ore Reserve of 15,993 kt, Taylor predicts an LOM of 12.6 years, giving an annual production rate of 1.27 Mt/a. The production rate in the 2018 Internal Feasibility Study averages 3.20 Mt/a, which uses a multiplier of 2.5 that when applied to the LOM predicted by Taylor results in a LOM of 5 years, which is in line with the 2018 Feasibility Study.

The updated Mineral Resource estimate (Section 4.0) would result in an increased LOM, depending on the increase in the Ore Reserve. If the Ore Reserve were to increase 25%, then Taylor's rule predicts a LOM of 13.4 years at a production rate of 1.5 Mt/a. Figure 6.1 shows a graph of Ore Reserve increase vs. LOM. The multiplier can be used to adjust the LOM and production rate.

Figure 6.1 Ore Reserve Increase vs. LOM as Predicted by Taylor



The production schedule shows ore, waste and total material mined. Waste is split into two components: non-acid generating (NAG) and potentially acid generating

(PAG) and ore is split into low-grade mineralisation (below cut-off grade) and above cut-off grade. For the purposes of compliant reporting, the low-grade ore must be classified as waste. Consequently, the total waste is 67,312 kt, which when added to the ore gives a total material mined of 83,305 kt at an overall strip ratio of 4.2. Whilst the strip ratio may appear high, it must be noted that this mine is located in mountainous terrain, which means there is more waste to be excavated on the topside of the orebody in order to maintain safe slopes and to account for the avalanche benches.

Table 6.3 Tulkubash Project Production Schedule

Description	Pre-strip (kt)		Production (kt)				Total LOM (kt)
	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	
NAG Waste	1,928	11,058	17,246	16,750	14,342	3,786	65,110
PAG Waste		3	2	5	9	32	51
NAG + PAG Waste	1,928	11,061	17,248	16,755	14,351	3,818	65,161
Low Grade Mineralisation		11	335	1,318	367	120	2,151
Total Waste	1,928	11,072	17,583	18,073	14,718	3,938	67,312
Ore		554	3,899	4,927	4,928	1,685	15,993
Total Material Mined	1,928	11,626	21,482	23,000	19,646	5,623	83,305
Strip Ratio		20.0	4.5	3.7	3.0	2.3	4.2

Source: Tetra Tech (2018)

The 2018 Internal Feasibility Study indicates that there are five phases to the production schedule defined by major pushbacks. Several pits are formed in the early stages of operations, which expand to form two larger pits. A vertical development of 120 m/a is envisaged, which equates to twelve, 10 m benches or one bench per month. This may be optimistic given the terrain but is achievable with good operation practice.

Due to the Mineral Resource estimate update (Section 4.0), the production schedule will change in line with the arguments noted in this section. The tonnages and gold grades will increase, and the distribution of gold grade may improve, with high grades closer to surface that may be mined earlier. This should have a beneficial effect on the economics of the Chaarat Gold Project.

6.1.6 WASTE ROCK DUMP

The waste rock dump (WRD) will be located immediately adjacent to the open pit, keeping waste haul distances to a minimum. PAG waste material will be blended into the NAG waste material, as it has a relatively low sulphur content and constitutes a very small fraction of the overall waste.

Due to the Mineral Resource estimate update (Section 4.0), the Ore Reserve tonnage estimate is likely to increase as discussed above. On the assumption that the pit size will increase, the waste rock will also increase. A review of the waste rock dump design may be required.

6.1.7 LOW-GRADE STOCKPILE

Low-grade mineralisation will be located adjacent to the waste rock dump, also minimising haul distances. If there is sufficient value to process the low-grade mineralisation at the end of the LOM, then it will be readily distinguishable from the waste rock dump.

Due to the Mineral Resource estimate update (Section 4.0), it is likely that the amount of low-grade ore will change. At this stage it is not known if this will increase or decrease. Further work will be required to assess this. A review of the low-grade stockpile design may be required.

6.1.8 MAIN DRAINAGE

Water will be collected in sumps and pumped into drains that will discharge into settling lagoons. From there water will be returned to the local water course or re-used.

6.1.9 MANPOWER

Table 6.4 shows the manpower required to operate all machines and to provide mine management, supervision, drilling and blasting, and general labour.

Table 6.4 Manpower Requirements

Role	No. Required
Management	29
Supervision	49
Machine Operators	321
Drilling and Blasting	36
Workshop	66
General Labour	20
Total	**521**

Source: Tetra Tech (2018)

The manpower will be split between Turkish and Kyrgyz labour; Turkish labour will represent 20%. While the manpower numbers may not change, the Mineral Resource estimate update (Section 4.0) is likely to increase the longevity of employment.

6.2 KYZYLTASH DEPOSIT

The 2015 Internal Feasibility Study (Nerin 2015) describes underground mining for the Kyzyltash deposit sulphide ore.

The buried depth of orebodies in zones 01, S1, and S2 are approximately 200 to 400 m from surface to underground. Most can be mined by open pit; however, a small part of the remaining orebody could be extracted through underground mining after the open pit is completed with a 30 m crown pillar. The main orebody of the S3 Zone occurs approximately 2,700 to 1,900 m at a depth of 800 m, little of which can

be mined by open pit. To secure economically viable production, the S3 Zone is envisaged to be mined by underground mining methods.

6.2.1 Access to Underground Workings

The 2015 Internal Feasibility Study envisages access to the underground workings by either adit above the 2,260 mRL or a vertical shaft below the 2,260 mRL.

6.2.2 Mining Method

Shrinkage stoping can be used to mine zones S1 and S2 and cut-and-fill can be used to mine zone S3.

The 2015 Internal Feasibility Study gives a detailed description of the geomechanical properties of the rock in support of the underground mining methods selected. While the geomechanical properties may support shrinkage stoping, this type of mining has been largely superseded in many parts of the world because of the labour-intensive nature of the method. It would be advisable to review this method.

Cut-and-fill mining comes in various forms and is a widely used method which can be mechanised.

The 2015 Internal Feasibility Study also discussed the use of sub-level caving. It is not clear whether this should be shrinkage stoping as it is unlikely that this orebody is amenable to sub-level caving.

6.2.3 Drilling and Blasting

Adequate detail is given in the 2015 Internal Feasibility Study on drilling and blasting.

6.2.4 Ground Support

Considerable detail is given on the geomechanics of the rock and the support requirements.

6.2.5 Ventilation

Considerable detail on ventilation is given in the 2015 Internal Feasibility Study using the shafts and tunnels.

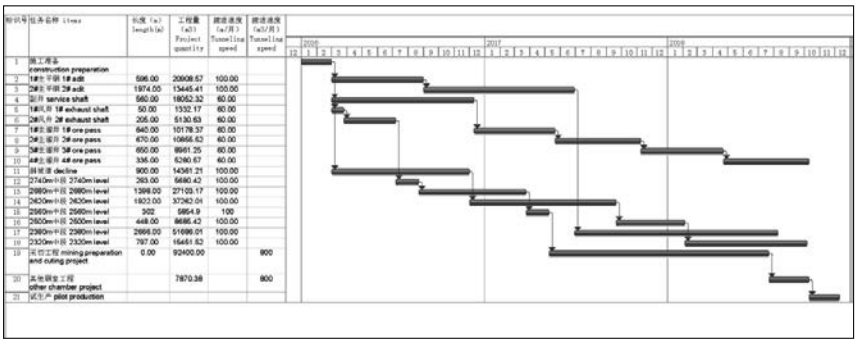
6.2.6 Water Control

Detail is given on the water drainage arrangements for the mine.

6.2.7 Construction Schedule

Figure 6.2 below gives an indication of the two-year construction schedule envisaged for the underground operations.

Figure 6.2 Construction Schedule



1	施工准备 construction preparation				
2	1#主平硐 1# adit	596.00	20908.67	100.00	
3	2#主平硐 2# adit	1974.05	15445.41	100.00	
4	副井 service shaft	560.00	18052.32	60.00	
5	1#风井 1# exhaust shaft	50.00	1332.17	60.00	
6	2#风井 2# exhaust shaft	205.00	5130.63	60.00	
7	1#主溜井 1# ore pass	640.00	10178.57	60.00	
8	2#主溜井 2# ore pass	670.00	10868.62	60.00	
9	3#主溜井 3# ore pass	650.00	8661.25	60.00	
10	4#主溜井 4# ore pass	335.00	5280.67	60.00	
11	回坡道 decline	900.00	14381.21	100.00	
12	2740m中段 2740m level	260.00	6840.42	100.00	
13	2680m中段 2680m level	1398.00	27103.17	100.00	
14	2630m中段 2630m level	1802.00	37262.04	100.00	
15	2580m中段 2580m level	302	5854.9	100	
16	2530m中段 2530m level	448.00	8686.42	100.00	
17	2380m中段 2380m level	2666.00	51696.01	100.00	
18	2320m中段 2320m level	797.00	15451.82	100.00	
19	采切工程 mining preparation and cuting project	0.00	92400.00		900
20	其他硐室工程 other chamber project		7870.38		800
21	试生产 pilot production				

7.0 PROJECT INFRASTRUCTURE

The Chaarat Gold Project is located at the confluence of the Sandalash and Kumbeltash valleys, in the Alatau Mountains in the western Kyrgyz Republic. The valleys have challenging topography with steeply-sloped sides running into the Sandalash River and Kumbeltash Stream below. The watercourses are protected by water exclusion zone regulations that govern the distance permanent structures can be built from the watercourse. The larger Sandalash River is protected by a 100 m water exclusion zone from the bank of each water course, and the smaller Kumbeltash Stream is protected by a 50 m water exclusion zone from each river bank.

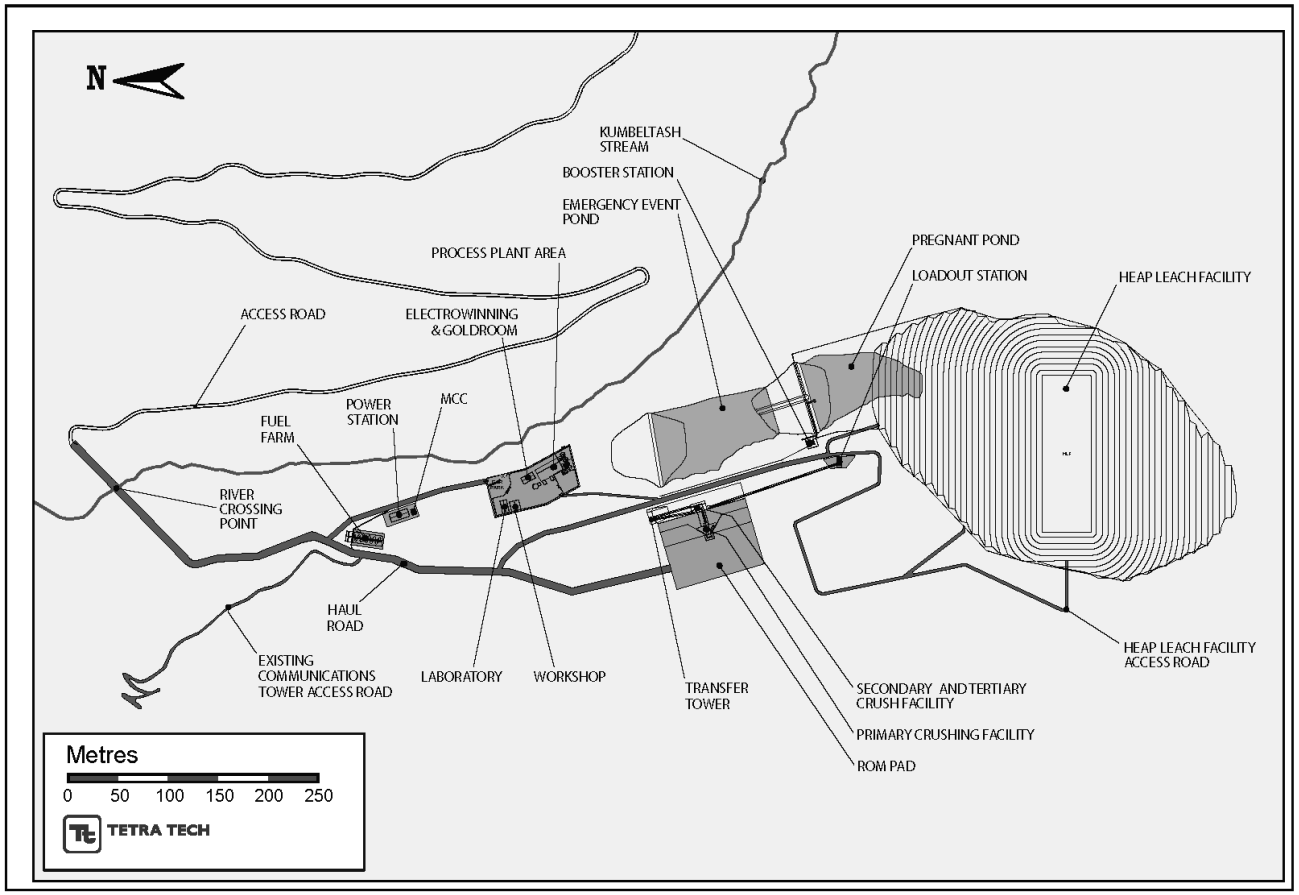
Stage 1 of the Chaarat Gold Project will extend the Tulkubash Project heap leachable oxide resource base and develop low capital intensity heap leach production. For Stage 1, the Chaarat Gold Project will require the development of the following infrastructure items:

- off-site infrastructure:
  - the Access Road, Chatkal Station and Kumbel Pass check point
- on-site infrastructure:
  - temporary contractor-supplied accommodation, batch plant, and mobile plant
  - water systems to supply, treat, and distribute plant water, fire water, and potable water
  - diesel-generator power station, diesel fuel farm, and power distribution to all facilities via two 10 kV feeder circuits
  - crushing facility, including ROM pad, primary crushing facility, secondary and tertiary crushing facility, and loadout station
  - process area, including ADR plant, electrowinning and goldroom, cyanide storage facility, reagent storage facility, laboratory, process maintenance workshop, and administration building
  - HLF, comprising a heap leach pad; liner system with overliner drainage; catchment drains and underliner drainage; and pregnant solution, emergency, and attenuation ponds and dams
  - process controls and instrumentation
  - communications infrastructure
  - additional infrastructure, including gatehouse and weighbridge; explosive storage; ammonium nitrate (AN) storage, emergency response facility; accommodation camp; and mine maintenance workshop.

The original site layout in the 2018 Internal Feasibility Study (Tetra Tech 2018) was based on topography derived from publicly available satellite imagery and, where available, site observations. The current overall site layout for the Chaarat Gold

Project shown in Figure 7.1 is based on detailed topographical maps which facilitated in repositioning several infrastructure items to improve the cut-fill balance of the site.

Figure 7.1 Chaarat Gold Project Site Layout



7.1 INFRASTRUCTURE CONSTRAINTS

The following constraints apply to the infrastructure for the Chaarat Gold Project:

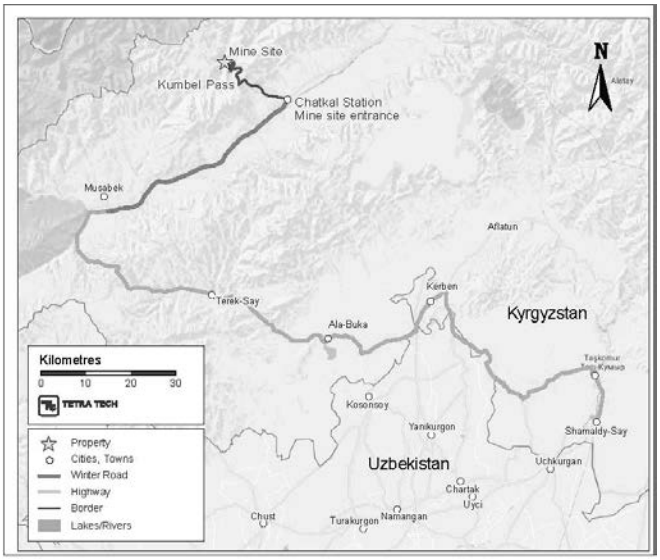
- All power will be self-generated.
- All consumables, personnel, and spares will be transported over mountainous terrain to site.
- Extreme winter conditions prevail for approximately three months of the year. Between November and April, it may be too cold to install the HLF liner.
- Site access for large and heavy loads is limited. Maximum container size will be 20 feet long.
- Personnel and small, incidental loads can be flown in by chartered helicopter.
- The Chaarat Gold Project needs to be self-reliant as there is no logistical or infrastructure support in the region.

7.2 OFF-SITE INFRASTRUCTURE

7.2.1 ACCESS ROAD

Goods and fuel will be transported from the Shamaldy-Say railway depot to Ala-Buka, over the Ala-Buka Pass and the Chapchyma Pass to the Chatkal Station, and from the Chatkal Station over the Kumbel Pass to site. The final section of the existing Kumbel Pass Access Road is in an area of high avalanche and rockfall activity, which leads to frequent road closures. A new all-weather access road is currently under construction from the Chatkal Station to the gate house via the Kumbel Pass checkpoint (Figure 7.2.

Figure 7.2 Tulkubash Project Access Road



7.3 ON-SITE INFRASTRUCTURE

7.3.1 TEMPORARY CONSTRUCTION FACILITIES

Temporary construction facilities will be supplied by the construction contractor(s) and include a temporary accommodation camp, laydown area, construction power, construction water, mobile equipment, and batch plant.

Construction water will be available from the Sandalash River.

7.3.2 WATER

WATER SOURCES

Water will be pulled from two boreholes in Sandalash Valley in close proximity to the points of major demand. These boreholes will provide potable water to the accommodation camp, supply process water to the ADR plant, and supply potable water to the crushers, ADR plant, administration and laboratory buildings, and the gate house complex. The potable water system has been designed for 180 L per person per day on site, plus the process requirements.

A detailed hydrological model has not been completed and should be completed to confirm adequate water is available for this Chaarat Gold Project.

FIRE WATER SYSTEM

Dedicated fire water system will distribute water through a fire water ring main which will run through the process area, reagent mixing area, and goldroom. Stringers for fire hoses will be installed throughout the ring main.

7.3.3 POWER

Electrical power will be generated on site using stand-alone, diesel-powered generators. The power station will be a modular design with an N+2 operating philosophy (one set to cover maintenance/downtime and the second set as standby). Power generation capacity on site will be 4.8 MW, which will be sufficient for the site requirements, excluding the accommodation camp (power generation for the accommodation camp will be supplied by the mining contractor).

Power will be generated at 400 V, 50 Hz, 3 Phase. Each generator will have an individual step up 0.4/10 kV transformer which will connect into a common 10 kV switchboard for medium-voltage distribution at 10 kV.

Diesel fuel will be reticulated to the power station from the on-site fuel farm.

A total of six generators will be installed which will be sufficient to cater for the power supply needed for the site.

MEDIUM-VOLTAGE POWER DISTRIBUTION

Main power at 10 kV will be provided to all site areas via two radial feeder circuits.

LOW-VOLTAGE POWER DISTRIBUTION

Low-voltage power distribution will be at 400 V. Feeders for the packaged substations/pole mounted equipment will supply individual motor control centres (MCCs) and distribution boards (DBs) in the load areas. MCCs and DBs will supply and control the individual items of process area.

Identified emergency loads will have standby generators installed to provide power in the event of a mains power failure.

There will be two outgoing 10 kV radial feeder circuits which will feed the following two areas:

- radial feeder to run north to feed areas and facilities up to the mine maintenance workshop
- radial feeder to run south to feed the wet and dry process areas and facilities.

Three phase low-voltage supply to MCCs, motors and other services will be 400 V.

FUEL FARM

The fuel farm will be made up of a tank farm holding a total of 1,066,000 L of diesel on a bunded concrete pad. Storage capacity was on a 10-day strategic and 4-day operational demand calculated from the mining operations fuel demand as well as the site power demand.

Fuel will be delivered to a receiving pump station on the power station by tanker where the fuel will be pumped to the fuel farm. Alongside the pumping station will be a facility to fuel site vehicles.

7.3.4 SITE ROADS

Site roads will be used to transport materials and personnel around the site. Site roads have been designed in accordance with the general criteria that considers road use, vehicle type, and speed limit. Design criteria can be found in Appendix D.

7.3.5 MINING INFRASTRUCTURE

The mining contractor will be responsible for providing all the mining infrastructure (including truck maintenance shop) as well as provide equipment and services enabling the Owner to manage the site and main access road and to haul crushed ore from the loadout station to the heap leach pad. The mining contractor will perform all vehicle and mobile equipment maintenance on site for both the mining contractor fleet and vehicles belonging to the Owner.

7.3.6 BUILDINGS

Building structures will be provided for:

- accommodation camp (supplied and operated by the mining contractor)
- site administration included in camp building
- process building
- process maintenance workshop included in process building
- process – ADR and goldroom included in process building
- power plant and fuel farm
- loadout station
- transfer tower
- primary, secondary, and tertiary cruhing
- mine maintenance workshop (supplied by the mining contractor).

7.3.7 ADDITIONAL INFRASTRUCTURE

The following additional infrastructure will be provided for the site:

- site gatehouse
- fire station included in gatehouse
- mountain rescue included in gatehouse
- medical facility included in gatehouse
- medical evacuation helipad
- explosives storage container
- ammonium nitrate storage container
- reagent storage container.

7.4 STOCKPILE AND CRUSHING INFRASTRUCTURE

LOW-GRADE STOCKPILE AND WASTE ROCK DUMP

The low-grade stockpile and the WRD will be managed and operated by the mining contractor.

ROM PAD AND PRIMARY CRUSHING FACILITY

The ROM pad and crushing circuit have been relocated since the 2018 Internal Feasibility Study was written due to better topography (see Figure 7.1). This relocation has resulted in reduced earthworks quantities for the crushing circuit and haul roads (Table 7.1).

Table 7.1 Tulkubash Project Crushing Circuit Earthworks Quantities

Area	2018 Internal Feasibility Study (m^3)		Current (m^3)	
	Cut	Fill	Cut	Fill
Pads				
Combined Pad including ROM, Primary and Secondary Crushers and Transfer to Loadout Station	2,491,365	10.408	1,396,243	0
Loadout Station	32.578	801	25,663	0
Process Plant Buildings	5,497	5.438	7,878	11,601
Gatehouse	23,182	25	23,182	25
Explosives Storage	8,712	8,444	8,712	8,444
Ammonium Nitrate Stores	3,554	1,104	3,554	1,104
Accommodation Block Pad	59,418	59,002	59,418	59,002
Vehicle Workshop	140,955	103,356	-	-
Fuel Farm and Power Station Combined Pad	-	-	43,664	32,445
Barren Liquor Distribution Pad	-	-	1,890	1
Pads Total	**2,765,262**	**188,597**	**1,570,240**	**112,622**
Roads				
Main Haul Road (to Crossing 3 at New Location)	902,682	306,517	4,514,577	221,339
Vehicle Workshop Access Road	283,718	102,998	-	-
Accommodation Block Access Road	505,527	129,015	505,527	129,015
Ammonium Nitrate Stores Access Road	1,219	38,018	1,219	38,018
Explosives Storage Access Road	199,236	54,019	199,236	54,019
Communications Tower Access Road	58,765	50,331	58,765	50,331
Process Plant Buildings Pad Access Road	21,271	45,804	1,612	139,295
Loadout Station Access Road	119,734	2,484	257,044	31,568
Process Buildings to Crushers Access Road	-	-	129,343	190
Roads Total	**2,092,149**	**729,185**	**5,667,322**	**663,774**

The primary crushing facility will be enclosed within a cladded building and will include dust suppression. The primary crushing structure will be a mixture of materials that can be categorised as steel to the south and concrete to the north. The buildings will be cladded, but unheated, relying on heat from the process machinery inside each building to keep the internal temperature at a sustainable level during the winter months.

To the north, underneath the inlet hopper and primary crusher, will be a support frame made from reinforced concrete to take the heavy load down to the foundation pad.

The ROM ore will be fed to the crushing facility either by mine trucks directly from the mine, or by front-end loader from the ROM stockpile located on the ROM pad.

The secondary crushing structure will be a clad portal framed structure with an overall footprint of 16 m by 16.5 m.

The structure will consist of a 4 x 4 grid of structural columns, on a 5 or 6 m by 5.5 m grid, with 6 floor levels, plus a roof. A support frame made from reinforced concrete,

to take the heavy load down to the foundation pad, will be located under the secondary crusher.

7.5 HEAP LEACH FACILITY DESIGN

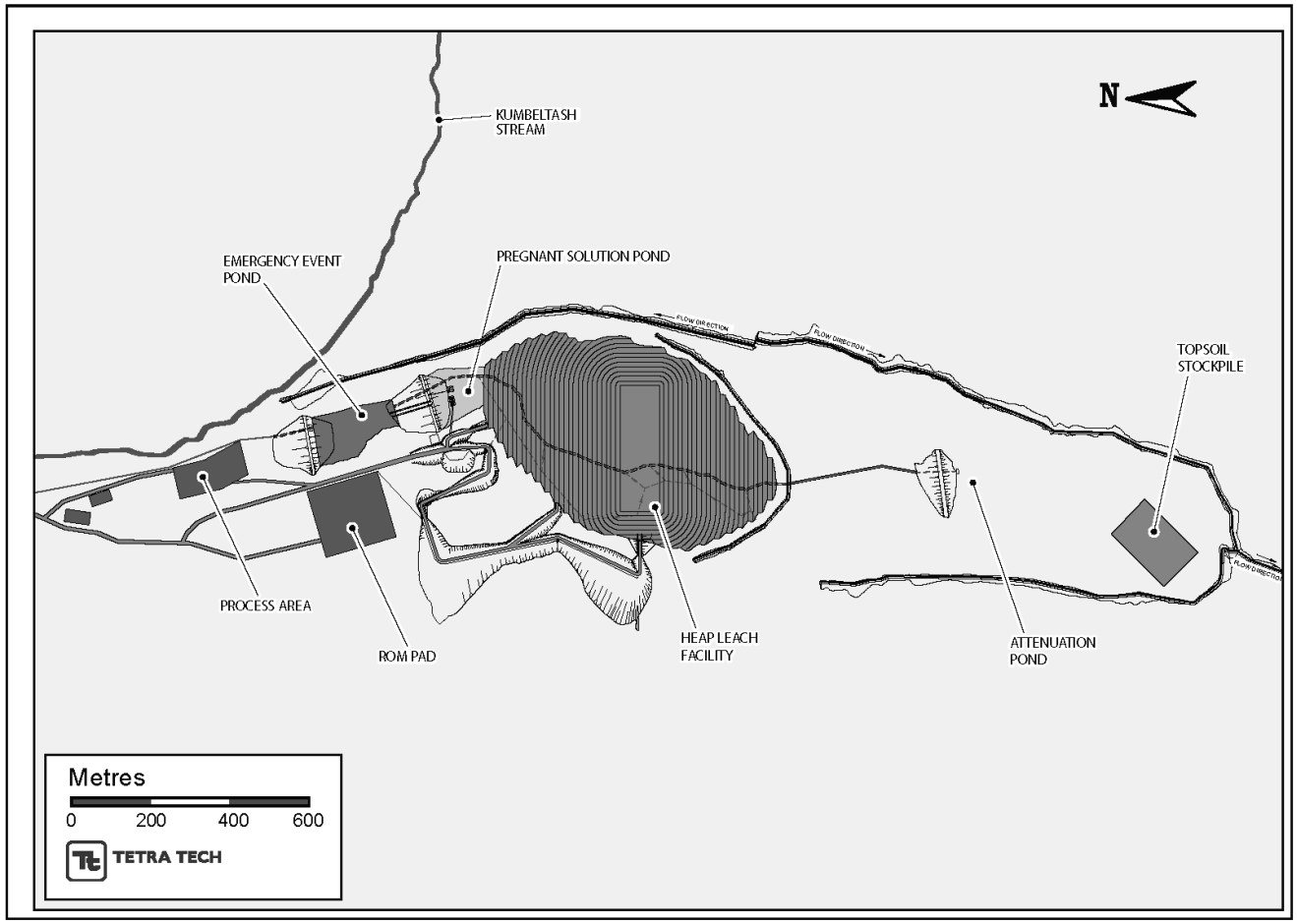
7.5.1 LAYOUT

The heap leach facility (HLF) is positioned centrally in the valley but also utilises the western slopes of the dry valley. The eastern slopes have large and currently unpredictable geohazards. Utilising the western slopes in this manner will improve the western slope stability as the heap is stacked against it. The HLF design has changed since the 2018 Internal Feasibility Study with associated increases in the emergency dam, pregnant solution pond, and attenuation pond. Table 7.2 details the changes in the HLF earthworks.

Table 7.2 Tulkubash Project HLF Earthworks Quantities

Area	2018 Internal Feasibility Study (m^3)		Current (m^3)	
	Cut	Fill	Cut	Fill
Emergency Dam	-	145,723	50,200	219,600
Pregnant Pond Dam	-	119,461	85,300	234,500
Pregnant Pond Fill	-	78,378	-	105,900
Pregnant Pond Cap	-	41,436	-	46,500
Attenuation Pond Dam	-	48,179	59,300	114,200
Heap Leach Pad Access Road	27,561	10,177	770,906	24,464
HLF Total Earthworks	**27.561**	**443,354**	**965,706**	**745,164**

Figure 7.3 HLF Layout



Slope stability assessments of the heap were undertaken to determine a slope angle for the final overall profile that would satisfy design factors of safety (FOS) (static loading – 1.5 and seismic loading – 1.1) for a facility life of 60 years, including decommissioning. The analysis results indicate that an overall slope angle of 1:3.5 (16°) is feasible.

Tetra Tech adopted the following HLF internal lifts (consistent with achieving the requisite slope angle for the final overall profile):

- slopes of 1:1.5 (33.7°)
- 7 m high lifts
- 12 m benches between lifts.

The seismic code for the region indicates that a design should be completed to a 0.4 *g* seismic event or that a site-specific seismic assessment be completed. The 2018 Internal Feasibility Study used 0.24 g and in consultation with the Owner this was adjusted to use 0.3 *g* as the design basis for the HLF with a decision not to conduct a site-specific assessment. Additional changes were made to the size of the ponds and the liner in order to further de-risk the Chaarat Gold Project.

7.5.2 STACKING PLAN

Tetra Tech designed an HLF stacking plan for the 16 Mt heap. The footprints of the lifts that will be placed to construct the 16 Mt HLF will have a volume of 10.156 Mm^3 at an ore unit weight of 1.6 t/m^3.

Fifteen lifts will be required to construct the 16 Mt HLF. All lifts will have a height of 7 m, except the first lift. The first lift will be used to create a level surface 7.9 m above the capped surface of the pregnant pond; this level will spread at a reducing thickness, moving up-valley towards the south over a section of the HLF basal liner. After that, lifts will progress at a height of 7 m.

The mine plan shows the anticipated initial production rate:

- Q1 – 5%
- Q2 – 37%
- Q3 – 22%
- Q4 – 95%
- Thereafter 100%.

7.5.3 LIQUID BALANCE

The liquid balance for the HLF has two components: the sodium cyanide solution which irrigates the orebody and is then collected as pregnant liquor in the pregnant solution pond, and precipitation, which falls onto the HLF (the main body of the ore heap, the pregnant and emergency ponds) and the surrounding area within the boundary defined by the eastern catchment ditch. This area is described as the "intermediate catchment".

The simplifying approach adopted for this liquid balance is that the pregnant solution pond holding capacity (two days of operation, value in cubic metres) is essentially for pregnant liquor only (ignoring precipitation), and when precipitation occurs (both rain and/or snow), this will be managed by overflow to the emergency pond, which therefore must be adequately sized to handle the peak maximum flood (PMF). It is understood that in practice, when significant precipitation occurs, the pregnant pond will contain a dilute solution of pregnant liquor and at times this will overflow into the emergency pond.

Water balance and pregnant solution volume design is required to size the pregnant pond and emergency pond dams. The two liquids (pregnant solution and precipitation) will feed directly into the sizing of the two ponds, hence the sizing and position of the two dams, respectively.

At a constant rate of solution application, the irrigation area size determines the input volumes (dosing flux) to the pad, and ultimately the volume of pregnant liquor flowing to pregnant solution pond. The design of the pregnant pond is based on the maximum anticipated irrigation area of 72,300 m^2, to allow for the maximum throughput operation from start up, despite lower throughputs during the early years of operation.

7.5.4 SURFACE WATER MANAGEMENT

A surface water drainage system was designed to collect and divert surface water runoff external to the HLF and prevent it from entering the internal HLF water balance.

7.5.5 DRAINAGE REQUIREMENTS

The following drainage were included:

- attenuation pond or similar surface water management upstream
- underdrainage
- outfall (including stilling basins and/or other required ancillaries)
- sampling regime and access points
- side slope and liner drainage
- catchment water management, ditches, drainage blankets
- road drainage.

7.6 PROCESS AREA

7.6.1 DESIGN CRITERIA

The process area location located close to the HLF the elevation differenc eallows for gravity flow of the pregnant solution from HLF to feed the process area.

The ADR plant building will be clad, but unheated, relying on heat from the elution process to keep the building internal temperature above freezing in winter. Most of

the process will be located within the ADR plant building, with the electrowinning and goldroom equipment located in a separate, high-security building. Generally, buildings will be sandwich panel-clad steel portal frame or containerised, but some will need to be blockwork. Concrete blocks will be manufactured on site at the concrete batch plant.

The two largest tanks, the barren solution tank and the raw water tank, will be located outside the ADR plant building at the southern end.

The plant facility and buildings were laid out to ensure that personnel do not have to venture outside unnecessarily.

7.6.2 Process Area Infrastructure

The process area pad will be a level, graded and compacted fill, approximately 165 m by 90 m, located to the north of the HLF and ponds.

The process area will comprise the process area pad, the administration building, laboratory, core storage, goldroom, ADR plant and building, reagent storage areas, raw water and fire water tanks, barren solution tank, barren solution pumps, and parking area.

7.6.3 ADR Plant

The ADR plant will be a 48 m by 24 m portal frame structure.

The ADR equipment package will be a modular package comprising of four sub-packages; the carbon-in-column (CIC) package, the acid wash, elution and electrowinning package, the carbon regeneration package, and the gold room package.

The CIC circuit will be made up of six carbon adsorption columns supported on structural steelwork and arranged linearly in a cascade, with each column containing 10 t of activated carbon. Each carbon adsorption column will be 4 m in diameter by 4 m high. The CIC columns and vibrating screens within the ADR plant will be covered to comply with the Kyrgyz Republic regulations on equipment within cyanide metallurgical recovery plants.

7.6.4 Electrowinning and Goldroom

The electrowinning and goldroom building, referred to as the goldroom, will be a secure, blockwork building. The goldroom will be a clad portal framed building with an overall footprint of 18.4 m by 12.4 m. The building will be 5.1 m high to the eaves, with a double-sloping roof above. The structure will consist of a 3 by 3 grid of structural columns, on a 9.2 m by 6.2 m grid (central column will be omitted).

7.6.5 Process Maintenance Workshop

The process maintenance workshop was planned be constructed on site from used shipping containers, this however, has now changed and it will be constructed as a portal frame building.

Separate storage areas will be set up for the warehouse for process items which need to be stored in a heated facility, including flammable materials and lubricants. The remaining area will be utilised for office space, tool stores, a lunchroom and ablutions.

7.6.6 REAGENT STORAGE AND PREPARATION

The shipping containers will be utilised as on-site storage where possible to limit the requirement for buildings on site.

7.6.7 LABORATORY

The laboratory will be situated within the process facility and located next to the goldroom on the northern side. The laboratory will be sized to handle the samples as shown in Table 7.3.

Table 7.3 Laboratory Sample Schedule

Type of Sample	Per Shift	Per Day	Per Week	Per Month
Grade Control	-	85	1,400	5,600
Crushed Ore	2	4	30	130
Heap Leach Pad Samples	2	4	30	130
Solution Samples (pregnant and barren)	2	4	30	130
Carbon Samples (pregnant and barren)	2	4	30	130
Smelter Slag Samples	2	4	30	130
Total Metallurgical Samples	10	20	150	650

7.7 GEOHAZARD MITIGATION MEASURES

Desktop geohazard assessment was done to determine suitability of the selected sites for construction of facilities in those areas. It is strongly suggested that a detailed geohazard assessment of the entire site is done and that a comprehensive geohazard management and mitigation plan is developed.

7.7.1 POWER STATION AND FUEL STORES

Tetra Tech selected a safe location for the power station as close as possible to the largest power user, the crushing facility. The power station will use the greatest quantity of fuel, so the power station and fuel farm will be located adjacent to one another.

7.7.2 EXPLOSIVE STORAGE

The location of the explosives storage is limited by the requirement of a 500 m exclusion zone. The explosives storage will sit on a cut-and-filled pad on the eastern side of the Sandalash Valley, downstream of the confluence of the Sandalash River and Kumbeltash Stream. The geohazard assessment identified minor risks of rock fall and boulder debris but considered the location reasonable if some mitigation measures are put in place.

7.7.3 AMMONIUM NITRATE STORAGE

The AN storage will be located on the eastern side of the Sandalash Valley, upstream of the confluence of the Kumbeltash Stream and Sandalash River, accessible via a spur road off the main north-south haul road. The AN storage will be located on a cut-and-filled, bunded pad. The site, which is large enough for the storage of AN shipping containers, is located outside the river exclusion zone on the lower slopes of the valley.

7.7.4 HLF, PROCESS AND ROM

Tetra Tech conducted a geohazard assessment in the dry valley around the proposed HLF location that highlighted several areas of rockfall and avalanche risk around the HLF, process area, and ROM pad locations. Further north of the site, Tetra Tech completed a high-level, desktop geohazard assessment to determine suitability of the selected sites for construction of facilities in those areas.

Key geohazard hazards identified within the local area include:

- rock fall from upper mountain slopes (rock crags) as isolated block fall events
- rock avalanche
- large-scale active/seasonal debris flows
- snow avalanches, which include dry avalanches, wet snow avalanches, and slush flow
- seasonal snow melt and storm water runoff.

Significant geohazards to site infrastructure were managed by either avoiding the risk through relocation of facilities, preventing the risk by stabilizing the area that poses the danger, or controlling the impact of the event through protective measures.

Typical control measures include rock fall catch fences and earth diversion bunds. The actual size and location of the mitigation measures is dependent on a detailed geohazard assessment for the entire Chaarat Gold Project site.

Future detailed assessments should be undertaken to determine the magnitude and frequency of events to inform the selection and design of suitable mitigation measures and their capacity. This will enable an informed understanding of the balance between mitigation measures and the outstanding risks.

8.0 ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL OR COMMUNITY IMPACT

This section presents the findings of a desktop review of documents pertaining to the environmental and social aspects of the Chaarat Gold Project; the potential impacts and risks. The environmental and social impact assessment (ESIA) for the Tulkabash Gold Project is part of early-stage feasibility studies. The ESIA addresses Stage 1 (open pit mining, heap leach processing and adsorption desorption recovery plant for producing doré gold); if Stage 2 is pursued it will tentatively comprise additional processing lines, an autoclave and tailings management facility. The current ESIA (currently in draft) focusses on Phase 1; Phase 2 has been considered in terms of cumulative impacts.

CGHL has full legal responsibility for complying with all Kyrgyz Republic legislation in terms of the environment including protection of air, water, land and rehabilitation. CGHL must obtain all the environmental permits for activities that will take place throughout the life of the Chaarat Gold Project, make quarterly payments for environmental pollution as required by law, and submit compliance reports (as per environmental requirements).

A defensible ESIA is based on a sufficiently baseline studies and detailed project description to enable all potential biophysical and socio-economic impacts to be identified (aspects). Each biophysical and socio-economic specialist study needs to define a project's area of influence (i.e., a local, regional and national/international study areas) so that direct and indirect impacts can be understood. The baseline studies and project description are fundamental to the quality of the impact assessment and, subsequently, the environmental and social management plans that are developed.

The primary reference documents used for this CPR are the draft ESIA in Support of the Chaarat Gold Feasibility Study (Stage 1 Tulkabash) (WAI 2018) and the 2018 Feasibility Study (Tetra Tech 2018). Other specialist studies and documents are referred to throughout this section and a list of references is presented in Section 14.0.

WAI completed a preliminary ESIA in 2017 which is currently being updated to reflect changes in project design; it should be noted that the ESIA is still in draft form so additional information, not available at the time of drafting this CPR, may be included in the final document.

In accordance with international standards such as the International Finance Corporation (IFC) Performance Standards (PS) and the Equator Principles (2013), mines are typically classified Category A. Category A projects have potential significant adverse environmental and social risks and/or impacts that are diverse, irreversible, or unprecedented. Thus, in conformance with international standards, a full ESIA and stakeholder engagement programme has been undertaken for the Chaarat Gold Project by WAI (2017 and 2018, the latter being progress).

By default, an ESIA that conforms with international standards must comply with in-country legislation. Ken-Too, an in-country consultant, carried out an Environmental Impact Assessment (EIA, or OVOS) to comply with Kyrgyz Republic legislation (Ken-Too 2015). Davletbakov completed an environmental review with field surveys of soil, flora and fauna, and Leshem Scheffer carried out a social review in 2011.

CGHL has in-house environmental policies, systems and operational procedures in place to guide the company in terms of environmental, social, security, and health & safety performance. CGHL is developing environmental and social management plans and will be incorporated into the Chaarat Gold Project's environmental and social management system (ESMS). This is in line with good international industry practice and an ESMS is a requirement of IFC PS1.

8.1 ENVIRONMENTAL STUDIES

The WAI ESIA is based on a project description and previous environmental studies including scoping undertaken by AMEC (2012); Stage 1 Report on the existing state of the environment at site (Ken-Too 2015, and updated 2017); Background Environmental Assessment Report (Davletbakov, 2013); Kyrgyz Republic government letter regarding UNESCO Heritage Site borders (2016); Environmental and Social Review and Gap Analysis (AMEC 2012); Environmental and Social Baseline Study (Leshem Sheffer Environmental Consultants 2011); and the 2015 Internal Feasibility Study (Nerin 2015).

Potential impacts that present the most risk to the Chaarat Gold Project are those on water, natural hazards (geohazards), and acid rock drainage (ARD). Overall significant impacts have been addressed in the ESIA report and include climate change, ARD, air quality, soil, water, biodiversity, culture, social infrastructure, economy, livelihoods, labour, human rights, and community health, safety and security. All impacts have been either reduced (negative impacts) or enhanced (positive impacts) by the application of mitigation and measures presented in the draft management plans.

8.1.1 SITE LAYOUT AND INFRASTRUCTURE

The layout and engineering design of the mine infrastructure has been based on the physical environment including geohazards (e.g., avalanches and rock falls) (Tetra Tech 2018). Significant geohazards were mitigated through avoiding the risk or engineering solutions.

It transpired that only one site was suitable for the HLF (i.e., the dry valley where there is no perennial water course). Once the HLF site was fixed, site layout was planned with reference to physical and environmental factors.

The ESIA report has summarised the alternative of analyses that were undertaken for the overall mine design and integrated into the design of the environmental and social mitigation presented in the 2018 Internal Feasibility Study. The analysis included the no-go option.

The standards that were referenced by Tetra Tech when assessing project alternatives (i.e., IFC PS and guidance notes and European Bank for Reconstruction and Development (EBRD) Performance Requirements). Other factors considered

during design were optimisation of economic value of the Chaarat Gold Project, availability of local resources, good international industry practice, CGHLs in-house corporate policies and commitments, and cost-benefit analyses (tax revenue and social investment). WAI (2018) states that stakeholder engagement was part of the analysis of alternatives and design process.

A comprehensive analysis of alternatives has been carried out by Tetra Tech and WAI resulting in the layout and design presented in the ESIA and feasibility reports. The CPR reviewer concludes that environmental and social risks associated with the overall layout and design have been minimised through good international industry practice and particularly, the application of the mitigation hierarchy (avoid-reduce-mitigate and lastly, compensate).

It should be noted that the draft ESIA states there is no economic displacement associated with the selection of the HLF site. However, there is a herdsman that will have to move to other pastures for grazing animals (he has his own animals and two people pay him to take their animals to graze so derives at least part of his livelihood from land that will be used by the Chaarat Gold Project); this is economic resettlement even though the herdsman is satisfied there is plenty of other pasture to move to.

If there are changes to design, process and/or layout that vary from those in the current draft ESIA report, then further analyses of alternatives will be required.

8.1.2 HYDROLOGY AND HYDROGEOLOGY

The sources of potential impacts include the open pit, heap leach, emergency event pond, ADR plant, WRDs, power plant, camp, storage areas (explosives and reagents), waste transfer facility, and open ground (such as roads). Activities with their potential effects on the environment have been described in the draft ESIA report.

Extensive baseline studies have been undertaken (e.g., flora, fauna, aquatic and social) to determine the sensitivity of the Sandalash River. The quantity of water in the river varies seasonally but it is resilient due to catchment size, length and run-off from rainfall and snow melt has a dilution effect. As the catchment mountains are steep, run-off time is rapid, and attenuation occurs through interaction with the geology, in particular, carbonate-rich rocks.

WAI asserted the only significant impact on hydrology and hydrogeology is associated with acid rock drainage (ARD) (WAI 2018; Section 9.1.3). Potential sources of ARD include the WRD. Material that is potentially acid generating, will be encapsulated to prevent reactions and thus, impacts will not be significant.

The “dry valley” is the sole option for the HLF. It is infilled with Quaternary boulders and rubble which is colluvial material which is weathered material transported from the mountain. Drilling indicated the infill is at least 100 m deep. A series of drilling programmes (2010, 2011, 2016, and 2017) took place but groundwater was only encountered on two holes in 2010 and eight holes in 2017; water levels were 5 mbgl in the upper (southern) valley and 10 mbgl in the lower northern processing area. As groundwater is not regarded as a resource, it has no amenity value and is low sensitivity.

The Sandalash alluvium, Sandalash tributaries, and Palaeozoic bedrock (which hosts the ore body and groundwater flow is controlled by fractures i.e., bedrock is not a primary aquifer) do not constitute groundwater resources. Surface water receptors have been identified.

Dewatering is not expected to be required for the open pit as groundwater levels are estimated to be below the final depth of the pit. However, WAI indicates this is based on scanty data and groundwater monitoring results should be used to assess groundwater inflows and dewatering requirements.

Chaarat Gold Project activities and their potential impacts on the water environment have been summarised by WAI (2018). Flood risk is limited to the mine and will not impact third parties or the external environment. There may be localised lowering of the water-table in the Kumbeltash Valley where boreholes will be pumped out for use as process make-up water. Impacts to surface and groundwater are assessed as being low significance or insignificant, apart from ARD and metal leaching.

Overall, the CPR reviewer is of the opinion that the water environment has been adequately described and assessed, with appropriate mitigation presented in the management plans. Where data is lacking (e.g., on groundwater levels, aquifers, flow rates/volumes, and overall water balance) an action plan should be drawn up to address the gaps. Based on the information supplied in the ESIA report (WAI 2018), it appears there are no critical issues that could delay the Chaarat Gold Project, but it is essential that gaps are addressed so the confidence level of the impact assessments can be improved.

8.1.3 GEOCHEMISTRY

ARD and metal leaching has been assessed in terms of potential impacts on receptors (i.e., soil and water resources at and downstream of the Chaarat Gold Project).

The baseline studies addressed the mechanisms associated with ARD and metal leaching. The activities and sources considered were contamination of mine water in the open pit, water through run-off and seepage from the WRD, stockpiles, and from the spent heap leach pad/HLF at mine closure and post-closure. All Chaarat Gold Project phases were considered in the geochemical assessment.

The Tulkabash ore was considered to be high geochemical risk material based on field and high humidity cell testing which indicated metal leaching from ore stockpiles may be an issue. More work needs to be done to gain clarity about reactivity, metal mobility, and lag-time. Contamination from the HLF at the end of the life mine comprises seepage and run-off from spent heap leach residue.

Geochemical characterisation needs more work to be done as representative samples have not been fully covered plus test results have been variable and inconclusive. WAI states that there are uncertainties about geochemical risks and thus, a conservative approach must be taken. The ESIA report includes a list of monitoring and methods to mitigate the risk that is comprehensive and effective in the circumstance where there is uncertainty.

The main operational mitigation for ARD and metal leaching impacts is to construct and operate a site-wide collection system for all mine contact water. The aim is re-use mine water where feasible and to excess water will be diverted to the emergency event pond where it will be stored and / or evaporated; water will only be released when it has been treated and / or meets standards for discharge into the environment.

A provisional mine closure and rehabilitation plan for managing long-term geochemical impacts has been included in the ESIA report. Actions and procedures address the open pit, WRD, stockpiles, and HLF.

In the opinion of the CPR reviewer, the proposed actions are practical and likely to be effective if the mitigation and procedures are applied fastidiously; WAI has recorded the residual impacts (i.e., the impacts after mitigation has been applied) as minor (WAI, 2018: Table 5.3.1). WAI states the approach is conservative and may prove to be un-necessary (i.e., the precautionary principle has been followed and aligns with good international industry practice).

8.1.4 PROCESSING

Heap leach was the preferred option for processing and will be comprise an impounding valley leach pad across the full width of the dry valley. The design includes an upstream attenuation dam, main leach pad area with an internal pregnant solution pond, pregnant pond dam and spillway, and downstream emergency pond and spillway.

Based on the information supplied in the ESIA and the proposed mitigation in the management plans, the CPR reviewer is of the opinion that the measures are adequate.

8.1.5 CYANIDE MANAGEMENT

CGHL management aims to achieve certification with the Internal Cyanide Monitoring Code (ICMC). The ICMC is a voluntary code that focusses on safe management of cyanide to protect human health and reduce environmental impacts. A requirement of the Cyanide Code is that operators are required to undergo independent third-party audits; results are made public so that stakeholders are able to know the status of cyanide management practices at certified operations.

A cyanide management plan has been compiled which covers all aspects of cyanide use for this specific Chaarat Gold Project, including training requirements, emergency response, an action plan and auditing. Cyanide has been considered through all phases of the life of mine through to closure and monitoring.

The opinion of the CPR reviewer is that CGHL is aiming to achieve high standards through certification with the ICMC and will operate the mine in a transparent manner regarding transporting, storing and using cyanide. The risk of using cyanide is therefore, minimised.

8.1.6 WASTE MANAGEMENT

The two main waste components are mine and non-mining waste. A framework waste management plan has been developed for solid waste (hazardous and non-hazardous) and covers waste produced by CGHL and/or its subcontractors. The plan considers Kyrgyz Republic legislation and international standards; it excludes waste water, atmospheric emissions, soil and overburden excavated in construction, drilling wastes and mining wastes which require other permitting / approvals in respect of Kyrgyz Republic regulations.

The framework waste management plan is adequate for this phase of the Chaarat Gold Project development.

8.1.7 WATER SUPPLY

Water supply and management will be defined at the detailed design stage. For the current phase of Chaarat Gold Project design, high-level comments have been made for management and treatment (e.g., septic tanks).

8.1.8 POWER SUPPLY

Options for power supply included generation on-site (diesel, liquefied petroleum gas [LPG] or duel-fuel generators) or off-take from the national grid. The feasible alternative is diesel generators as national grid and LPG is not available. Emissions and routing has been considered in the impact assessment, and practical mitigation has been proposed for managing potential, negative impacts.

8.1.9 HEALTH AND SAFETY

Legislation pertaining to health and safety have been included in the ESIA report, and a health and safety manager and coordinator will be appointed to the Chaarat Gold Project. Health and safety has been referred to throughout the ESIA report but an overarching Health and Safety Plan for the mine, included in the ESMS, will consolidate requirements for operating the mine with reference to good international industry practice.

CGHL has a Health, Safety, Environment and Community (HSEC) committee which is responsible for the overall performance of the company, its operations and local communities in the Kyrgyz Republic. The entire board is on the HSEC Committee but the make-up of it will be reviewed when non-executives with relevant safety, health, environment and community skills are appointed.

8.1.10 DECOMMISSIONING AND CLOSURE

Aspects of decommissioning, closure and post-closure monitoring have been addressed in the ESIA report and Mine Closure and Rehabilitation Plan albeit the Plan is generic at this juncture. It is recommended that unplanned for closure is included in closure planning and that stakeholders are involved in deciding on post-closure land-use.

8.2 PERMITTING

Kyrgyz Republic legislation requires an OVOS (similar to an ESIA) be undertaken for all economic activity and permission has to be granted by the authorities before work can begin. Ken-Too, a Kyryz Republic consultancy has prepared OVOS reports for the Chaarat Gold Project. There are broad similarities between the OVOS and ESIA processes and reporting but an ESIA has more focus on the social impact assessment. Much of the baseline data requirements are similar for the OVOS and ESIA so duplication of effort can be avoided if there is communication between the environmental and social teams (if more than one consultant / team is responsible for both the OVOS and ESIA processes).

The list of permits and licences pertaining to the Chaarat Gold Project, in terms of the environmental aspects, are summarised in Table 8.1. The ESIA report does not refer to the timeframes required for obtaining the state-approved licenses and authorisations; timeframes to obtain such authorisations and licences is critical for the Chaarat Gold Project to maintain a schedule for the construction and operational phases.

Table 8.1 Environmental Permits and Licenses Required for the Chaarat Gold Project

Name	Date Issued	Valid Until	Comment
Licences Already Issued for the Chaarat Gold Project			
Exploration Licence (No. Au-174-02)	10 December 2002		
Exploration Licence (No. 3319)	7 October 2013 and renewed 21 April 2016	21 April 2023	The exploration area was extended to include Chaarat, Kashkasu, and Minteke propects. Conditions are attached to the licence (e.g., paying taxes for subsoil use; informing SCIES of licence retention fee payments; geological reports to State Geological Fund; and opening disturbed land rehabilitation fund)
Mining (or production) Licence (No. 3117 AE)	22 January 2014 and renewed 7 September 2017	25 June 2032	Covers the core 700 hectares of the Chaarat Gold Project (defined mineral resources area). Conditions are attached to holding the licence (e.g., developing the deposit; continuous work on preparation to mine; paying taxes; submitting a social package to SCIES; and opening a disturbed land account)
State-approved Licences and Authorisations Required for the Chaarat Gold Project			
Subsoil Usage			Licence and land allotment allocation
Land Usage Agreement			
Public Ecological Expertise Statement on Project Feasibility			
Licence to Undertake Works			
Water Usage Permit			
Air Emissions and Water Discharge Permit			
Explosive Storage Use and Road Transportation Licence			
Licence for Utilization, Storage, Disposal, Destruction of Toxic Waste Materials and Substances			State Agency of Environmental Protection and Forestry; CGHL will obtain this licence before work begins. Contractors will obtain this permit after CGHL receives construction permit
Permits for Transporting Hazardous Goods			Ministry of Internal Affairs; Transport Company will have this permit
Ecological Safety Expertise			State Agency of Environmental Protection; designs must pass ecological safety expertise (to be completed when designs are finalised)
Licence for Water Use From Underground Sources			Licence is issued by State Committee on Energy, Industry and Subsoil Use; will be applied for when water well design is completed

The ESIA includes a comprehensive review of Kyrgyz Republic legislation and international standards. The report states that permits are not in place for all the land-take areas; pending or missing permits relate to the part of the explosives area and part of the road to it; most of the detonator pad; cut area above the ROM pad; haul road to the ROM pad as per the design; part of the cut above the 400 person camp; large part of the power generation plant and fuel storage area; edges of the future open pit area; and main gate and laydown area.

The Kanysh-Kiya Rural Council has issued a letter of guarantee to CGHL stating that land shall be allocated for temporary land-use under lease for a period of validity of the licence for subsoil use (No. 3117 AE, 25.06.2012). The areas referred to in the letter are land for the implementation of the Chaarat Gold Project (Chaarat licence area); land for waste rock dumps with areas of 229 ha and 399 ha; land for tailings dam of 116 ha; and land for the southern road 68 ha. The ESIA report does not discuss the hierarchy of authorities nor whether the letter issued by the Kanysh-Kiya Council is valid/ has precedence in terms of national/regional legislation (i.e., if national-level authorities do not agree or challenge the contents of the letter of guarantee, does the Council's decision prevail?). There is potential risk to the Chaarat Gold Project if the Council decision can be over-ruled, as it could lead to project delays.

It is recommended that (a) all permits/licences that will be required for the Chaarat Gold Project are listed in a legal register included in the ESMS and (b) that a table of conformance is included in the ESIA report so that there is clear indication that the ESIA has fulfilled the requirements of international standards. The IFC PS and sector-specific environmental, health and safety guidelines are extensive; a table of conformance is a concise method to demonstrate that the ESIA has addressed international-standard requirements.

A gap that has not been addressed in the ESIA report is whether the Chaarat Gold Project already has permission to go ahead based on the submission of the OVOS report to the authorities (i.e., before the international- standard ESIA is completed). If the Chaarat Gold Project is able to proceed, there is risk because there are gaps in information regarding some aspects of the environment (e.g., water balance and ARD).

8.3 SOCIAL AND COMMUNITY

Primary and secondary data were collected as part of the social baseline studies, and formal and informal interviews were carried out throughout settlements in the Chatkal Valley. Household surveys were carried out in 2010- 2011 by Leshem Sheffer, and additional surveys were carried out by WAI over a 10-day period in September 2016. CGHL and WAI focussed household surveys on the settlements closest to the Chaarat Gold Project.

WAI visited the Chaarat Gold Project site and held meetings with CZ staff in Bishkek. The purpose of the visit and meetings were to verify baseline information included in the previous baseline reports, assess if data is still relevant (up-to-date), and address gaps. One hundred and fifty-nine households were included in additional household surveys (WAI 2016) in settlements near the mine operated by China Gold. It is not stated how many household surveys have taken place in total (for all baseline studies

undertaken by WAI and others) nor the percentage of households compared to the total number of households in the study area.

The lack of information on the number of households surveyed and the methods used to select households is a limitation of the baseline studies because surveys have to be representative and statistically defensible. It is recommended that the local and regional study areas are defined with rationale for defining them; data can be related to these areas with statistical analyses of the findings.

8.3.1 CONSULTATION

CGHL hosts stakeholder meetings in the main office in Kanysh-Kiya. The company is developing good relations with stakeholders and has made efforts to engage and inform them about Chaarat Gold Project developments. A grievance procedure is in place. A stakeholder engagement plan has been developed and is being implemented by CGHL.

An example of pro-active engagement with communities is that in 2015 local community members were hosted by CGHL on a paid-for visit to similar mining communities in Turkey. Company representatives informed WAI that the trip increased support for the Chaarat Gold Project and mitigated negative perceptions about environmental consequences of a mine being developed in the district.

WAI refers in the ESIA report to reports by local people that quality of life has improved through the presence of other mines that have funded projects. Whereas others report that they are worse off since the last operating mine left in 2015.

Due to the efforts being made to engage and develop good relations with local communities, CGHL is increasing approval of the Chaarat Gold Project amongst communities and others which is resulting in a social licence to operate. Consultation undertaken by WAI and other independent consultants has verified that a generally positive attitude towards the Chaarat Gold Project prevails. It is critical that independent persons / consultants are involved in consultation, at least periodically, as it demonstrates a transparent approach by CGHL.

During meetings with local stakeholders in 2016 WAI learned that three herders use land on and adjacent to the land-take area, access road and winter camp, for grazing livestock. One of the herders grazes his own animals and earns money from residents of Ala-Buka for taking their animals to the pastures. During interviews the herder reported that the land-take is unlikely to be detrimental to his business because there is enough alternative grazing land for herders to use. Local herders generally regard the Chaarat Gold Project as a business opportunity because CZ buys milk, cheese and meat from them as part of supplies for workers on site.

There is no reference to any formal agreement being made between the herders and CGHL. In terms of international standards, the loss of access to and use of land amounts to economic resettlement. Although the herders are seemingly amenable to using other land, there is risk to CGHL and its reputation in the case that the herders did not fully understand the implications of the Chaarat Gold Project land-take or a third-party takes issue with the seemingly causal arrangement with the herders (with or without the consent of the herders). The CPR reviewer recommends that consultation takes place with the herders and a formal agreement is undertaken that

aligns with international good practice, which is effectively some form of a resettlement action plan.

Local mining companies including CGHL and environmental organisations hold regular meetings to coordinate activities with reference to minimising impacts on the natural environment. The Sandalash River flows through the Besh-Aral Nature Reserve; the Reserve was established for the protection of biodiversity. Officials report any incidence of pollution would have a detrimental effect on the health of the Reserve particularly the aquatic species.

Public consultation and disclosure for an ESIA is specifically dedicated to identifying parties who may be directly or indirectly affected by a development, or other interested parties. This entails mapping communities, developing a database of stakeholders, holding meetings (e.g., public, open-house, focus group, and one-on-one meetings), recording comments/questions received and giving responses to comments / questions received. Although it is apparent that consultation has taken place, no evidence has been made available to the CPR reviewer (apart from a stakeholder list dated 2013 in the current stakeholder engagement plan and it is highly likely the named stakeholders have changed in the interim five years). It is recommended that details of meetings, attendee lists, stakeholder database, and a comments and response report are attached to the ESIA report as appendices.

WAI has made recommendations for future stakeholder consultation so that trust and CGHLs social licence to operate is maintained; public consultation during an ESIA is only part of overall stakeholder for any project. The stakeholder engagement plan will be developed by CGHL so that it applies to all phases of the life-of-mine and will provide documentary evidence of consultation, should the company be challenged by communities, authorities and /or third parties such as non-governmental organisations, and conservation organisations.

Overall, risk associated with communities is currently managed by a number of initiatives including through meetings, the grievance procedure and stakeholder engagement plan. The CPR reviewer strongly recommends that the stakeholder engagement plan is updated and made applicable to all phases of the mine from pre-construction to closure and post-closure. Designated staff should be responsible for managing relationships with communities and all other stakeholders. Ultimately, the CGHL management team is responsible for providing qualified personnel and resources to facilitate the successful management of these relationships.

8.3.2 ENVIRONMENTAL AND SOCIAL MANAGEMENT

IFC Performance Standard 1 refers to environmental and social assessment and management systems as part of the overall process to identify risks and impacts associated with development. An ESMS is a tool that supports companies plan, implement, review their environmental and social performance, and achieve continual improvement.

CGHL will develop an integrated ESMS to assist it achieve its commitment to occupational health and safety, and environmental and community protection and well-being. WAI report that the ESMS will align with legal and administrative requirements of the Kyrgyz Republic and international good practice.

A number of framework management plans have been prepared by WAI as a step to enable CGHL to manage significant impacts that were identified in the ESIA. The management plans include air quality; biodiversity, mine closure and rehabilitation, noise and vibration, soils, cyanide, water and waste water, waste management plan, chance-find procedure, and an updated stakeholder engagement plan. Some of the plans are well documented and achieve near-alignment with the principles of SMART mitigation (specific, measurable, achievable, relevant and time-bound). However, the current plans could not be handed to workers to implement until SMART mitigation has been developed and included in them.

The biodiversity management plan notes that there are monitoring and management tasks that are common to biology and other aspects of the environment such as water and soil management (i.e., there is understanding that environmental and social management is an integrated process).

The mine closure and rehabilitation plan has been initiated and will be revised once the Chaarat Gold Project design and ESIA are completed. The framework lists the Kyrgyz Republic legislative requirements for closure and lists the steps and actions that should be included in the management plan. The CPR reviewer recommends that unplanned for closure is included in the plan as well as early or temporary closure that is referred to in the framework plan.

Before any work begins on site, the framework management plans must be developed sufficiently to include SMART mitigation so that contractors and all other workers will have a clear vision of their roles and responsibilities. Environmental and social management plans should be included in contract documentation, as appropriate to contractors' scopes of work.

Environmental and social management should be part of site induction for all workers and visitors, using information in the management plans.

9.0 CAPITAL AND OPERATING COST ESTIMATES

9.1 CAPITAL COST ESTIMATE

Tetra Tech prepared the capital cost estimate for Stage 1 of the Chaarat Gold Project, which includes the Tulkubash Project from the 2018 Internal Feasibility Study (Tetra Tech 2018). The initial capital cost estimate was calculated as US$121.7 million, excluding Value Added Tax (VAT) and US$131 million including VAT (Table 9.1). The Kyzyltash Project is not included as it will form part of Stage 3 of this mining property development

Table 9.1 Tulkubash Project Initial Capital Cost Summary

Area	Cost* (US$)	VAT (US$)	Import Duty (US$)	Total (US$)
Mining	20,029,375	2,225,046	0	22,254,421
Crushing	25,380,956	1,900,539	477,157	27,758,651
Processing	24,138,904	1,039,332	900,194	26,078,429
Site Infrastructure	9,879,441	1,167,063	5,196	11,051,700
Site Utilities	8,113,658	176,823	512,774	8,803,255
Camp	2,800,000	336,000	0	3,136,000
Temporary Facilities	85,000	10,200	0	95,200
Off-site Infrastructure	3,639,777	436,773	0	4,076,550
Financials (Contingency)	12,256,189	954,853	131,377	16,474,101
Indirect Costs	15,387,871	0	0	12,256,189
Total Initial Capital Cost	**121,711,171**	**8,246,628**	**2,026,698**	**131,984,497**

Notes: *excluding VAT and import duty
Source: Tetra Tech (2018)

This is a Class 3 estimate prepared in accordance with the AACE International cost estimate classification system. The estimate accuracy interval is –10% to +15% and the estimate base date is Q2 2018.

All costs are in US dollars. Quotations received in other currencies were converted to US dollars.

9.1.1 ASSUMPTIONS

In developing the capital cost estimate for the 2018 Internal Feasibility Study, Tetra Tech made the following assumptions:

- Materials for construction will be readily available, with knowledgeable and experienced local contractors and client team available to arrange transport in the region.

- Project execution will commence in the current economic climate where equipment and contractors are readily available to supply equipment and perform the works and the market is competitive in favour of the purchasers.
- The relative political stability in the region that allows relative ease of transport stays as at the time the estimate is prepared.

9.1.2 EXCLUSIONS

The following items were excluded from the 2018 Internal Feasibility Study capital cost estimate:

- cost escalation during construction
- piling foundations
- airstrip and helipad other than any costs included in the camp construction actual expense lump sum amount
- interest on loans and other financing costs during construction
- schedule delays and associated costs, such as those caused by the following:
  - large-scale unexpected ground conditions
  - extraordinary climate events
  - labour disputes
  - schedule recovery or acceleration
  - financing costs
  - taxes (except as supplied by Owner)
  - costs outside Tetra Tech's battery limits
  - sunk costs
  - research and exploration drilling costs
  - force majeure
  - engineering, procurement, and construction management (EPCM)
  - currency fluctuations.

Working capital costs, closure costs, salvage values, and operating costs were excluded from the capital cost estimate but were included in the financial model.

9.1.3 APPROACH

Tetra Tech prepared a capital cost estimate as part of the 2018 Internal Feasibility Study (Tetra Tech 2018). The estimate was structured according to a work breakdown structure (WBS).

Mining capital costs were obtained from CGHLs selected mining and earthworks contractor from Turkey, Ciftay, who supplied informal quotes for unit mining rates, equipment rental, mine maintenance workshop, and accommodation camp construction and management. No contracts were available to reference for this Competent Persons Report, however it is understood that CGHL is currently

negotiating a contract with Ciftay at which point the mining capital costs will be confirmed and updated. Ciftay also provided mobile equipment prices and rental costs as well as rates for earthworks, which were used to calculate road estimates.

The basis for fuel, reagents, and consumables were provided by CGHL and no formal quotes were available for review.

Detailed flowsheets formed the basis for the process capital estimate with major process equipment (including power generation) estimated based on budget quotes from vendors. Unit rates were used for construction, installation, and supply of materials along with rates and prices from Tetra Tech's in-house database for items of lesser value. Installations and maintenance allowances were also included from Tetra Tech's in-house database.

Tetra Tech provided a detailed equipment list with the description, size, and unit cost for each piece in accordance with the process flow diagrams and process equipment lists. Budget quotations were obtained and analysed from the vendors, for all the major items based on preliminary specifications.

Costs for additional infrastructure were determined through a combination of actual quotations from reputable suppliers as well as construction and installation contractors who are active and experienced in the region. Information from these quotations, along with experience of construction costs globally was used for the estimate. CGHLs Bishkek office assisted with identifying and liaising with suitable suppliers and contractors and provided local knowledge of climate conditions, government policies, and logistical options for importing and transporting equipment and materials.

All equipment and material costs were included in the estimate as Free Carrier (FCA) manufacturer plant Incoterms 2010. Other costs, such as spares, taxes, duties, freight, and packaging, are covered in the indirect costs section of the capital cost estimate.

9.1.4 DIRECT COSTS

The AACE defines direct costs as:

"...costs of completing work that are directly attributable to its performance and are necessary for its completion. In construction, (it is considered to be) the cost of installed equipment, material, labour and supervision directly or immediately involved in the physical construction of the permanent facility."

Examples of direct costs are mining equipment, process equipment, mills and permanent buildings.

The total initial direct capital cost from the 2018 Internal Feasibility Study was estimated at US$94 million, excluding VAT or US$103 million including VAT.

OPEN PIT MINING

Table 9.2 shows the initial open pit mining capital costs.

Table 9.2 Initial Open Pit Mining Capital Cost

Area	Cost* (US$)	VAT (US$)	Total (US$)
Contract Mining Pre-strip	15,641,957	1,877,035	17,518,992
Mobilise Mining Equipment	1,480,000	177,600	1,657,600
Mining Cost During Pre-strip	1,987,418	60,011	2,047,429
Mine Maintenance Workshop	920,000	110,400	1,030,400
Total Initial Open Pit Capital Cost	20,029,375	2,225,046	22,254,421

Note: *excluding VAT
Source: Tetra Tech (2018)

WRD and stockpile costs were incorporated with the mine development costs supplied by Ciftay.

At the end of LOM, the remaining ore from the mine and ROM pad will be processed and placed on the HLF for final leaching, rinsing, and closure. Machinery and personnel will be reassigned to complete the earthworks required for mine closure.

CRUSHING

Table 9.3 shows the initial crushing circuit capital costs.

Table 9.3 Initial Crushing Circuit Capital Cost

Area	Cost* (US$)	VAT (US$)	Import Duty (US$)	Total (US$)
General	15,162,261	1,819,471	-	16,981,732
Conveyors and Loadout Station	2,834,301	34,171	127,477	2,995,949
Primary Crushing	2,608,301	25,357	119,850	2,753,508
Secondary and Tertiary Crushing	4,776,093	21,539	229,830	5,027,462
Total Initial Crushing Capital Cost	**25,380,956**	**1,900,539**	**477,157**	**27,758,651**

Note: *excluding VAT and import duty
Source: Tetra Tech (2018)

PROCESS

The structure used in the 2018 Internal Feasibility Study for estimating the process cost did not allow for stripping out the installation costs.

Table 9.4 shows the initial process capital cost. The heap leaching cost will increase due to the increase in HLF pond sizes.

Table 9.4 Initial Process Capital Cost

Area	Cost* (US$)	VAT (US$)	Import Duty (US$)	Total (US$)
Process Plant Infrastructure	1,531,296	78,175	43,992	1,653,463
Heap Leaching	15,617,045	914,445	519,000	17,050,490
ADR. Electrowinning and Goldroom	5,800,122	26,255	286,203	6,112,580
Laboratory	828,156	240	41,308	869,704
Reagent Storage and Preparation	205,805	1,440	9,690	216,935
Stacking	156,480	18,778	-	175,258
Total Initial Process Capital Cost	**24,138,904**	**1,039,332**	**900,194**	**26,078,429**

Note: *excluding VAT and import duty
Source: Tetra Tech (2018)

The procedure used in the 2018 Internal Feasibility Study to obtain an estimate for the process area is sufficient for this level estimate. However, there are instances where not enough quotations were received for major equipment items. These gaps should be filled, and the process capital cost confirmed with additional budget quotations.

A sustaining capital investment was not considered due to the short LOM. An allowance for plant maintenance and spares (5% of the capital cost) is included in the operating costs.

SITE INFRASTRUCTURE

Table 9.5 shows the initial site infrastructure capital costs.

Table 9.5 Initial Site Infrastructure Capital Cost

Area	Cost* (US$)	VAT (US$)	Import Duty (US$)	Total (US$)
Haul Roads	3,433,229	411,987	-	3,845,216
Site Gatehouse	183,254	21,990	-	205,244
Explosives Storage	85,217	10,226	-	95,443
Site Administration Office	516,535	60,423	651	577,608
Workshop	216,089	16,283	4 020	236,392
Access Roads	3,924,587	470,950	-	4,395,537
Fire Station	86,907	9,168	525	96,600
Site Vehicles	1,183,623	136,035	-	1,319,658
Geohazard Management	250,000	30,000	-	280,000
Total Initial Site Infrastructure Capital Cost	**9,879,441**	**1,167,063**	**5196**	**11,051,700**

Note: *excluding VAT and import duty
Source: Tetra Tech (2018)

The allowance for geohazard management should be confirmed with a detailed geohazard assessment of the site.

INITIAL SITE UTILITIES

Table 9.6 shows the initial site utilities capital costs.

Table 9.6 Initial Site Utilities Capital Cost

Area	Cost* (US$)	VAT (US$)	Import Duty (US$)	Total (US$)
Power Generation and Fuel Farm	2,725,914	25,564	192,640	2,944,118
Plant Water System	215,247	1,926	9,960	227,133
Power Distribution	4,156,306	141,061	238,464	4,535,831
Control System	902,491	6,466	66,778	975,735
Fire Water System	113,700	1,806	4,933	120,439
Total Initial Site Utilities Capital Cost	**8,113,658**	**176,823**	**512,774**	**8,803,255**

Notes: *excluding VAT and import duty

Fuel capacity was calculated by adding the fuel requirements per day for the power plant, haul trucks, other vehicles, eluent heating, regen kiln, smelting furnace, and camp heating. That total was then multiplied by strategic and operational storage capacity to arrive at on-site storage capacity required.

9.1.5 INDIRECT COSTS

AACE defines indirect costs as:

"...costs not directly attributable to the completion of an activity, which are typically allocated or spread across all activities on a predetermined basis. In construction, (field) indirects are costs which do not become a final part of the installation, but which are required for the orderly completion of the installation and may include, but are not limited to, field administration, direct supervision, capital tools, start-up costs, contractor's fees, insurance, taxes, etc."

The total initial indirect capital cost from the 2018 Internal Feasibility Study is estimated to be US$15.4 million, excluding VAT and US$16 million including VAT.

Indirect capital costs include project indirect costs, Owner's cost, and contingency allowance. The estimate assumes no EPCM contractor, with the Owner hiring personnel and consultants as required.

Table 9.7 Initial Indirect Capital Costs

Area	Cost* (US$)	VAT (US$)	Import Duty (US$)	Total (US$)
Contractor Overheads	2,898,678	347,841	-	3,246,519
Transport and Logistics	1,398,262	167,791	-	1,566,053
Commissioning	600,000	72,000	-	672,000
Commissioning Spares	127,343	5,280	8,414	141,037
Critical Spares	1,492,338	103,200	80,886	1,676,424
First Fills	807,903	9,600	42,077	859,580
Owner's Team	8,063,347	249,140	-	8,312,487
Total Initial Indirect Capital Cost	**15,387,871**	**954,853**	**131,377**	**16,474,101**

Notes: *excluding VAT and import duty

Indirect costs plus contingency is generally expected to be about 40% of direct cost, currently it is at 27%. It is acknowledged that the high cost of earth works could skew the estimate, it is suggested that the indirect cost items be re-confirmed as part of an updated estimate.

CONTRACTOR OVERHEAD

The contractor overhead cost is the cost of contractors to operate on site and execute their work, but that is not directly associated with the quantity of activities (e.g., cubic metres of concrete or tonnes of steel).

TRANSPORTATION AND LOGISTICS

Freight and logistics are important components for the Tulkubash Project due to the remoteness of the site and the mountain passes that need to be crossed in order to deliver anything to site. Equipment and supplies are shipped in from a number of countries, which will incur high freight and logistics charges. These items are brought in by train, staged and are then transferred to road vehicles which will transport it over three mountain passes in limited container weights and sizes, which will increase the number of loads and definitively the cost. Unless there are transport costs buried in direct costs, this number should be re-confirmed

Transportation rates were received from Move One Inc., a specialist logistics company in the region, and the cost estimates were compared with advice from ICT Logistics, a logistics co-ordinator.

Although transportation costs were completed in detail by assigning specific costs for significant items and estimated with allowances for the rest (as well as allowances for bulk material) the costs are still deemed to be too low. A freight and logistics cost closer to US$5 million should be expected. An independent logistics study should be completed and the costs for freight and logistics should be reconfirmed as part of an updated capital cost estimate. The logistics cost for concrete (including cement and re-bar) is unclear.

COMMISSIONING

Commissioning costs is deemed to be too low, a number of expensive professionals will be flown in from around the world to commission the plant, in a very remote area. This number is an allowance of US$600,000 and the basis for this is not clear. It is suggested that this number be further investigated and reconfirmed as part of an updated estimate.

CRITICAL SPARES

Critical spares were included as part of the budget quotations for equipment packages received from vendors.

FIRST FILLS

The first fills estimate includes provision for initially stocking stores with consumables and general spares.

OWNER'S COST

In addition to labour costs, Owner's costs include off-site office staffing, off-site office families, travel, off-site office general expenses, computer hardware, software and phone expenses, recruiting and training expenses, consulting, insurance, general field expenses, and mineral lease and claims costs. Environmental department Owner's costs include environmental monitoring programs, community relations costs, communication and public relations costs, and permitting costs.

The Owner's cost provides for Owner-related activities associated with the Chaarat Gold Project and includes the allocation of head office costs for CGHL, as well as EPCM functions. The EPCM cost is believed to be understated as the Owner is planning to perform this function. The 2018 Internal Feasibility Study estimate was prepared with a list of line items for various personnel, equipment, and general costs; however, the Owner's cost seems to be too low and should be re-confirmed.

CONTINGENCY AND ALLOWANCES

The total capital contingency allowance is US$12.3 million, which is 11% of the total capital cost estimate. The contingency percentage for each item in the estimate was individually assessed based on the accuracy of quantity measurement, type, scope of work, and price information. The estimate does not provide for escalation, nor for exchange rate fluctuations. A contingency of 11% for this level of estimate is within acceptable limits.

Tetra Tech estimated a closure cost of US$6.5 million (including taxes) for the labour and operating costs of the HLF during the flushing, drainage, and rehabilitation stages of the closure plan.

Due to the short LOM, it was assumed that the residual value of the processing plant and equipment will cover the costs of dismantle and removal from site, as well as rehabilitation of the mine, process, and infrastructure areas.

9.2 OPERATING COST ESTIMATE

Operating costs consist of mining, process, G&A, refining, and doré transport costs. The LOM operating cost estimate from the 2018 Internal Feasibility Study is US$260 million or US$16.32/t ore (including VAT) (Table 9.8). Table 9.8 also shows the adjusted LOM operating costs taking into consideration the increase G&A costs (due to the addition of labour costs) with the LOM operating cost at US$296 million or US$16.82/t ore.

Table 9.8 Tulkubash Project Operating Cost Estimate

Area	2018 Internal Feasibility Study		Adjusted G&A*	
	Cost Including VAT (US$)	Cost Including VAT (US$/t ore)	Cost Including VAT (US$)	Cost Including VAT (US$/t ore)
Contract Mining Cost	156,800,000	9.80	156,800,000	9.80
Owner Mining Costs	6,429,000	0.40	6,429,000	0.40
Processing Costs	75,898,000	4.75	75,898,000	4.75
G&A Costs	18,365,000	1.15	26,592,000	1.66
Refining Costs	3,257,000		3,257,000	*
Gold Transport Costs	239,000	-	239,000	-
Total LOM Operating Cost	**260,988,000**	16.32-	**269,215,000**	16.82

Note: *Adjusted G&A increased by 44% from US$1.15/t ore to US$1.66/t ore, with resultant increase of 3% in Operating costs

9.2.1 MINING

Mining costs are based on International Mining Consultants' (IMCs) mine plan and schedule and the contract mining rates for ore and waste quoted by Ciftay from the 2018 Internal Feasibility Study. IMC completed a cost review on the Ciftay contractor rate, with a 15% assumed contractor mark-up, and were calculated at US$1.97/t of material mined, which correlates with the Ciftay quote of US$2.02/t of material mined.

The Ciftay quote includes rates for drill, blast, load, and haul costs as well as materials, fuel, equipment, maintenance, labour, and management and personnel accommodation costs.

The Ciftay quote is based on a fuel cost of US$0.54/L and explosives costs, both provided by CGHL, and daily camp cost at US$13 per person per night. Table 9.9 shows the Ciftay contractor rates used to calculate the mining costs. A density of 2.66 t/m³ was applied to all cost calculations.

Table 9.9 Ciftay Mining Operating Costs

Area	Ciftay Quotation (US$/m³)	Cost Excluding VAT (US$/m³)	Cost Including VAT (US$/m³)	Cost Including VAT (US$/t)
Waste	4.63	4.53	5.07	1.703
Ore	6.64	6.50	7.28	2.443

Source: Ciftay quote 0020/678 dated 16th April 2018 and CGHL VAT adjustment calculation

9.2.2 PROCESS

Table 9.10 summarises the process operating costs.

Table 9.10 Process Operating Costs

Area	Process Operating Cost (US$/t of ore processed)	
	Excluding VAT	Including VAT
Consumables	1.17	1.32
Reagents	1.99	2.23
Power	0.70	0.78
Light Vehicles	0.02	0.02
Labour	0.25	0.25
Maintenance and Spares	0.16	0.18
Total Process Operating Cost	**4.28**	**4.78**

The largest cost contributors are reagents, consumables, and power.

CONSUMABLES AND REAGENTS

Reagent consumptions were estimated based on the 2018 Internal Feasibility Study test work results, from experience on similar projects, or using industry standard assumptions. The annual reagent consumptions were calculated by multiplying the hourly plant consumption for a typical year at full production.

The unit cost of reagents and consumables were provided by CGHL, based on quotations provided by vendors (FOB), plus transport costs to site, plus application import duties and VAT. Table 9.11 summarises the reagent and consumable cost estimate.

Table 9.11 Reagents

Area	Unit	Consumption Per Unit	Cost per Unit (US$)		Cost including VAT and Duty (US$/a)	Cost including VAT and Duty (US$/t)
			Excluding VAT	Including VAT		
Leach, Adsorption and Detoxification						
Cyanide - Leaching	kg/t ore	0.60	2.63	2.95	8,716,624	1.77
Lime - pH modification	kg/t ore	0.50	0.31	0.35	864,153	0.18
Stripping and Goldroom						
Cyanide - Striping	kg/t carbon	8.5	2.63	2.95	91,422	0.02
Sodium Hydroxide	kg/t carbon	25	0.62	0.70	63,671	0.01
Hydrochloric Acid	kg/t carbon	150	0.78	0.87	478,909	0.10
Activated Carbon	kg/t carbon	25	1.60	1.79	163,520	0.03
Fluxes	kg/oz Au & Ag	0.15	1.36	1.52	25,255	0.01
Diesel - Furnaces	L/mo	20,000	0.48	0.54	129,024	0.03
Laboratory supplies	US$/a	-	394,268	441,580	441,580	0.09
Total Reagents Cost	**-**	**-**	**-**	**-**	**10,974,158**	**2.23**

Table 9.12 Consumables

	Operating Hours per Year	Consumption (Excluding VAT and Duty) (US$/h)	Cost (Including VAT and Duty) (US$/a)	Cost (Including VAT and Duty) (US$/t)
Vibrating Grizzly	6,132	3.66	26,258	0.01
Jaw Crusher	6,132	54.48	390,863	0.08
Screens	6,132	3.64	76,154	0.02
Cone Crusher	6,132	62.40	1,304,741	0.26
Trucks	7,300	43.55	2,461,005	0.50
Dozers	7,300	147.11	1,202,748	0.24
Loader	7,300	83.55	683,134	0.14
Piping/Drip Emitters (Fixed Allowance)	-	-	377,941	0.08
Total Consumables Cost	**-**	**-**	**6,522,845**	**1.32**

POWER

Power consumption per ton was calculated as annual power requirement per area multiplied by the unit power rate of US$0.15/kWh based on a fuel price of US$0.54/L, including VAT, divided by the annual tonnage processed. Table 9.13 summarises the process power costs.

Table 9.13 Process Power Operating Costs

	Absorbed Power (kW)	Operating Hours per Year	Cost Including VAT (US$/a)	Cost Including VAT (US$/t)
Crushing and Material Handling	1,890	6,132	1,749,363	0.35
Solution Handling	1,385	7,906	1,652,899	0.34
CIC Circuit	72	7,906	85,462	0.02
Acid Wash	10	1,460	2,292	0.00
Elution and Electrowinning	292	2,920	128,728	0.03
Carbon Regeneration	82	7,906	98,066	0.02
Filtration and Goldroom	23	2,920	10,228	0.00
Reagent and Utilities	38	7,906	45,357	0.01
Plant Lighting (2%)	-	-	75,448	0.02
Total Process Power Cost	**-**	**-**	**3,847,843**	**0.78**

LABOUR

The labour costs were developed based on a schedule of labour costs by labour category (fully burdened employment costs to CGHL) in the Kyrgyz Republic, which was provided by CGHL. The total process labour cost was calculated as US$817,850 and the total process maintenance cost was calculated as US$393,000

MAINTENANCE AND SPARES

Maintenance and spares were calculated assuming 5% of the cost of the mechanical equipment.

9.2.3 GENERAL AND ADMINISTRATIVE

The G&A costs were developed in conjunction with CGHL and are based on the labour costs provided by CGHL.

Table 9.14 shows a detailed breakdown of the annual G&A costs for an average year at full production. The total G&A cost has increased by US$26,592 due to the addition of labour costs.

Table 9.14 G&A Operating Costs

Description	Normal Operations Excluding VAT (US$/a)	Normal Operations Including VAT (US$/a)
Clinic	100,000	112,000
Personnel Transport	143,812	161,069
Chatkal Station	38,314	42,912
Light Vehicle Usage	177,929	199,280
Power	611,698	685,102
IT and Communications	132,143	148,000
Environmental and Social Training	150,000	168,000
Land and Property Tax and Rates	Understood to be included in the licence	
Environmental Expenses	301,228	337,375
Corporate Social Responsibility	205,357	230,000
Camp	449,080	502,970
Security Supplies	25,000	28,000
Insurance	Chaarat proposes to self-insure	
Regulatory Compliance	80,000	89,600
Consultants	100,000	112,000
Head Office Expenses	240,000	268,800
Health and Safety	217,900	244,048
Travel and Expenses	Senior management travel included in corporate costs-	
Site Services	659,005	738,086
Avalanche Management	250,000	280,000
Miscellaneous	200,073	224,082
Labour cost	26,592	26,592
Total G&A Cost	**4,108,132**	**4,597,917**

10.0 ECONOMIC ANALYSIS

10.1 SUMMARY

The economic analysis was based on a pre-tax and pre-financing financial model (inclusive of VAT and import duties, both of which are not recoverable). The base case uses a gold price of US$1,300/oz, a 3.75-year LOM, a 16 Mt Ore Reserve, and a foreign exchange rate KGS70:US$1. All currency units are in US dollars unless otherwise specified. Table 10.1 shows the internal rate of return (IRR), net present value (NPV), and payback period from the 2018 Internal Feasibility Study and after the operating cost estimate was adjusted for labour.

Table 10.1 IRR, NPV and Payback for the Chaarat Gold Project

	Unit	2018 Internal Feasibility Study (Including VAT)	Adjusted* (Including VAT)
IRR	%	8.2	6.5
Payback	years	3.2	3.3
NPV @ 5% Discounted Rate	US$ million	12.1	5.3

Note: *G&A cost adjusted to $1.66/t ore

The updated Tulkubash Mineral Resource estimate (effective 28th August 2018) shows indications of an improved Ore Reserve, which could increase the financial outlook of the Chaarat Gold Project

10.1.1 SENSITIVITY ANALYSIS

The Chaarat Gold Project's NPV, calculated at a 5% discount rate, is most sensitive to revenue followed by operating costs and capital costs.

The Chaarat Gold Project's IRR is most sensitive to operating costs followed by revenue and capital costs.

The payback period is most sensitive to revenue, followed by operating costs and capital costs.

10.2 INPUT PARAMETERS

Table 10.2 shows the input parameters used in the financial model.

Table 10.2 Mine Production from the Tulkubash Project

Description	Unit	Value
Total Tonnes to HLF	kt	15,993
Average Daily Tonnes to HLF	t/d	13,500
Total Waste Tonnes Mined	kt	65,110
LOM	years	3.75
Average Head Grade		
Gold	g/t	0.91
Silver	g/t	1.13
Recoveries		
Gold	%	76.5
Silver	%	61.80
Total Production		
Gold	('000 tr oz)	360
Silver	('000 tr oz)	360

The peak funding requirement is US$141.5 million in the first six months of operation, due to the delay in gold production from the HLF.

The head grade of 0.91 g/t gold and 1.13 g/t Ag were calculated as part of the Mineral Resource model. It is acknowledged that the updated Mineral Resource model has rendered higher grades which will most likely improve the financial result. An Ore Reserve model not available at the time of writing this CPR; adjusted numbers could not be reflected as part of this section. Please see Section 5.0 of this report for updated head grade.

Smelter terms were obtained from Kyrgyzaltyn OJSC and were calculated at US$0.26/g at 31.1035 g/tr oz, which equals US$8.09/tr oz. It is assumed that Kyrgyzaltyn OJSC will only enter into a supply contract after an extensive audit is completed on the Tulkubash Project and the raw material supply chain, as stated in their letter dated 16th February 2018.

Penalties are assumed to be zero as doré will not exceed the free limits specified for harmful impurities.

Commodity prices were obtained from the publication *Summary of Select Energy & Metal Consensus Forecasts* by the Energy and Metals Consensus Forecast (EMCF 2018).

Transportation costs were calculated according to a proposal supplied by Interpost Ltd/Brinks Inc. A monthly trip is assumed to cost US$6,036.46 per trip, calculated as US$1,400 plus 0.03% of cargo value at a market rate of US$1.329.90 x 10,000 oz per trip x 12% VAT.

Table 10.3 Foreign Exchange Rates

Currency	Currency Conversion	Inverse Rate
EUR	1.25000	0.8000
KGS	0.01429	70.0000
USD	1.00000	1.0000

Source: Internet conversion calculator April 2018

Royalties are payable to the Kyrgyz Republic government and were calculated using Table 10.4 obtained from CGHL A revenue tax of 1% and a fixed royalty of 7% is indicated for gold price of US$1,300 therefore the total royalty percentage of 8% which resulted in an allowance of US$37,927 million for royalties payable.

Table 10.4 Royalty Calculations

Royalty (%)	Non-tax (%)	Fixed Royalty Total (%)	Price per troy ounce (US$)		Revenue Tax (%)	Total Fixed Royalty Plus Revenue Tax (%)
			From	To		
5	2	7	0	1,300	1	8
5	2	7	1,301	1,400	3	10
5	2	7	1,401	1,500	5	12
5	2	7	1,501	1,600	7	14
5	2	7	1,601	1,700	9	16
5	2	7	1,701	1,800	11	18
5	2	7	1,801	1,900	13	20

10.3 BASIS OF FINANCIAL EVALUATION

The production schedule was incorporated into financial model to develop the annual recovered gold production from the relationships between tonnage processed, head grades, and recoveries.

Payable gold values were calculated using the base case gold prices and refining terms presented by Kyrgyzaltyn OJSC. Transport costs were included based upon a proposal from Interpost Ltd/Brinks Inc.

The net invoice value was calculated for each month by subtracting the applicable refining charges from the payable metal value. The at-mine revenues were then estimated by subtracting the transportation and insurance costs.

Operating costs for contract mining, owner mining, processing and G&A were deducted from the net revenue to derive the operating cash flows.

Initial capital, working capital, and closure costs have been incorporated over the LOM. Capital expenditures were then deducted from the operating cash flow to determine the net cash flow.

Initial capital expenditures include costs accumulated prior to the first production of gold.

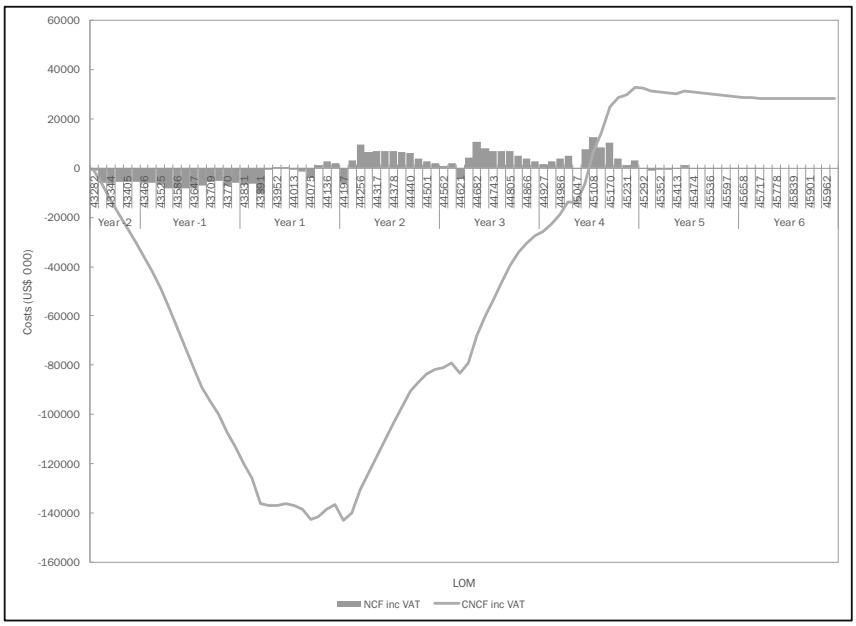
The pre-production construction period is twenty-one months. The NPV of the Tulkubash Project was calculated at the beginning of this period.

Working capital is assumed to be one month of the annual on-site operating cost and fluctuates from month to month based on the operating cost. The working capital will be recovered at the end of the LOM. The working capital was reduced from three months to one month, which is justified as the mining costs will be paid one month in arrears and the gold revenue will be received in the month of production. However, the working capital requirement will increase over the first year as production and operating costs increase.

Mine closure and reclamation costs were estimated and included as capital costs.

The undiscounted annual net cash flow (NCF) and cumulative net cash flow (CNCF) are illustrated in Figure 10.1.

Figure 10.1 NCF and CNCF (including VAT



Due to the delay in gold production from the HLF, the peak funding requirement rises to $141.5 million in the first six months of operation.

10.3.1 ASSUMPTIONS

The following assumptions were made:

- There is no tax payable on profit.
- There will be no penalties for impurities

Kyrgyzaltyn OJSC a wholly state-owned company, will take full production capacity of doré from the Tulkabash Project. Gold is governed by an international market and market price if Kyrgyzaltyn OJSC does not take the full production. Then the doré will be sold on the international market assumed at this stage under the same conditions.

10.3.2 TAX

There is no tax payable on profit. Letters from Baker and Tilly LLP dealt with VAT and import duties that are payable and not recoverable. As such, the financial model that was completed for the 2018 Internal Feasibility Study is regarded as a pre-tax model. An additional pre-tax model was developed by stripping out VAT and import duties to derive an artificial pre-tax model which was quoted in the 2018 Internal Feasibility Study as pre-tax. The validity of this approach should be confirmed with a tax consultant as it should be considered as a pre-tax cashflow excluding VAT. The suggestion is that no post tax comments can be made as the only tax calculated was VAT, import duty and royal all regarded as pre-tax tax on purchases and revenue and not on profit.

10.4 SUMMARY OF FINANCIAL RESULTS

The financial model was established on a 100% equity basis, excluding debt financing and loan interest charges. The financial results for the base case are presented in Table 10.5 both with the pre-tax results and including VAT and Import Duties.

Table 10.5 Summary of Financial Results

Item	Units	2018 Internal Feasibility Study (Including VAT)	Adjusted (Including VAT)
Gold Price (LOM Weighted Average)	US$/tr oz	1,300	1,300
Recovered Gold	'000 tr oz	360	360
Recovered Silver	'000 tr oz	360	360
Recovered Gold Value	US$000	467,430	467,430
Recovered Silver Value	US$000	6,653	6,653
Payable Gold	'000 tr oz	360	360
Payable Gold Value	US$000	467,430	467,430
Refining Charge	US$000	(3,257)	(3,257)
Net Invoice Value	US$000	470,827	470,827
Transportation and Insurance Costs	US$000	(239)	(239)
At-mine Revenue	US$000	470,588	470,588
Royalty	US$000	(37,927)	(37,927)
Net Revenue	US$000	432,661	28,456
Contract Mining Cost	US$000	(156,800)	(156,800)
Owners Mining Cost	US$000	(6,429)	(6,429)
Processing Cost	US$000	(75,898)	(75,898)
G&A Cost	US$000	(18,365)	(26,592)
Total On-site Operating Costs	US$000	(257,492)	(269,215)

table continues...

Item	Units	2018 Internal Feasibility Study (Including VAT)	Adjusted (Including VAT)
Operating Cash Flow	US$000	175,169	166,942
Initial	US$000	(131,984)	(131,984)
Sustaining	US$000	(0)	(0)
Closure and Reclamation	US$000	(6,511)	(6,511)
Total Capital Costs	US$000	(138,496)	(138,496)
Initial Working Capital Requirement	US$000	(4,229)	(4,406)
Peak Working Capital Requirement	US$000	(6,603)	(6,780)
Net Cash Flow	US$000	36,673	28,446
NPV at 5% Discount Rate	US$000	12,069	5,311
NPV at 10% Discount Rate	US$000	(6,510)	(12,396)
Pre-tax IRR	%	8.2	6.5
Pre-tax Payback	years	3.2	3.3
Average Operating Cash Cost	US$/tr oz Au recovered	726	749
Capital Cost	US$/tr oz Au recovered	385	385
Total Cost	US$/tr oz Au recovered	1,217	1,239
All-in Sustaining Cost	US$/tr oz Au recovered	831	854

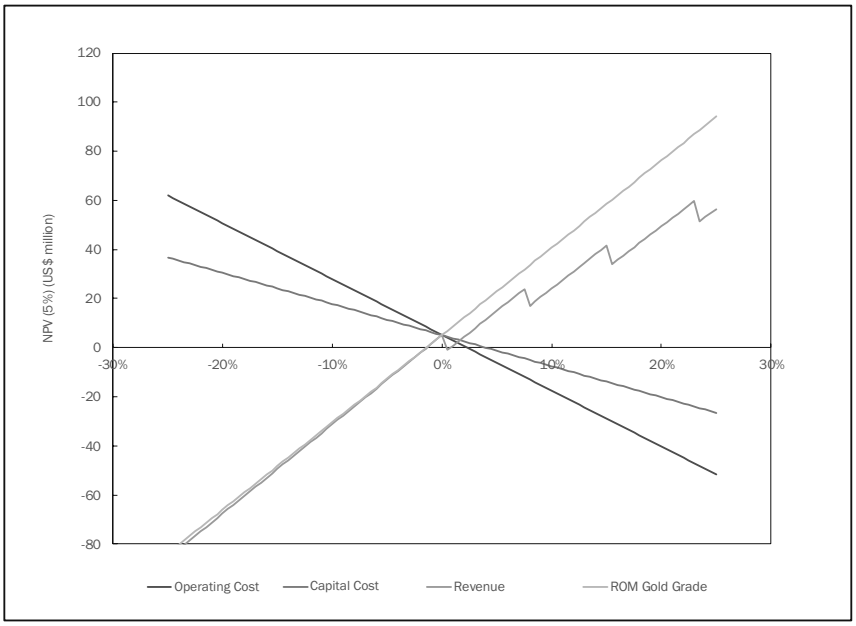
10.5 SENSITIVITY ANALYSES

The sensitivity of NPV, IRR, and payback period to the key project variables was analysed using the post-tax base case as a reference, each of the key variables was changed between –25% and +25%, while maintaining the other variables constant. The following key variables were investigated:

- revenue (gold price)
- capital costs
- operating costs.

The Tulkubash Project's post-tax NPV, calculated at a 5% discount rate, is most sensitive to revenue followed by operating costs and capital costs, as shown in Figure 10.1. A 2% drop in the gold price would reduce the NPV to zero and a 2.5% increase in Operating cost would drop the NPV to zero. The step change in the royalty calculation with the increasing gold price leads to a stepped revenue sensitivity.

Figure 10.2 NPV (including VAT) Sensitivity Analysis



As shown in Figure 10.3, the IRR is most sensitive to revenue followed by operating costs, and capital costs. An 8.5% drop in gold price to $1,190/tr oz reduces the IRR to zero. And an increase of 11% in operating cost from US$269 million to US$299 million would reduce the IRR to zero.

A drop of 7% in gold price would reduce the IRR to zero, at US$1,213/tr oz and an 11% increase in operating cost would drop the IRR to zero.

Table 10.6 NPV Sensitivity at 10% Discount Rate (Adjusted including VAT) (US$000)

Sensitivity Factor (%)	Operating Cost	Capital Cost	Revenue	ROM Gold Grade
25	(60,829)	(42,764)	30,887	62,544
20	(51,143)	(36,691)	24,896	47,556
15	(41,456)	(30,617)	18,238	32,568
10	(31,770)	(24,544)	3,584	17,580
5	(22,083)	(18,470)	(4,073)	2,592
0	(12,396)	(12,396)	(12,396)	(12,396)
-5	(2,710)	(6,323)	(27,716)	(27,385)
-10	6,977	(249)	(43,036)	(42,373)
-15	16,663	5,824	(58,356)	(57,361)
-20	26,350	11,898	(73,676)	(72,349)
-25	36,037	17,971	(88,996)	(87,337)

Note: *G&A cost adjusted to $1.66/t ore

Figure 10.3 IRR (including VAT) Sensitivity Analysis

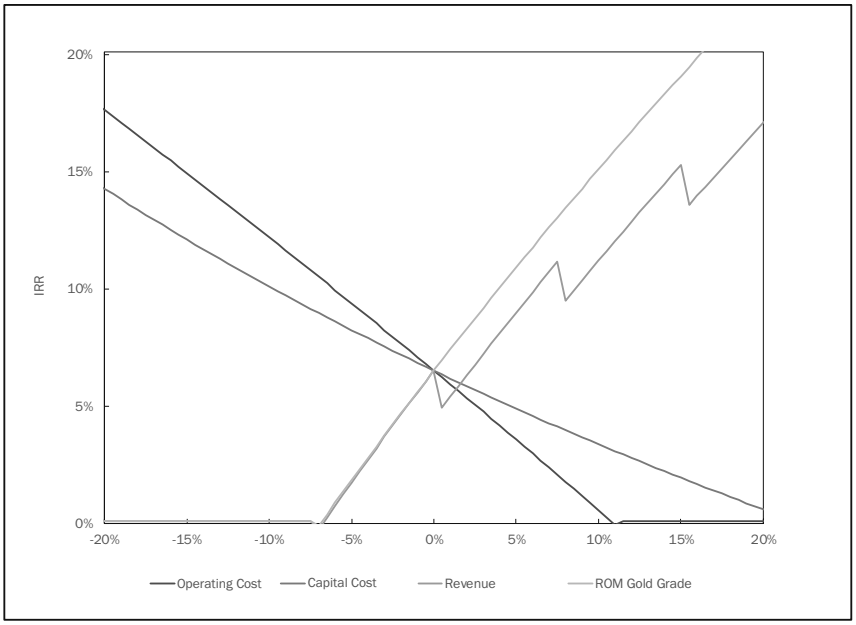
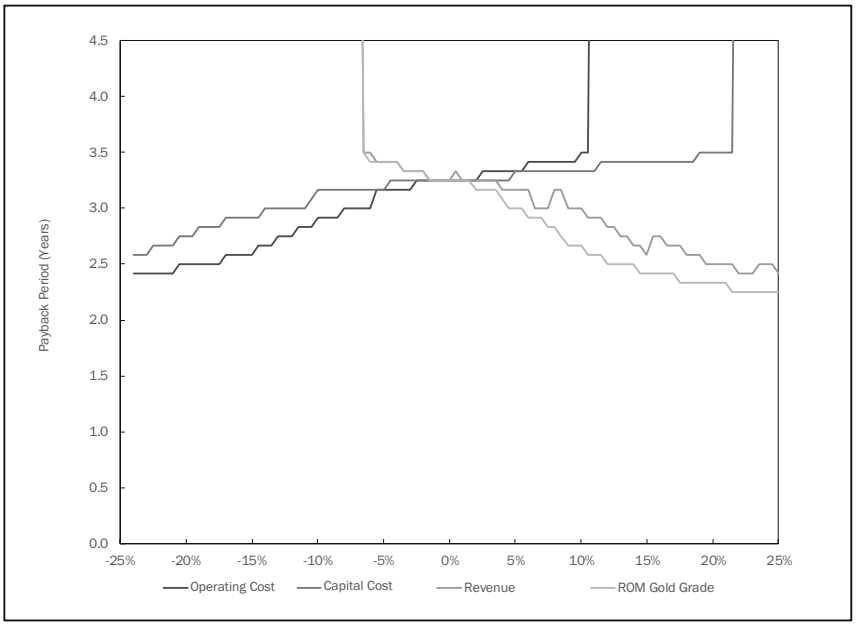


Figure 10.4 shows that the payback period is most sensitive to revenue and operating costs, followed by capital costs. The sensitivity on project economic analysis suggests that if gold price drops below US$1,216/tr oz the Tulkubash Project is unlikely to reach payback and if the operating costs increases by more than 10.5% to over $18.61/t ore processed, the Tulkubash Project is unlikely to payback during the operating LOM.

Figure 10.4 Payback Sensitivity Analysis



It can be concluded that the Tulkubash Project is most sensitive to revenue, followed by operating cost and then capital cost

10.6 ECONOMIC RISKS

The results of the economic analyses discussed in this section represent forward looking information. The results depend on inputs that are subject to a number of known and unknown risks, uncertainties and other factors that may cause actual results to differ materially from those presented here.

Information that is forward-looking includes:

- Mineral Resource and Ore Reserve estimates
- assumed commodity prices and exchange rates
- mine production plans
- projected recovery rates
- sustaining and operating cost estimates
- assumptions as to closure costs and closure requirements
- assumptions as to environmental, permitting and social risks

Additional risks to the forward-looking information include:

- changes to costs of production from what is assumed
- unrecognized environmental risks

- unanticipated reclamation expenses
- unexpected variations in quantity of mineralised material, grade, or recovery rates
- geotechnical and hydrogeological considerations during mining being different from what was assumed
- failure of plant, equipment, or processes to operate as anticipated
- accidents, labour disputes and other risks of the mining industry.

11.0 PROJECT EXECUTION PLAN

11.1 OBJECTIVES

The project execution plan framework that was presented by Tetra Tech in the 2018 Internal Feasibility Study is sufficient for this level of study. The stated objectives of CZ strategy to unlock the long-term value of the Chaarat Gold Project is outlined in the following stages.

- Stage 1 – Extend the Tulkubash Project heap leachable oxide resource base; develop low capital intensity heap leach production.
- Stage 2 – Ongoing Tulkubash Project oxide exploration; expand heap leach production capacity.
- Stage 3 – Complete a detailed Feasibility Study for the refractory Kyzyltash sulphide ore body.
- Stage 4 – Develop parallel sulphide processing facility.

The Chaarat Gold Project objective is to generate significant equity reserves through the development of the Tulkubash Project oxide orebody, to unlock the long-term Kyzyltash deposit.

Key performance indicators (KPIs) outline factors that are crucial to the success of a project. Table 11.1 shows the Tulkubash Project KPI.

Table 11.1 Tulkubash Project Key Performance Indicators

KPI	Unit	Value
Mining Production Rate	t/d	13,500
Plant Availability	-	>0.80
Metallurgical Gold Recovery	-	>0.70
Total Operating Cost	$/t processed	<20
Environment	-	minimise harm and impact

11.1.1 PROJECT CONSTRAINTS

STATUTORY AND COMMUNITY REQUIREMENTS

Project execution, and the associated permit and license applications required, are subject to Kyrgyz Republic federal and regional regulatory frameworks. Part of the application and approval process includes submitting formal studies including TEO (feasibility study), Proekt (design documentation), and OVOS (environmental impact assessment).

PROJECT AND SITE-SPECIFIC CONSTRAINTS

The following constraints apply to the Chaarat Gold Project:

- All power will be self-generated.
- All consumables, personnel, and spares will be transported over mountainous terrain to site.
- Extreme winter conditions prevail for approximately three months of the year. Between November and April, it may be too cold to install the HLF liner.
- Site access for large and heavy loads is limited. Maximum container size will be 20 feet long.
- Personnel and small, incidental loads can be flown in by chartered helicopter.
- The Chaarat Gold Project needs to be self-reliant as there is no logistic or infrastructure support in the region.

TECHNOLOGY

The specification and operation of equipment is governed by the extreme weather and the challenging transport logistics.

Where possible, the selection of technology should consider CZ's aim to employ personnel as local to the site as possible.

LANGUAGE AND CULTURE

It is acknowledged that there is a difference in culture and professional practice between the stakeholders, and this needs to be considered at every phase of the Chaarat Gold Project. Clear communication of intent and required outcome, without assuming the other party automatically knows what is expected of them, is essential.

11.1.2 ORGANIZATION AND RESPONSIBILITIES

OVERVIEW

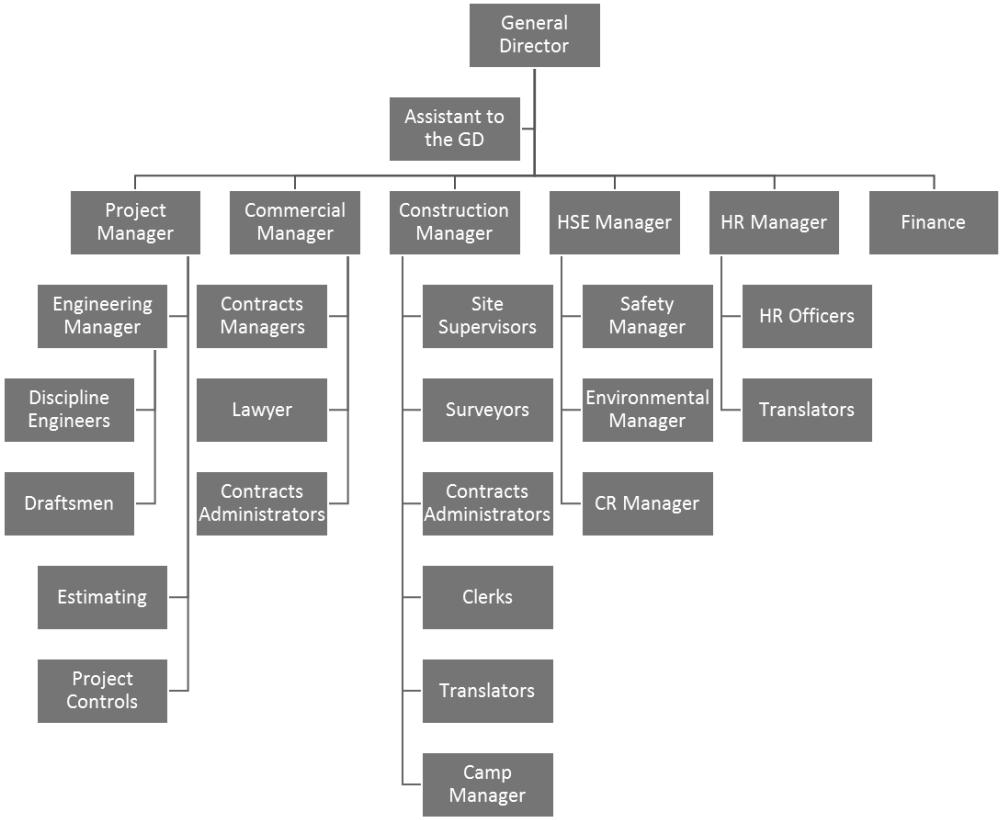
CZ intends to use Kyrgyz Republic nationals, specifically people from the Chatkal province, to build a team to construct and operate the Chaarat Gold Project. Specialist skills will be imported from further away where required and limited to temporary appointments where possible.

The Chaarat Gold Project will be managed from the Bishkek administration office headquarters of CZ.

PROJECT ORGANIZATION STRUCTURE

Figure 11.1 shows the planned organizational structure for CZ.

Figure 11.1 Chaarat Gold Project Organizational Structure



ROLES AND RESPONSIBILITIES

The roles and responsibilities identified by Tetra Tech are summarized in Table 11.2.

Table 11.2 Roles and Responsibilities

Description	CZ	Tetra Tech	Mine Designer	Mining Contractor	Earthworks Contractor
Requirement Statement	A	R	-	R	R
Project Management	A	R	-	-	C
Basic Engineering	I	A	-	-	C
Detailed Design Mine	C	I	A/R	C	-
Detailed Design Infrastructure	I	A	-	-	C
Procurement	A	R	-	R	R
Logistics and Transport	A	C	-	R	R
Contract Administration	A/R	I	-	C	C
Contract Management	A/R	I	-	C	C
Construction Installation	A	R	-	-	R
Payments	A/R	-	-	-	-
Project Cost Control	A	R	-	R	R
Quality Management	A	R	-	R	R
Commissioning	A	R	-	-	-
Ramp-up	A	C	-	R	C

Notes: R = responsible; A = accountable; C = consult; I = inform

11.1.3 SCHEDULE

CZ's stated objective is to design and construct all mission critical components of the Chaarat Gold Project such that first gold is poured at the end of Q4 2020.

The execution strategy will have the following features:

- fast-track approach with design, construction, and permitting in parallel
- single mining contractor
- single major earthworks contractor
- modular design with offsite construction assembly and checking.

KEY SCHEDULE PARAMETERS

The schedule from the 2018 Internal Feasibility Study produced by Tetra Tech is outdated and needs to be re-done due to milestones that have already lapsed.

Table 11.3 Chaarat Gold Project Execution Plant Constraints

Constraints	Value
First Access Across Existing Roads to Site 2018	1 May 2018
Limited Access due to Snow Periods	January – March
Avalanche Risk Periods	February – March
Ambient Conditions Suitable for Conventional Concrete Curing	May – October
Ambient Conditions Suitable for Installation of Lining Systems	April – October
Minimum Time between Start of Irrigation and First Pregnant Solution	2 months

Table 11.4 High-level Activities and Durations

Activity	Durations (mo)	Dependency
Major Earthworks Contractor Mobilisation	2	Appointment of contractor.
Process Plant Construction	15	Detailed design by area. Subarea completion of earthworks. Procurement of long-lead items.
Mine Pre-strip	18	Mobilisation of mining contractor.
Kumbel to Site Access Road Construction	12	Mobilisation of contractor.
HLF Pad Construction		
Provide Access for Construction	1	Mobilisation of contractor.
Geohazard Assessment and Ground Investigation Site Works	3	First available weather window.
Install Geohazard Mitigation Measures	4	Geohazard assessment complete.
Topsoil Strip and HLF Bowl Scalping	2	Legalised design. Construction permits. Access for construction.
Surface Water Management Features and Drain	3	Legalised design. Construction permits. Access for construction.
Dams Construction	6	Surface water management features and drain completion.
Lining System Installation	5	Topsoil strip and HLF bowl scalping. Dam completion.
Place Overliner	2	Liner installed. Crushed overliner material available.

11.1.4 PROJECT EXECUTION

STRATEGY

Construction will be undertaken by a series of contracts:

- a single contract to develop the mine, complete major earthworks, construct and operate the camp, and construct and stack the HLF
- specialist lining contractor
- structural, mechanical, platework, and piping

- electrical, instrumentation, and control.

To appropriately schedule and manage these activities, a construction schedule will be developed to incorporate the EPCM and project management activities.

INTERFACES

External interfaces include local and federal authorities, suppliers, consultants, refineries, contractors, the local communities, shareholders and the CGHL Board of Directors. The project execution strategy is novel and will require careful management of these interfaces. A reliable, bilingual document management system will be essential. Language and culture needs to be navigated carefully.

12.0 RISKS AND OPPORTUNITIES

12.1 GEOLOGY

The August 2018 Mineral Resource update has increased the Mineral Resource to 1.5 million tr oz of gold. This represents a 57% increase in Measured and Indicated grade, up to 1.35 g/t gold.

A lot of work was completed to de-risk the previous Mineral Resource model through reinterpretation of the geological control, based in part by new understanding gained from the drill programme. The 2018 drilling campaign is part way through and this Mineral Resource update is a mid-year interim update based on an additional 10,525 m of drilling from 63 holes since the January 2018 update. This additional drilling has added 443,000 tr oz of Measured and Indicated gold to the Mineral Resource, a 46% increase, and an additional 20,000 m of drilling is currently under way, representing significant opportunity.

The risks are reflected in the Mineral Resource classification applied to the deposit as defined in the JORC code (2012).

CGHL plans to continue an aggressive drilling programme comprising an additional 30,000 m in 2019 and 15,000 to 20,000 m/a thereafter. The additional 443,000 tr oz of gold added to Measured and Indicated Resource with the first roughly 10,000 m of drilling occur within an approximate 1 km strike length extension of the Tulkubash zone. To date, only approximately 4 km of a 24 km mineralized trend within CGHLs licenses has been drilled. There is therefore considered to be significant upside potential for the discovery of additional gold resources, possibly comprising an entirely new emerging gold district.

12.2 MINING

There are always risks associated with operating in mountainous terrain, but these are surmountable. Avalanches are a particular risk that has been addressed in the pit design and should be adhered to.

The production schedule is ambitious but there is an opportunity to improve this with the Mineral Resource update.

The mining contractor's quote allows for increases in the rate due to haul length. This is normal practice but there is a risk that the contractor may use this as a means to inflate the rates. Good management should mitigate this and could provide an opportunity to reduce the rates.

12.3 METALLURGY AND PROCESS DESIGN

The Tulkubash process plant design does not included an agglomeration step prior to heap leaching. Based on the balance of probabilities with respect to the available test work data, the potential risk associated with this approach is that the fine particles generated during the crushing may accumulate as a layer within the heap leach pads, affect permeability, and hinder solution flow. This may result in gold lock up within the heap in terms of pregnant solution hold-up.

Crushing variability test work was not undertaken for Tulkubash ore. The crushing circuit design was based on the average crusher work index of a composite sample. The potential risk associated with this approach is that the screens may become a bottleneck to heap leach operations during the processing of soft ore.

The Tulkubash Project historical test work indicated mild preg-robbing characteristics in relation to some samples of oxide ore; however, this was not evaluated during the 2018 Interim Feasibility Study test work programs. The possibility of preg-robbing behaviour being exhibited during future heap leach operations cannot be ruled out unless eliminated by further test work.

The Chaarat Gold Project location has wide range of temperature variations ranging from +38ºC to -35ºC. Heap leach kinetics slow down significantly below 7ºC and production may be affected during the winter months.

Significant opportunity exists for the optimisation of the extraction process for Kyzyltash through the implementation of a comprehensive metallurgical testing and development program and associated economic trade-off studies.

The Kyzyltash test work completed to date on the Contact Zone of the mineralisation is limited and scoping level in nature. No test work has been done on the Main Zone mineralisation. The conceptual processing methods are based on the available test work however, the tested sample is not representative of the ore zones. The potential risk associated with this approach is the likelihood that the Main and Contact zones will exhibit different metallurgical processing characteristics

Further operational risks for Kyzyltash are noted:

- The Chaarat Gold Project is located at high altitude (2,320 to 2,480 masl); this means the performance of pre-oxidation processes such as BIOX will be impaired as a result of low oxygen saturation levels at high altitude.
- It may not possible to make a bulk sulphide concentrate at acceptable grades and concentration ratios for the implementation of pre-oxidative treatments such as BIOX or POX
- The oxidation of the refractory ores will produce significant quantities of acid. This in turn require a cheap and ready source of limestone for neutralisation. The lack of local sources for sufficient limestone could be a potential risk.

12.4 ENVIRONMENTAL

Upon review of the completed environmental work for the Chaarat Gold Project, the following opportunities are noted:

- The baseline studies and subsequent impact assessments contain extensive amount of information and data. They provide an opportunity to develop a comprehensive (environmental and social) aspects register to include in the ESMS.
- All management plans are live documents and remain so throughout the life of a project. The time before construction begins provides ample opportunity to develop plans with SMART mitigation from the framework plans that have already been drafted.
- Equally, the timeframes provide time to develop training schemes appropriate for contractors and employees who will arrive on site for the onset of construction.
- Employing the HSE manager and coordinator at the earliest possible time will enable plans and training to be developed for a smooth transition into construction. The ESMS will need to evolve as management plans and standard operating procedures are drafted.
- Stakeholder engagement has been ongoing, and it is apparent that relations are good. Developing the stakeholder engagement plan timeously will enable CGHL to build on the relationships and continue with a social licence to operate.
- WAI recommends that stakeholders participate in monitoring (e.g., water, air, noise). This will further build relations and enable communities to see that the company is operating in a transparent manner.
- As part of the ESMS there is an opportunity develop a filing system and keep records of all monitoring and consultation events. This could enable CGHL to produce evidence of activities for audits and if challenged about incidents by third parties.

The following environmental risks are also noted:

- Gaps exist in data for surface and groundwater which should be addressed by developing an action that guides additional data collection and monitoring. An overall water balance based on existing and new data would enhance the quality of the impact assessment.
- ARD and metal leaching is regarded by WAI as amongst the most significant impacts but due to a lack of data a precautionary approach has been taken in the impact assessment and developing management plans. Additional data collection and monitoring may prove that less stringent measures are required to manage potential impacts.
- A comprehensive review of Kyrgyz Republic legislation and permit requirements has been presented in the ESIA report. Timeframes have not been given for how long permit applications take to be processed.

Timeframes should be ascertained as there is a risk that Chaarat Gold Project activities and schedules could be affected by processing times.

- Land-take has been modest for the Chaarat Gold Project and the need for resettlement has not been identified. However, a local herdsman in a consultation meeting indicated that he grazes his animals) on land that will be incorporated into the project footprint (and earns money by managing other peoples' animals grazing with his own on the land). He was apparently amenable and informed WAI that there is other land he can go to. However, this is a risk unless there is an agreement that follows due process; it is economic resettlement as it concerns access and his livelihood.
- It should be verified if the letter from the Kanysh-Kiya Rural Council stating that land shall be allocated for temporary land use under lease for a period of validity of the licence for subsoil use (No. 3117 AE, 25.06.2012) has standing if challenged by higher levels of government.
- CZ will employ an HSE manager and coordinator to manage health, safety environment, and community matters. It is essential that at least one person has practical experience and knowledge of environmental and social aspects (not just health and safety) so that he/she can successfully fulfil the scope of work required for the role.

12.5 INFRASTRUCTURE

Access to the Chaarat Gold Project site is easier during the summer than in the winter. The addition of the road constructed between the Chatkal Station, over the Kumbel Pass to the site will make winter access to the site more reliable.

The infrastructure locations have taken into account geohazard and topography as well as can be expected with the limited information available. However, this remains a risk to the Chaarat Gold Project and a detailed geohazard assessment and management plan should be developed. Due to relocation of several pads, some of the proposed locations for site infrastructure are not covered by the current suite of exploratory ground investigation and should be re-assessed.

The assumptions relating to the allowable bearing pressure made in this report will need to be verified at the detailed design stage through further investigation work. The civil geotechnical aspects of the Chaarat Gold Project will also need to be reviewed in the light of a detailed geohazard assessment which should include an avalanche assessment (a preliminary assessment was completed by Dynamic), rockfall assessment, and debris flow assessment.

The site is located in a seismic zone, as indicated by a letter from the Krygyz National Academy of Science (KNAS) Institute of Seismology (KNAS 2013). *The Probabilistic Seismic Hazard Study for a Site in Kyrgyzstan* (KNAS 2017) presents mean PGAs with 10% probabilities of exceedance over various return periods. According to the seismic zonation map of the Kyrgyz Republic in 2012, the seismic intensity at the mine site is 9 point, which requires further investigation. Concerning are the seismic design parameters used for the HLF which are below code for the area without an on-site seismic survey.

Water will be supplied from two wells. The absence of a detailed hydrology report and the absence of monitoring wells are a concern as to the sustainability of the ground water to support the Chaarat Gold Project's water requirement. CZ apparently has done some work to mitigate the risk since the 2018 Internal Feasibility Study, but the extend of these actions were not clear at the writing of the CPR.

The principle used in the costing of the earth works for on-site road development, should be confirmed in that access cut can be pushed over the edge and thus does not incurring transportation cost. If this cannot be confirmed the road building cost will increase.

12.6 CAPITAL COSTS

The capital cost estimate for the 2018 Internal Feasibility Study was completed as an internal estimate and relies heavily on CGHL and Ciftay as source for costs and pricing. The capital cost numbers supplied by Ciftay and CGHL should be confirmed with budget quotes from more than one independent vendors or source. This includes mining rates, accommodation camp, roads, fuel price (electricity), mobile equipment, cement, steel, labour, etc.

12.7 FINANCIAL ANALYSIS

The results of the economic analyses represent forward looking information. The results depend on inputs that are subject to a number of known and unknown risks, uncertainties and other factors that may cause actual results to differ materially from those presented here. Information that is forward-looking includes:

- Mineral Resource and Ore Reserve estimates
- assumed commodity prices and exchange rates
- mine production plans
- projected recovery rates
- sustaining and operating cost estimates
- assumptions as to closure costs and closure requirements
- assumptions as to environmental, permitting and social risks.

Additional risks to the forward-looking information include:

- changes to costs of production from what is assumed
- unrecognized environmental risks
- unanticipated reclamation expenses
- unexpected variations in quantity of mineralised material, grade, or recovery rates
- geotechnical and hydrogeological considerations during mining being different from what was assumed
- failure of plant, equipment, or processes to operate as anticipated.

13.0 CONCLUSIONS AND RECOMMENDATIONS

This CPR was undertaken at the request of CGHL to support ongoing finance activities for the Chaarat Gold Project. The Competent Persons reviewed available information supplied by CGHL and CZ.

In addition, an updated Mineral Resource estimate for the Tulkubash zone is also included in this report.

It is recommended that the 2018 Internal Feasibility study is re-assessed and updated.

The updated Tulkubash Mineral Resource estimate (effective 28th August 2018) shows indications of an improved Ore Reserve, which could dramatically increase the financial outlook of the Chaarat Gold Project. With a new Ore Reserve, the mine plan can also be redone.

During a feasibility study update, gaps in the cost estimate (high dependence on Owner and one contractor, gaps in quotations, lack of a basis of estimate) can also be reviewed and updated.

13.1 MINING

The Tulkubash open pit is located in mountainous terrain that brings with it some challenges. Avalanches of snow are a particular hazard that has been addressed with the safety benches in the pit design.

The Mineral Resource to Ore Reserve conversion of 45% is low, however this may improve with the current Mineral Resource update (effective 28th August 2018), which has increased the gold grade considerably.

The equipment selection for Tulkubash is typical for a mining contractor in this region but consideration should be given to using articulated dump trucks, as the worst of the winter conditions may make it difficult to operate the Mercedes tipper trucks.

The Tulkubash mining production schedule is ambitious but is achievable with good management and practice. An increase in the Ore Reserve as a result of the updated Mineral Resource estimate (effective 28th August 2019) will increase the LOM and give the CGHL an opportunity to review the schedule further.

Ciftay's mining quote is good but should be reviewed to ensure it incorporates all the infrastructure costs.

13.2 METALLURGY

Internal technical studies are required to properly define the optimal development route for Kyzyltash, including a detailed metallurgical test work program followed by trade-off studies between concentrate bio-oxidation (BIOX) or pressure oxidation (POX) options or a whole ore POX processing route. Upon completion of the trade-off studies a pilot scale test work program should be completed.

Indicative costs for project development, based on a restatement of the Kyzyltash internal technical report costs, are shown in Table 13.1 and Table 13.2.

Table 13.1 Kyzyltash Sulphide Project Development Costs

Description	Cost (US$ million)
Owner's Team	1.0
Drilling for Metallurgical/Geotechnical Samples and Metallurgical Testing	5.5
Plant Site Geotechnical (including boreholes)	0.5
Open Pit/Underground Geotechnical	1.0
Feasibility Engineers	6.0
Tailings Facility/Lead Pad Design	1.0
Peer Reviews/Project Consultants	0.5
Environmental Studies	2.0
Travel	0.5
Miscellaneous Expenses	0.5
Total Feasibility Study	19.0

Table 13.2 Preliminary Metallurgical Development Program, Indicative Sample Requirements and Costs

Test Work	Sample Mass (kg)	Cost (US$)
Essential Programme		
General	80	40,798
Comminution	2,580	166,943
Mineralogy	20	9,696
Flotation	712	87,808
Oxidation	100	2,265
Thickening and Tailings Tests	40	102,758
Refractory Pre-oxidative Treatments	50	111,656
Neutralization Tests	0	1,892
Project Management and Reporting (Lab @ 15%)	-	78,572
Test Work Supervision and Management (Tetra Tech)	-	55,372
Total Essential Program Estimate	3,6230	657,759
Additional Programme		
Pilot Plant	400	220,000
Project Management and Reporting (Lab @15%)	-	33,000

table continues...

Test Work	Sample Mass (kg)	Cost (US$)
Test Work Supervision and Management (Tetra Tech)	-	10,160
Total Additional Programme Estimate	400	263,160
Total Comprehensive Programme Estimate	**4,030**	**920,019**

13.3 INFRASTRUCTURE

Overall, the CPR reviewer is of the opinion that the infrastructure designed for the Chaarat Gold Project has been adequately described, located, and assessed, with appropriate regard for the remoteness and topography of the site.

Access to the project site is easier during the summer than in the winter. The addition of the road constructed between the Chatkal Station over the Kumbel Pass to the site will make winter access to the site more reliable.

The specified project infrastructure was designed to accommodate operation in a remote area, and the requirement to use stand-alone generators for power supply. Fuel for the generators and mining fleet will be supplied from a scaled tank farm that will keep 10-days strategic and 4-days operational fuel, which should be sufficient during winter operations

The infrastructure locations have taken into account geohazard and topography as well as could be expected with the limited information available.

The lack of detailed ground investigation, geohazard assessment and mitigation plan is a concern. Also concerning are the seismic design parameters used for the HLF below code of the area without an on-site seismic survey.

The site is located in a seismic zone, as indicated by a letter from the KNAS Institute of Seismology (KNAS 2013). *The Probabilistic Seismic Hazard Study for a Site in Kyrgyzstan* (KNAS 2017) presents mean PGAs with 10% probabilities of exceedance over various return periods. According to the seismic zonation map of the Kyrgyz Republic in 2012, the seismic intensity at the mine site is 9 points, which requires further investigation and the development of a geohazard management plan. The civil geotechnical aspects of the Chaarat Gold Project will also need to be reviewed in the light of the detailed geohazard assessment, which will include an avalanche assessment (a preliminary assessment was completed by Dynamic), rockfall assessment, and debris flow assessment.

Water supply will come from ground water obtained from two wells. The absence of a detailed hydrology report and the absence of monitoring wells are a concern as to the sustainability of the ground water to support the Chaarat Gold Project's water requirement.

On-site road design criteria are sufficient for the expected vehicle use. If larger haul truck were to be considered, the haul road design criteria needs to be adjusted. The principle used in the costing of the earth works, should be confirmed that access cut can be pushed and thus not incurring transportation cost.

The design change to move from containerised building to portal frame buildings is a more suitable design for areas of high snow fall.

The design criteria and scaling for the accommodation camp should be re-confirmed according to the site loading. It is unclear how the size was determined and if it would be sufficient for the expected operations.

The haul from the open pit to the ROM pad has increased due to the relocation of the ROM pad to the HLF and process area. However, the relocation improved the cut-and-fill balance of the crushing circuit.

It should be noted that due to relocation of a number of the pads, some of the proposed locations for site infrastructure are not covered by the current suite of exploratory ground investigations. Additionally, no in-situ testing (such standard penetration tests or cone penetration tests) was undertaken during the ground investigation work. The assumptions relating to the allowable bearing pressure made in this report will need to be verified at the detailed design stage through further investigation work comprising the aforementioned tests or similar.

Avalanche hazards were considered in principle during Tetra Tech's geohazard assessment, based on the site visit and a review of site aerial photographs. A detailed avalanche hazard assessment will be required before construction commences (this assessment will be undertaken in May/June 2018). Avalanche and associated debris flows are considered a significant hazard. WAI (2017) undertook a preliminary avalanche hazard assessment for the mine license area. The report concluded that the site is generally categorized as high risk. No existing avalanche hazard assessment is available for the dry valley.

For the HLF there are some outstanding test work which could influence the final design, these items are:

- ground survey
- liner system test work (Interface shear testing and Shear strength testing)
- The 2018 summer field program which needs to confirm that "The potentially compressible soils to a depth of approximately 18 m in the base of the valley. will pose no risk to the 16 Mt HLF footprint."

13.4 CAPITAL COSTS

The capital cost estimate for the 2018 Internal Feasibility Study was completed as an internal estimate and relies heavily on CGHL and Ciftay as source for costs and pricing. The capital cost numbers supplied by Ciftay and CGHL should be confirmed with budget quotes from more than one independent vendors or source. This includes mining rates, accommodation camp, roads, fuel price (electricity), mobile equipment, cement, steel, labour, etc.

The CPR reviewing makes the following conclusions and recommendations:

- VAT seems to be a confusing issue in the capital cost estimate with some costs including VAT and some costs not including VAT. An updated capital cost estimate should be completed, inclusive of VAT.

- No formal basis of estimate was available to govern the cost estimate. It is suggested that a detailed basis of estimate be established that includes the source and build-up of all cost items and be formally signed-off.
- Due to the topography, valley roads are expensive. A principle that must be confirmed is that “excess cut is pushed over the edge and does not need to be removed”. Official verification or permits for road construction allowing this practice should be obtained, if this cannot be confirmed it means that road costs need to be increased to account for this additional transportation of excess fill and the associated environmental impact needs to be assessed and managed.
- The indirect costs plus contingency is expected to be close to 40% of direct capital. Currently it is at 30% and should be re-confirmed. However, even with a 10% increase in the indirect cost the current estimate is still within the estimation limits for an estimate at this level
- Freight and logistics, commissioning and Owner’s costs are indirect cost items that seem low and could contribute to an increase in indirect costs.
- EPCM, which forms part of Owner’s costs, was not estimated as CGHL regards it as an in-house managed project. Some allowance was made, however, it should be re-considered and updated as part of the capital cost estimate update.
- For major equipment budget quotes were obtained; however, there are items for which there were not at least three quotes. It is suggested that these gaps be filled with a request for additional quotes when the capital cost estimate is updated.
- The seismic design parameters are lower than those specified by the seismic code and, as such, it is suggested that a site-specific seismic investigation be conducted.
- The earth works for the HLF ponds have increased as a result of a seismic review, the re-design has lowered the seismic impact risk but has increased earth works, which needs to be adjusted as part of the capital cost estimate update.
- Geohazard management allowance should be confirmed with a detailed geohazard assessment of the site and an update of the capital cost estimate accordingly.

13.5 OPERATING COSTS

The following recommendations are made for the Chaarat Gold Project operating costs:

- The G&A cost is currently too low at US$1.15/t ore (including VAT) and should be adjusted to US$1.66/t ore (including VAT) to include the labour component.
- The cost of electrical power at US$0.15/kWh is based upon the price of fuel at US$0.54/L (including VAT) for fuel and should be independently confirmed with existing fuel contracts.

- The labour cost received from Ciftay should be verified independently.
- Although the contract mining costs have been verified by IMC, it is suggested that a contract be obtained from Ciftay, which is understood to be currently under negotiation.
- The accommodation camp cost for a 400-person camp is low, but further investigation indicates that the camp cost for 300 people was included in the mining cost and that the operating cost for camp was only for 100 people. The basis for camp size should be verified, preferably with man-hours required. Camp operating costs should be for 100% of use and not just for 25% with rest of accommodation costs buried in mining rates from Ciftay.

13.6 ECONOMIC ANALYSIS

The use of pre-tax and post-tax analysis is confusing in the financial analysis section of the 2018 Internal Feasibility Study, as it should both be regarded as pre-tax models including or excluding VAT. The tax situation should be referred to a tax expert to ensure there is no tax on profit, only on royalty and revenue tax.

The addition of labour to the G&A cost increased the operating costs by 3%. This increase is still within acceptable limits of an estimate at this level; however, the increase has resulted in the following:

- The NPV, calculated at a 5% discount rate, is most sensitive to revenue followed by operating costs and capital costs. The sensitivity to operating costs is clearly demonstrated by the 3% increase in operating costs, resulting in a drop in NPV of US$6.8 million.
- The IRR is most sensitive to operating costs followed by revenue and capital costs. This sensitivity to operating costs is clearly demonstrated by the 3% operating cost increase resulting in a drop of 1.7% in IRR.
- The payback period is most sensitive to revenue, followed by operating costs and capital costs. The 3% increase in operating costs has increased payback from 3.2 years to 3.3 years.

Indirect costs in the capital cost estimate should be investigated closer, as the estimate appears to be approximately 10% too low. If the capital cost estimate increases by US$6 to 10 million which is still within the limits of this estimate, the increase in cost will negatively impact on NPV, IRR, and payback period.

The updated Mineral Resource model (effective 28th August 2018) has enormous potential upside for the Chaarat Gold Project and the cost estimate should be updated to include the gaps and the new Mineral Resource model together with the mine schedule.

Overall, the CPR reviewer is of the opinion that the cash flow estimate is appropriate for this level of estimate and that the Chaarat Gold Project has a positive IRR and NPV.

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APPENDIX A

JORC TABLE 1 AND CONSENT

JORC Code, 2012 Edition – Table 1 report template

Section 1 Sampling Techniques and Data

(Criteria in this section apply to all succeeding sections.)

Criteria	JORC Code explanation	Commentary
Sampling techniques	• *Nature and quality of sampling (eg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling.* • *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.* • *Aspects of the determination of mineralisation that are Material to the Public Report.* • *In cases where 'industry standard' work has been done this would be relatively simple (eg 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (eg submarine nodules) may warrant disclosure of detailed information.*	• All drilling was undertaken by standard and triple barrel Diamond Core Drilling, with all sampling in accordance with industry standard techniques. • Diamond core is cut in half using a core saw, creating half core samples typically 1.5 m in length. • Duplicate samples are created from quarter core. • Sample preparation is undertaken at ALS Global (Kara Balta) following by 30 g charge fire assay.
Drilling techniques	• *Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).*	• In total, 67,667 m of drilling across 492 drillholes has been completed across the Tulkubash deposit. • Diamond drillholes comprise a combination of HQ and NQ diameter standard tube and triple barrel holes where ground conditions are poorer. • Holes are drilled using contractor and Chaarat rigs.
Drill sample recovery	• *Method of recording and assessing core and chip sample recoveries and results assessed.* • *Measures taken to maximise sample recovery and ensure representative nature of the samples.* • *Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.*	• Core recovery is measured and recorded by Chaarat geologists, with an average recovery of 95%. • In areas of highly fractured material triple-tube drilling is utilized.
Logging	• *Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate*	• Core is logged geologically and geotechnically by company geologist into standard hard copy logging sheets and transcribed into Microsoft

Criteria	JORC Code explanation	Commentary
	Mineral Resource estimation, mining studies and metallurgical studies. • *Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.* • *The total length and percentage of the relevant intersections logged.*	Excel®. • Logging is performed at nominal 1.5 m intervals, reducing to shorter lengths when required. • Logging does cross mineralised boundaries due to the mineralisation style being fracture controlled in a brittle unit containing few obvious contacts. • The core is photographed wet with photographs stored within the database. • All drillholes up to the 28th August have been logged. • Logging is to a standard suitable for the support of a Mineral Resource Estimate.
Sub-sampling techniques and sample preparation	• *If core, whether cut or sawn and whether quarter, half or all core taken.* • *If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.* • *For all sample types, the nature, quality and appropriateness of the sample preparation technique.* • *Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.* • *Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling.* • *Whether sample sizes are appropriate to the grain size of the material being sampled.*	• Competent core samples are split on site using a core saw, while highly fractured material is sampled with a trowel. • Half core samples are placed in labelled polyethylene sample bags a weighed. • All current samples are transported to ALS Global (Kara Balta) for sample preparation and analysis, where crushing, milling, homogenization and sample splitting was completed in accordance with company standards. • Duplicate sample for QA/QC were taken every 20 samples in the form of quarter core samples.
Quality of assay data and laboratory tests	• *The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.* • *For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.* • *Nature of quality control procedures adopted (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.*	• Samples collected from 2007 to 2013 were prepared and assayed at the IRC Laboratory in Kara Balta. All samples are analyses for gold by aqua regia digestion followed by atomic absorption. Sample returning grades higher than 0.3 g/t Au were sent to ALS Global (Kara Balta) for re-testing by 30 g fire assay. • The 2014 sample preparation took place at the IRC Laboratory in Kara Balta, with analysis taking place at ALS Global (Kara Balta). • From 2017 all sample preparation and analysis are undertaken at the ALS Global laboratory in Kara Balta. Referee check samples are sent to SGS Vostok for analysis. • Assay quality control was achieved by the use of duplicates, blanks and standard reference material (SRM). • The QA/QC programme and results are in line with industry best

Criteria	JORC Code explanation	Commentary
		practice and the resultant dataset is suitable for Resource estimation.
Verification of sampling and assaying	• *The verification of significant intersections by either independent or alternative company personnel.* • *The use of twinned holes.* • *Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.* • *Discuss any adjustment to assay data.*	• Prior to Resource estimation, below detection limit assay results have been replaced with values of half detection limit (0.025 g/t Au) and absent values have been replaced with 0.0001 g/t Au.
Location of data points	• *Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.* • *Specification of the grid system used.* • *Quality and adequacy of topographic control.*	• All collar locations are reported in Gauss Kruger Pulkovo 1942 Zone 12 with their locations recorded using a Leica Total Station (centimeter accuracy) • Downhole surveys were recorded with Reflex “EZ-shot” electronic single-shot equipment. • A Total Station survey along roads, ridges, valleys and traverses has produced a contoured topography across the Tulkubash Resource area. • Regional topography data is derived from satellite data.
Data spacing and distribution	• *Data spacing for reporting of Exploration Results.* • *Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.* • *Whether sample compositing has been applied.*	• The current data spacing, nominally fans on 40m fences, is sufficient to establish grade continuity and provides sufficient support for Measured and Indicated classifications.
Orientation of data in relation to geological structure	• *Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.* • *If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.*	• Surface drilling is inclined, attempting to cut the mineralization at a close to normal angle to the strike orientation as possible. • Underground drilling is orientated normal to the strike of the structure. • The holes were designed to provide intercepts perpendicular to the mineralization as possible. • The drilling dip ranges from 35 to 90°, striking generally between 125 and 147°. • Metallurgical drillholes were drilled at 90°, resulting in a greater intersection of mineralization.
Sample security	• *The measures taken to ensure sample security.*	• Labelled samples are transported to and from the laboratory by company personal, employing a full chain of custody documentation procedure. • Reject pulps are returned to Chaarat and stored along with drill core at their locked and secure core storage facility in Bishkek.

Criteria	JORC Code explanation	Commentary
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	• Tetra Tech's competent person visited the project during the current drilling campaign and reviewed the protocols and procedures adopted by Chaarat's company geologists. • Tetra Tech has completed an independent analysis of the QA/QC data. The data is deemed appropriate for Resource estimation.

Section 3 Estimation and Reporting of Mineral Resources

(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

Criteria	JORC Code explanation	Commentary
Database integrity	• *Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes.* • *Data validation procedures used.*	• All data used in the Resource was provided by Chaarat as two separate Excel drillhole files (2007-17 and 2018). The two files have been combined into a central Excel database for verification prior to Mineral Resource estimation. • Leapfrog was used to validate the database with any errors in interval overlap and surveys reported to Chaarat for correction.
Site visits	• *Comment on any site visits undertaken by the Competent Person and the outcome of those visits.* • *If no site visits have been undertaken indicate why this is the case.*	• The Competent Person for this project is Mr. Joe Hirst B.Sc (Hons)., M.Sc., European Geologist (EurGeol) and Chartered Geologist (CGeol). Mr. Hirst is a Resource Geologist and Competent Person as defined by the JORC code. Mr. Hirst visited the project between the 7th and 13th of August 2018.
Geological interpretation	• *Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.* • *Nature of the data used and of any assumptions made.* • *The effect, if any, of alternative interpretations on Mineral Resource estimation.* • *The use of geology in guiding and controlling Mineral Resource estimation.* • *The factors affecting continuity both of grade and geology.*	• Geological interpretation was based on correlating mineralized intersections in sampling. Outcrop is visible in a number of roadcuts, which were inspected, to support the interpretation • Interpretation was completed in Leapfrog creating wireframe models using indicator shells.
Dimensions	• *The extent and variability of the Mineral Resource expressed as length (along strike or otherwise), plan width, and depth below surface to the upper and lower limits of the Mineral Resource.*	• The Mineral Resource extends 3.8 km along strike, maximum plan width of 500 m and a maximum depth of 700m.

Criteria	JORC Code explanation	Commentary

Estimation and modelling techniques	• *The nature and appropriateness of the estimation technique(s) applied and key assumptions, including treatment of extreme grade values, domaining, interpolation parameters and maximum distance of extrapolation from data points. If a computer assisted estimation method was chosen include a description of computer software and parameters used.*
	• *The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.*
	• *The assumptions made regarding recovery of by-products.*
	• *Estimation of deleterious elements or other non-grade variables of economic significance (eg sulphur for acid mine drainage characterisation).*
	• *In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.*
	• *Any assumptions behind modelling of selective mining units.*
	• *Any assumptions about correlation between variables.*
	• *Description of how the geological interpretation was used to control the resource estimates.*
	• *Discussion of basis for using or not using grade cutting or capping.*
	• *The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.*
		• The Mineral Resources have been estimated into a block model prepared in Datamine Studio RM (version 1.3). The block model comprises the following parameters:
		  ○ Parent cell dimensions of 10 m x 10 m x 5 m (x, y, z)
		  ○ Sub-cell dimensions of 2 m x 2 m x 2 m (x, y, z)
		• Wireframe models were created using Indicator shells in Leapfrog, producing high-and low-grade zones (Domain 2 and Domain 1).
		• The model is typically estimated to a depth of 450 m.
		• Grade estimates were based on 3 m composited assay data.
		• The interpolation of grade concentration was undertaken using Ordinary Kriging.
		• Au was estimated as part of this interim estimate, as the primary metal of interest. Ag, Sb, and As were also estimated but not reported as Resource
		• Top cut requirements were assessed using the Parrish method, a top-cut of 10 g/t Au was applied for Domain 1, Domain 2 not top-cut applied.
		• Block model validation was completed using a full set of statistical measures and plots, along with visual inspection on plan and section.

Moisture	• *Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.*	• Tonnage is estimated on a dry basis in accordance with the specific gravity determination.

Cut-off parameters	• *The basis of the adopted cut-off grade(s) or quality parameters applied.*	• Au g/t cut-off grade was applied based upon grade tonnage sensitivity analysis and the Chaarat 2018 Feasibility Study assumptions:
		  ○ Au price of US$ 1,500/troy oz
		  ○ Au recovery of 72%
		  ○ Mining cost of US$ 1.80/t
		  ○ Processing and G&A cost of US$ 7.33/t
		  ○ Discount Rate of 5%

Mining factors or assumptions	• *Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating*	• Mining assumptions were made in accordance with the Chaarat 2018 Feasibility Study utilizing conventional hard rock open pit excavation.

Criteria	JORC Code explanation	Commentary
	Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.	
Metallurgical factors or assumptions	• *The basis for assumptions or predictions regarding metallurgical amenability. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential metallurgical methods, but the assumptions regarding metallurgical treatment processes and parameters made when reporting Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the metallurgical assumptions made.*	• Basic metallurgical assumptions were drawn from the Chaarat 2018 Feasibility Study and multiple metallurgical test work to date. • Metallurgical test work indicates the oxide ore is amenable to conventional cyanide heap leaching. • The life-of-mine gold recovery was estimated to be 72.9 %.
Environmental factors or assumptions	• *Assumptions made regarding possible waste and process residue disposal options. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider the potential environmental impacts of the mining and processing operation. While at this stage the determination of potential environmental impacts, particularly for a greenfields project, may not always be well advanced, the status of early consideration of these potential environmental impacts should be reported. Where these aspects have not been considered this should be reported with an explanation of the environmental assumptions made.*	• An Environmental and Social Impact Assessment (ESIA) is currently being prepared by Wardell Armstrong for the Tulkubash project. • It is assumed there will be no environmental impediments to advancing the Tulkubash project. • Upon completion of the ESIA further information will be available on the full environmental and social impacts of the Tulkubash deposit.
Bulk density	• *Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.* • *The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc), moisture and differences between rock and alteration zones within the deposit.* • *Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.*	• Bulk density values have been estimated into the block model using an inverse distance weighting interpolation. • The density estimate was based upon 1,125 dry specific gravity determinations, completed by Chaarat personnel using Archimedes method.

Classification	• *The basis for the classification of the Mineral Resources into varying confidence categories.*
	• *Whether appropriate account has been taken of all relevant factors (ie relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).*
	• *Whether the result appropriately reflects the Competent Person's*
		• The Resource classification at the project considers the following criteria:
		  ○ confidence in the sampling data and geological interpretation
		  ○ analysis of variogram parameters
		  ○ data distribution (based upon graphical analysis and average distance to informing composites)

Criteria	JORC Code explanation	Commentary
	view of the deposit.	○ analysis of the quantitative measures of kriging performance. • The model was classified according to the JORC (2012) guidelines. • The classification appropriately reflects the status of the Resource development.
Audits or reviews	• *The results of any audits or reviews of Mineral Resource estimates.*	• An external peer review was conducted for this study by independent third parties. No material concerns were raised.
Discussion of relative accuracy/ confidence	• *Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.* • *The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.* • *These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.*	• The Resource estimate is deemed appropriately accurate globally, based upon the informing data and is suitably accounted for in the resource classification.

TETRA TECH

Competent Person's Consent Form

Pursuant to the requirements of ASX Listing Rules 5.6, 5.22 and 5.24 and Clause 9 of the JORC Code 2012 Edition (Written Consent Statement)

Report name

Competent Persons Report for the Chaarat Gold Project, Kyrgyz Republic

(*Insert name or heading of Report to be publicly released*) ('Report')

Chaarat Gold Holdings Ltd.

(*Insert name of company releasing the Report)*

Tulkubash

(Insert name of the deposit to which the Report refers)

If there is insufficient space, complete the following sheet and sign it in the same manner as this original sheet.

7th December 2018

(Date of Report)

Coffey Geotechnics Ltd.
Trading as Tetra Tech | Mining and Minerals from 2 Apple Walk, Kembrey Park, Swindon, SN2 8BL, UK
Tel: +44 (0) 1793 512305 www.tetratech.com
Registered Address: 1 Northfield Road, Reading Berks, RG1 8AH, United Kingdom
Registered in England: 06328315

Statement

I/We,

Joseph Hirst, BSc (Hons), MSc, EurGeol, CGeol

(Insert full name(s))

confirm that I am the Competent Person for the Report and:

- I have read and understood the requirements of the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code, 2012 Edition).
- I am a Competent Person as defined by the JORC Code, 2012 Edition, having fourteen years experience that is relevant to the style of mineralisation and type of deposit described in the Report, and to the activity for which I am accepting responsibility.
- I am a Member or Fellow of *The Australasian Institute of Mining and Metallurgy* or the *Australian Institute of Geoscientists* or a 'Recognised Professional Organisation' (RPO) included in a list promulgated by ASX from time to time.
- I have reviewed the Report to which this Consent Statement applies.

I am a full-time employee of

Coffey Geotechnics Ltd., a Tetra Tech Company

(Insert company name)

and have been engaged by

Chaarat Gold Holdings Ltd.

(Insert company name)

to prepare the documentation for

Tulkubash

(Insert deposit name)

on which the Report is based, for the period ended

28th August 2018

(Insert date of Resource/Reserve statement)

I have disclosed to the reporting company the full nature of the relationship between myself and the company, including any issue that could be perceived by investors as a conflict of interest.

I verify that the Report is based on and fairly and accurately reflects in the form and context in which it appears, the information in my supporting documentation relating to Exploration Targets, Exploration Results, Mineral Resources*).*

Consent

I consent to the release of the Report and this Consent Statement by the directors of:

Chaarat Gold Holdings Ltd.
(Insert reporting company name)

"Original document signed by Joseph Hirst, BSc (Hons), MSc EurGeol, CGeol"	7th November 2018
Signature of Competent Person:	Date:
Geological Society of London	1007756
Professional Membership: *(insert organisation name)*	Membership Number:
"Original document signed by Deborah S. Fairclough"	Deborah S. Fairclough, Oxford
Signature of Witness:	Print Witness Name and Residence: (eg town/suburb)

Additional deposits covered by the Report for which the Competent Person signing this form is accepting responsibility:

Additional Reports related to the deposit for which the Competent Person signing this form is accepting responsibility:

Signature of Competent Person:	Date:
Professional Membership: *(insert organisation name)*	Membership Number:
Signature of Witness:	Print Witness Name and Residence: (eg town/suburb)

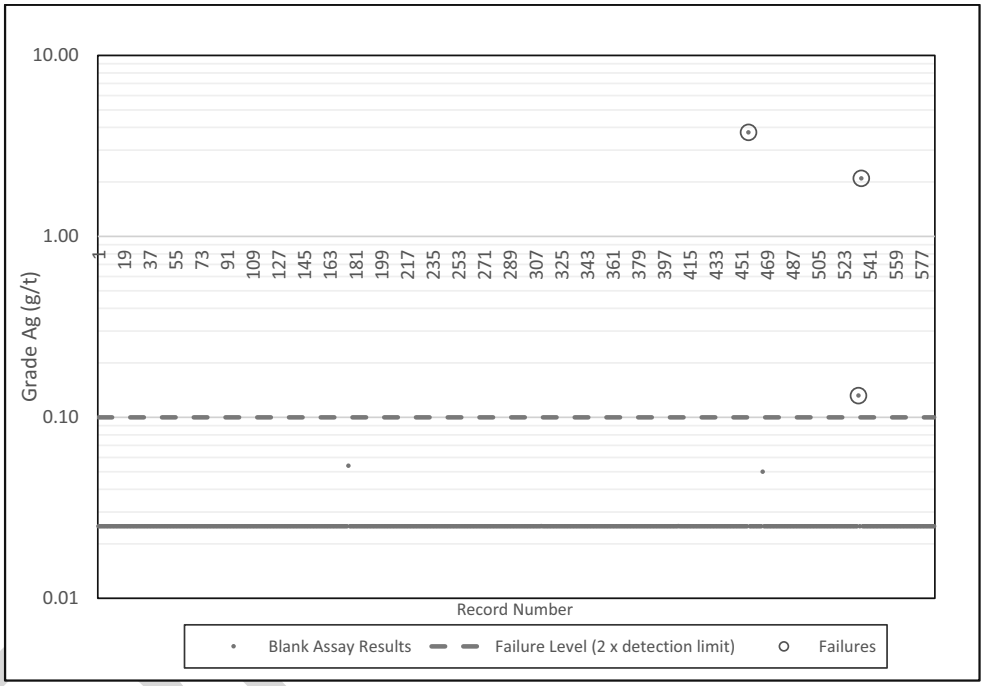
APPENDIX B

GEOLOGY QA/QC

APPENDIX – X: 2018 QA/QC PLOTS

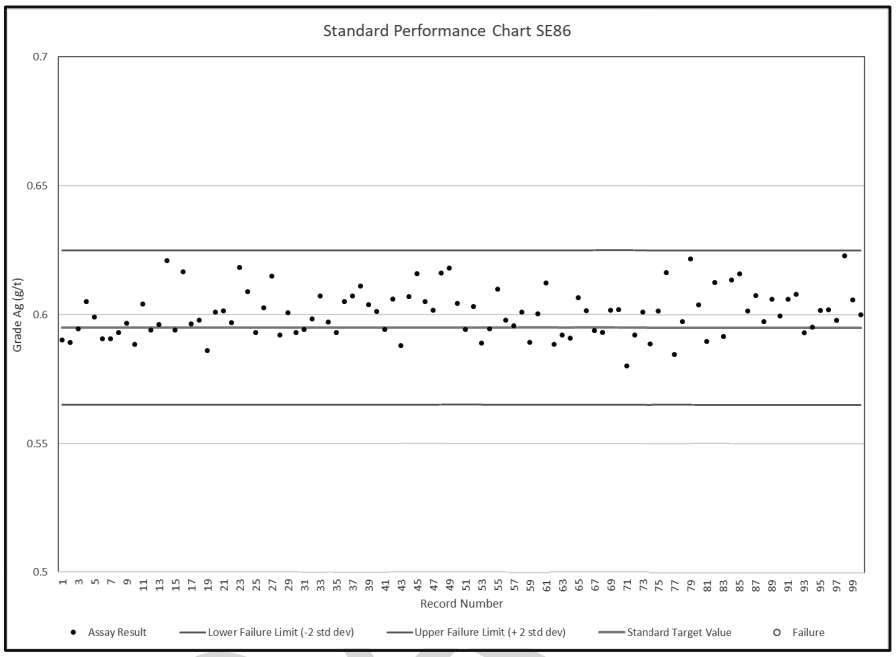
2018 BLANKS

Blank Performance Chart for the 2018 Tulkubash Exploration Data

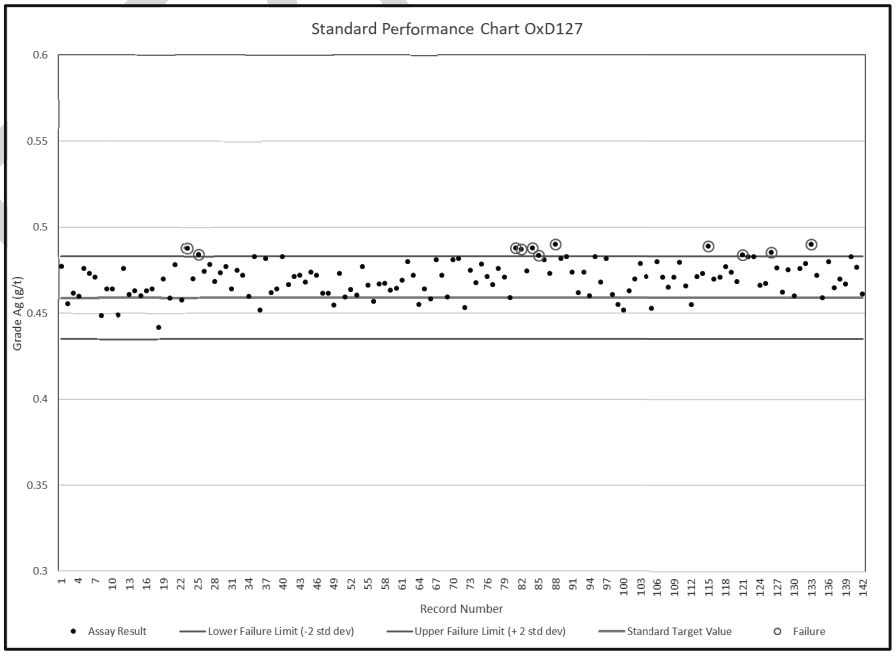


2018 STANDARDS

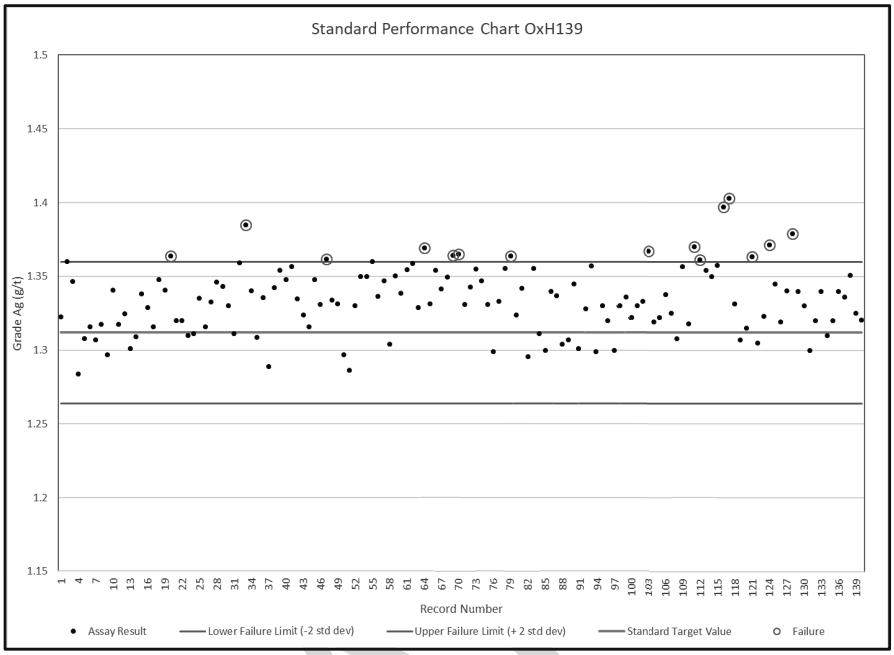
SE86 SRM Performance Chart for the 2018 Tulkubash Exploration



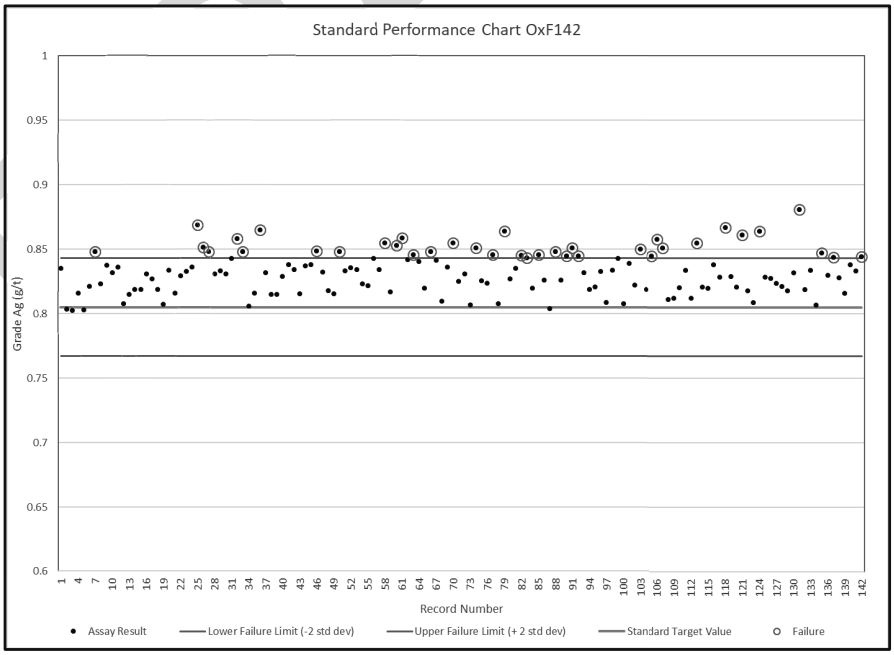
OxD127 SRM Performance Chart for the 2018 Tulkubash Exploration



OxH139 SRM Performance Chart for the 2018 Tulkubash Exploration



OxF142 SRM Performance Chart for the 2018 Tulkubash Exploration



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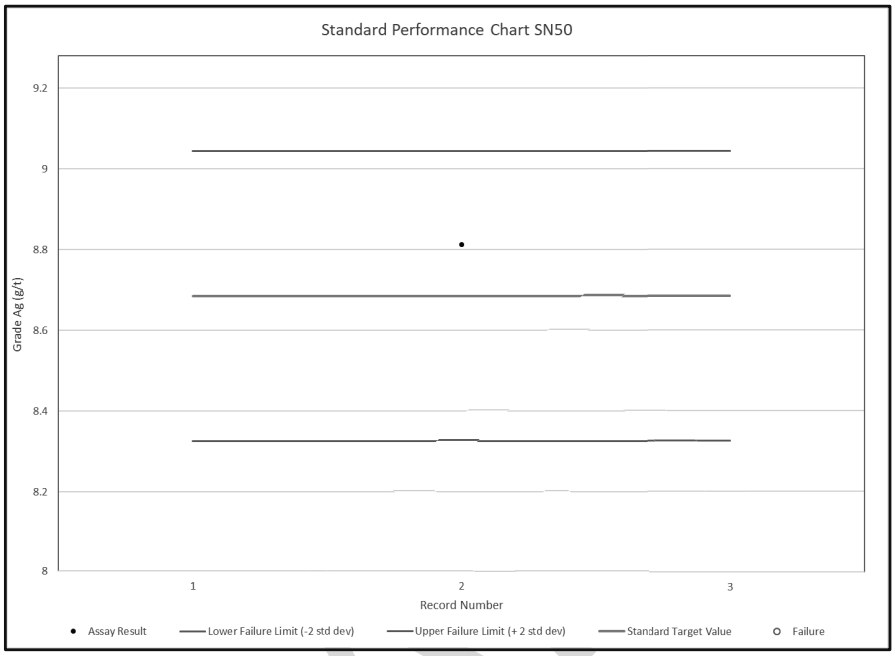
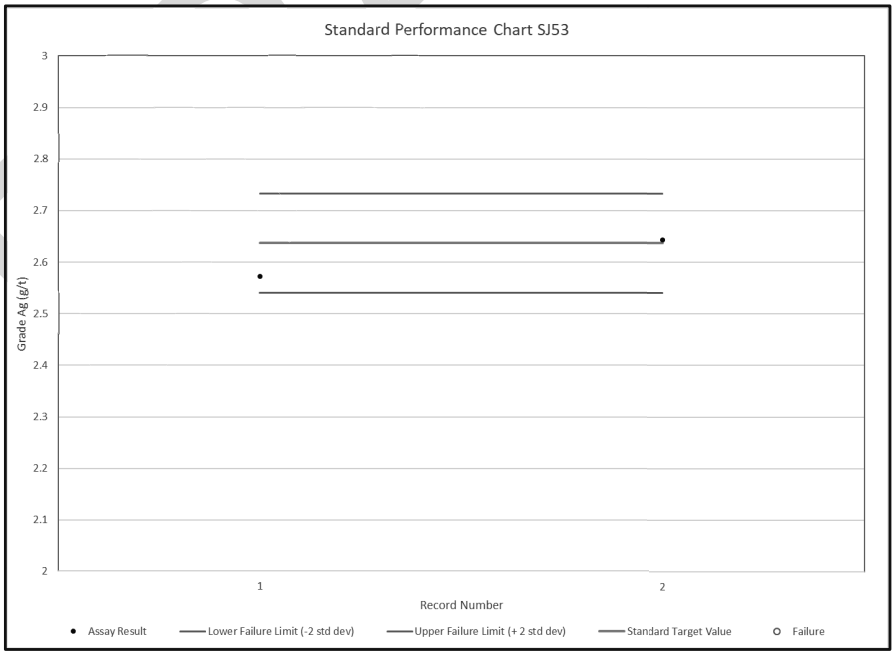
SN50 SRM Performance Chart for the 2018 Tulkubash Exploration

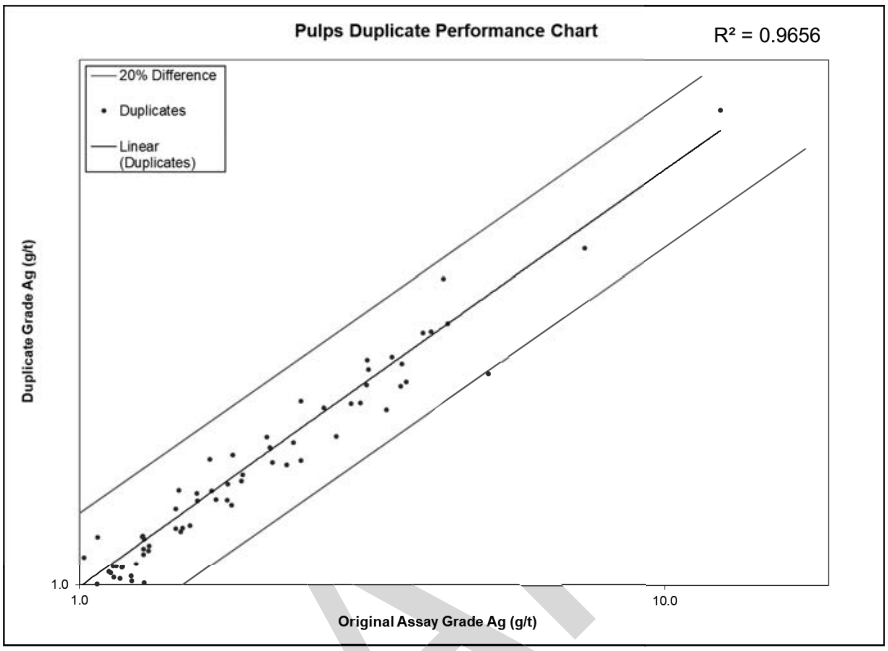


SJ53 SRM Performance Chart for the 2018 Tulkubash Exploration

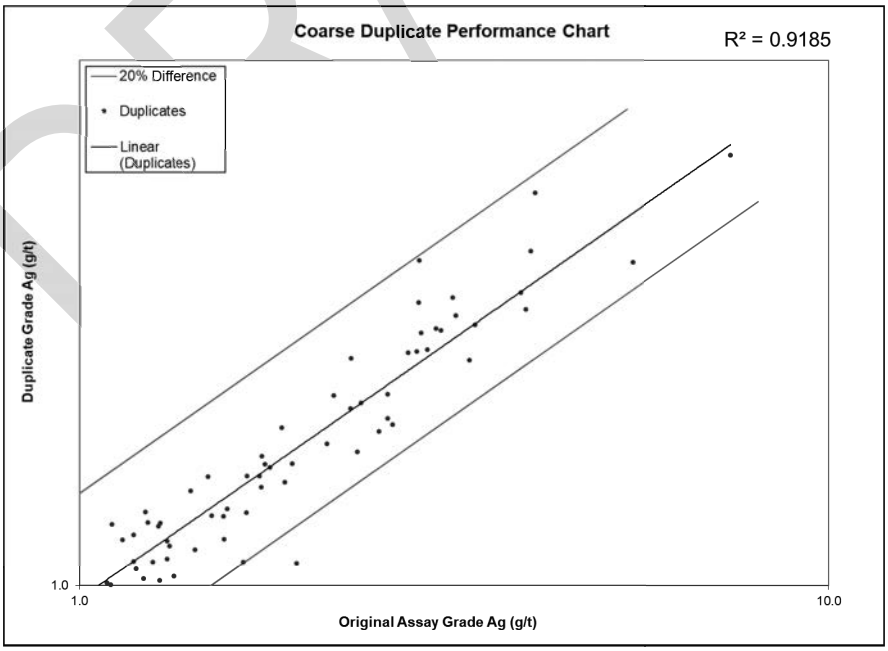


DUPLICATES

Log Pulp Duplicate Performance Chart for the 2018 Tulkubash Exploration



Log Coarse Duplicate Performance Chart for the 2018 Tulkubash Exploration



APPENDIX C

MINING EQUIPMENT CHECK CALCULATION

Year	Production schedule							Hours	
	Tonnes (Kt)		Strip ratio	SG		BCM (Km3)		Working	Productive
	Ore	Waste	t:t	Ore	Waste	Ore	Waste	Hrs pa	Hrs pa
				2.66	**2.66**			**7,700**	**71%**
-2		**1,928**			2.66		725	7,700	5,464
-1	**554**	**11,069**	20.0	2.66	2.66	208	4,161	7,700	5,464
1	**3,899**	**17,586**	4.5	2.66	2.66	1,466	6,611	7,700	5,464
2	**4,927**	**18,073**	3.7	2.66	2.66	1,852	6,794	7,700	5,464
3	**4,928**	**14,718**	3.0	2.66	2.66	1,853	5,533	7,700	5,464
4	**1,685**	**3,938**	2.3	2.66	2.66	633	1,480	7,700	5,464
	15,993	67,312	4.2			6,012	24,580		

Ore excavators					Ore trucks					
Production	Productivity	Tot.buck.cap.	Number		Trips/hr	Production		Number		
m^3/hr	m^3/hr/m^3_{bc}	m^3_{bc}	Theory	Actual	No.	tph each	Ktpa each	Theory	Actual	per excav.
	35		**4.5**			**25**				
38	35	1.1	0.2	**1**	**2.48**	62	339	1.6	**1**	1.0
268	35	7.7	1.7	2	**2.52**	63	344	11.3	12	6.0
339	35	9.7	2.2	2	**2.52**	63	344	14.3	15	7.5
339	35	9.7	2.2	2	**2.47**	62	337	14.6	15	7.5
116	35	3.3	0.7	1	**2.42**	60	330	5.1	5	5.0

	Waste excavators					Waste trucks				
	Production	Productivity	Tot.buck.cap.	Number		Trips/hr	Production			Nur
Passes	m^3/hr	m^3/hr/m^3_{bc}	m^3_{bc}	Theory	Actual	No.	tph each	Ktpa each	Theory	Actual
3.3		**53**		**4.5**			**25**			
	133	53	2.5	0.6	1	**5.35**	134	731	2.6	3
3.3	762	53	14.4	3.2	3	**4.86**	122	664	16.7	17
3.3	1210	53	22.8	5.1	5	**3.73**	93	510	34.5	35
3.3	1243	53	23.5	5.2	5	**3.73**	93	510	35.4	36
3.3	1013	53	19.1	4.2	4	**3.59**	90	491	30.0	30
3.3	271	53	5.1	1.1	1	**3.46**	87	473	8.3	9

		Total				
nber		Excavators	Trucks	Excavators	Material	Truck/Excav.
per excav.	Passes	Nos.	Nos.	M^3_{bc}	Kt	Nos.
	3.3					
3	3.3	1	3	2.5	1,928	3.0
6	3.3	4	18	15.5	11,623	4.5
7	3.3	7	47	30.5	21,485	6.7
7	3.3	7	51	33.1	23,000	7.3
8	3.3	6	45	28.8	19,646	7.5
9	3.3	2	14	8.4	5,623	7.0
	Avg/Sum	5.9	40.3	26.6	83,305	6.9

APPENDIX D

DESIGN CRITERIA

Report to:

Chaarat Gold Holdings Ltd.

CHAARAT

Tulkubash Gold Project

Design Criteria

Document No. 782-SWIN03008AA_S_002C_GRM

TETRA TECH

Report to:

CHAARAT GOLD HOLDINGS LTD.

CHAARAT

TULKUBASH GOLD PROJECT

DESIGN CRITERIA

EFFECTIVE DATE: 5 APRIL, 2018

Prepared by	Geoff Marshall	Date	09 March 2018
Reviewed by	Tom Blagden	Date	09 March 2018
Authorized by	Jacques du Toit	Date	09 March 2018

JdT/lt

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REVISION HISTORY

REV. NO	ISSUE DATE	PREPARED BY AND DATE	REVIEWED BY AND DATE	APPROVED BY AND DATE	DESCRIPTION OF REVISION
A	09Mar2018	GRM	HTB	JDT	Initial Draft
B	27Mar2018		HTB	JDT	Re-issue for use after ongoing updates
C	05Apr2018	AMB	HTB	JDT	Re-issue for use after ongoing updates

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GLOSSARY

UNITS OF MEASURE

degrees centigrade	°C
Metres	m
Metres above sea level	masl
Kilometres	km
Millimetres	mm
Kilometres per hour	kph
Miles per second	m/s
Grams	g
?	kV
Hour	hr
Tonnes per hour	tph
Cubic metres per hour	M^3/h
?	mtpa

Foot	ft
Cubic metres	m^3
?	MWe
?	Hz
?	VDC
Voltage	V
Length	l
Width	w
Height	h
Hours per day	h/d
Days per annum	d/a
?	KPa
?	Ma DC
?	kPag
Millimetres squared	mm^2
?	kN
?	k_p
Inches	in

ABBREVIATIONS AND ACRONYMS

Chaarat Gold Holdings Ltd	CGH
Tulkubash Gold Project	project
adsorption-desorption recovery	ADR
Tetra Tech Mining and Minerals	Tetra Tech
Jalal Abad oblast	Province
Bankable Feasibility Study	BFS
issued for construction	IFC
Direct On Line	DOL
Variable Speed Drive	VSD
Supplier Data Requirement	SDR
Polychlorinated biphenyl's	PCB
Chloro-fluoro-hydrocarbons	PCB
International Fire Code	IFC
Safe Working Load	SWL
Standard Operating Procedure	SOP
Life of mine	LOM
Material Test Certificate	MWE
Non-destructive Testing	NDT
Pressure Equipment Directive	PED
Conveyor Equipment Manufacturer's Association	CEMA
Variable Frequency Drive	VFD
World Health Organisation	WHO
Overhead Line	OHL
Totally enclosed fan cooled	TEFC
Positive temperature coefficient	PTC
Ingress Protection	IP
Glass re-enforced plastic	GRP
Plant control system	PCS

Proportional, integral and derivative	PID
Uninterrupted power supply	UPS
Intensity-Duration-Frequency	IDF
Nominal diameter	DN
Process flows diagram	PFD
Three pipe diameters	3D
Five pipe diameters	5D

1.0 INTRODUCTION

Chaarat Zaav CJSC, a wholly owned subsidiary of Chaarat Gold Holdings Ltd (CGH or Owner), is planning to commence the Tulkubash Gold Project (Project) located in the Sandalash Range of the Alatau Mountains in the Chatkal district of the Jalal Abad oblast (province) of western Kyrgyzstan. The Project consists of open pit mining and processing via heap leach with gold recovery undertaken at an onsite adsorption-desorption recovery (ADR) plant.

Tetra Tech Mining and Minerals (Tetra Tech) has been contracted to complete a Bankable Feasibility Study (BFS) for the Project and the Basic and Detailed Engineering of the major site infrastructure.

The BFS will define the elements of the project from design, construction, start-up, and operations through final closure and reclamation with a capital and operating cost accuracy to AACE® International Class 3 (-10% +15%).

Detailed Engineering will produce issued for construction (IFC) documents to be legalized by the local in-country design agency.

This document contains the design criteria that forms the basis of the engineering design of the project as it relates to Tetra Tech's scope of work. This is a live document that will be updated continuously as the project advances from feasibility study level through Basic Engineering to the final Detailed Engineering phase. Formal revisions will be published from time to time at key design stages or at the discretion of the Lead Engineer and Project Manager.

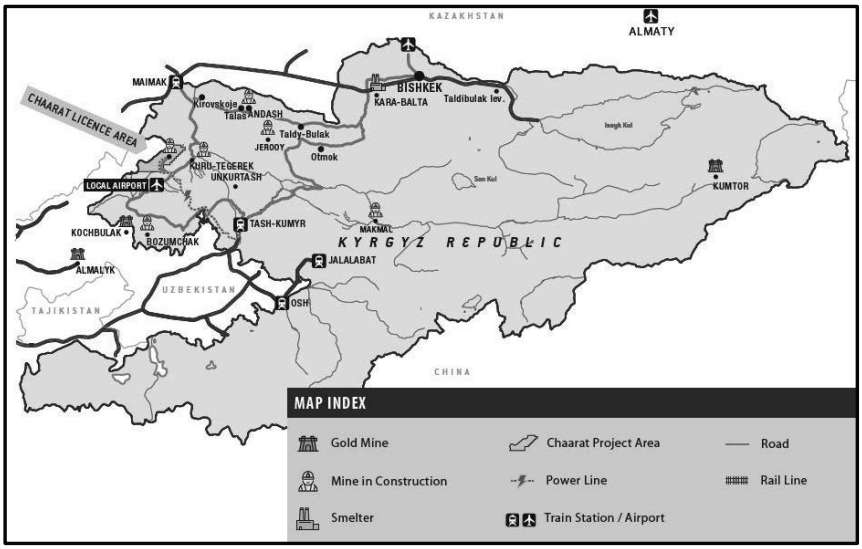
2.0 PROJECT DESCRIPTION

The Tulkubash Heap Leach Project (the Project or the Property) is located in the Sandalysh Range of the Alatau Mountains, in the Chatkal District, within the Jalal-Abad Region of western Kyrgyzstan. The Chatkal District shares borders with the Ala-Buka and Aksy districts to the south and southeast, the Talas Region to the northeast, and Uzbekistan to the west and southwest.

The Project area is characterized by extreme topography ranging from the Sandalysh River valley at an elevation of 2,200 to 2,100 m to the mountain ranges on both sides that peak at an elevation of 3,800 masl. The Sandalysh River runs through a relatively narrow valley and follows a linear south-westerly trend, with a moderate gradient in the Project area and intermittent rapids between swiftly flowing segments. The Sandalysh River flows into the Chatkal River south of the Project area at Zhany-Bazar.

The Project site is located within an undeveloped mountainous rural area with the nearest settlements and population located more than 20 km away. The closest settlements to the site, located along the Chatkal River, include the Chakmak Suu, Bashky-Terek, Korgan-Say, and Kanysh-Kiya villages.

Figure 2.1 Project Location Map



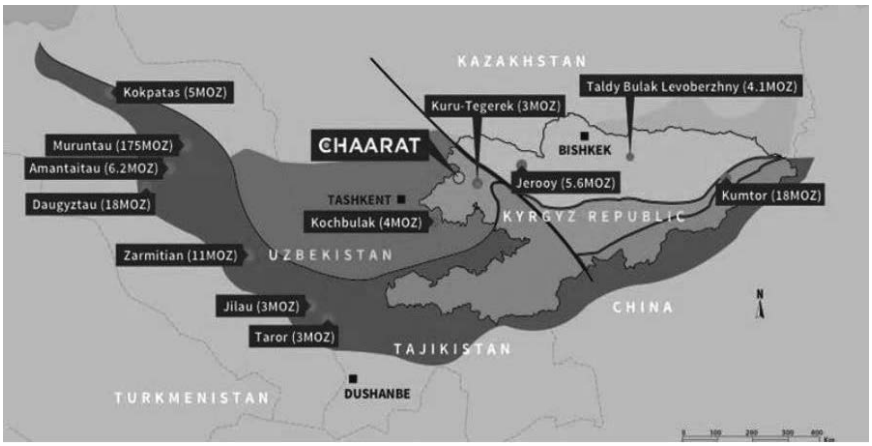
3.0 SITE DESCRIPTION

3.1 LOCATION

The property is located in the Sandalysh Range of the Alatau Mountains, in the Chatkal district of the Jalal Abed oblast of western Kyrgyzstan, approximately 327 km southwest of the Kyrgyz Republic capital, Bishkek. The project area is characterized by extreme topography, with the Sandalysh River valley running along the property at an elevation of approximately 2,200 m and mountain ranges on both sides that peak at 3,800 masl.

- Elevation: 2250 to 3800 metres above sea level
- Latitude: 42°1'12" N
- Longitude: 71°9'84" E

Figure 3.1 Site Location



Source: Figure courtesy of Chaarat Gold Holdings Ltd as taken from the January 2018 Investor Presentation.

3.2 CURRENT LAND USE

The site is located within an undeveloped mountainous rural area with the nearest settlements more than 20 km away. The closest villages to the site, all along the Chatkal river, include the Chakmak Suu, Bashky-Terek, Korgan-Say and Kanysh-Kiya villages. There are no existing industrial activities in the vicinity of the project area except for the Kitchi-Chaarat China Gold gold mine, owned by China Gold International Resources Corporation, near Chakmak-Suu, approximately 15km from the mine site.

3.3 ACCESS TO SITE

From Bishkek, the Chaarat Property is accessible by a combination of 520 km of paved and unpaved roads, of which 185 km are gravel. Travel time from the capital

city to the Chaarat camp is in the order of 10 to 12 hours via the northern road, which is closed between the end of October and early June.

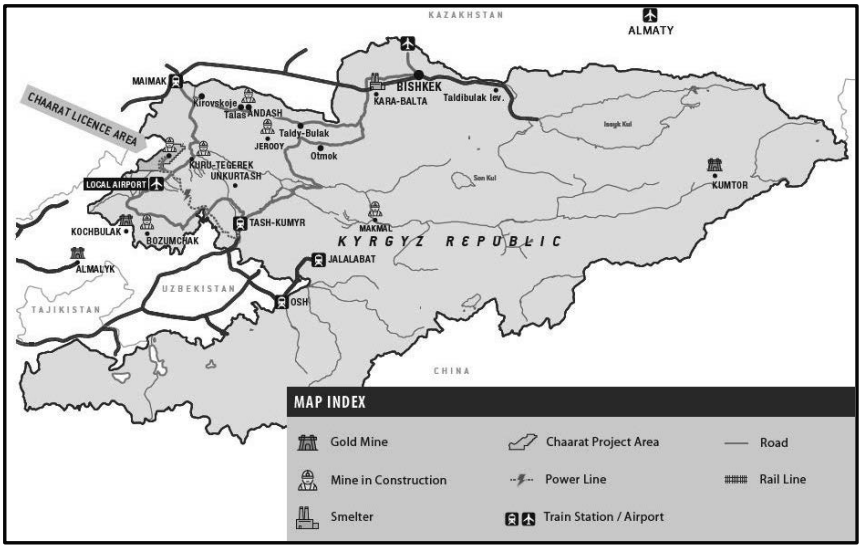
There is an alternative southern access into the Chatkal valley through the town of Jany-Bazar at the intersection of the Chatkal River and the Sandalysh River. This route provides virtually year-round access to the Property and, although longer (760 km), is the route preferred for future development. Travel time from Bishkek using this route is approximately 15 to 18 hours.

From the national road, a dedicated 25 km road leads to the site over a mountain pass at 3,250 metres. Access to the site via the mountain pass is only possible by off-road vehicle.

The nearest railway station is 180 km away at Maimak. Access to site from Miamak is via the northern road.

An alternative rail route, and possibly a better option for rail access, is via Tash-Kumyr, 200 km from site or Shamaldy– Sai, about 320 km from site.

Figure 3.2 Project Location Map



The nearest international airports are Bishkek and Almaty in Kazakhstan, with a local airport approximately 50 km from the deposit.

3.4 CLIMATIC CONDITIONS

A weather station is located on site. The climate is characterised by a semi-arid to temperate climate.

3.4.1 DESIGN TEMPERATURES

Daily and seasonal temperatures are highly variable but typically reach their minimum in February (-35°C) and maximum in July/August (+33°C) with an annual

average of -10°C and 200 days a year below 0°C. The minimum and maximum Indoor Design Temperature is +7°C to+33°C.

Table 3.1 Monthly Temperature (06/10 – 09/14) (°C)

	Month											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average	-12.6	-11.1	-4.3	2.8	9.0	11.9	14.2	14.9	10.3	4.0	-3.1	-10.7
Minimum	-31.6	-35.2	-29.2	-15.6	-5.3	-2.8	-1.1	-1.3	-8.2	-16.3	-23.7	-29.4
Maximum	5.0	2.6	9.5	21.7	25.2	27.6	32.9	32.7	29.3	24.2	17.3	7.6

3.4.2 RAINFALL

The annual precipitation averages 700 millimetres (mm) with the majority occurring as rain during the summer months. Obviously during winter period, the precipitation will fall a snow and the average snow fall over this winter is reported to 500 – 600 mm.

Table 3.2 Monthly Precipitation (mm)

	Month												Year
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Average	3.7	15.2	106.5	90.6	75.3	94.6	41.5	25.1	28.2	42.1	78.8	18.0	643.0
Minimum	2.0	0.0	0.0	74.6	44.0	21.6	23.2	6.4	0.0	11.6	15.6	2.6	261.0
Maximum	5.6	41.2	242.8	110.0	115.6	288.4	53.6	55.8	80.4	77.2	238.2	34.4	1203.8

3.4.3 EVAPORATION

The recorded monthly average for the region ranges between 242mm in July and 4 mm in February, with an annual average of 94mm.

Table 3.3 Average Evaporation (mm) (112 years on record)

	Month											
Annual	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
94	12	4	21	75	153	184	242	214	141	51	18	13

Source: www.weatherbase.com

3.4.4 HUMIDITY

The recorded monthly average for the region ranges between 6.7°C in July and -12.9°C January, with an annual average of -1.7°C.

Table 3.4 Average Dew Point (°C) (112 years on record)

	Month											
Annual	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
-1.7	-13	-11	-5.6	-0.2	3.1	4.8	6.7	5.7	1.8	-2.0	-6.2	-9.7

Source: www.weatherbase.com

3.4.5 WIND

The recorded monthly directional data shows that during the months from April to October the general wind direction is South / Southwest and during the months from November to March the general wind direction is East / Northeast.

The annual average wind speed is 8 kph (2.2 m/s), with the highest speed recorded in April and the lowest recorded in January, February and December.

Table 3.5 Average Monthly Wind Direction (min)

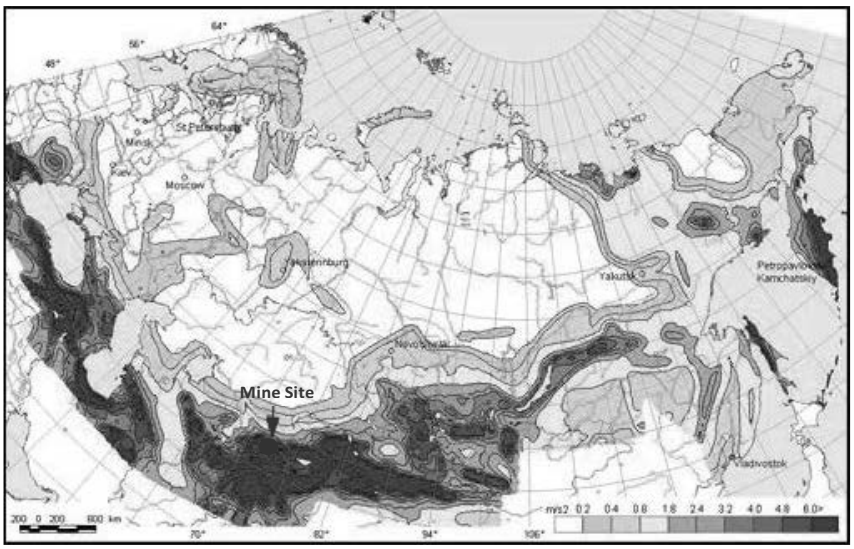
Direction	Month											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
N	0	0	0	0	0	0	1	1	0	0	0	0
NE	55	52	50	23	11	11	11	14	10	23	43	54
E	18	12	15	13	7	7	5	9	4	6	20	20
SE	0	0	1	0	0	0	1	0	0	0	0	0
S	0	1	1	1	4	2	4	3	4	4	1	0
SW	14	18	20	34	47	47	44	47	55	41	18	13
W	12	17	13	19	31	32	34	27	27	26	18	13
NW	0	0	0	0	0	1	1	0	0	0	0	0
CLM	49	55	62	62	60	69	58	59	58	60	61	54

3.5 SEISMIC

Seismic loads of 0.217 g will be applied to all aspects of the permanent design (based on outcome of report 'Probabilistic Seismic Hazard Analysis for a Site in Kyrgyzstan', 2017, Institute of Mine Seismology) for a return period of 50 years (potential for reducing to 0.125 g over facility working life of 15 years).

The typical effects of earthquakes of various magnitudes near the quake's epicentre are detailed in Table 24.1.

Figure 3.3 **Peak Ground Acceleration with 10% Probability of being exceeded in 50 Years for Northern Eurasia**



Source: Seismic Hazard of Northern Eurasia – V.I. Ulomov 1999.

Table 3.6 **Typical Effects of Earthquakes**

Magnitude	Description	Mercalli Intensity	Average Earthquake Effects	Average Frequency of Occurrence
<2.0	Micro	I	Micro-earthquakes, not felt, or felt rarely by sensitive people. Recorded by seismographs.	Continual/several million per year
2.0 to 2.9	Minor	I to II	Felt slightly by few to many people. No damage to buildings.	Over 1,000,000 per year
3.0 to 3.9		II to IV	Often felt by at least some people, but very rarely causes damage. Shaking of indoor objects can be noticeable.	Over 100,000 per year
4.0 to 4.9	Light	IV to VI	Noticeable shaking of indoor objects and rattling noises. Many people to everyone feel the earthquake. Slightly felt outside. Generally causes none to slight damage. Moderate to significant damage very unlikely. Some falling of objects.	10,000 to 15,000 per year
5.0 to 5.9	Moderate	VI to VIII	Can cause moderate to major damage to poorly constructed buildings. At most, none to slight damage to all other buildings. Felt by everyone. Deaths can depend on the effects.	1,000 to 1,500 per year

table continues...

Magnitude	Description	Mercalli Intensity	Average Earthquake Effects	Average Frequency of Occurrence
6.0 to 6.9	Strong	VII to X	Can be damaging/destructive in populated areas in regions of any size. Damage to all buildings. Earthquake-resistant structures survive with slight to moderate damage. Poorly-designed structures receive moderate to severe damage. Felt in wider areas; likely to be hundreds of miles/kilometres from the epicentre. Can be damaging of any level further from the epicentre. Strong to violent shaking in epicentral area. Death toll between none and 25,000.	100 to 150 per year
7.0 to 7.9	Major	VIII to XII	Causes damage to many to all buildings over areas. Some buildings partially or completely collapse or receive severe damage. Well-designed structures are likely to receive damage. Felt in enormous areas. Death toll is usually between none and 250,000.	10 to 20 per year
8.0 to 8.9	Great		Major damage to poorly-designed buildings and most structures, likely to be destroyed. Will cause moderate to heavy damage to normal and earthquake-resistant buildings. Damaging in big areas. Possible total destruction. Definitely felt in unusually large regions. Death toll is usually between 100 and 1,000,000.	1 per year (rarely 0, 2, or >2 per year)
9.0 to 9.9			Severe damage to all or most buildings with massive destruction. Damage and shaking extends to distant locations. Ground changes. Death toll usually between 1,000 and several million.	One per 5 to 50 years

4.0 PROCESS DESIGN

Description	Units	Value
ROM		
ROM Specific Gravity	t/m³	2.79
ROM Bulk Density	t/m³	1.6
ROM Moisture	%	5
ROM Top Size (P_{100})	mm	450
ROM Feed Size (P_{80})	mm	300
Head Grade Au	g/t	0.92
Head Grade Ag	g/t	2.76
Metallurgical Recovery Au	%	70
Metallurgical Recovery Ag	%	60
Crushing		
Flow sheet	-	3 stage
Product Size (P_{80})	mm	12.5
HLF		
Stacking Method	-	Truck, permanent
Stacking Rate	t/d	13,500
Cyanide Dosing Flux	l/hr/m²	10
Residual Moisture	%	9
ADR		
Adsorption Method	-	Cascade columns
Carbon Advance Rate	t/d	10
Elution Type	-	Pressure Zadra
Elution Capacity	t	10
Elution Frequency	/d	1
Goldroom		
Smelting Furnace Type	-	Diesel fired
Final Product	-	Doré

5.0 OPERATING PARAMETERS

5.1 OPERATING CONDITION

13,500 t/d for 365 d/a = circa 4.93 Mt/a

Tonnages and volumes for equipment sizing have been derived by applying the availability and operating regime to the daily tonnage rate above.

5.2 AVAILABILITY

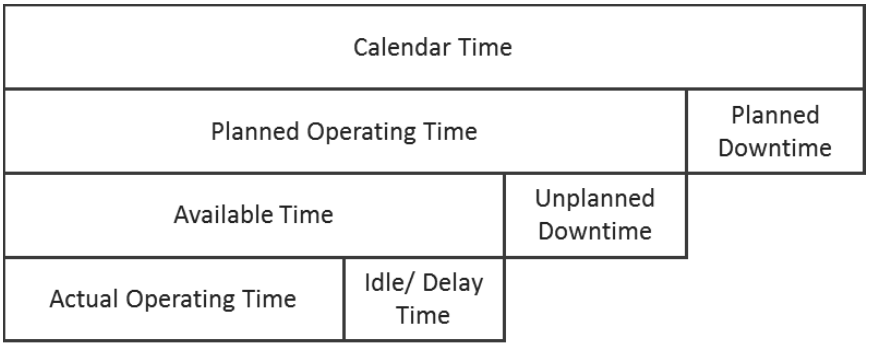
5.2.1 DEFINITION

Availability is defined as the probability that a system will be able to operate at design capacity and quality during the planned operating time. This excludes planned and unplanned downtime. Distinction is drawn between system availability and component availability as the former is the result of a specific configuration of components, each with its own availability.

A system capacity and quality target are set in narrow bands. Typically, a system is deemed available if it achieves 95% or more of its design capacity and the quality is within 90% of the specified parameter.

Availability is calculated by convention in accordance with Figure 5.1.

Figure 5.1 System Time Allocation



- Calendar time: total number of hours in a calendar year (defined as 8,760 hours).
- Planned downtime: including statutory holidays, planned maintenance and down shifts.
- Unplanned downtime: where not mechanically (electrically) operable when it should be.
- Idle and delay time: Equipment operable but not producing e.g. no feed or short term interruptions to production.

- Availability (%) = Available Time / Planned Operating Time
- Utilisation (%) = Actual Operating Time / Available Time

Four main systems are indicated for the Project:

- Comminution and HLF
- Adsorption
- De-adsorption, regeneration, electrowinning and goldroom
- Power supply

5.2.2 COMMINUTION AND HLF SYSTEM AVAILABILITY

The Comminution and HLF system battery limits are:

- Discharge of ROM ore onto the primary crusher static grizzly.
- Pregnant solution pond discharge pump suctions.
- Discharge of the barren solution liquor into the irrigation network on the HLF.

Comminution and HLF system design availability will be at least 85%.

Table 5.1 Comminution and HLF System Design Availability

Time Component	Annual Hours
Calendar Time	8,760
Planned Downtime	1,344
Major shutdown	*384*
Minor shutdown	*384*
Inspection shutdown	*576*
Planned Operation Time	7,416
Available Time (85%)	**6,304**
Unplanned Downtime	1,112

5.2.3 ADSORPTION SYSTEM AVAILABILITY

The adsorption system battery limits are the:

- Pregnant solution pond discharge pump suctions.
- Discharge from carbon transfer pump 6 (240-PP-006)
- Discharge from barren solution pumps (240-PP-021 & 240-PP-022)

Adsorption system design availability will be 95%.

Table 5.2 Adsorption System Design Availability

Time Component	Annual Hours
Calendar Time	8,760
Planned Downtime	624
Major shutdown	288
Minor shutdown	192
Inspection shutdown	144
Planned Operation Time	8,136
Available Time (95%)	**7,729**
Unplanned Downtime	407

5.2.4 DE-ADSORPTION, REGENERATION, ELECTROWINNING AND GOLDROOM SYSTEM AVAILABILITY

The de-adsorption, regeneration, electrowinning and goldroom system battery limits are the:

- Discharge from carbon transfer pump 6 (240-PP-006)
- Discharge from carbon holding tank pump (240-PP-020)
- Loaded carbon screen undersize
- Eluant returns pump discharge (250-PP-004)

De-adsorption, regeneration, electrowinning and goldroom system design availability is 95%.

Table 5.3 De-adsorption, Regeneration, Electrowinning and Goldroom System Design Availability

Time Component	Annual Hours
Calendar Time	8,760
Planned Downtime	384
Annual shutdown	192
Weekly shutdown	192
Planned Operation Time	8,376
Available Time (95%)	**7,955**
Unplanned Downtime	421

5.2.5 POWER PLANT AVAILABILITY

The Power plant has an N+2 philosophy which applies to each generator train (i.e the generator engine, alternator and transformer). This will allow for one individual generator train to be off-lined for maintenance or failure whilst still maintaining one set in standby mode. This is also important when starting large Direct On-Line (DOL) motors or Variable Speed Drive (VSD) motors as the resultant high starting currents can cause a large voltage drop when there is a high existing standing load. Additional

capacity (spinning reserve) is required in these transient conditions and also to counter harmonics from VSDs.

There is one common MV switchboard although this would have individual bays for each generator/transformer stream and for both outgoing circuits for the ring main (plus spares).

Switchgear, transformer and MV circuit inspections will be both visual and manual with online oil samples being taken at the manufacturer recommended intervals. Thermographic imaging profiles should be recorded and maintained. Exercising of switchgear shall also be practiced when an individual genset stream is down for maintenance.

The Power Plant has been designed as an N+2 philosophy, the probability of the power plant (assuming N=4 duty generator set/transformer streams with an individual manufacturer stated availability of 95%) being available at full load capacity at the 10kV switchboard is 99.95%.

Table 5.4 Power Plant Design Availability

Time Component	Annual Hours
Calendar Time	8,760
Planned Downtime	0
Annual shutdown	0
Weekly shutdown	0
Planned Operation Time	8,760
Available Time (99.95%)	**8,755**
Unplanned Downtime	5

5.3 OPERATIONAL CAPACITY

Annual throughput and operating hours will be as follows:

Table 5.5 Operational Parameters

Plant Area	Crushing Plant	Adsorption Plant	Desorption & Recovery Plant	Power Plant
Annual available operating hours	6,304	7,729	7,955	8,755
Type of operation	Continuous 24h/d	Continuous 24h/d	Batch 1 cycle/d	Continuous 24/h
Nominal capacity	782 t/h	864 m^3/h	51 m^3/h	-

5.4 STORAGE AND RESIDENCE

5.4.1 STORAGE – GENERAL REQUIREMENTS

General storage of consumables is required to buffer the difference between supply chain availability and continuous demand. Owing to the remoteness of the mine site

and the higher probability of natural hazards to operation, additional storage capacity is required to procure production continuity.

By definition storage is considered external to the process flow and mass balance, as opposed to residence which is internal to the circuit.

STORAGE PARAMETERS

Storage is governed by a number of considerations:

- Rate of consumption
- Importance to process
- Lead time from order to delivery on site
- Frequency of delivery
- Cost (inventory cost of tied-up capital)
- Shelf life
- Size of store
- Hazard posed (whether explosive, chemical, or other)
- Format of Packaging (in what form it is delivered)

Storage for site occurs in two main places:

- Chatkal station (at the turn-off from the main road to site)
- On site

On-site storage must be a minimum of 10 days. This is a client requirement due to the risk of the access to site being cut off due to avalanches, and based on the assumption that it will take less than 10 days to clear the worst-case blockage of access to site.

Storage at Chatkal will be implemented for two reasons:

- Trucks that are not able to negotiate the pass road to the site will drop their load at Chatkal station and the load will be possibly split up into smaller loads and transported to site using more rugged site vehicles, and
- In the event of access to site being blocked off and site levels running low, immediately that the access is unblocked stock can be transported from Chatkal to replenish site, and then in time the stocks at Chatkal can be replenished by regular delivery

Primary commodities are defined as those commodities of:

- Critical importance, and/or
- High volume

Storage Parameters for On-Site primary commodities are as per the table below:

Table 5.6 Storage Parameters for On-site Primary Commodities

Commodity	Considerations	Storage Quantity
Fuel – Operational	High inventory cost due to high volumes required. Bulk tankers unable to negotiate the pass to site so will have to decant their fuel into smaller site-owned bowsers. Delivery from supplier has short lead time (1-2 days).	10 days on site 1 day at Chatkal (using non-bunded Transtank 20-ft-container sized units) for the design case of the pass shut for the full 10 days and site levels on 0%.
Fuel – Safety	Minimum amount to keep personnel from freezing even if all operational fuel has been consumed	20ft Transtank storage placed near the camp.
Detonators	500m exclusion zone around detonators is required. Lead time delivery assumed to be 1 week (to be confirmed) Storage can thus only be on site; no detonator storage at Chatkal station. Full 10 days plus lead time to delivery to site. Method of delivery is TBC	~7,000 detonators (minimum strategic storage for 2 weeks consumption) Plus uses and ancillaries 2x specialised explosives store 20 ft ISO container All storage on site. No storage at Chatkal station.
Ammonium Nitrate	500m exclusion zone around ammonium nitrate storage is required. Lead time delivery assumed to be 1 week (to be confirmed) Storage can thus only be on site; no detonator storage at Chatkal station. Full 10 days plus lead time to delivery to site. Method of delivery is TBC ANFO (96% nitro plus 4% fuel) consumption approx. 0.3 kg/t rock	~16,000 kg ammonium nitrate (minimum strategic storage for 2 weeks consumption Supplied in 1000 kg bags Stored in 2x 20 ft ISO containers (each container can store up to 24 tonnes AN, 2 containers have capacity for 6 weeks consumption All storage on site. No storage at Chatkal station. Storage quantity is 10 days client requirement plus quantity associated with lead time to delivery.
Cyanide	Hazardous chemical and thus has national regulations governing its storage and use. Cyanide to be stored in accordance with the International Cyanide Management Code (ICMI) Thus no storage at Chatkal Lead time to delivery assumed to be 1 week Method of delivery is TBC	All storage on site. Storage quantity is 10 days client requirement plus quantity associated with lead time to delivery.
Caustic	Chemical is aggressive but can be stored safely at Chatkal. Lead time to delivery assumed to be 1 week Method of delivery is palletized bulk bags (TBC)	Storage on site to be 10 days client requirement. Storage at Chatkal to be sufficient for the lead time to delivery.

Commodity	Considerations	Storage Quantity
Antiscalant	Antiscalant is a slightly aggressive chemical but can be stored safely at Chatkal. Lead time to delivery assumed to be 1 week Method of delivery is palletized bulk bags (TBC)	Storage on site to be 10 days client requirement. Storage at Chatkal to be sufficient for the lead time to delivery.
Hydrochloric Acid	Hydrochloric acid is highly aggressive and highly dangerous but transport and storage is safe provided it is properly managed. Thus storage is feasible at Chatkal. Safety showers at Chatkal may be required. Method of delivery is TBC	Storage on site to be 10 days client requirement. Storage at Chatkal to be sufficient for lead time to delivery. Safety shower required so small water storage for toilets to be extended to include for safety shower, plus recirculation to prevent freezing or biological growth.
Activated Carbon	Activated carbon is not classified as corrosive or aggressive and can be safely stored at Chatkal. Lead time to delivery is TBC Method of deliver is TBC (palletized bulk bags?)	Storage on site to be 10 days client requirement. Storage at Chatkal to be sufficient for lead time to delivery.

Secondary commodities are defined as those commodities of:

- Low volume AND
- Non-critical importance.

Storage of secondary commodities (for example reagents and consumables for the laboratory) will not be detailed here and will become an operational consideration.

5.4.2 RESIDENCE PARAMETERS

Residence is quoted in time which translates into the volume required to smooth out fluctuations in the process, where the fluctuations are a function of time.

Residence parameters are listed below without explanation. Explanations if required can follow:

Table 5.7 Residence Parameters

Commodity or Equipment	Residence time or volume
Fire water tank	Russian regulations to inform. Default will be 2 hours supply to 2 hose reels and 2 hydrants at full capacity at ring main pressure.
Raw water tank	2 days
ROM stockpile	1 week
ROM bin (primary crusher feed)	6 minutes
Crushed ore stockpile	12 hours
Secondary crusher feed bin	5 minutes
Tertiary crusher feed bin	5 minutes
Lime silo	1 day
Pregnant solution pond	78,378 m3
Emergency event pond	82,699 m3
Carbon feed bin Trash bin	10t batch 2 days
Fine carbon bin	2 days
Kiln Feed Hopper	2 hours
Carbon quench tank	2 hours
Carbon transfer water tank	1 day
Carbon conditioning tank	1 day
Carbon holding tank	2 hours
Barren tank	2 hours
Eluant returns pump box	2 hours
Cyanide mixing tank	Volume associated with 2 bags
Cyanide storage tank	1 day
Antiscalant tank	1 day
Lime silo	1 truck (assuming delivered as such)
HCl acid mixing and storage tank	1 day
Caustic Mixing Tank	Volume associated with 2 bags
Caustic Storage Tank	1 day
Air receivers	15 minutes

Philosophy above is that:

- Where no human intervention (top-up) is required, buffer storage will be sized to absorb the process fluctuations
- Where human intervention is required (eg make-up tanks where reagents must be added in batch) buffer storage should be sized for a minimum of once a day top-up (possibly increase to once every 2 days)

RESIDENCE – GENERAL REQUIREMENTS

Residence refers to the internal buffer capacity within the process that acts as a surge buffer to smooth out fluctuations in continuous flow, as well as to smooth out the effects of batch operations.

Residence parameters are set out below.

6.0 DESIGN AND FABRICATION

6.1 GENERAL

The design life for the plant and all static equipment shall be a minimum of 4 years.

All equipment shall be capable of operating in accordance with the performance specification in the equipment data sheet. The plant operating time is as follows:

- Operating days per year 365
- Operating hours per day 24

All designs shall facilitate ease of access for handling, transportation, installation, adjustment, control, maintenance and repair.

The equipment shall be the manufacturer's standard heavy-duty design, incorporating the best materials and practices in line with modern engineering concepts, suitable for continuous operation for the duty specified.

Notwithstanding any other specified provisions, all work shall be carried out in accordance with sound engineering practice and to accepted industry standards.

All materials used in the construction or assembly of equipment shall be new, free of defects and suitable for the duty and service intended.

Suppliers are not required to depart from their standard design or specification, but significant non-fundamental differences between their product and the requirements of the bid documents must be explained in their quotation. Where no differences are explained, the Supplier undertakes to supply equipment and/or materials in accordance with the bid documents.

Supplier Data Requirement (SDR) sheets shall be included in each equipment purchase package requesting for necessary weights, foundation design loads, and anchorage necessary for equipment.

For equipment located outside, the equipment should be winterised to withstand the conditions on site.

6.2 UNITS

The project will be designed in the S.I. unit (metric) system. It is requested that Suppliers use these units in all specifications and drawings, whenever possible.

6.3 CODES AND STANDARDS

The latest editions of codes and standards of the following organisations are applicable:

Table 6.1 Codes and Standards

Institution	Description
ABMA	American Bearing Manufacturer's Association
ACI	American Concrete Institute
AGMA	American Gear Manufacturer's Association
AISC	American Institute of Steel Construction
ANSI	American National Standards Institute
API	American Petroleum Institute
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWWA	American Water Works Association
BS EN	British Standards Institute (BSI)
CE	European Compliance Services
CEMA	Conveyor Equipment Manufacturer's Association
CEN	European Committee of Standardisation
CENELEC	European Committee of Electrotechnical Standards
FEBMA	Federation of European Bearing Manufactures Association
FEM	European Federation of Material Handling
GHS	Globally Harmonised System (Hazardous Labelling)
HI	Hydraulic Institute
ISO	International Organisation for Standardisation
IEC	International Electrotechnical Commission
IHEOH	Industrial Ventilation: A Manual of Recommended Practice published by Industrial Hygiene, Environmental, Occupational Health
IEEE	Institute of Electrical & Electronics Engineers
ICEA	Insulated Cable Engineers Association
IBC	International Building Code
IFC	International Fire Code
ISA	International Society of Automation
MSS	Manufactures Standardisation Society
NFSC	Natural Fire Safety Concept
PED	Pressure Equipment Directive
PFI	Pipe Fabrication Institute
PPI	Plastics Pipe Institute
SAE	Society of Automotive Engineers
SMACNA	Sheet Metal & Air Conditioning Contractors' National Association
SNT	Society of Non-Destructive Testing
SSPC	Steel Structure Painting Council

table continues...

Institution	Description
TEMA	Tubular Exchanger Manufacturers' Association
TEPPFA	The European Plastic Pipes and Fittings Association
UL/FM	Underwriters Laboratories/Factory Mutual

Unless specifically otherwise noted all equipment, devices and systems shall be designed, manufactured and tested in accordance with the latest applicable codes and standards as listed below.

Table 6.2 Applicable Codes and Standards

Institution	Description
CE	European Compliance Services
CEN	European Committee of Standardisation
CENELEC	European Committee of Electrotechnical Standards
IBC	International Building Code
IFC	International Fire Code
IEC	International Electrotechnical Commission
ISA	International Society of Automation
ISO	International Organisation for Standardisation

Note: Suppliers shall specify which of these standards their equipment shall be in compliance with. Failure to so stipulate will result in application of the first listed applicable codes and standards. Suppliers shall also nominate what certification marks their equipment will bear.

All electrical equipment shall bear a CE Approval label where appropriate standards exist. The arrangements for such special "one-off" approval and the cost thereof shall be the Supplier's responsibility. These requirements shall apply to all electrical equipment including that provided with mechanical items.

Referenced publications within this specification will be the latest revision, unless otherwise specified and applicable parts of the referenced publications will become a part of this specification as if fully included.

All requirements as stipulated by local, state or federal governments shall have jurisdiction.

6.4 HAZARDOUS MATERIALS AND ENVIRONMENTAL CONSIDERATIONS

The following materials shall not be used:

- Asbestos and compounds thereof;
- Polychlorinated biphenyl's (PCB's) and compounds thereof.

The following materials shall not be used without approval:

- Chloro-fluoro-hydrocarbons (CFC's) and compounds thereof.

The Supplier's equipment, materials and products (including, but not limited to, products of a toxic, hazardous, flammable or corrosive nature) shall be identified by the required labelling at the place of origin or manufacture for transportation, handling and storage of such equipment, materials and products in accordance with all applicable legislation at that place.

The Supplier shall comply with all applicable laws, orders and regulations concerning the control and abatement of land, water and air pollution.

The Supplier's on-site activities shall be performed by methods that will prevent entrance or accidental spillage of solid, liquid or gaseous matter, contaminants, debris, and other objectionable pollutants and wastes on unprotected ground, into streams, water courses, lakes, underground water sources and the atmosphere. Such pollutants and wastes shall include but are not limited to refuse, garbage, cement, concrete, sewage effluent, industrial waste, radioactive substances, oil and other petroleum products, aggregate processing tailings, substances capable of producing toxic or otherwise objectionable leachate, mineral dust and thermal pollution. Sanitary wastes shall be disposed of at an approved landfill site or by other approved means.

6.5 NOISE

Noise levels of emissions from any equipment shall not exceed 85 dBA at 1m and noise level for control rooms and offices shall not exceed 60 dBA at 1m.

6.6 UTILITY SUPPLY

Compressed air and water services will be supplied as follows:

Table 6.3 Compressed Air and Water Services

Service Code	Service	Operating		
		Temp (°C)	Press. (kpag)	Press. (kpag)
		Normal	Normal	Max.
Compressed Air				
APL	Plant Air	Amb.	620	820
AIN	Instrument Air	Amb.	420	700
Water				
WPT	Potable Water	Amb.	280	350
WFI	Fire Water	Amb.	690	875
WGL	Gland water supply	Amb.	700	770
WRA	Raw (Borehole) water	Amb	700	800
WPL	Plant water	Amb	700	800

Air compressors, air blowers and components provided, shall be altitude de-rated to permit continuous operation at the site elevation referenced elsewhere in this document.

Water supply will come from two boreholes, one feeding the accommodation camp and the other feeding the process plant.

6.7 FUEL SUPPLY

Diesel will be consumed by the following:

- Fuel for all mining equipment
- Fuel for site (light) vehicles
- Power generation
- Fuel-fired process equipment.
- Fuel-fired heating equipment (boilers)
- Explosives (4% diesel mixed with 96% Ammonium Nitrate)

There will be a minimum amount of fuel on site which will be reserved for emergency heating, for the scenario where the pass has been closed long enough to expend all the fuel on site for operational requirements, and the remaining fuel is for heating of the camp to keep the personnel from freezing to death.

Fuel storage in double-skin containerised tanks (such as those supplied by TransTank) require no bunding.

Fuel supply and storage:

- Supply: 25,000 liter fuel tanker trucks will supply the fuel
  - Tankers will offload their inventory at Chatkal station into smaller fuel bowsers that will transport fuel from there to site
  - Tankers may top up the fuel storage facility at Chatkal station as necessary
- Storage:
  - Chatkal station will have a small double-skinned containerised type storage facility (Transtank-type tanks)
  - Primary fuel storage will be by the power plant
  - Fuel storage will also be located at the mining contractor's workshop for refueling mining vehicles
  - A small amount of fuel will be stored for use at the process plant area for use in the process
  - A small amount of fuel will be stored for use at the accommodation camp for heating purposes

The bowsers that receive the fuel from road tankers for transport to site will also be able to refuel heavy and light vehicles, and thus double as mobile truck refueling stations.

6.8 POTABLE WATER

Potable water quality will be provided and a water supply pipeline as necessary to meet or exceed the parameters and guidelines defined in the latest edition of "Guidelines for Drinking-water Quality" prepared by the World Health Organisation.

The primary source of potable water will be a water treatment plant at the accommodation camp.

Potable water supply to all facilities within and outside the site will be via refillable water station bottles (25 liters) and/or by way of bottled water purchased from a local supplier. Water will have to be supplied and/or distributed to:

- Mining contractor offices
- Chatkal station guard hut
- Site access guard hut
- Process plant admin offices
- Process plant goldroom (internal)
- Light vehicle workshop
- Mining contractor's heavy vehicle workshop
- Laboratory

It is assumed that the following facilities will not be supplied with potable water, either in bottles or with a drinking fountain. Personnel will have to bring their own drinking water:

- Kumbal valley checkpoint
- Process plant gate house
- Explosives store (ammonium nitrate)
- Detonators store
- Process plant building

The reasons for the above not being supplied specifically, are as follows:

- Low personnel count
- Where there is a lack of a place to locate a water station
- Where there is suitable proximity to a water distribution point close by

6.9 RAW/FIRE WATER

Raw water and fire water will be supplied in compliance with the International Fire Code (IFC).

Water supply will be from two boreholes:

- One borehole to supply the camp
  - Raw borehole water will be filtered
  - Filtered water will be supplied to the potable water treatment plant
  - Potable water will be stored for use in tanks
- One borehole to supply the process
  - Raw borehole water will be filtered and store in tanks
  - Filtered water will be pumped to the fire water tank
  - Filtered water will be distributed to the process where required
  - Filtered water will be distributed to buildings for flushing toilets and hand wash stations (signs will be posted stating not to drink the water or wash fresh food)
  - Filtered water is considered suitable and clean enough for use in safety showers without first treating in a potable water treatment plant to make it potable water quality.

6.10 POWER SUPPLY

Electrical power is generated on site using stand-alone diesel powered generators with no connection to external power grids and will have a capacity of approximately 5MWe with an N+2 operating facility (one set to cover maintenance/downtime and the second set as standby).

The electrical system shall be designed using the voltage levels, frequency and earthing as listed below.

- Medium Voltage Level: 10 kV, 3 Phase, 50 Hz, high resistance grounded
- Low Voltage Level: 400 V, 3+N, 50 Hz high resistance grounded
- Lighting & Small Power: 220 V, 1+N, 50 Hz
- LV Motor Contactors: 220 V, 1+N, 50 Hz
- Equipment Heaters: 220 V, 1+N, 50 Hz
- MCC Control Circuits: 24 VDC
- Plant Control System Hardware: 24 VDC
- Electrical Field Controls: 24 VDC
- Instrumentation: 24 VDC

6.11 QUALITY ASSURANCE

Suppliers, vendors, manufacturers, etc. are required to have an established Quality Assurance Programme of Quality Plan that complies with the quality objectives of the Owner's Representative.

The quality obligations of suppliers, vendors, manufacturers, etc. are defined in the project supplier quality assurance specifications and inspection data sheets of the Owner's Representative.

Suppliers, vendors, manufacturers etc. shall be responsible for all quality control, inspection and testing. Where applicable, the equipment shall be shop assembled and tested before shipment to the extent required to ensure satisfactory assembly, installation and operation at site. If disassembly is required for shipment, all sub-assemblies and components shall be match-marked for re-assembly onsite. The extent of assembly and testing shall be fully described and documented and approved by the Owner's Representative.

7.0 MECHANICAL

7.1 GENERAL

7.1.1 LAYOUT

Equipment shall be arranged in accordance with the current and approved process flowsheets.

The design criteria for equipment layout are as follows:

- Gravity and natural properties of material flow shall be utilised to the maximum extent possible, to reduce energy inputs.
- Arrangements shall provide a smooth process flow, and allow for merging with other process flow streams.
- All material transfer points shall be designed to minimise spillage.
- Adequate accessibility and clearance around equipment shall be provided for installation, operation and maintenance.
- Suitable Safe Working Load (SWL) rated cranes, monorails and hoists shall be provided for operation and maintenance purposes and at all equipment that may require replacement.
- Wherever possible, ladders and cat ladders shall be avoided, and only after discussion with the Owner and/or the Owner's Representative shall they be used in a design.
- Optimal use of the structures and available space within the structures shall be implemented.
- Floors shall be suitably sloped and drains/sumps shall be provided and positioned at the lowest point to collect spillage and wash-down water. Each area's slope will be determined based on possible spills particle size and will be shown on the layout drawings. The slope range will be between 2% to 10%.
- Fire protection system shall be provided conforming local codes and regulations.

7.1.2 PERSONNEL SAFETY AND OPERATION

Personnel safety and protection shall be prime factors in the mechanical design and layout of equipment. The following issues shall be handled in complete accordance with all applicable codes and regulations:

- Safety devices for handling of bulk material
- Storage of hazardous material
- Dust control of hazardous airborne material
- Radiation hazards
- Building ventilation

- Ventilation of confined spaces and self-contained air supplies.

All mechanical moving parts shall be guarded. The design of the guards shall allow their removal without having to remove other items of equipment.

All openings, sumps, vessels, bins, hoppers, elevated platforms or pits that constitute a hazard shall be adequately fenced or otherwise guarded.

Equipment shall be provided with appropriate access areas where required for operation, maintenance or cleaning.

7.1.3 EQUIPMENT SELECTION CRITERIA

Manufacturers and fabricators shall be given the latitude to use their experience to employ the best design, installation practice and/or procedure, except where the latter would contravene Standard Operating Procedures (SOP) or other standards of the mine or these criteria.

The equipment shall be robust and fit for heavy-duty applications found in a mining environment.

All equipment shall be conservatively rated and sized to withstand capacity changes due to process upsets and variations.

All equipment shall be designed to meet site conditions, such as altitude, ambient temperatures, seismic, wind, rain, humidity and any corrosive surrounding atmosphere.

The equipment shall meet or exceed the project specified production requirements for the expected life of mine (LOM) operation.

Wherever possible, standard “off the shelf” equipment and components shall be used.

All materials used in the construction or assembly of equipment shall be new and free of any defects. Material Test Certificate (MTC) and non-destructive testing (NDT) shall be requested where applicable.

The equipment shall meet or exceed the current environmental standards of the jurisdiction in which it is installed, as well as any environmental restriction(s) that could or should be anticipated.

Where required for operation, maintenance or cleaning, equipment shall be provided with appropriate access. This access may include stairs and/or ladders, walkways and platforms complete with handrails, knee rails and kickboards that comply with the current applicable health and safety regulations.

All equipment shall be designed and/or selected in accordance with the process and site condition requirements. Other factors to be considered for equipment selection shall include, but not be limited to the following:

- Maximisation of personnel health, safety and protection.
- Ease of installation, operation, inspection, cleaning, maintenance, equipment removal and repairs.
- Minimisation of vibration and excessive noise.
- Minimisation of operating and maintenance costs
- Minimisation of capital costs
- Minimisation of thermal expansion stresses.
- Maximisation of standardised components.
- Availability of spare parts.
- Demonstrated successful operational history of equipment and components in comparable installations.

All equipment heavier than 34 kg shall be provided with lifting lugs or another convenient lifting arrangement.

All equipment shall have a transport weight of less than 10 tonnes per axle, or be able to be broken down into subcomponents weighing less than 10 tonnes per axle, in order to meet the transportation requirements to site.

All equipment shall have maximum dimensions of 12 m (l) x 3 m (w) x 2.6 m (h), or be able to be broken down into subcomponents of less 12 m x 3 m x 2.6 m, in order to meet the transportation requirements to site.

Drawings approved by the Owner and the Owner's Representative shall take precedence over other design information.

The equipment manufacturer and model shall be that which is specified in the mine standards unless agreed upon by Owner and/or the Owner's Representative.

Spare parts for equipment shall be readily available or procured with equipment at time of purchase. A list of required spares and their lead times shall be provided to the Owner and/or the Owner's Representative.

7.1.4 EQUIPMENT LOADING

All equipment shall be designed to withstand the following, or a combination the following:

- Dead and live loads
- Wind loads
- Earthquake loads
- Vibration loads
- Pressure induced loads
- Loads applied by machine action (e.g. torque)
- Acceleration or deceleration (inertia) loadings (e.g. braking forces)

- Impact loads
- Loads induced by expansion and contraction of materials of construction
- Loads produced by material spillage or abnormal operation (e.g. conveyor spillage onto adjacent walkways, blocked chutes)
- Loads produced during the course of plant maintenance (e.g. resting of equipment on adjacent platforms, leak testing of vessels).

Supplier shall provide relevant information on any inertial and dynamic loads caused by improper balance in the equipment and shall specify installation requirements for vibration control or isolation. Vibration isolation pads shall be provided if required.

Design service factors for all drive components, couplings, gear reducers and other major equipment shall be listed by the Supplier in the Equipment Datasheets.

7.1.5 PAINTING AND PROTECTIVE COATINGS

Manufacturer standard coating system shall be used for all supplied equipment. Suppliers shall provide their painting system for Owner and/or the Owner's Representative review.

Machined parts shall always be packaged for delivery with a suitable protective coating.

7.1.6 INSULATION

Wherever insulation is required, Supplier's standard insulation shall be used only after Supplier's proposed insulation system has been reviewed by the Owner and/or the Owner's Representative.

Insulation thickness shall be calculated and insulation/cladding material shall be selected based on the site climate conditions.

All other insulation requirements shall conform to insulation specification and Health and Safety Regulations, provided by the Owner and/or the Owner's Representative.

7.1.7 NAMEPLATES AND TAGS

Each item of equipment shall have the manufacturer's standard nameplate, showing at least the following:

- Equipment name;
- Name and address of manufacturer;
- Model and serial number;
- Date of manufacture;
- All pertinent technical data;
- Equipment design data and capacity;
- Design code.

A tag showing the equipment number for each item shall also be provided.

7.1.8 FASTENERS

Fasteners shall be ISO metric M series or as directed by the Owner and/or the Owner's Representative.

Fasteners materials shall be compatible with the environment in which they are installed.

7.1.9 SHIPPING

Shipping configuration drawings for the equipment including detailing supports, lifting attachment, weights, dimensions and restrictions shall be submitted for review by the Owner and/or the Owner's Representative. This review shall be approved before packing and shipping.

Sensitive equipment and material (e.g. to temperature, humidity and impacts) shall be properly preserved for shipping and storage.

Where possible, equipment shall be mounted on structural steel skids, fabricated in accordance with all applicable structural codes. Each skid shall be provided with the following:

- Proper lifting lugs for safe lifting, with lifting capacity clearly marked on skid
- Proper drainage holes on skid base members
- Fully welded structural skid members – stitch welding is not acceptable
- Completely painted skid assembly, as per painting specification
- Skid elements and final assembly free of sharp edges/corners
- Easy access to equipment for maintenance;
- Complete structural skid drawings, showing all dimensions, details, lifting lugs location and capacity, foundation loading and drain holes. Structural drawings shall be reviewed and approved by the Owner and/or the Owner's Representative.

7.1.10 WEATHER CONSIDERATIONS

Equipment shall be fabricated such that it is suitable for transportation, storage, handling and installation at the foreseen extreme ambient weather conditions.

Particular attention shall be paid to all equipment in service outdoors or when handling process material that shall reach ambient temperature.

Lifting lugs on equipment shall be of a material suitable for use at the foreseen extreme ambient weather conditions.

7.2 MECHANICAL DESIGN REQUIREMENTS

7.2.1 DRIVES

Equipment with individual drives is preferred.

Shaft-mounted reducers with V-belt drives shall be limited to 75 kW for conveyors and 300 kW maximum for all other equipment.

Supply of multiple units shall be standardised to maximise interchangeable parts and components and reduce spare parts inventory.

Drive overload devices shall be mechanical such as shear pins, ratchet wheels, couplings and V-belts, etc.

V BELT DRIVES

All V-belt drives shall utilise standard "Narrow" V-belts (3V, 5V, and 8V cross sections) in standard lengths and matched sets. A minimum of two belts shall be used.

All sheaves shall be statically balanced and shall incorporate compression type bushings, which shall be finish-bored and key-seated, to suit the related component shafts.

CHAIN DRIVES

Chain drives shall be avoided if possible. Chain drives shall include ISO 606:2015 roller chains, manual tensioning devices and dust free and oil tight chain casings.

Supplier shall provide service factor information for Owner and/or the Owner's Representative review.

7.2.2 COUPLINGS

FLEXIBLE COUPLINGS

Where flexible couplings are required, located either on the low-speed or high-speed side of the speed reducer, they shall be of the flexible grid member type.

The coupling hubs shall be finish bored and key-seated to suit the related shafts. If the bore size governs the coupling selection, this shall be stated in the quotation.

The maximum bore shall be based on the use of a standard square key. Where possible, low speed coupling halves shall be shop mounted to the driven shaft and reducer output shaft.

Supplier shall provide service factor information for Owner and/or the Owner's Representative review.

FLUID COUPLINGS

Fluid couplings shall be rated to match the rated motor horsepower.

Fluid couplings shall be of the delayed fill type with fill rates easily adjustable.

Torque limit shall be 140% of the motor full load torque. Alarm switches shall be provided if the coupling temperature exceeds its set-point.

Fluid couplings shall be removable without disassembly of the reducer or motor.

7.2.3 GEAR REDUCERS

Gear reducers shall meet ISO-ICS 21.200 or AGMA Standard, Class II. Gear quality shall be AGMA Level 10 minimum.

Reducers for high speed critical duties shall comply with ICS-21.200.

The following components shall be included:

- Helical or double helical gearing with internal splash oil lubrication system;
- Air breather with removable filter and magnetic drain plugs;
- Built-in backstop if required.

Supplier shall provide service factor information for Owner and/or the Owner's Representative review.

7.2.4 FLUID POWER

Fluid power shall meet current standards and requirements of the ISO, JIC, HI and NFPI.

Skid-mounted power packs are preferred.

Power packs shall incorporate dust enclosures where required.

Supplier shall provide service factor information for Owner and/or the Owner's Representative review.

7.2.5 SHAFTS FOR BELT CONVEYORS

Shafts shall be designed to take starting, running and stopping torsion plus any shock load.

Shaft stress analysis shall consider surface, size, reliability, temperature, duty cycle, fatigue stress concentration and safety factors.

7.2.6 ANTI-FRICTION BEARINGS

Bearings shall be selected based on the specific application and ISO-ICS 21.100 or ABMA standards. The minimum L-10 life for the mechanical equipment is listed below:

Table 7.1 Mechanical Equipment Minimum L-10 Life

Mechanical Equipment	Minimum L-10 Life
Gear drives	60,000 hours
Blowers and pumps	60,000 hours
Agitators	80,000 hours
Conveyor pulley pillow blocks	100,000 hours
Conveyor idlers	30,000 hours
Screens	80,000 hours

Table Continues...

Compressors, process fans, turbines	100,000 hours
8 hour service, intermittent usage	20,000 hours
8 hour service, fully used	30,000 hours
24 hour service, intermittent usage	60,000 hours
24 hour service, fully used	100,000 hours

The L-10 life shall be based on maximum speed and radial loads from motor rated power.

For pillow blocks, four mounting bolts shall be selected.

Taconite type seals shall be selected for dirty and outdoor environment. In general, indoor bearing seals shall be multiple type.

7.2.7 SHAFT SEALS AND LUBRICATION

Shaft seals and lubrication shall be designed to meet specific requirements.

Mechanical shaft seals for critical condition shall conform to ICS-83.140.50.

External lubrication systems shall conform to ICS-75.100 where required.

16 mm minimum hex Alemite grease nipples shall be utilised.

7.2.8 MACHINE BASEPLATES

Machine baseplates shall be designed to take all static and dynamic loading. Suppliers shall specify all the loading on the drawings.

Machine baseplates shall be constructed from structural shapes and steel plates and stress relieved after welding.

Mounting surfaces shall be machined after welding with shimming and grouting allowances.

7.2.9 MACHINE GUARDS

All exposed rotating or moving drive parts shall be provided with totally enclosed safety guards.

Safety guards shall be designed for:

- Lubrication of enclosed parts without dismantling or removing guard
- Easy removal of entire guard using normal maintenance tools (peg and socket design with lifting handles preferred)
- Heavy duty service.

V-belt drives shall be provided with an expanded metal guard designed in accordance with applicable standards. An opening in the guard shall be provided for the insertion of a hand-held tachometer.

Guards shall be provided at all nip points on the belt conveyors and feeders. The guards shall be of heavy gauge expanded metal and steel angle construction and designed for easy removal. The guards shall allow for lubrication of the equipment without removal.

Back spill guards shall be provided under the carrying side of the belt immediately after the tail pulley.

7.2.10 BRAKES

Brakes shall preferably be disc type, spring applied and hydraulic or electrically released.

Brakes shall be designed to take six stops per hour at full rated torque without overheating.

7.2.11 PRESSURE VESSELS

Pressure equipment including pressure accessories and safety accessories, shall comply with the requirements of the prevailing ICS-23.020.30 and Pressure Equipment Directive (PED) Codes.

Manways shall be a minimum of 600 mm unless approved otherwise.

Pressure vessels shall be fitted with lifting lugs. Each individual lug shall be designed to support the total vessel weight.

7.3 MATERIAL HANDLING

7.3.1 STOCKPILING

Stockpile live capacity shall be calculated as follows:

MINIMUM NOMINAL LIVE CAPACITY

For minimum nominal live and dead storage capacity calculations use maximum response angle and maximum bulk density.

Critical rat-hole diameter and possible rat-hole geometry shall be evaluated in calculating nominal live and dead storage volumes.

MAXIMUM NOMINAL LIVE CAPACITY

For maximum nominal live and dead storage capacity calculations use maximum repose angle and maximum bulk density, with the assumption that there are no rat holes formed.

For storage capacity and discharge heights, use maximum capacity angle and minimum bulk density.

7.3.2 BELT CONVEYORS AND FEEDERS

Conveyors shall be selected for the design capacity tonnage as shown in Data Sheets, conveyor size optimisation shall be given high priority with a design factor shall be

1.2. The conveyors shall operate at fixed speed with belt sag on carry side shall not exceed 2% and on the return side of the belt shall not exceed 3%.

All belt transition distances at the tail pulley loading zone shall be “full trough” design, and the length shall be according to ISO-ICS 53.040.10 or CEMA’s latest edition for specific trough angle.

All conveyors shall be designed in accordance with the most current issue of the ISO-ICS 53.040.10 or Conveyor Equipment Manufacturer’s Association (CEMA) manual.

Snub pulleys or other measures shall be utilised to ensure a positive traction of the driven pulley to ensure no belt slippage. Any modus operandi with the exception of the snub pulley is subject to approval by the Owner's Representative.

Each conveyor shall have one primary and one secondary belt cleaner, and single mining duty V or Diagonal Plow. Reversing conveyors shall have suitable reversing belt cleaners and Plows at both ends where possible.

All skirting shall be self-adjusting/tensioning type that follow belt undulations, keep positive contact, and come in contact with the belt at trough angle – 20 degrees. The rubber shall be wear resistant type.

The following criteria shall be used for design and specification of belt conveyors and feeders.

Table 7.2 Belt Conveyors and Feeders Design and Specification Criteria

Equipment	Design Criteria
Drive type	Shaft mounted, electro-mechanical drive, with solid shaft, rigid flanged coupling and flexible coupling between motor and reducer, on base-frame with torque arm assembly.
Conveyor motor start method	For motors ≤ 30 kW: DOL For motors > 30 kW: VSD (no soft starters to be used)
Maximum conveyor inclination at load point	Ore: 0 to 3° preferable, 5° maximum
Maximum conveyor inclination, crushed ore and scats	15° ore
Maximum conveyor speed	<300 m = 2.0 – 3.0 m/s 300 – 1000m = 3.0 – 4.5 m/s >1000 m= 4.5 – 6.5 m/s
Feeder Loads	Feeders shall be designed to start and operate under loads generated from both “initial fill” conditions and “flow” conditions.
Maximum belt feeder speed	0.3 m/s nominal 0.5 m/s maximum
Allowable belt widths	Minimum width 600 mm. Increments of 50 mm (850 mm, 900 mm, etc)
Drive pulley lagging / friction coefficient	Rubber, min 12 mm thick grade M, diamond pattern grooves / 0.25 & 0.35 for run & start, Or Ceramic / 0.35 & 0.45 for run & start
Non-drive pulley lagging	Rubber, min 10 mm thick grade M, plain pattern
Belt mass for lift-off	75% of new belt mass

table continues…

Pulleys	Head and tail pulley sizes to be standardized as far as practical
Pulley hub connections	Use locking elements - Ringfeeder or equivalent
Primary belt scrapers	Required, tungsten tip blades, spring lever tensioners.
Secondary belt scrapers	Required, tungsten tip blades, spring lever tensioners.
Tail pulley V scraper	Required, polyurethane blades, self-adjusting.
Take up pulley V scraper	Required, polyurethane blades, self-adjusting.
Troughing idlers	35° trough, 3 roll idler
Return idlers	For belt widths < 750 mm: flat return For belt widths ≥ 750 mm: 10°, V-return, 2 roll
Impact beds	35° trough, in high impact load areas
Impact idlers	35° trough, 3 roll idler
Training idlers location	Before and after discontinuities in conveyor such as head, tail and take-up pulleys etc. Plus at 50m intervals on carry and return sides
Tramp iron magnet type / mounting	Self-cleaning electromagnetic overhead suspension magnet on trajectory path at head chute, as required
Belt reeling & splicing stations	Provision required where ground level access for splicing is not feasible
Conveyor walkways	Conveyors with belt width ≤ 1,000 mm: 900 mm, on one side only Conveyors with belt width > 1,000 mm: 900 mm, on both sides
Belt reeling & splicing stations	Provision required where ground level access for splicing is not feasible
Safety guarding	ASME B20.1 “Safety Standards for Conveyors and Related Equipment”
Conveyor covers	All conveyor shall be covered
Windguards and walkway covers	None

7.3.3 BELTING

Crushing Conveyors and the Belt Feeders shall have cut/gouge resistant rubber or better impact-rip-tear resistant grade of rubber covers. ICS 53.040.20

Process conveyors shall have wear resistant grade of rubber covers. ICS 53.040.20

Fabric for crushing conveyors shall have high impact-rip-tear resistance. Straight–warp type of belts is recommended.

Grade of rubber covers shall be selected in compliance with climatic conditions.

7.3.4 HOLDBACK FOR CONVEYORS

External backstops shall be of the all-mechanical, automatic, overrunning, one-way clutch type, utilising hardened rollers or sprags. They shall be totally enclosed, independent units having effective seals, and shall be complete with torque arms of adequate length.

Where backstops are required “in reducer”, they shall be integral with and completely enclosed and sealed on, or within, the speed reducer. They shall be of the all-mechanical, automatic, over-running one-way clutch type, utilising hardened rollers or sprags.

For decline conveyors holdbacks will not be used. Brakes will be installed on the low speed side with torque rated as per holdback requirements.

7.3.5 COMMINUTION

The crushing circuit will crush 4.93 Mt of run-of-mine ore per annum to 80 % minus 12.5 mm. It will be a 3-stage crushing circuit consisting of a primary jaw crusher, secondary and tertiary cone crushers, with associated screens, conveyors and towers.

The crushing plant will be designed to operate 24 h/d, 365 d/a, for approximately 70 % of the time to take into account downtime for maintenance, no run-of-mine ore, etc.

PRIMARY CRUSHING

The run-of-mine ore will be fed to the crushing plant either by mine trucks directly from the mine, or by front end loader from the run-of-mine stockpile located at the crushing plant.

The run-of-mine ore will be dumped onto a static grizzly with an aperture of 600 mm. Periodically the oversize will be removed from the grizzly by a front-end loader and broken by a rock breaker attached to it before being returned to the grizzly. The undersize will drop into the run-of-mine bin.

The run-of-mine ore will be withdrawn from the bin, at a controlled rate, by a vibrating grizzly feeder. This feeder will have an aperture of approximately 90 mm. The undersize will fall onto the sacrificial conveyor and the oversize will feed the jaw crusher. The jaw crusher will crush the rock to 80 % passing 125 mm. The crushed rock will drop onto the sacrificial conveyor and be transported together with the grizzly feeder undersize to a transfer conveyor which will feed the secondary screen.

SECONDARY CRUSHING AND SCREENING

The secondary screen will size the crushed ore at the finished size of 12.5 mm, with the undersize going to the crushed ore conveyor and the oversize being transferred by a conveyor to the secondary feed bin. This bin will be a surge bin which will allow the secondary cone crusher to be choke fed by a belt feeder. The belt feeder is reversible so that if there is a problem in the crushing plant which results in a long downtime then the bin can be emptied onto the ground using the belt. This will prevent any freezing of the ore in the bins.

TERTIARY CRUSHING AND SCREENING

The secondary crushed product is transferred to the tertiary screen where the minus 12.5 mm rock is screened off and transferred to the crushed ore conveyor. The screen oversize will be transferred to the tertiary feed bin by a conveyor to the tertiary feed bin. The rock will be fed from this bin to the tertiary cone crusher at a controlled rate by a belt feeder. The crushed product will be recycled to the tertiary screen. The belt feeder is reversible so that the bin can be emptied onto the ground using the belt.

7.3.6 TRANSFER CHUTES AND PLATEWORK

All chutes and skirtboards shall be designed to withstand plugged conditions, impact and wear without deformation or failure of the walls and/or structural steel members or platework, and to loosen the bonding between wear liners and the plates.

Chutes shall be designed so the trajectory shall strike material contained in the rock boxes or where unavoidable liner plates.

The minimum valley angle in chutes shall be 60 degrees from the horizontal where achievable.

Material free fall height shall be limited where practical by use of rock boxes or accelerating chutes where applicable.

Wherever possible, chute exits shall be designed to transfer the momentum of the material in the direction of flow of the downstream equipment.

“Accelerating” chute design shall be employed for chutes transferring material from slow moving belts and/or feeders onto much faster moving belt conveyors.

The Mass Flow chute design shall be implemented for bin discharge where possible, in order to improve material evacuation.

Any non-impact wall in contact with removed carry-back shall be lined with low friction material (Ultra High Molecular Weight) or similar liner.

A clear envelope will be allowed around the head pulley, of three times the maximum lump size or one and a half times the flooded burden height, whichever is the greater.

The volumetric design density will be used to determine the volume of transfer chutes. The loading or mass design density will be used to determine the blocked chute loads.

Chute capacities will accommodate material accumulated in the chute from preceding or following equipment during normal operations or after an emergency stop.

CHUTE DESIGN FOR BULK SOLIDS FLOW

The volumetric design density will be used to determine the volume of transfer chutes. The loading or mass design density will be used to determine the blocked chute loads.

Chute capacities will accommodate material accumulated in the chute from preceding or following equipment during normal operations or after an emergency stop.

To prevent impact damage to conveyor belts and to reduce the abrasion wear, transfer points will be designed for soft loading by matching the material velocity and direction as closely to that of the receiving belt as possible. This will be achieved through the use of hood style deflector plates on discharge pulleys.

Material will be directed centrally onto the receiving belt in the direction of belt travel to ensure central tracking of the belt regardless of the transfer of material.

Where the transfer chutes operation is critical to the performance of the system, a Discrete Element Model may be prepared to examine the behaviour of material moving through the chutes.

The chute design will incorporate rotable spares to reduce downtime due to wear liner replacement.

- Chute side wall angle - 75º;
- Rear wall angle - 70º; and
- Valley angle - 66º

CHUTE LINERS

The following liners will be used for the basic design. The minimum work life required for the liners is 10,000hrs.

Table 7.3 Chute Liners

Low wear applications (eg conveyor skirts, chute sidewalls etc)	*Bisalloy*	*500 min*	*10*	*Countersunk bolt*
Medium wear & impact (Feeder side skirts and chutes)	*Bisalloy*	*500 min*	*20*	*Countersunk bolt*
High wear, med/high impact or very difficult to access locations (ROM bins and reclaim hopper liners)	*Bisalloy*	*500 min*	*25*	*Countersunk bolt*
Lip liners	*Bisalloy*	*500 min*	*50 H, 50 W*	*Welded to bolted plate*

CHUTE CONSTRUCTION

Chutes will be fabricated from mild steel plate, minimum of 10 mm thick and suitably stiffened and supported. In order to minimise accumulation of water and solids the use of stiffeners will be minimised by using thicker plate where required.

7.4 PROCESS DESIGN CONSIDERATIONS

7.4.1 PROCESS EQUIPMENT

Process equipment shall be specified in accordance with the process design criteria and flow sheets.

All process equipment design flows rates are based upon the plant design feed rate as stated in the Process Design Criteria and the flow diagrams as per the criteria mentioned hereunder. However, the safety factor details to be discussed and approved with process engineer before proceeding with mechanical design or preparation of any vendor package.

- If the process design is based on the nominal flow for process plant then apply a design Safety Factor / safety margin that range between 10-20% above the nominal process flow rate and throughput requirement. Note:

Grinding mills process data & safety factor shall be discussed and agreed with process engineer

- If the process design is based on design flow for the process plant then no safety factor/margin shall be added to the equipment flow rates and throughputs specified in the Process Design Criteria or flow diagrams

All equipment shall be compatible with the process for which they are designed and/or selected. Equipment material/design shall be selected where possible to eliminate corrosion, clogging, film build-up, etc. due to the process fluids.

7.4.2 LIFTING DEVICES

CRANES AND HOISTS

All cranes and hoists shall be designed, manufactured, tested and certified in accordance with the latest applicable editions of ISO-ICS53.020.20 and ISO-ICS19.060

Cranes and hoists shall be designed for moderate service operating indoors and/or outdoor, available 24 hours per day, 7 days per week.

Cranes and hoists shall be provided with overload protection, limit switches and proximity switches.

Hoist, trolley and control pendant shall be assembled, wired and shop tested prior to shipment. Speed and load test certificates shall be provided as per ISO-ICS19.060 current standards.

For all the cranes and hoists a junction box for external power connects shall be provided.

Overhead cranes shall be provided with radio controls and the radio control shall be on independent frequencies.

Instruments installed outdoors shall be supplied in weatherproof enclosures rated IP56, watertight and dust-tight as a minimum and suitable for ambient temperatures of 5°C to 50°C.

The maximum safe working load (SWL) of any electric overhead travelling (EOT) crane shall be limited to 20 tonnes as per local site standards.

MONO RAILS

Monorail hoists shall be designed, manufactured, tested and certified in accordance with the latest applicable editions of ISO-ICS53.020.20 and ISO-ICS19.060.

The hoist capacity shall be adequate for lifting and loading/unloading of the equipment maintenance/ erection period, as applicable.

7.4.3 STEEL TANKS

Tank sizing shall be as specified in the process design criteria and flow sheets.

Steel tanks can be bolted (only for field erected tanks) or welded construction.

Any tanks with the diameter less than 4200 mm shall be shop fabricated. All other larger diameter tanks shall come in maximum possible shippable sizes to reduce workmanship at site.

Tanks shall be designed with a minimum 500 mm freeboard for surges and freeboard has been considered in tank sizes in the Process Flow Diagrams (PDF). Frothing allowance shall be determined on a case-by-case basis. Overflow will be designed for 150% of inflow capacity, and routed to the floor, which will be sloped to a sump or trench. Tank materials shall be suitable for the application and shall be evaluated on a case-by-case basis.

7.4.4 FIBRE REINFORCED PLASTIC (FRP) VESSELS AND TANKS

Process equipment shall be specified in accordance with the process design criteria and flow sheets.

FRP Vessels and Tanks shall be designed to the requirements of ASME RTP-1 “Reinforced Thermoset Plastic Corrosion Resistant Equipment” latest edition or BS 4994 "Design and Construction of Vessels and Tanks in Reinforced Plastic”.

Tanks shall be designed with a minimum 500 mm freeboard for surges. Frothing allowance shall be determined on a case-by-case basis. Overflow will be designed for 150% of inflow capacity, and routed to the floor, which will be sloped to a sump or trench.

The FRP tank agitators (if any) shall be preferably supported from separate steelwork above the tanks, thus limiting the static and dynamic loads on the tank walls.

Where applicable, tanks shall be fitted with lifting lugs at suitable positions to ensure a level lift. Each individual lug shall be designed to support the total tank weight and stiffeners shall be added to ensure that no deformation of the tank occurs during installation.

7.5 PROCESS DISTRIBUTION SYSTEMS

7.5.1 COMPRESSED AIR SYSTEM

Compressed air system shall be designed considering maximum operational flexibility, good efficiency over a wide range of operating conditions, low maintenance and lifecycle cost with highest availability.

All compressor and blower stations will be indoors except mobile compressors. Systems shall include air filters and receivers. Air dryers shall be provided for instrument air applications only.

Three separate compressed air systems will be provided for:

- Crusher plant instrument air;
- ADR Plant instrument air; and
- ADR airlift pump air.

Compressors and blowers shall be a packaged skid-mounted, electric motor driven type.

A safety factor of 10% will be applied to the final air requirements.

The compressed air system will be designed for "n + 1" units where n is the number of units required to be running continuously to handle the projected continuous operating load.

Compressors shall be rated considering site conditions and elevation. Air compressors shall be de-rated for operation at the site elevation.

Instrument air systems shall have their own air filter, heatless desiccant type air dryer for instrument air supply and air receiver.

7.5.2 GAS AND DUST CONTROL EQUIPMENT

Process tanks shall be covered and vented to gas cleaning scrubbers where required. All indoor tanks shall be vented to outside and scrubbed per local environmental codes as required.

All emission sources shall be identified for control.

Ducting and dampers shall be designed with access doors for internal inspection and cleanout as required.

Fans shall be located on the clean side of gas cleaning equipment (preferably outside at grade with good maintenance access).

For saturated or wet gases, sloped ducts with drains shall be used to collect condensation in the ducts. Consideration shall be given to matching slopes with the process flow (i.e. will not drain against the process flow).

7.5.3 REAGENT SYSTEMS

The process reagent requirements and delivery systems are as follows:

- Hydrated Lime, in bags
- Sodium Cyanide (NaCN), briquetted in bags
- Sodium hydoxide (NaOH), in bags
- Copper sulphate ($CuSO_4$), in bags
- Hydrogen peroxide (H_2O_2), in tanks
- Hydrocholoric acid (HCl), in drums
- Anti-scalant, in bags
- Smelting fluxes, in bags

Reagent delivery, handling, and distribution systems shall be sized and designed based on the Process Design Criteria and flow diagrams. For minimum storage requirements, refer to 5.4 Storage and Residence

Reagent systems with common non-toxic and non-hazardous properties will each have a separate containment area. Possible spills for such reagents will be collected in each sump individually.

Reagent systems with toxic or hazardous or specific properties will have dedicated containment areas. Possible spills for such reagents will be collected separately.

A minimum working volume of 10 days of total reagent supply will be stored at site.

A minimum working volume of 20 days' supply of cyanide in dry briquette form will be stored at site.

7.5.4 LIME SYSTEM

Hydrated lime system will be sized and designed based on the Process Design Criteria and flow diagrams.

The lime system including of the holding tank and pump will be specified as a vendor packaged unit.

Hydrated lime will be delivered in bulk bags.

This package shall consist of a transfer system, a hopper and feeder to feed dry lime onto the ore conveyor, as per process flow diagrams.

7.5.5 FUEL SYSTEM

The fuel system will be a design, supply and installation package. Supplier shall design supply all necessary equipment including fuel delivery system, the storage tanks including pumps (if necessary), dispensers, internal piping and instrumentation on the tank farm and transfer system. Inter connection piping shall be sized and specified but excluded.

Diesel fuel oil for surface vehicles, power generation and fuel-fired process equipment.

Fuel delivery to the Chatkaal gatehouse and fuel farm shall be by articulated road fuel tanker.

Fuel delivery to the mine site fuel store, over the mountain pass, shall be by 20 tonne off-road fuel tanker

Fuel storage shall be above ground in winterised tanks. Supplier to recommend type and size for climate conditions on site. All tanks will be located in a contained area to prevent any possible environmental contamination in the event of a leak. The containment volume shall meet all necessary applicable codes and requirements and at minimum shall be large enough to contain 110% of the largest tank volume.

Fuel tanks shall have the appropriate insulation for the conditions laid out in Section 3.0

Feed to the diesel generator sets will be via day tanks supplied with diesel generator units.

Fuel receiving and dispensing stations shall have spill containment pads.

7.6 HEATING, VENTILATION AND AIR CONDITIONING

Buildings, including process areas, administrative and office areas, rest areas, and accommodations may be partially or fully heated to maximise the life of process equipment and/or improve indoor environmental conditions in accordance with the Owner's health and safety objectives.

Heat loss and heat gain calculations shall be determined using ASHRAE or Carrier methods and factors, an additional 5% shall be added to the calculated value.

Heat loss calculations shall not deduct internal heat gains from any equipment, lights or personnel.

Heat gain calculations shall include all internal heat gains and peak solar gains.

Electrical type rooms and control rooms shall be maintained at a positive pressure by mechanically supplying filtered air into the space.

Sufficient make-up air shall be introduced into the buildings to exceed the exhaust requirements of the various rooms. This make-up air shall be filtered and heated or cooled where required.

Non-air conditioned rooms shall be ventilated and heated with sufficient air to prevent condensation during the winter months.

7.7 WATER AND SOLUTION PUMPING SYSTEMS

7.7.1 WATER AND SOLUTION PUMPS

Pump design flow rates will be operating flow rates as specified in the Process Flow Diagrams.

Variable Frequency Drive (VFD) use will be as specified in the Process Flow Diagrams.

System friction head losses shall be calculated using the Darcy or Hazen and Williams formulae.

Head losses for fittings, expressed as equivalent length of straight pipe shall be based on the Crane Handbook data. In general, the following pipe roughness coefficients shall be used when employing the Hazen and Williams formula:

- Steel pipe: C=110
- Rubber lined pipe: C = 120
- Plastic pipe: C = 140

The rated impeller size shall not exceed 90% of the maximum impeller size and not less than 110% of the minimum impeller size.

Pump TDH will be calculated based on the design flow rates (excluding the froth factor). The design factor for TDH will be 20% on friction loss or 1.1 times the TDH, whichever is greater.

Where possible the operating point on the head-capacity curve shall be close to, or just to the left of, the best efficiency point shown on the pump performance curve.

Particular attention shall be paid to the NPSH requirement. Available NPSH shall exceed required NPSH by a minimum of 10% or 2 m, whichever is greater.

Open type impellers are preferred whenever entrained air is likely.

7.7.2 POTABLE WATER SYSTEM

Water from the fresh water line will be treated as required by World Health Organisation (WHO) drinking water quality standard and transferred to the potable water tank. Water from this tank will be pumped by the potable water distribution pumps and will be distributed to required locations.

Pump flow will be as per maximum estimated instantaneous consumption and pump head will be calculated based on the maximum pressure requirements at the farthest consumer.

7.7.3 PROCESS / RECLAIM WATER SYSTEM

The process / reclaim water system will be design as per the process design criteria and flow diagrams.

Water from the mine dewatering lines will be collected as process water.

The process water pumps flow will be as per process design criteria and pump head will be calculated based on the maximum pressure requirements by the farthest consumer.

The process water pumping system and related piping design shall consider the requirement for ensuring the system operating integrity for the site climatic conditions.

7.7.4 FRESH WATER SYSTEM

The fresh water system will be designed as per the Process Design Criteria and flow diagrams.

Water from fresh/fire water tank will be distributed in the following distribution lines:

- Process make-up water
- Gland seal water
- Reagents water
- Fire water.

Pump flow will be as per process design criteria and pump head will be calculated based on the maximum pressure requirements by the farthest consumer.

7.7.5 GLAND WATER SYSTEM

Gland water flow requirements will be as per the Process Design Criteria and flow diagrams.

Gland water pressure (P) for each pump will be calculated as follows:

- P = Max. Discharge pressure + 100 kPa

Gland water will be distributed by the gland water booster pumps from the fresh/ fire water tank. For high pressure gland water requirements, a separate high pressure pump will be provided if required.

Pump flow will be as per process design criteria and pump requirements. Pump head will be calculated based on the maximum pressure requirements by the gland sealing system of the farthest pump.

7.7.6 FIRE WATER SYSTEM

Fire water will be supplied by a combined fresh/fire water tank. The tank will include segregated fire water storage and will be fed by the fresh water pumps. Fire water will be transferred into two distribution systems as follows:

- Process plant fire water
- Ancillary facilities site fire water.

Fire pumps type and quantity will be as per applicable fire protection codes and standards.

A jockey pump will keep the fire water ring under pressure.

Fire water supply and pump flow will be as per applicable fire protection codes and standards and pump head will be calculated based on the maximum pressure requirements by the farthest hydrant/user.

7.8 SLURRY PUMPING SYSTEMS

7.8.1 SLURRY PUMPS

Pump design flow rates will be operating flow rates as specified in the Process Flow Diagrams multiplied by a process variation factor of 1.1 and a mechanical flow factor to compensate impeller wear equal to 1.05 to 1.1.

Pump TDH will be calculated based on the design flow rates (excluding the froth factor). The design factor for TDH will be 20% on friction loss or 1.1X of TDH, whichever is greater.

When pumping slurries, head losses and pump hydraulic efficiencies shall be adjusted where appropriate to reflect the “solids effect” of the slurry. The pump supplier shall confirm the head and efficiency de-rating factors used to calculate pump speed and brake power (kW).

The slurry pump motor size should be at least 20% greater than designed power.

When pumping abrasive slurries, impeller tip speeds shall preferably be as per the recommendation of CEN / ISO standards.

Where possible the operating point on the head-capacity curve shall be close to, or just to the left of, the best efficiency point shown on the pump performance curve.

Previous experience of pumping similar slurries shall be employed to specify the type of material to be used for the impellers and casings. Supplier recommendations shall also be requested.

Particular attention shall be paid to the NPSH requirement. Available NPSH shall exceed required NPSH by a minimum of 10% or 2 m, whichever is greater.

Open type impellers are preferred whenever entrained air is likely.

A froth factor will applied to pump flow rates as necessary.

The froth factor is a multiplier that increases the process design capacity to allow for the increased passing volume caused by the gas in the froth. The factored volume usually causes the pump to be at least one pipe size larger than would normally be selected. Depending on the manufacturer and the application, the factor applied will vary; typical values are 1.5 to 4. Froth factor for each pump will be applied as necessary. Froth factors value will be shown in pumps schedule as per process requirements.

7.8.2 PUMPBOXES FOR ABRASIVE SLURRIES

For abrasive slurries, rubber-lined conical or cylindrical pump boxes with an inclined bottom plate are preferred.

Conical pump boxes shall incorporate a horizontal parting flange above the outlet nozzle.

Where an operating and a standby pump are connected to a common pump box, care shall be taken to minimise the separation between the outlet nozzles on the pump box to avoid excessive sanding.

For abrasive slurries incorporating coarse material, a sacrificial insert is preferred at the pump box outlets to the pumps, complete with water injection nozzles to assist in clearing the outlet nozzle before starting up a pump.

8.0 ELECTRICAL STANDARDS

The following standards shall apply where motors, controls, and other electrical equipment are supplied by the Supplier in conjunction with mechanical or other equipment.

Electrical and instrumentation items shall be designed, manufactured and tested in accordance with the requirements and relevant sections of the latest International Codes, Standards and Regulations. The Supplier shall state which set of standards, regulations and codes have been applied to the equipment offered. The relevant International standards include, but are not limited to, the following list.

Table 8.1 International Electrical Standards

Identification	Title
IEC 60417	Graphical symbols for use on equipment
IEC 60445	Identification of fuse terminals
IEC 60502	Power cables with extruded insulation and their accessories for rated voltages from 1kv to 30kv
IEC 60529	Degrees of protection provided by enclosures (IP code)
IEC 60617	Graphical symbols for diagrams
IEC 60694	Common specifications for high-voltage switchgear and control gear standards
IEC 60896-21	Stationary lead-acid batteries. Valve regulated types. Methods of test
IEC 60896-22	Stationary lead-acid batteries. Valve regulated types. Requirements
IEC 60898	Electrical accessories - Circuit breakers for overcurrent protection
IEC 60947	Low voltage switchgear and control gear
IEC 61000	Electro magnetic compatibility (EMC)
IEC 61009	Residual current operated circuit breakers with integral overcurrent protection for household and similar uses (RCBO's)
IEC 61293	Marking of electrical equipment with ratings related to electrical supply - Safety requirements
IEC 61439	Low Voltage switchgear and control gear assemblies
IEC 61537	Cable management – Cable tray systems and cable ladder systems
IEC 61850	Communications networks & systems in substations
IEC 62040	Uninterruptible power systems
IEC 62262	Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK Code)
IEC 62271	Standards for high-voltage switchgear and control gear
IEC 61800-3	Semiconductor power converters for adjustable frequency drive systems environments 1 and 2
IEC 61800-5-1	Adjustable speed electrical power drive systems safety requirements – Electrical, thermal and energy
IEC 62305	Protection against lightning

table continues...

Identification	Title
IEC 60502-1, IEC 60228 EN 50288-1, EN 50288-7 and EN 50290-2	Low Voltage Instrumentation & Control Cables
Energy Institute Model Code of Safe Practice Part 15	Area Classification Code for Installations Handling Flammable Fluids

The codes and laws of the country, municipality or jurisdiction in which a project occurs may take precedence over the afore mentioned codes.

In case of conflict between the referred codes, specifications, standards and manufacturer's preferred procedures, the most stringent code will apply.

8.1 POWER SYSTEM

8.1.1 GENERAL

Main power for the mine will be provided from an on-site power plant consisting of synchronous generators, driven by diesel engines. Power shall be generated at 400 V, 50Hz, 3 Phase. Each generator shall have an individual step up 0.4/10kV transformer which shall connect into a common 10kV switchboard for distribution.

Main power at 10kV will be provided via two radial feeder circuits.

Circuit 1 will feed;

- Gatehouse
- Explosive Stores
- Ammonia Stores
- Accommodation Camp
- Vehicle Workshop

Circuit 2 will feed;

- Primary Crusher & Secondary/Tertiary Crusher Areas
- Load Out Area
- Process Plant Area (ADR, Gold-room & Reagents)

All facilities loads will be supplied from individual areas. Each area will be fed either by a packaged substation/switchgear/transformer unit or pole mounted switchgear/transformer.

The 10kV system shall be of a radial Over Head Line system (OHL) with bare Aluminium conductors. Overground cable shall be installed on cable ladder/tray and utilize conveyor, building and plant support structures for reticulation where possible.

Emergency loads identified will have standby generators installed to provide power in the event of a mains power failure.

Locations with low demand which are remote from the process plant will have stand-alone diesel generating sets.

8.2 VOLTAGE AND SIGNAL LEVEL

All electrical, instrumentation and control equipment should function correctly at the voltage, current and frequency levels specified in Section 1.5.10 and between the following steady state voltage and frequency tolerances:

- Voltage: +6%, -10%
- Frequency: ±5%

Further, all electrical equipment shall be able to function through the following short-term transient variations.

- Voltage: +15%, -20%
- Frequency: ±10%

Where alternate voltages are necessary for the package, voltage conversion units shall be provided as part of the package

8.3 ELECTRIC MOTORS

The Supplier shall supply all motors required for operation of the package as per the project documentation and shall comply with IEC 60034.

If a project nominated Supplier exists then the motors shall be sourced from the named Supplier. If no nominated Supplier exists then the motor Supplier must be approved by the client.

Single phase motors shall not be supplied unless agreed by the Tetra Tech engineer.

The Supplier shall provide suitably rated Local Control Stations for each motor.

Each LV motor shall include, but not be limited to:

- Supply of equipment as listed in the project documentation
- Connection diagram and general arrangement drawings
- Motor terminal box with gasket lid and gland plates
- Slide Rails with belt tightening screws where applicable
- Anti-condensation heaters and thermistors where specified
- Separate auxiliary terminal boxes for instrumentation and anti-condensation heaters
- Nameplates and labelling
- Lifting lugs
- Local control station
- Packaging for transport and

- Inspection, testing and certifications.

The motors shall be totally enclosed fan cooled (TEFC) with enclosure protection to at least IP55 unless stated otherwise in the project documentation.

Insulation shall be class F (155°C) but the motors shall be limited to class B (80ºC above ambient) temperature rise.

Horizontal foot mounted motors shall be used as standard with flange and/or vertical shaft mounting only where specified.

All motors shall be suitable for a three phase supply unless special equipment necessitates the use of a single phase supply.

Motors shall be of the squirrel cage induction type with a maximum speed of 1500rpm at 50 Hz or 1800rpm at 60 Hz unless otherwise specified.

Where specified for use with variable voltage or inverter drives the motors shall be suitably derated.

All motors 75 kW or greater shall be provided with two sets of positive temperature coefficient (PTC) in the stator winding

Where thermistors are to be included these shall have a trip temperature of 140ºC.

Ball bearings shall be fitted at both ends of motors up to 30 kW and either ball or roller bearings above that size.

All motors specified for belt drive applications shall have suitably upgraded drive end bearings.

Oil seal shall be fitted to drive end and non-drive end bearing housings to prevent the ingress of solid particles and liquids.

All motors are to be suitable for direct on line starting. The maximum volt drop measured at the motor terminals during motor starting shall not be more than 20%.

Motors above 3 kW are to be provided with six winding terminal for star/delta starting where required.

Drive end shafts are to be machined for parallel keys and are to be provided with a tapped hole as standard for ease of removing or securing fitments.

All motors are to be fitted with earthing terminals both inside the terminal box and on the motor frame.

Shaft earth brushes shall be supplied on all motors 110kW and larger that are to be used on variable frequency drive applications.

Power supply terminal boxes shall be oversized. Where cable sizes have not been provided in the scope of works, terminal boxes shall be suitable for terminating power cables of 200m length with a voltage drop of 5% at full load.

For motors 75 kW and larger, the stator terminal box shall be suitable for the entry of three separate single-core cables.

Cable entry to the terminal box is to be possible in any one of four positions at 90° intervals.

For all motors greater than 22 kW, terminal boxes are to be supplied with undrilled aluminium, brass or non-ferrous stainless steel detachable gland plates.

Where motors are provided with an anti-condensation heater and / or thermistor connections, these items shall be provided in a separate terminal box to the motor terminal box.

Where motors are provided with anti-condensation heaters, the heater terminal box shall contain a warning that the heater may be energised when the motor is isolated.

Motors shall be provided with suitable attachment points for lifting.

Each motor shall be provided with a readily accessible stainless steel metal rating plate with details as required by IEC 60034.1

Use Supplier's standard paint specification only after review and approval by Owner and/or Owner's Representative.

Suggest and quote alternate materials deemed suitable or superior for the application based on Supplier's experience. Use of alternate materials shall be approved by Owner's Representative.

Select bearings for minimum L10 life listed in Section 7.2.6

8.4 DEGREES OF PROTECTION FOR ELECTRICAL EQUIPMENT

Unless stated otherwise, the minimum acceptable degree of ingress protection (IP) for electrical equipment and devices is as listed in Table 8.2 and Table 8.3 below. With enclosures open, all live parts shall be shrouded to provide IP 20 protection as a minimum.

Table 8.2 Control Room and Switch Room Equipment IP rating

Equipment	Min IP
MCC's	41
Motors	55
Dry type transformers	21
VSD / Soft starters	42
UPS	42
Lighting and small power	42
MV Switchgear	32
LV Switchgear	52
Instrumentation	*52*

Table 8.3 Process Plant and Field Equipment IP rating

Equipment	Min IP
MCC's	65
Motors	55
Transformers	54
VSD / Soft starters	65
UPS	65
Lighting and small power	65
MV Switchgear	56
LV Switchgear	56
Instrumentation	66

8.5 ELECTRICAL ROOMS AND ENCLOSURES

Electrical rooms will be provided in strategic locations, in the operational areas. Typically, they will house switchgear, MCCs, VSDs, PLC/DCS panels, fire alarm protection panels and lighting/distribution panels as needed.

Filtered ventilation and air conditioning will be provided to keep the rooms clean and maintain a temperature of 30°C (86°F) or less under normal plant operational conditions. Incoming air should be at a temperature such that condensation cannot occur on or in the electrical equipment.

Unused cable entries shall be plugged, ensuring that the IP rating and enclosure integrity is maintained.

All enclosures shall be suitable for the environmental conditions specified in the process specification.

All enclosures shall be made of a material that is suitable for the environment where it is installed. Stainless steel, painted mild steel or glass-reinforced plastic (GRP) materials are acceptable.

8.6 JUNCTION BOXES

All junction box doors shall be front access type, and all internal equipment shall be accessible and maintainable from the front. Doors shall be hinged with a door stay in the open position.

All hinged parts shall be connected by means of a flexible earth connection to the fixed portion of the frame.

A minimum of 25 % of clear mounting space shall be provided on the backing plate for future expansion.

Removable gland plates shall be provided for all marshalling boxes. Gland Plates shall be adequately sized and strengthened to accommodate all package cables, external interface cables, and 25% spare capacity. Gland Plates shall be brass or aluminum.

8.7 SWITCHGEAR AND CONTROL GEAR

Where included in Supplier scope switchgear shall be rated for the maximum fault level specified.

Low voltage power distribution and motor control centres shall be in accordance with IEC 60947. Enclosure type shall be suitable for indoor installations.

Each low voltage switchboard shall be complete with an incoming main breaker section and suitable digital protective relaying including ground fault detection and alarms, with a stored energy mechanism for closing and tripping, and a digital meter display of instantaneous three phase voltage, current and power parameters. These power monitoring devices will be capable of communicating with the plant control system.

Arc flash will be managed by maintenance use of suitable personal protective equipment and appropriate lock-out and maintenance procedures.

Bus bars shall be insulated.

Individual distribution feeder cells will be circuit breaker type with digital protective relaying.

Design loading for low voltage distribution and motor control centres shall not exceed 75% of calculated running loads.

8.8 CABLES

Unless stated otherwise in the project documentation, LV power and control cables shall have stranded plain annealed circular copper conductors rated to 0.6/1kV, PVC insulation, steel wire (multicore) or aluminium wire (single core) armour, PVC bedding and a PVC sheath overall.

All LV power and control cables shall have a temperature rating of 90ºC or better and shall be ultra violet (UV) stabilised for outdoor use.

Instrumentation cables shall have annealed copper conductors and PVC insulation. Pairs of insulated conductors shall be uniformly twisted. Multiple paired cables shall have one blue core and one black core in a pair identified by a numbered pair screen isolation tape. Conductor size shall be 0.5mm^2 for multi-pair instrument cables and 1.5mm^2 for single pair instrument cables. Cables to solenoid valves shall be 1.5mm^2 unless voltage drop or current limitations require a larger cross-sectional area.

An aluminium/polyester tape screen shall be applied to each pair of instrumentation cores and this is to be in continuous contact with a 0.5mm^2 tinned copper drain wire. Cables shall have an overall screen and a PVC sheath.

The instrumentation cable shall have a voltage rating of 300/700V and a temperature rating of 70ºC.

Multi cored cables shall have black numbered cores.

Cable reels/drums shall be marked in indelible letters on aluminium plate with conductor material, size and length and weight of cable clearly identified.

Cables sheaths and cores shall be coloured as per the requirements listed in Table 8.4

Table 8.4 Cable sheath and core colours

Cable	Sheath	Cores
LV power – multicore	Orange	3C+E: brown, black, grey and green/yellow stripe 4C+E: brown, black, grey, blue and green/yellow stripe 2C+E: brown, blue and green/yellow stripe
LV power – single	Black	-
LV control	Black	White with black numbering
Multi-pair instrument	Black	Pairs: core 1 white, core 2 black Triples: core 1 white, core 2 black and core 3 red
Earth cables (single core)	Green/yellow	-
Optical fibre cables	Black	-
Control and instrumentation cables for Profibus DP	Violet	Channel A: green Channel B: red
Control and instrumentation cables for Modbus/RS-485	Grey	Pair 1: white/blue and blue/white Pair 2: white/orange and orange/white Pair 3: white/green and green/white
Category 5e data cables	Blue	Pair 1: blue and white/blue Pair 2: orange and white/orange Pair 3: green and white/green
Category 6	Grey	Pair 1: blue and white/blue Pair 2: orange and white/orange Pair 3: green and white/green Pair 4: brown and white/brown

Where instruments require special cable, the instrument manufacturer's requirements shall be followed.

Separate trunking shall be supplied for AC and DC circuits.

The insulation of panel wiring shall be coloured as follows:

Table 8.5 Panel Wiring Colour Specification

Wire Type	Insulation Colour
3 phase AC Circuits	L1 – Brown L2 – Black L3 - Grey
Neutral	Blue
DC Positive	Brown
DC Negative	Grey
Earthing Conductor	Green / Yellow
Control Conductor 24 VDC	White
Intrinsically Safe circuits	Light Blue
Signal Positive	White
Signal Negative	Black

Table Continues...

All wiring interconnections shall be by fixed, rail mounted, terminal blocks. All terminals shall be identified using proprietary markers in accordance with the wiring diagrams.

Insulating barriers shall be provided between adjacent terminals of differing voltages.

Terminals for voltages 50VAC or 48VDC and higher shall be provided with an insulated cover and shall be marked with an appropriate warning label.

A clearance of at least 50mm shall be maintained between plastic trunking and terminals.

Fifteen percent spare terminals shall be provided.

Crimping lugs or pins and core markers shall be applied to all control and instrument cables using an approved tool with a ratchet action. Separate lugs or pins shall be used for each conductor. The size of the lug or pin shall be suited to the size of the conductor to be terminated.

All power cables shall be connected with a suitably sized lug unless the equipment where cable is terminated has tunnel type terminals.

8.9 CABLE GLANDS

All cables shall be terminated using brass glands except where the environment is not suitable for brass metal. Cable glands shall be rated so that the ingress protection of the device or enclosure is maintained.

Cable glands shall be of the correct size and type for the cable, and shall be used strictly in accordance with the manufacturer's instructions. Cable glands for instruments shall be M20 thread. If an instrument does not have an M20 entry, an appropriate thread adaptor shall be fitted, and an M20 gland used.

8.10 CABLE INSTALLATION

All cable shall be supported by cable tray or cable ladder. Cables shall be adequately protected from mechanical damage using covered cable ladders and trays, covered unistrut, or conduit. Any cables mounted in areas exposed to direct sunlight, and without UV stabilised black sheath, shall be protected against UV degradation over their entire length. Installation using mechanical protection described above will satisfy this clause.

Bushings or grommets shall be provided to protect cable sheaths from sharp edges.

Instrument/intrinsically safe/telecommunication signal cables and electrical power cables shall not be run in the same cable tray.

Solenoids, proximity switches, and other items of equipment with DIN type plugs, encapsulated leads, or similar connections not suitable for direct termination of ordinary circular cable shall be terminated at a junction box close to the device.

8.11 LABELLING AND IDENTIFICATION

All cables, control/instrumentation cable cores, terminals, junction boxes, marshalling boxes, and control panels shall be numbered in accordance with the system described in the project documentation.

All valves and instrumentation (including relief valves, control valves, and actuated valves) within the package shall be allocated unique tag numbers in accordance with the project requirements and shall be tagged by the Supplier using a stainless steel tag as defined elsewhere in this specification.

All nameplates and labels in the front and rear of panels and in the field shall be engraved laminated Formica Traffolyte with black letters on white background. Panel/enclosure nameplates shall include equipment tag number and equipment title.

All panel mounted devices including relays shall be clearly labelled by the relevant number appearing on the schematic, loop or wiring diagram. Fuse ratings shall also be identified. These labels shall be fastened by means of a suitable adhesive adjacent to but separate from the device.

All field-mounted electrical/instrumentation equipment shall be identified with conspicuously placed engraved labels fixed on steel backing plates adjacent to but separate from the device.

Each wire, regardless of length, type, size, colour or location, shall be fitted with ferrules and identified with a wire number. The number shall correspond exactly to the number shown on the loop or wiring diagram for the specific unit.

All cables and control tubing shall be identified at each end with an approved type of engraved stainless steel cable numbering system.

All devices, including instruments that form part of a trip or shutdown circuit shall be labelled to indicate as such.

The Supplier shall submit a list of all equipment nameplates and labels for approval, prior to manufacture. Incorrect labels that have not been approved shall be replaced at no cost.

If the equipment could start automatically – "Automatic start" signs shall be supplied.

Where the opening or removal of doors exposes personnel to live conductors and terminals – "Electrical Flash" and "Danger live terminal" signs shall be supplied

8.12 ELECTRICAL EARTHING AND LIGHTNING PROTECTION

Electrical Earthing and Lightning protection for the entire site will be subject to a detailed design study.

All electrical equipment and devices installed on the package/skid shall be provided with facilities/connections for the termination of earth conductors.

Two M10 earth bosses (as a minimum) shall be installed at diagonally opposite corners of each package. Such earth bosses will be utilised for earthing the package. All tanks, vessels and structures not welded to the package shall be bonded with the items in the package via earth bosses or an earth bar. The earth cable shall be 35 mm^2 (minimum) cross sectional.

Cable armours of all armoured cables shall be bonded to earth via the gland and gland-plate at both ends of the cable.

The metallic enclosures of all electrical and instrument equipment/devices and all metallic piping/equipment shall be bonded to the skid base either directly via an earth boss or earth bar. Such earth wires shall be of 10 mm2 (minimum) cross sectional area.

Cable ladders shall be electrically bonded by the installation of 35 mm2 single core insulated earth cable installed at each end of run.

Each cable ladder and/or tray run shall be earthed by connection to the structural steel skid by the installation of a 10 mm2 single core insulated earth cable installed at each extremity of the cable ladder.

Earthing and lightning protection for all structures and equipment shall be designed as required and determined through soil resistivity tests in accordance with IEC 62305.

8.13 VARIABLE SPEED DRIVES (VSDS)

Requirements for Variable Speed Drives for AC motors will be rated to suit individual motor sizes and will be designed in compliance with IEC 61800-3 and IEC 61800-5-1.

8.14 UNINTERRUPTIBLE POWER SUPPLIES (UPS)

UPS systems will be installed in electrical rooms to provide AC power for the DCS/PLC controls, telecommunications and other critical process monitoring systems. They shall comply with IEC 62040.

8.15 LIGHTING

Power for lighting will be supplied from lighting panels with incoming breakers, rated for the available short circuit current level.

Control room lighting will be electronically dimmable and fixtures shall be complete with louvers to minimise glare from operating monitors. Lighting for offices and control rooms will be 230V, high efficiency fluorescent type fixtures

Emergency lighting will be provided by self-charging battery powered lights and exit signs. These units will be provided for offices, labs, electrical rooms, the control room and major egress routes indoors. Electrical/Control Rooms will have at least one self-charging unit connected to the room normal lighting circuit.

The types lighting fixtures and illumination levels will be determined in accordance with CIBSE Guidelines.

Haulage road lighting shall be installed from the Vehicle Workshop area and shall be strategically placed throughout the roadside to the ROM Pad area.

Lighting circuits for each area shall be arranged such that the loss of one circuit shall not result in total lighting outage of the relevant area.

As far as practicable, loads shall be balanced across each phase of the relevant Distribution Boards.

All lighting circuits that require permanent energisation shall be connected to the maintained lighting distribution section of the light and power distribution board.

8.16 ELECTRICAL TESTING

All cables, equipment and works included in the packaged unit shall be tested in accordance with the relevant IEC standard. As a minimum, testing shall include:

- Insulation resistance
- Earth continuity
- Operational test to confirm correct functionality
- Check that installation and inspection are in accordance with drawings and specifications and that adequate supports have been provided for cables and tubing.
- Soap and water test of instrument tubing.
- On completion of tests and prior to shipment, a full set of test documents shall be provided for approval.

9.0 INSTRUMENTATION AND CONTROL

9.1 GENERAL

9.1.1 SCOPE AND BATTERY LIMITS

Process control shall generally be from a central control system located in the plant control room.

Vendor control systems where provided with equipment packages shall have local operator control stations. These control packages will be interfaced to the main plant control system via a digital communication gateway.

The remaining process areas shall be monitored and controlled via operator control stations located in Central Control Room.

A monitor only stations shall be provided in the plant superintendent's office, and an engineering work station will be provided in the E&I maintenance shop.

For site wide infrastructure i.e. telephone, internet, security, fire alarm, gas alarm and control system a fibre optic network shall be installed throughout the mine and process plant area and a radio backbone to the camp, minesite and other locations remote to the process plant building

For surface communications a mobile hand held radio system and/or mobile phone communication will be utilised.

Cellular communication will be made available on site by others. Internet communication to site will be provided via satellite communication. A fibre optic LAN system will be provided for the site and routed with the 10kV MV network where appropriate. Radio communications will provide back up.

9.1.2 CODES AND STANDARDS

The design and manufacture of electrical, instrumentation and controls equipment shall conform to the latest versions of the following codes and standards:

- CE – European Compliance Services
- European Committee for Standardisation (CEN) – EN Standards
- European Committee of Electrotechnical Standards (CENELEC)
- International Electrotechnical Commission (IEC)
- International Organisation of Standards (ISO)
- International Society of Automation (ISA)
- Manufactures Standardisation Society (MSS)

All equipment inside the process plant building shall be rated for a minimum elevation of 2250 meters above sea level, an ambient temperature range of 7°C to +35°C

All equipment outside the process plant building shall be rated for a minimum elevation of 1400 meters above sea level, an ambient temperature range of -35°C to +38°C

Manufacturer's recommended design, installation practices and procedures shall be adhered to whenever such practices and procedures are available.

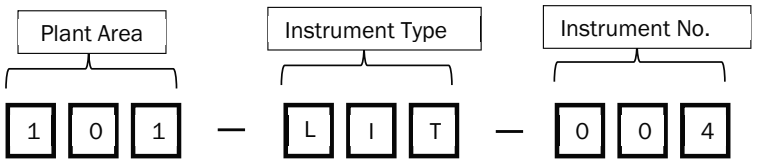
9.1.3 INSTRUMENT NUMBERING

All instrumentation shall be identified accordance with the ISA format. The first three digits are to indicate the plant area number, the following three digits are to indicate instrument type as per ISA conventions and the last four, the sequential equipment number.

XXX–YYY–ZZZ

Where:

XXX – Plant Area number
YYY – Instrument Type
ZZZ – Sequential



9.1.4 INSTRUMENTATION DESIGN AND CONSTRUCTION

GENERAL

Electrical Supply – Electrical supply to field instruments, relays, solenoids, control systems, panel and back of panel instruments where required shall be meet the design requirements of the instruments. A supply of 24 V is preferred.

Pneumatic transmitters shall have an output signal of 20 to 100 KPa. Electronic transmitters shall have an output signal of 4-20 mA DC. If the electronic transmitter is externally powered (4-wire), its output signal must be isolated or floating with respect to ground so that the 4-20 mA DC signal can be transmitted to its associated receiver without any ground loop problems. If ground isolation is a problem, a signal isolator must be used.

The materials of components that come into contact with process fluids (instrument wetted parts) shall be resistant to stress resulting from pressure, temperature, corrosion and erosion, and shall be made of a material certified for use with the

process fluid, this shall be 316 stainless steel minimum; or a material where the process and piping specifications require a different or higher grade material.

Control valves shall have integrally mounted smart electro-pneumatic positioners.

Instrument Air – The instrument air supply shall be dust-free, oil-free and dry. The minimum instrument air dew point at line pressure shall be at least 0 °C. No condensation shall occur in the distribution system or in the instruments. The minimum instrument air supply pressure on the header shall be 670 kPag. Air drying will be required.

The capacity of the instrument air system shall be rated for all the connected loads plus 20%. An air receiver shall be provided for protection against loss of air. A low-pressure alarm shall be provided to indicate that the air pressure has fallen below 500 kPag. The air receiver shall be sized such that, 15 minutes after the low air pressure an alarm, the instrument air header pressure shall not be below 250 kPag.

All field electrical instrumentation shall be wired to field mounted junction boxes. Single pair cables shall be used between field junction boxes and individual instruments or electrical devices. Multi-conductor cables shall be used between the field junction boxes and the control system I/O panels.

INSTRUMENTS AS PART OF PACKAGES

All instruments within the package shall be complete self-contained units, completely piped and wired up with all terminal interface connections provided at a common marshalling location. All components shall be contained within the outer edges of the skid bases.

The Supplier shall ensure that all transmitters are calibrated and certified. Instruments shall be supplied with full calibration certificates. Output indicators calibrated in engineering units shall be supplied along with the transmitters.

Pressure and temperature gauges shall be supplied with liquid fill connections.

All instruments & shutdown devices shall be “fail safe” where appropriate.

All instruments’ wetted parts shall be 316 Stainless Steel except for process service with chlorides and maximum temperature above 600^0C. For such cases, material selection shall be agreed with the Owner’s Representative.

Where a control system is included in the Supplier battery limits, control signals shall be provided by the Supplier for the Plant Control System (PCS) to monitor and control the package generally as listed below.

- The general monitoring signals to the PCS will be available/ready, running, stopped and fault.
- The interface or signals for the control of the package by the PCS will include start/ stop signals. This shall include an analogue signal for Variable Speed Drives (VSDs)
- Other control signals to and from the package control system will be as specified in the package datasheet or specification.

9.1.5 CONTROL SYSTEM

The control system shall be capable of integrated process control, PID (Proportional. Integral and Derivative) loops, and sequence logic control.

The control system shall have the capability of communicating via various industrial protocols including but not limited to DeviceNet, Foundation Field Bus, Profibus DP, Ethernet IP and Modbus TCP/IP.

The control system shall have, as a minimum, redundancies on: controllers, operator consoles, power supplies, and communications modules. Critical I/O and I/O for duty/standby shall not be installed on the same card/controller.

An Uninterruptible Power Supply (UPS) shall be installed to power the control system and field instruments. The UPS should have a minimum capacity of 30 minutes. The UPS system will be sized so that the connected load is only 60% of the nameplate full load rating of the UPS. The inverter units will be redundant so that in the event that a failure of one of the units, the additional load will be handled by the balance of the inverter units.

The control system shall operate from a global database to allow ease of engineering and operational data access modification and troubleshooting.

The control system shall have built-in diagnostics to allow system troubleshooting down to device I/O level. The system diagnostics shall be accessible to offsite technical personnel via a secure remote connection.

Configuration of control strategies on the control system shall be via graphical means (such as function blocks). Control system configuration shall be self-documenting to provide for ease of system commissioning and troubleshooting.

All interlock systems shall be designed to be “fail-safe”. On device failure, loss of power or loss of instrument air, the outputs that control process streams shall fail to a pre-defined safe state, e.g. output contacts fail open, solenoid valves fail de-energised, and control valves fail closed, motors fail stopped.

The control system shall include a continuous historian to collect process data. Access to the data historian shall be via the control system operator stations.

Control system equipment located in electrical rooms shall be housed in IP52 enclosures. Field mounted control system equipment shall be housed in IP66 enclosures. Control system equipment installed outdoors shall be housed in weather and dust proof enclosures.

Where control is to be provided by the package Supplier, the requirements shall be as described below.

Where the package is equipped with a PLC based Control System the Supplier shall supply a detailed logic diagram, software and hard copy with a full explanation of the PLC program prior to the commissioning of the packaged system. The Supplier shall include the supply of the necessary software to fault find and modify the program as part of the deliverables for the project.

All trip and Emergency Shut Down signals shall be hard wired unless otherwise specified in the project documentation.

The Supplier shall ensure that the LCP will interface with the package instrumentation and other package equipment as a minimum.

All enclosures shall be suitable for the environmental conditions specified in the project documentation. LCP enclosures mounted in locations exposed to direct sunlight shall be provided with a hood above the enclosure.

A minimum of 15 percent of clear panel mounting space shall be provided for large panels, and 25 percent for small panels to permit adding future control devices and panel instrumentation.

Where panels are mounted outdoors, the Supplier shall ensure LCD or LED display devices are either legible in sunlight or effectively shaded.

If motor control is determined by a process controller supplied by the Supplier then the Supplier shall provide a volt-free control contact for each motor as a run signal for interfacing to by others.

Digital signals from the package to external control systems shall be fail-safe volt-free contact closures. Digital signals from external control systems to the package will be fail-safe volt-free contact closures.

9.1.6 INSTRUMENT EARTHING

Manufacturers recommended grounding procedures and installations shall take precedence over all grounding designs and installations.

All signal cable shields shall only be grounded at the control system end of the circuit. The field end shall be trimmed flush with the cable jacket and taped to prevent accidental ground contact. Instrument cable screens shall be insulated at the device in the field. Instrument cable screens (insulated from safety earth) shall be terminated at all field junctions and marshalling boxes in the field and bonded to earth at the relevant control panel or switchboard. Field junction boxes shall be used to maintain the continuity of interconnecting cable screens via insulated terminals.

An M10 internal/external earth stud shall be provided on all field termination boxes. An earth cable of minimum size 25 mm^2 shall be used to connect the termination box to the skid base.

9.1.7 FIELD MOUNTED INSTRUMENTS AND EQUIPMENT

To provide easy access for operation and maintenance all field instruments shall be mounted at grade or platform.

Consistent with instrument accessibility all field mounted remote transmitters with indicators shall be mounted so that the transmitter is 1400 mm above grade or platform and shall be located as close to the primary connection/element as possible.

Dial thermometers and pressure gauges that are line mounted shall be plainly visible and accessible from grade or platform.

All field instruments shall meet the electrical classification of the area. Field mounted instrument electrical devices shall be supplied in weatherproof enclosures rated IP66, watertight and dust-tight as a minimum.

Instruments shall be installed with flanges or unions and isolation valves to permit removal without process shutdown. Isolation valves shall be provided so that inline valves and instruments can be removed for maintenance without draining tanks and equipment.

Separate process connections are required for each instrument including pressure gauges. Process connections for instruments on vessels shall be dedicated to the instrument and not shared with process piping.

Junction boxes shall be in accordance with the requirements of the associated electrical area classification. In an unclassified area the enclosures shall be IP66 corrosion resistant, non-metallic, watertight and dust tight construction. Hinges and latches shall be 316 stainless steel. Cable entries shall be through cable glands in the bottom of the box. Watertight seals shall be used. Terminal rails shall be mounted vertically complete with sufficient grounding terminals. All connections within the junction box shall be made via terminal blocks. Splicing of wires is not permitted.

All cables, wires, terminals and any other device shall be tagged uniquely in each box. A junction box layout and wiring diagram shall be provided and placed in a pocket in the rear side of the front door. Junction boxes shall be tagged uniquely with a lamacoid nameplate attached to the front panel. Lamacoids shall be white with black lettering.

Instruments installed outdoors shall be supplied weatherproof enclosures suitable for ambient temperatures of -35°C to +38°C.

9.1.8 INSTRUMENT SELECTION

FLOW MEASUREMENT

Generally for remote flow monitoring, electro-magnetic type flow meters shall be used. For slurry applications or installations in non-conducting pipes, the magnetic flow tubes will be supplied with liner protection/grounding rings. Rotameters shall be used for local flow indication of air or clean fluids. Vortex flow meters will be used for remote flow measurement of air or clean fluids. Where mass flow measurement is required, it shall be calculated in the plant control using a separate density measurement and the volumetric flow. Gland water flow switches will be thermal type, mechanical type flow switches will not be used.

LEVEL MEASUREMENT

Generally, for point liquid level measurements in sumps, tanks or pumpboxes conductivity type level switches shall be used. For continuous liquid level measurements in sumps, tanks or pumpboxes ultrasonic level transmitters shall be used. For continuous level measurement in environments that are misty or

applications that may involve a liquid interface, the use of radar level type transmitters will be investigated. Capacitance Plate type switches will be installed in conveyor discharge chutes for high chute level indication. Ultrasonic level transmitters and target floats shall be used for continuous liquid level measurement in flotation cells. Continuous level measurement of outdoor ponds will be by submersible (pressure type) level transmitter.

PRESSURE MEASUREMENT

Generally local pressure indication shall be measured by bourdon type element process pressure gauges. Where process service conditions dictate, gauges shall be supplied with an integral diaphragm seal to protect gauge internals. For continuous remote pressure measurement of air, water, or other clean services standard process type pressure transmitters will be used. For pressure measurements of corrosive or erosive services pressure transmitters with diaphragm seals will be used. For single point pressure sensing snap action type switches will be used with adjustable dead bands.

TEMPERATURE MEASUREMENT

Generally, temperature sensors will be platinum type RTD's. The RTD's will be installed in thermowells and wired to integral connection heads. RTD signals will be wired to remotely mounted temperature transmitters. Thermowell materials will meet all project piping specifications of the line that they are installed in.

MODULATING VALVES

Generally, all modulating control valves will be supplied with an electro-pneumatic positioner, spring opposed actuator and air set all pre-tubed and mounted to the valve prior to shipment to site. For clean service eccentric disc type or v-ball type valve will be used. Control valves will not be used for slurry flow control. Rubber pinch valves will be used for slurry applications in reagents only. Knife gates will be used in slurry applications greater than 100 mm. All modulating valve positions shall be fed back to the control system.

ON/OFF VALVES

Generally, on/off valve types will follow the project piping specification. Valves that are 100mm (4") or larger will be supplied with a double acting pneumatic actuator, limit switches, and a remotely mounted pneumatic hand switch. A spring opposed actuator and solenoid valve will be supplied with on/off valves requiring actuation to a fail-safe position on loss of power or loss of air. In-line solenoid valves will be used for isolation of non-slurry lines of 50 mm or less.

DENSITY MEASUREMENT

Radiation gauges will be used for slurry density measurements. Generally, the gauges will consist of Cesium 137 sources and Ion chamber type detectors.

DISCRETE INPUTS

All discrete switch type field instruments shall be dry form "C" contacts, with a preferred rating to 24 VDC. Other voltages are not acceptable.

9.1.9 INSTRUMENT ELECTRICAL WIRING

All instrument cabling and wiring shall meet the requirements of EN 50288-1, EN 50288-7 and EN 50290-2.

Armoured multi-pair instrument cables shall be individually twisted shielded pairs of stranded 1.5 mm^2 copper conductors with drain wire, cable overall shield with drain wire, inner jacket, interlock armour, and outer jacket, which meeting the required cabling specifications. Wire pairs shall be dual coloured, preferably black and white, with black as positive and white as negative. Cables installed outdoors require protection for weather and fauna, and must meet the requirements specified in EN 50288-1.

Armoured control and instrument power cables shall be stranded copper conductors, with interlock armour, and an outer jacket that meeting the requirements of EN 50288-1. Cables installed outdoors require protection for weather and fauna, and must meet the requirements specified in EN 50288-1.

Power cables shall be supplied with bare copper grounding conductor.

All wiring shall be clearly identified at every termination with a permanent marking system. Wire markers shall be the heat-shrunk type unless otherwise specified. The preferred method of identification shall be the loop number as specified on the loop diagrams.

All communication cabling shall at minimum meet the requirements of EN 50289 and EN 50290.

Fibre optic cables shall be multi-strand armoured, multimode for short runs up to 1 km, single mode for longer distances. The number of fibre strands shall be as per drawings.

9.2 ACCESS, OPERATION, MAINTENANCE AND INSTALLATION

All connections for level, temperature and pressure instruments on vessels shall be accessible from the ground around the skid or from a platform or permanent ladder. All instruments including in-line devices shall be installed in accordance with manufacturer requirements.

All pipe mounted instruments, and isolating valves, shall be installed so that they are easily accessible, i.e. within 2 m of the ground around the skid, or 2 m above a permanent platform.

Indicating instruments shall be readable from ground level or permanent platforms.

Enclosures, canopies or hoods shall be provided for instruments/panels in open locations exposed to direct sunlight.

9.3 INSTRUMENT TUBING AND FITTINGS

All tubing compression fittings shall be imperial size, of the double ferrule design, and shall be 'Swagelok' brand or equivalent. Intermingling of fittings will not be permitted.

All connection threads shall comply with the project standard.

All process connections and instrument connections shall have NPT threads.

9.4 INSTRUMENT IMPULSE LINE/TUBING INSTALLATION

The distance between any two supports shall not exceed 1.5 m for ½" OD tube. Tubing ¼" and 3/8" shall preferably be continuously supported by cable tray and firmly fixed by the use of clips at intervals no greater than 1 metre.

Mounting to the supports shall be by poly-tube spacers or similar to ensure tubing separation and elevation.

Tubing shall not be routed through areas where a high risk of fire or mechanical damage exists (such as over vessels, compressors, or pumps)

Tubing shall be routed to avoid removal of the tubing when maintenance or repair of equipment is required.

10.0 CIVIL

10.1 DESIGN CRITERIA SCOPE

These design criteria cover the following design considerations:

- Bulk earthworks
- Terracing
- Roads
- Pavements and hard standing
- Storm water drainage
- Dams and ponds
- Bunds
- Sewers

This document is intended for the use of the civil design team and, where applicable, for external design consultants engaged to complete design work for the project directly.

10.2 UNITS

The International System of Units (SI units and prefixes) will be used for all design calculations and on all drawings.

10.3 SITE DEVELOPMENT

10.3.1 CLEARING, GRUBBING AND TOPSOIL REMOVAL

Clearing and grubbing refers to removal of vegetation and trees from the construction site. Top soil refers to the uppermost layer of soil that usually has the highest concentration of organic matter and microorganisms. The depth of top soil varies across the project site typically between 100 to 500 mm and further geotechnical studies should be carried out at the specific terraces / pads that will be created on this site

Remove topsoil to a depth as noted from all areas where roads will run and terraced earthworks pads are to be constructed, and stockpile in designated areas. Disposal options are to include on site re-use, or development of a designated area for disposal.

10.3.2 EARTHWORKS

Earthworks generally includes excavation and fill for roads, buildings and equipment pads, trenching, foundation excavation, and construction of ditches, berms, and dykes, dams and other earthworks structures. Subject to detailed design earthworks shall be carried out in accordance with the following general guide lines:

- Soils should be compacted to at least 98% maximum dry density where they underlie foundations and access road. Compaction of 95% maximum dry density is considered sufficient for earthworks and general backfill. The soil foundations for any embankments are likely to be adequate, without much preparation or removal of unsuitable material.
- Side slopes, to be used in excavation or fills/embankments, to be constructed as follows, pending validation by the geotechnical consultant:
  - Temporary cuts in undisturbed soil, slopes not steeper than two horizontal to one vertical (1H:1V), to a maximum depth of 2 m.
  - Permanent cuts in undisturbed soil, slopes not steeper than two horizontal to one vertical (2H:1V).
  - Clean waste rock fill, slopes not steeper than one and a half horizontal to one vertical (1.5H:1V).
  - Provide intermediate benches minimum 5 m wide for waste rock fill slopes greater than 10m in vertical height.
- Use native materials from site excavations to shape the site and balance cuts and fills as much as is practical.

10.3.3 SITE GRADING

Finished grade elevations for roads and yards will be set a minimum of 200 mm below the finished floor elevation of buildings

Rough grade elevations will be generally 300 mm below finished grade for roads and yards and a minimum of 500 mm below finished finish floor elevation in buildings.

Rough grading shall be set to a slope of 1%, unless noted otherwise.

Finished grading shall be set to slope away from structures at 2% minimum over distances of up to 20 m, draining to surface runoff collection system. Distances beyond the initial 20 m shall be set at 1% slope.

10.3.4 FENCING

Security fence, where required, will be galvanised chain link 50 mm mesh with 2,000 mm height complete with three (3) strand barb wire bracketed off the top of the fence, 500 mm in height for a total height of 2,500 mm.

10.3.5 BOLLARDS

Construct steel or HDPE bollards at building entrances and around hazard areas such as tanks and transformers.

Bollards will be filled with concrete.

Bollards to be painted and reflectorised for clear visibility.

10.4 INTERNAL ROADWAY DESIGN

Surface mine roads are used for transporting raw products from the mine to the processing facility, and waste dumps. Every aspect of highway engineering, including minimum slope inclines, properly banked curves, and adequate drainage, must be followed to facilitate construction of safe and efficient mine roads for fast and economical transportation of the mined product to its destination. By maintaining good mine roads, both truck and equipment maintenance will be kept to a minimum, resulting in reduced mining costs and subsequently higher profits. Haul roads and ramps are the lifeline of the open cut mine. Road design must accommodate a number of factors and expected weather conditions, the largest vehicle on site and the speed of operations are taken into account in the design process.

Road parameters are limited by the largest and usually least agile vehicle on site. Haul trucks are usually the heaviest, slowest and largest vehicle to traverse the roads on site. The haul truck turning radius, braking capacity and sheer size must be considered in the design of any permanent haul road. Permanent haul roads are designed with these limiting factors in mind, leaving a wide margin of safety for all other mining equipment.

A minimum clearance of two metres shall be allowed between the edge of a road and any part of a pipe rack, including its support structure.

Design speeds are an important factor in many of the different areas of design and these vary around site. These speeds are appropriately signed and are tabulated below:

Table 10.1 Typical Speed Limits on a Mine Site

Area	Speed Limit
Mining Area Surface Roads	30 km/hr
Ramps	30 km/hr
Workshop	10 km/hr
Plant site and Admin	20 km/hr

In many cases the following design parameters are also applicable to temporary haul roads and light vehicle roads.

10.4.1 STOPPING DISTANCE

Stopping distance is the minimum distance needed by a vehicle to stop, when travelling at a design speed, to avoid an oncoming hazard. The distance takes into account driver reaction time, the retarding action time delay for any vehicle and the time taken for the vehicle to come a complete stop. In each situation stopping distances may vary according to the vehicle concerned, the grade and the travelling speed. As a result, designs are based on those vehicles that have the lowest braking capacity that will be using the particular road and on the maximum speed limit on the road.

10.4.2 SIGHT DISTANCE

The sight distance is the distance measured along the carriageway from a driver to an object, or between two drivers at specific heights above the carriageway, occurring in the same lane of travel. Sight distance is closely correlated with stopping distance and in all instances, the distance ahead of the driver to an unforeseen hazard must always be greater than the distance required to bring the vehicle to a stop.

Sight distance is dictated by:

- the design speed of the road
- lowest vehicle using the road
- the stopping distance of the largest vehicle using the haul road in the worst-case driving conditions.

Sight distance is particularly important for horizontal and vertical curves, and also at intersections. In the case of a horizontal curve, sight distance may be impeded by steep rock cuts, trees or structures. Vertical curves that are too sharp create similar problems. Simple solutions such as laying back rock cuts and smoothing of crests increase the sight distance and lengthen the operator reaction time.

With regard to intersections, optimising sight distance for all incoming traffic is an important consideration. At intersections, batters, signs, windrows or other obstructions may restrict the sight distance.

Where possible bends and intersections should have all sight restrictions removed or minimised.

10.4.3 ROAD WIDTHS

The width of any haul road is designed to allow ample room for vehicles to maneuver along the entire length of the road. This basic design consideration reduces safety risks and improves operating efficiency.

Roadways that are too narrow create uncomfortable driving conditions which, in effect, slows traffic and increases production cycle times. Inadequate clearance between vehicles is a major safety hazard. There are also risks of damage to the road shoulder and to tyres. Specifications for road widths are intended to eliminate these unnecessary risks.

Switchbacks or other areas of haul roads requiring sharp curves must be widened to take into account the overhang of the vehicles and also a vehicle's minimum turning radius. The minimum negotiable turning radius must be exceeded in all but the most severe and restricting conditions.

10.4.4 STRAIGHT SECTIONS

The following haul road traffic surface widths are to be applied to straight sections of all permanent and temporary haul roads.

10.4.5 STRAIGHT SINGLE-LANE ROADS

This type of road is required to be a minimum of twice the width of the largest vehicle using the road.

This does not include standard windrows on either side of the road. This width is intended to prevent incapacitated vehicles that may be stopped on the side of the road from hindering the movements of other vehicles.

10.4.6 STRAIGHT DOUBLE-LANE ROADS

This type of road is required to be a minimum width of 3.5 times the width of the largest vehicle using the road.

This does not include standard windrows on either side of the road (2 x 5m). This width allows vehicles to comfortably pass one another or to pass stopped or incapacitated vehicles on the roadside.

10.4.7 CURVED SECTIONS

The following haul road traffic surface widths are to be applied to all curved sections of permanent and temporary haul roads (a factor of 1.18 has been included to allow for the front and rear overhang):

Single-Lane roads

- 2.0 x 1.18 x the width of the largest vehicle using the road

Double-Lane roads

- 3.5 x 1.18 x the width of the largest vehicle using the road

10.4.8 TEMPORARY HAUL ROADS AND ON-BENCH HAUL ROADS

Temporary haul roads and on-bench roads should be maintained at a minimum of the 3.5 x the width of the largest vehicle using the road. If the road width is excessive, the time spent grading and watering for dust suppression is non-productive and expensive. Anything less than this introduces safety risks and unnecessary production losses.

10.4.9 CROSSFALL

Crossfall is the difference in elevation between the crest (crown) and the road edge. It is a widely used technique that effectively drains water from road surfaces and is to be incorporated in all road designs. Crossfall helps protect the road pavement from damage by water by reducing pooling of water, mud and potholing. If water is allowed to accumulate on the running surface, deterioration of the sub-base due to water saturation may occur. If the sub-base becomes exposed, tyre damage may also occur

The rate of crossfall depends on a number of factors including the road gradient, the road surface and the expected weather conditions. From an operator's point of view, a level driving surface is most preferred because this requires the least steering

effort. However, to allow adequate drainage, crossfall must be applied and so the rate must accommodate both a rapid removal of surface water and steerability.

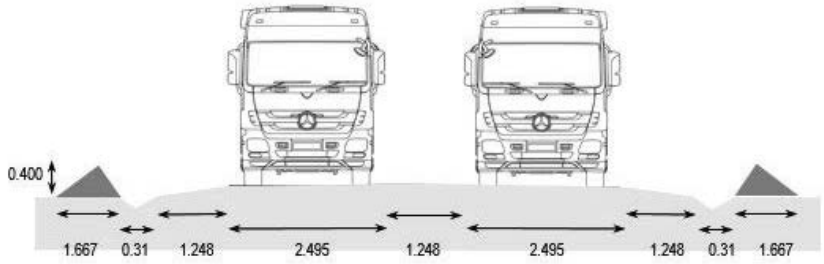
Table 10.2 Recommended Rates of Crossfall for Roadways

Road Gradient	Minimum crossfall – low rainfall or smooth surface.	Maximum Crossfall – high rainfall or rough surface
0 – 3%	2%	5%
4 – 6%	2%	3%
6 - 10% (maximum grade)	1%	1.5%

The crossfall for double-laned roads slopes from the crown between the lanes, out to the road edges`. Single lane roads slope one way, the direction of which is determined according to surrounding topography. Crowns are not to extend across intersections or around corners.

10.4.10 TYPICAL ROAD DESIGN (STRAIGHT SECTION)

Table 10.3 Typical Road Design



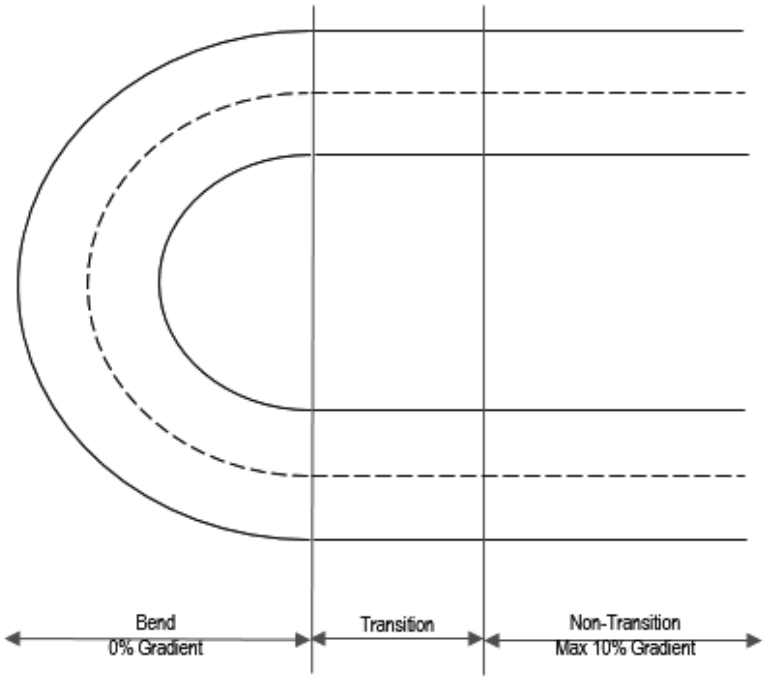
10.4.11 GRADIENT

The gradient on a ramp is the grade line profile along the road centre line, in the vertical plane. It is important to find a good balance between low cycle times and minimum wearing on machinery and tyres. Excessively steep gradients reduce the length of the haul road but require the use of low gears for all types of vehicles. Not only does this put more stress on machinery, it also increase production cycle times. Too gentle a grade requires more excavation and construction for the longer road, and the added travel distance means cycle times are inefficient.

Road gradients are particularly important for in pit roads, whether they be temporary or permanent. Heavy haul trucks frequent these roads and so the grades must accommodate the braking limits and stopping distances of such vehicles.

Any road is required to have smooth transitions between straight sections of road. The grade should be kept as constant as possible to reduce the tendency of trucks to change through gears on the up grade hauls. This puts a large amount of stress on the transmission of heavy machinery and also effects production cycle times, and operating and maintenance costs.

Figure 10.1 Plan View of Transitional Gradient into and out of Corners



The maximum sustained grades for different types of roads are tabulated below:

Table 10.4 Recommended Gradients

Road type	Maximum grade
Permanent surface haul roads	10%
Permanent in pit haul roads	10%
Temporary surface haul roads	10%
Temporary in pit haul roads	10%
On-bench roads	10%
Light vehicle roads	20%
Major bends/Switchbacks	0%

Some temporary and light vehicle roads may vary depending on the location and circumstances.

10.4.12 INTERSECTIONS

Interactions between heavy and light vehicles on mine sites and the large discrepancies between travelling speeds and dimensions mean that there is an ever-present risk of collisions. Poorly designed intersections in any area of the mine enhance this risk and so it is extremely important to find the best design in the planning stages.

There are certain practices and numerous intersection designs that have lead to accidents in the past because major risk and hazard were present. These are obviously to be avoided wherever possible and significant examples are:

Y-junctions where vehicles approach the intersection at shallow angles creating major visibility restrictions particularly in the left-hand drive haul trucks.

T- junctions at the crest of a hill or at the bottom of a ramp. In the first instance, the hillcrest reduces sight distance for operators, and in the latter, stopping distance is a problem with vehicles having to stop at the bottom of a descent.

Minor roads crossing over major roads in a "+" formation. This creates an avenue for high speed crossing movements by light vehicles and an increased risk of cross accidents.

The intersection of more than two roads at one point. This has the potential to create driver confusion when it comes to selecting a departure path. These intersections need special traffic control devices and a larger pavement area.

It is important for any intersection that priority of the roads involved is determined in the design stages so that when conflicting traffic streams meet, one is required to give way. A range of traffic control devices such as stop signs, give way signs or roundabouts, may establish priority. All intersections will, in some form, be signed to clearly indicate priority and this will often be determined using the site traffic rules for giving way.

It is also vital that adequate intersection sight distance be incorporated into design for a safe intersection. At intersections the sight distance may be restricted by batters, signs or other obstructions. Consideration should be given to the height of windrows and median strips, placement of sign posting and the proximity of nearby crests, corners and intersections. Along with these factors, a minimum of 20m of flat road leading into any intersection will give drivers enough distance to sight the intersection and road furniture, and to slow to a speed that allows them to negotiate the intersection safely. A flat section of road also allows vehicles on a major road to sight an approaching vehicle from a minor road so action to avoid a collision can be taken if the need arises.

Particular attention must also be paid to drainage at intersections. Intersections are usually the most frequently used sections of road and so drainage is vital to help maintain surface integrity for such heavy use areas.

10.4.13 SKEWED CROSS ROADS

To avoid the increased risks associated with a minor road crossing a major road, skewed cross roads are used. This treatment places the minor road in a staggered geometry preventing high speed crossing movements and cross accidents, which are more prevalent in areas where light vehicles operate.

Roads should intersect at 90° where possible with an absolute minimum of 70° and are to have a minimum of 20 m of flat road on approach to the intersection. The minor road is to have stop signs on approach. The minor road shall be divided down

its centre using traffic islands, which are to be at least 5m long. Keep left signs at either end will indicate to operators the correct direction of travel.

Where possible the intersection should be orientated so that a vehicle crossing the major road makes a right turn and then a left turn through the intersection. This prevents vehicles lining up in the centre of a road to turn right.

10.4.14 T-INTERSECTIONS

T-intersections are a relatively safe and simple type of intersection to have in the road network. Priority is given to through traffic with the intersecting road marked with a stop sign or give-way sign. The determination of the traffic control sign to be used is at the discretion of the Mine Development Superintendent.

The roads should meet at 90° where possible with an absolute minimum of 70°. The terminating road should be divided in the centre of the road by a traffic island, which is to be a minimum of 5m long. Keep left signs at either end will indicate to operators the correct direction of travel.

10.4.15 GUARDRAILS AND EARTH BERMS

The height and width of the safety berm on a haul road should be designed to arrest a fully loaded truck travelling at max design speed. Standard haul road design is for a safety berm that is 2/3 x the wheel diameter of the largest vehicles using the road with an inner slope face of 1H:1V and an outer slope face of 1H:1V.

Provide guardrails or earth berms where a 3.0 m or more drop-off exists at the edge of a road.

Guardrails, berms, or safety barriers shall be installed where horizontal distance from road side to an obstruction is less than 1.0 m, or a slope steeper than 1V:2H.

Provide discontinuous openings in berms for drainage, with openings smaller than half the blade width of vehicles constructing or maintaining the berms.

10.5 STORM WATER COLLECTION AND MANAGEMENT

The storm water collection system can be divided into two categories:

- External surface drainage
- Internal surface drainage

10.5.1 EXTERNAL SURFACE DRAINAGE

External drainage refers to storm water runoff from areas located outside the plant site, draining towards the plant. Management of external storm water runoff is outside of Tetra Tech's scope and is to be completed by external consultants.

10.5.2 INTERNAL SURFACE DRAINAGE

Design overall site drainage, including roadside ditches, culverts and open channel system, to convey the storm water peak flow runoff from a 1 in 10-year return period storm.

Provision must be made to ensure that there is a safe flow path for events up to the 1 in 100-year event, such that the runoff will not flood key plant areas, cause significant erosion, pick up excessive contaminants or cause other significant problems.

Run-off from localised areas with the potential of chemical contamination, e.g. waste rock stockpiles, will be contained separately from the larger plant area collection network.

Site drainage will consist of open ditches, where possible, with the following criteria:

- Minimum slope through yard of 0.3%
- Minimum ditch depth of 300 mm
- Minimum width of ditch bottom of 300 mm

Open ditches conveying storm water runoff from 'clean' plant areas such as parking lots, main access roads that will not convey any potentially contaminated surface water (i.e. spills) may be grass-lined.

Earth ditches will be utilised with gradients designed to ensure that drain flow velocity will not exceed the maximum non-eroding channels (1.5 m/s).

Maximum slope of a ditch will be 2%, with a side slope of two horizontal to one vertical (2H:1V)

Rip rap will be used at erosion susceptible locations of the storm drainage system including ditch sections subject to high-velocities (1.5 m/s to 4.0 m/s), ditch outlets, storm sewer outfalls and culverts. Energy dissipating devices will be used where the flow velocities would otherwise exceed the acceptable maximum.

Maximum slope of a rip rap lined ditch will be 4%, with a side slope of one horizontal to one vertical (1H:1V)

Minimum set back distance of structures from top of drainage ditch slopes is 10 m.

Culverts will be designed to convey runoff peak flow from the 10-year return period storm.

Minimum cover for culverts is 600 mm beneath roads. Loading over culverts and pipes will be in accordance with AASHTO HS20-44 or with EN 1991-2 table 4.8, except for areas of special equipment operation, which will consider actual vehicle loading.

10.5.3 RUNOFF CALCULATION

Calculate the design discharge for site-runoff by the Rational Method, using a minimum Time of Concentration (tc) of 10 minutes and rainfall Intensity-Duration-Frequency (IDF) curves for a 1 in 10-year return period storm event. The average run-off coefficient (c) for the rational equation will be based on the values shown as follows:

- Bare rock, roofs and other impervious areas - 0.95
- Light to heavy industrial area (composite) - 0.80 - 0.90
- Gravel roads and shoulders - 0.60
- Woodland - 0.35

The Rainfall Intensity (I) is determined using the IDF curve for the study area for specific time of concentration (tc) and return rainfall event (1 in 10 years). Time of concentration will be based on the Kirpich Method as given below:

$t_c = 0.0195kL^{0.77}(L/H)^{0.385}$

Where:

tc = Time of concentration (minutes)

L = Maximum hydraulic flow length (m)

H = Difference in elevation between the outlet of the area and the hydraulically most remote point in the area (m)

k = Kirpich adjustment factor based on:

- General overland flow and natural grass channels - 2.0
- Overland flow on bare soil or roadside ditches - 1.0
- Overland flow on concrete or asphalt surfaces - 0.4
- Flow in concrete channels - 0.2

10.5.4 STORM WATER MANAGEMENT POND

Run-off from the plant area will be collected and routed to a storm water management pond which will be designed to achieve sedimentation of the major particulate load. The design particle size to be captured in the in the sedimentation pond will be identified based on particle distribution analyses on plant soils.

Storm water management ponds will be designed with a minimum depth for the permanent pool (i.e. dead storage) to allow for the build-up of sediments in the bottom of the pond and to minimise the re-suspension of settled particles. The minimum permanent pool depth will be 0.7 m with a recommended depth of 1.0 m.

Storm water management ponds will be designed with a minimum length to width ratio of 3:1 at a pond elevation equal to the crest of the spillway elevation, pending availability of footprint on site.

Storm water management pond embankments will be designed with interior and exterior side slopes not steeper than 2.5:1 (horizontal:vertical).

Pond emergency spillways of the storm water management ponds will be designed to pass the inflow from the 100-year return period, 24-hour storm event without any detrimental damage to the spillway or embankment slopes.

All controlled water releases from the storm water ponds will be discharged to surface waters. Storm water quality discharge limits applicable to project to be defined by external consultants.

10.6 SANITARY COLLECTION AND TREATMENT

10.6.1 SEWAGE GENERATION RATE

Sewage generation rates for the plant will be dependent on the number of personnel that working at the site. The inputs for plant personnel during the (i) peak construction period; and (ii) full-scale plant operations are as follows:

- Permanent Camp personnel count – 400.
- Plant operations staffing count – 109.

Daily sewage volumes will be calculated based on an assumed generation rate of 150 L/capita/day.

10.6.2 SANITARY COLLECTION NETWORK

Design flows of sanitary system components are based on the collection and discharge for a peak flow situation.

All gravity sewer lines and manholes will be free draining.

Minimum design velocity for gravity sanitary sewers: 0.6 m/s. Maximum design velocity for gravity sanitary sewers: 3.0 m/s.

Minimum slope for gravity sanitary sewers will be 0.3%.

Gravity sanitary sewers will be designed as flowing 50% full.

All gravity sewer lines shall be SDR35 PVC pipe or equivalent complete with minimum 900 mm soil covering.

Manholes shall meet requirements of EN 476 or equivalent; they will be made of reinforced cast-in-place or precast concrete, with cast iron frames and cover meeting requirements of EN 124 or equivalent.

Spacing between manholes will be no greater than 100 metres and will be provided at each change of direction and change in pipe diameter.

10.6.3 SEWAGE TREATMENT REQUIREMENTS

Sewage will be collected at two common locations at the plant site and the permanent camp where it will be treated by a septic tank and drain field system.

Septic tanks will be based on retaining 200% of the daily flow.

Peak discharge through the sewers will be determined by considering the cumulative manpower of first and general shifts as well as future manpower requirements.

DESIGN PARAMETERS FOR SEWERS

- Minimum diameter 150 mm
- Minimum size of branches to wet fittings 100 mm
- Maximum slope 1:10
- Minimum slope - sewers collecting up to 10 wet fittings 1:80
- Minimum slope - sewers collecting 10-50 wet fittings 1:100
- Minimum slope - sewers collecting more than 50 wet fittings See notes below
- Maximum spacing on manholes 60 m
- Maximum flow speed 3 m/s

Sewers collecting in excess of 50 wet fittings shall be designed hydraulically to achieve a minimum self-cleaning velocity of 0.9 m/s under daily peak dry-weather flow.

Sewers shall be uPVC Corflo or similar. The normal depth, subject to the other constraints stated herein, shall be such as to provide a minimum of 900mm cover over the crown of the pipe. The minimum internal depth of any manhole, from soffit of cover slab to the invert, shall be one metre.

In order to allow for construction tolerances and ensure that fall is achieved on short runs, the minimum designated fall between manholes shall be 100 mm.

Sewer invert levels shall be such that any branch sewer can connect to the main sewer under the following conditions:

- The start depth of the branch sewer (depth at upstream end) shall be 0.45m m minimum at the most remote wet fitting.
- The minimum gradient of the branch sewer shall be 1:60.
- Branch sewers shall connect to main sewers via an access bend and Y-junction so as to cascade from the branch sewer into the main sewer. The fall, measured invert-to-invert at the connection from the branch sewer into the main sewer, shall be at least 80% of the diameter of the main sewer.

For trafficked areas where the maximum axle loading will not exceed 90 kN, the minimum cover over the pipe shall be 1.0 m to finished ground level, except where deeper depths are necessary to accommodate branch connections.

For areas where there are no designated cuts or fills, but it is intended to clear vegetation or strip topsoil, the cover shall be 1.0 m to the intended ground level after stripping. Alternatively, the ground levels shall be re-surveyed after site clearance and prior to designing the sewers, in which case the minimum cover of 900mm may be applied.

11.0 STRUCTURAL

11.1 GENERAL

11.1.1 STRUCTURAL CLIMATIC LOADS

Based on data received for the project area (Latitude 42°1'12" N, Longitude 71°9'84" E) at Elevation of 3800 m above sea level, the climatic data for structural design are as follows:

11.2 STRUCTURAL STEEL AND CONCRETE

11.2.1 CODES AND STANDARDS

All structural designs shall be carried out in accordance with the latest revision of the following standards, regulations, specifications and codes:

- Structural design shall conform to European Committee for Standardisation codes as per: CEN/TC 250 - Structural Eurocodes
- Concrete, reinforcement, mortar and grout shall conform to European Committee for Standardisation codes as per: CEN/TC 104 – Concrete and Related Products
- Aggregates for concrete shall conform to European Committee for Standardisation codes as per: CEN/TC 154 – Aggregates
- Cement and lime shall conform to European Committee for Standardisation codes as per: CEN/TC 51 – Cement and Building Lime
- Masonry shall conform to European Committee for Standardisation codes as per: CEN/TC 125 – Masonry
- Structural steel shall conform to European Committee for Standardisation codes as per: ECISS/TC 103 – Structural Steels other than Reinforcements
- Welding shall conform to European Committee for Standardisation codes as per: CEN/TC 121 – Welding
- Galvanisation shall conform to European Committee for Standardisation codes as per: CEN/TC 262 – Metallic and Other Inorganic Coatings
- Painting shall conform to European Committee for Standardisation codes as per: CEN/TC 139 – Paints and Varnishes

11.2.2 UNITS

All notes, calculations, data instructions, dimensions on drawings, and specifications shall be in Metric Units.

Materials and equipment shall all be specified in Metric units. Where certain items are available in imperial sizes only, they shall be specified in Metric units after soft conversion, with corresponding imperial sizes specified in brackets.

11.2.3 DESIGN

Preliminary design will be carried out for reinforced concrete structures, foundations, structural steel supports, steel structures, access ways and platforms. As much as possible the structural steel shall be modularised so that construction work on site is minimised.

IMPORTANCE CATEGORY

The Importance Category of all buildings and structures shall be categorised as "Importance Class II" as defined in EN 1998-1 with the description as "ordinary buildings, not belonging in the other categories".

EXPANSION JOINTS

Maximum length of buildings and structures between expansion joints shall be 120 m.

DEFLECTION

Do not exceed the following deflection (D) to span (L) or height (H) ratios under live loads:

Vertical D/L

Crane runway beams	1/800
Floor members	1/360
Roof members supporting plaster	1/360
Roof framing with sheet metal cladding	1/180

Lateral D/H

Walls with sheet metal cladding	1/180
Walls with un-insulated cladding	1/90
Interior walls with permanent partitions subjected to 0.5 kN/m2 normal to the walls: with brittle finishes with flexible finishes	 1/240 1/120
Crane runway beams* (subject to crane lateral force)	1/600
Building column* (subject to crane lateral force or wind force)	1/300
Building frames (subject to wind forces)	1/300
*Follow manufacturers standards or the following additional crane runway tolerance criteria, whichever produces the most adverse effect:	
Maximum permissible tolerance between rail centers	+/- 5mm
Height tolerance between rails (S = crane span)	S/1000
Permissible height tolerance between two crane rail supports (L = distance between supports)	L/1500

MEMBER DEPTHS

Recommended depth (d) to span (L) ratios for steel beams and trusses:

	d/L
Trusses	1/14
Equipment Support Beams*	1/16
General Platform Beams	1/20
Walkway Beams	1/24

Note: A deeper section may be required to avoid the beam resonating at the natural frequency of equipment.

SLAB ON GRADE

Slab on grade shall be constructed on engineered fill over suitable existing subgrade approved by Geotechnical Engineer unless noted otherwise.

Minimum thickness of slab on grade will be as follows:

General Areas	= 150 mm
Light vehicular traffic areas	= 200 mm
High wheel load areas	= 250 mm

LIVE LOADS /IMPOSED FLOOR LOADS

Minimum live/imposed loads will be as follows:

General Areas	= 5.0 kPa
Office Areas	= 5.0 + Partition kPa
MCC/Electrical rooms	=15.0 kPa
ADR Operating Floor	=15.0 kPa
Lay down Areas	=12.0 kPa

ROOF LOADS

- In addition to roof live loads, a collateral load of 0.75 kPa shall be allowed for the design of all building roofs unless noted otherwise.

DEAD LOADS

Dead loads include the following:

- The specified empty weight of vessels including all permanent fixtures, internals, lining and insulating materials and equipment self-weight.
- Platforms, structural frames, built-in partitions, fireproofing, piping, insulation and electrical conduit and other permanent fixtures and finishes.
- The load produced by other non-structural passive elements such as paving and backfill.

MATERIAL LOADS

The loads stated below shall be used for design.

- Concrete 24.0 kN/m3
- Steel 78.5 kN/m3
- Hollow concrete block 19.0 kN/m3
- Insulation As stated by manufacturer

EARTH LOADS

Soil and backfill loads shall be obtained from the geotechnical report or its author. In the absence of such data, and for purposes of the study only, the values stated below may be used.

- Loose sand 17.0 kN/ m³
- MDD for maximum loads 22.0 kN/ m³
- Density for maximum loads Actual density at the specified percent of MDD
- Density of all soil materials for stability 16.0 kN/m3
- Active pressure coefficient k_a 0.3
- Passive pressure coefficient k_p 3.0

IMPOSED LOADS (LIVE LOADS)

Live loads include all movable loads such as personnel, tools, cranes, platform loads, miscellaneous equipment, hoists, parts of dismantled equipment, vehicles, movable partitions and stored material.

IMPOSED FLOOR LOADS, STORAGE LOADS AND PLATFORM LOADS

For process plant structures and buildings, the imposed loads adopted for these areas shall be as stated below:

- Stairs and landings 2.5 kN/m2
- Lay-down areas around equipment 10 kN/m2
- Areas designated for storing loads greater than 7.5 kN/m2 Actual Loads
- Electrical control rooms and sub-stations – surface bed loading 10 kN/m2
- Point loads on slabs in electrical control rooms and sub-stations that
- are accessed by a forklift Minimum 25 kN
- Point load on floor members, excluding UDLL 10 kN
- Flat roofs (accessible) 2.0 kN/m2
- Sloped roofs > 30° (inaccessible) 0.5 kN/m2

Live loads will be positioned on continuous members by the designer so as to create the most adverse loading arrangement.

In the absence of stated horizontal loads, a minimum horizontal loading will be allowed for equal to 2.5% of the vertical load, acting in the floor plane in the most severe direction.

EQUIPMENT LOADS

General

The loads stated herein, which are to include the self-weight of equipment, shall be adopted for the design of foundations, structures or members supporting the equipment.

They shall be applied in logical combination with other loads, to produce the most adverse effect on the foundation, structure or member being designed.

Erection Load

Erection loads shall be defined as any temporary forces caused by the erection of structures or items of equipment on to the complete or partially complete foundation. They shall be considered in load combinations as nominal imposed loads.

The erection loads must be considered in conjunction with stability during erection since certain items, such as piping, partitions, fireproofing and insulation, may not have been completed and cannot provide a stabilising weight.

Test Loads – Vessels and Pipes

The test load is the load produced by a vessel or pipe during the specified testing condition, inclusive of the empty weight plus the contents. The designer shall allow for vessels and piping systems to be pressure tested concurrently.

Operating Load

The load produced by the equipment including empty weight and contents under the specified operating conditions.

Maintenance Loads

Maintenance loads shall be defined as any temporary forces caused by repairing, dismantling, cleaning or painting of equipment. They shall be applied in load combinations as imposed loads.

Upset Loads

Upset loads are defined as the short-term effects which occur during start up, shutdown or any interruption of the normal operating process. It includes conditions such as the possible loss of a reactor blade.

In the absence of specified data, a contingency load equal to 5% of the dead load shall be added for upset conditions.

Anchor Loads

The thermal component of an anchor force shall have the same load factor as that used for the imposed load.

Friction forces, including friction component of anchor forces, shall have the same load factors as used for the load causing the friction.

IMPACT LOAD

Impact load is defined as an equivalent static force caused by a moving object, generally due to automatically or manually controlled lifts, cranes, and hoists.

WIND LOADS (W_N)

General

In calculating wind forces, no reduction will be made for the shielding effect of structures adjacent to the structure being designed. The dynamic forces resulting from wind effects will also be taken into consideration.

Vessels

Add the allowances from the below to the diameter of a vessel to obtain the effective diameter A_z in compensation for attachments including platforms, ladders and insulation.

- Diameter ≤ 1.0 m 50%
- m ≤ Diameter ≤ 2.0 m 30%
- Diameter > 2.0 m 20%

THERMAL AND FRICTION LOADS

Thermal and friction loads are those forces and bending moments which are generated by changes in temperature. Such forces shall include those caused by expansion, contraction and thermal gradient of equipment, vessels, piping, structures, or hot stored liquids. Thermal loads and displacements caused by operating conditions shall be based on the specified design temperature of the item of equipment, rather than its normal operating temperature.

DYNAMIC LOADS

Design of structures supporting machines must be carried out on the basis of the manufacturer's information on loads, their mode of action and vibration characteristics.

Manufacturers' information must include the following items:

- Weight of machine and ancillary equipment.
- Power and speed of machine.
- Position of centre of gravity of machine in the three major planes.
- Out-of-balance forces and moments at primary and secondary speeds.
- Line of action of out-of-balance forces.
- Inertia of driver and driven in the three major planes.
- Class of machinery.

CONVEYOR LOADS

- Impact load = 0.25 * (material + belt + rotating parts)
- Start-up load = Fluid drive coupling (T1 + T2) * 1.4

- Normal drive = (T1 + T2) * 1.5

Where

- T1 = Material belt tension and
- T2 = Return belt tension

SERVICE GANTRY AND PIPERACK LOADS

Service support gantries including piperacks shall be designed for a minimum uniform loading of 3.0 KPa over the gantry width or as calculated from service loadings, whichever yields the worst case.

Piping loads shall allow for the weight of pipe, pipe contents, fittings, valves, insulation and instruments.

Service gantry design shall allow for pipe anchor points and for frictional loads due to thermal movements caused by the temperature of process fluids.

As a guide, the designer can assume the following horizontal forces apply at each support trestle location:

- Transverse load of 5 KN at each service deck
- Longitudinal load of 15% for the calculated service load at each service deck.

LOAD COMBINATIONS

Designs shall be checked for all effects due to any abnormal loading combinations.

For the purposes of ultimate limit state design, a load factor of 1.2 to 1.4 shall be adopted for nominal self-weight (G_n) where it is considered in combination with nominal imposed loads (Q_n) with a load factor of 1.6.

The designer shall decide which combinations are applicable or which additional combination are logically appropriate. The resulting forces shall be applied to all concrete substructure including foundations, pile caps and piles.

11.2.4 MATERIALS SPECIFICATIONS

STRUCTURAL STEEL

- Conform to latest edition of Eurocodes:

Hot rolled structural steel IPN, HP HD, HE/HL, IPE shapes, UPN Channels and steel angles	Steel Grade S355
Plates and Bars	Steel Grade S275
Hollow sections	Steel Grade S355
Structural Pipes	Steel Grade S355

Table Continues…

Sag rods & Pins	Steel Grade S275
Bolted connections	Grade 8.8 or 10.9 bolts
Welded connections	As per EN ISO 2590 fy = 500 MPa
Anchor bolts	Grade 4.6, 8.8 or 10.9 bolts
Floor grating	32mm x 4.8mm Welded Standard "Flowforge" type Serrated grating : 38mm x 4.8mm
Trench grating	32mm x 4.8mm Welded Standard "Flowforge" type Serrated grating: 38mm x 4.8mm
Checkered plates	8mm minimum checker plate with raised pattern 6mm minimum for lightly loaded area
Stair treads	Grating tread with checker plate nosing 32mm x 4.8mm Welded Standard "Flowforge" type Treads with serrated grating: 38mm x 4.8mm Stair tread width – 308mm
Railing and handrails	48.3 outer diameter by 4 mm thick wall round pipe for horizontal handrails, 48.3 outer diameter by 6 mm thick wall round pipe for all vertical handrail posts
Kick plates	150 mm high

Note: For primary members subject to tensile fatigue stresses and/or high impact loads and/or exposed to cold weather conditions steel grade used shall be weldable notch-tough grade.

CONCRETE

- Cement shall conform to EN 197. Use CEM I or CEM type II/A, unless noted otherwise. Use corrosive resistant cement where applicable.
- Use sulphate resisting cement where applicable.
- The specified compressive cube strength of concrete shall be as follows:

	28 Day Strength	Max. Aggregate	W/C ratio
Structural Concrete	30 MPa	20mm	0.45 0.40 (corrosive)
Mass foundation (only if noted as such on the drawings)	15 MPa	40mm	0.45 0.40 (corrosive)
Blinding Concrete (only if noted as such on the drawings)	15 MPa	20mm	0.45 0.40 (corrosive)

REINFORCING STEEL

Deformed type billet steel bar	In conformance with EN 10080 Grade B500C fy = 500 MPa
Welded Wire Fabric	In conformance with EN 10080 Grade B500C fy = 500 MPa

GROUT

- Normal grout shall be non-shrink, non-metallic and non-corrosive cementitious grout.
- Epoxy based non-shrink grout shall be used under sensitive equipment only.

MASONRY

- Modular metric size as per Eurocodes.
- Minimum compressive strength of hollow core concrete block unit shall be 15 MPa.

Compressive strength of masonry grout shall not be less than that of the concrete block used.

BUNDS

Bund areas are sized to accommodate 110% of the largest tank volume within each process area. Overflow from bunded areas shall be routed through a spillway or notch, sized for the maximum inflow rate. Interconnected tanks shall be taken as a single tank of the combined volume.

11.3 SERVICEABILITY REQUIREMENTS

11.3.1 SAFETY FACTORS

In the absence of overriding considerations, the safety factors under service load conditions will be as follows:

- Overturning ≥ 1.5
- Uplift ≥ 1.5
- Sliding ≥ 1.5

11.3.2 DEFLECTION LIMITS

Unless specified otherwise by the equipment vendor, the following deflection limits shall be used in design.

Permissible horizontal deflection of columns at top level due to the effect of all vertical loads in the most unfavourable positions, together with wind load or horizontal effect of cranes will not exceed H/300, where H = distance between column top and bottom level.

- For beams and girders of span 18m and above camber shall be provided due to dead load plus 50% of the live load where the deflection may cause problems, the maximum camber will be 1/2000 of the span with a tolerance of ±3mm. The crane supplier shall specify deflection limits of crane girders; this should not be more than span/1200. The contractor may use Span/1000 with the crane supplier's approval, subject to a performance guarantee.
- Roof components: (DL +LL) deflections < 1/200 of the span.

11.4 DESIGN OF CONCRETE STRUCTURES

11.4.1 DESIGN METHODS

The analysis of all foundations, structures, foundations and buildings shall be carried out using appropriate methods, taking into account the nature and complexity of the facility.

The combined structure/foundation/soil model should be used in the general framing structural analysis, where appropriate.

11.4.2 PERFORMANCE AND DESIGN REQUIREMENTS FOR CONCRETE

In order to maintain corrosion resistance, normal structural concrete components shall be designed to achieve a maximum crack width of 0.2mm. Where process requirements dictate, or where water retention is a requirement, concrete structures shall be designed in accordance with BS 8007 to achieve a limiting crack width of 0.1mm.

Under favourable environmental and loading conditions, crack widths of greater than 0.2mm may be permitted.

All structural concrete details shall be designed and reviewed with regard to minimising any potential for corrosion.

11.4.3 CONCRETE GRADES

The following concrete grades shall be used in design and specified for construction.

- 15 MPa Blinding and mass concrete
- 40 MPa All reinforced concrete other than precast elements
- 50 MPa Precast elements

For concrete that is exposed to extremely severe conditions such as acid spillages, other methods of concrete protection will be prescribed.

11.4.4 HOLDING DOWN BOLTS AND CAST-IN ITEMS

Holding down (HD) bolts and cast-in items shall be designed using Class 350WA material unless otherwise specified by the equipment or technology supplier.

11.5 PAVING AND FLOOR SLABS

11.5.1 MEMBRANE BELOW SLABS AND BUNDS

Membranes shall be provided only to the extent that they are required by the environmental management plan or in terms of process requirements. In these instances, the membrane shall be high-density polyethylene (HDPE) of 1.5 mm thickness with continuously welded joints and designed as secondary tanking to contain leaks and spillages. These slabs shall be designed, without penetrations, as continuous-reinforced slabs or raft foundations, thickened locally to take loads from columns and plinths as necessary.

11.5.2 ISOLATION JOINTS

Except as required in Section 10.1, pile caps and foundations supporting heavy or vibrating equipment shall be isolated from the adjacent floor slabs by means of sealed isolation joints.

11.5.3 DRAINAGE

Paved areas shall be provided with sufficient cross-falls designed to permit free drainage of process spillage or storm water into sumps and drainage systems. In the absence of more stringent process requirements, the designated slopes shall be such as to achieve a minimum of 1:100 principal fall and 1:70 minimum in valley lines.

11.6 LIQUID RETAINING STRUCTURES

Reinforced concrete structures that are required to retain aqueous liquids shall be designed to BS 8007. For concrete structures containing corrosive solutions, design and construction specifications shall be compatible with the requirements of the corrosion resistant linings specified. Where a specialist contractor is required to supply and install linings, his requirements for concrete properties and surface finishes shall be made part of the concrete construction specification.

Thermal loading effects shall be in accordance with the process data. The lead civil engineer shall advise the lead process engineer that concrete liquid-retaining structures shall be started (and restarted) in the cold condition, further that this requirement shall be captured in the plant operating procedures.

11.7 FOUNDATIONS

11.7.1 CONVENTIONAL FOUNDATIONS

For project execution, foundations will be designed to the bearing pressures allowed in the geotechnical report. In the absence of a geotechnical investigation, and for the purpose of studies only, design shall proceed on the assumption that allowable ground bearing pressures are 200kPa at shallow depths and 500kPa at depths below 2.5 metres.

Foundation design shall also comply with the limiting settlement criteria specified by the equipment supplier or the project lead mechanical engineer, as applicable. Foundations shall be sized such that, under maximum overturning loads, the compression zone of the ground pressure distribution covers at least 75% of the length and 75% of the width of the base.

11.7.2 DYNAMICALLY LOADED FOUNDATIONS

Foundations and structures that support equipment which generates dynamic loads shall be designed using the codes quoted in Section 7.12 and with the use of finite element modelling techniques for dynamic analysis. For large foundation blocks, dynamically loaded volumetric reinforcement shall be included.

11.7.3 EARTHING

Earthing lugs will be provided at each bund area and at each steel structure.

11.8 EXCAVATIONS

Backfill over and around structures and foundations shall be compacted to 93% of MDD, alternatively to 90% of MDD and stabilised with 4% cement by mass.

Excavations shall be designated as neat excavations except where the below-ground concrete work must be formed.

Safety measures shall be prescribed as recommended by the appointed geotechnical engineer

12.0 PIPING

12.1 SCOPE

Piping Design Criteria outlines the basis for the overall design of piping systems, general requirements of the piping components and drawings.

The base design code shall be European Standard CEN/TC 54 and EN 13445 (latest edition) or European Standard EN 13480-1 Metallic Industrial Piping-General.

Note: If noted and required by client, the client's specifications and design criteria shall supersede this design criteria.

12.2 CODES AND STANDARDS

12.2.1 REQUIREMENTS

The components of piping systems will comply, as a minimum and as appropriate, with the following standards. In the event of a conflict between the codes and the technical specifications, the requirements of the more stringent shall govern:

ISO	International Organisation for Standardisation
CEN	European Committee for Standardisation
NFSC	Natural Fire Safety Concept
TEPPFA	The European Plastic Pipes and Fittings Association
BS 2971	British Standard, Specification for Arc Welding Fluid Carrying Pipe
GHS	Globally Harmonised System (Hazardous Labelling)
CE/FM	European Compliance Services / Factory Mutual

12.2.2 OTHER REQUIREMENTS

Pressure piping systems such as steam, condensate, glycol etc. are subject to design registration and shall be submitted for approval by the appropriate authorities.

All calculations and drawings associated with fire protection/detection shall be prepared by a company certified person for this work and shall be submitted to the local Fire Marshall or authority having jurisdiction and to the designated insurance rating agency or underwriter.

12.3 GENERAL DESIGN DEFINITIONS

12.3.1 DESIGN PRESSURE

Design pressure shall be the most severe condition of internal or external pressure under normal operating conditions.

Normal operating condition is the most severe condition of pressure and temperature expected to exist during continuous operation.

Normal operating conditions do not include pipe pressure testing.

Design pressure for unrelieved piping on pumped systems shall be the pump shut-off discharge pressure, taking into account additional pressure from hydraulic head.

Design pressure for vacuum piping shall be full vacuum pressure.

Where two piping systems of different design pressures are connected, the design pressure requirements of the piping system with the higher pressure will extend to the first block valve or check valve on the lower pressure system.

12.3.2 DESIGN PRESSURE AND TEMPERATURE

The design pressure of a piping system is the pressure at the most severe condition of coincident pressure and temperature expected during service. Refer to codes listed in Section 1 for conditions and limitations of this definition.

The design temperature of a piping system is the temperature at the most severe condition of coincident pressure and temperature where the greatest thickness or highest component rating is required. Refer to codes listed in Section 3.0 for conditions and limitations of this definition.

12.3.3 DESIGN REDUNDANCY

Any added safety margin above the calculated system head shall be supported by a calculation establishing the “run-out” power required if the specified pump operates at/or 5% lower than the calculated system head.

12.4 PIPING MATERIALS AND METHODS

12.4.1 GENERAL

Pipes, pipe components and valves will be classified primarily in accordance with the pipe material and each class group will be given a secondary classification based on service performed and/or pressure/temperature ratings.

12.4.2 PIPING MATERIAL SELECTION

Piping material selection shall be reasonable and economical. Piping material should be selected based on application, operating conditions, climate conditions and industry common practice. Typically, HDPE pipe is used for tailings handling systems and rubber-lined pipes are used in slurry pumping systems. Stainless steel pipes are usually used in corrosive reagent system in mining division. Other than these, carbon steel pipes are used in all piping areas.

Flange pressure rating shall be 10 bar throughout the plant.

12.5 PIPING DESIGN

12.5.1 LINE SIZING CRITERIA

Pipe sizing shall be calculated and analysed carefully. For slurry applications pipe diameters shall be based on the critical settling velocity at the minimum design flow rate. Table 5.1 gives the fluid velocity ranges for most piping areas.

Table 12.1 Line Sizes

Description		Velocity m/s
General Slurries	pump discharge gravity flow	1.2 - 2.1 0.5 – 1
Process Solution Lines	pump discharge gravity flow	2.0 -2.5 0.8 -1.5
Air, Plant	compressed air	20 – 35
Air, Instrumentation	compressed air	20 – 46
Air	blower	9 – 20
Steam		30.0 - 45.0
Water	pump discharge gravity flow	2.0 - 3.0 2.0 -3.0
Flocculant	pump discharge	0.25 - 0.5
Fuel Oil	pump discharge	1.0
Reagent	pump discharge	0.7
Cyanide Solution Lines		1.2-1.5

Note: The velocities of slurries listed above are for general estimation only. The design velocities should be calculated and selected in each case with respect to their respective concentrations and size distributions.

12.5.2 LINE SIZING

All pipe sizes will be expressed in Nominal Diameter (DN) using SI unit (metric) system.

Piping shall be sized for design flowrates and conditions stated on Process Flow Diagrams (PFD). Provision for future increase in capacity shall be made only when specifically requested by client.

Nominal Diameters 32 mm, 65 mm, 90 mm, 125 mm, 175 mm, 225 mm, 325 mm, 550 mm, 800 mm and 850 mm shall not be used, except where required to connect to equipment or recommended and approved by client. Transition to standard piping shall be as near the equipment as possible.

Minimum pipe size run shall be 25 mm except for connections to equipment, instrument services, lube oil piping and auxiliary services such as pump and x-ray tube cooling.

General pipe sizing will be based on:

- Available pressure drop and power consumption
- Velocity limitations

- Comparison of technical and economic factors.

Pump suction lines will be at least one size larger than pump suction flange size.

In general gravity piping shall be sized to provide maximum design flow at 50 ~ 60% full pipe cross-sectional area or 1/3~2/3 full square-shaped launder area respectively.

Control valve bypasses on slurry piping shall be line size and for solution, air, and steam piping shall be control valve size. Bypass piping shall be designed so that its flow may never exceed the maximum flow rate of the control valve being bypassed.

In pipe utilidors the minimum pipe size shall be 50 mm.

12.5.3 PIPE SLOPES

Table 12.2 Pipe Slopes

Description	Nominal Size Fraction	Percent Solids (%)	Minimum Slope (degree)
Slurries	-	-	1.0 – 2.0
Solutions	-	-	0.5 – 1.0
Air and Vents	-	-	0.5 - 1.0
Steam and Condensate	-	-	0.5 – 1.0
Water	-	-	0.5 – 1.0

Note: The slurry slope given here is used for general piping estimation only. The slope of each slurry pipeline shall be determined in each case by hydraulic analysis or client standards.

12.5.4 LAUNDERS

Launders are defined as an open channel for carrying suspended solids in water under gravity flow conditions. Although launder sizes are calculated, specified and verified by the Process and Mechanical Engineering groups, Launder design generally conform to the following guidelines:

- The quality of flow in an open channel is dependent on several factors, which include the cross-sectional area of the flow stream, the slope of the launders, the roughness condition of the sides and bottom of the launder and the shape of the launder as well as the flow characteristics of the pulp itself. The preferred shape of the launder is the semi-circular bottom-type. This particular shape reduces the hydraulic radius, thus allowing for a lesser slope and still maintaining the required velocity. Flat bottom launders may be used where connections to distributors are rectangular in shape. Flat bottom launders may also be used where gravity flow pipelines are collected by a common launder.
- For each launder, minimum geometric parameters including slopes and sizes, shall be determined by appropriate calculation methods (Colebrook-White, Chezy or Manning formula) or client standards to ensure adequate flow.
- It is recommended, slurry launders be designed one third full of their cross-section areas to avoid spillage; in the case of tenacious froth the launder

may be sized to be 25%-30% full. Slope should be calculated or determined based on similar projects.

12.5.5 SLURRY PIPING

All piping shall be routed as directly as possible to its destination minimising the use of bends. This will minimise wear, increase operating life and decrease the chance of plugging.

Piping shall be routed above ground whenever possible.

Erosive slurry service piping shall be lined with natural rubber. Rubber lining thickness shall be a minimum 6 mm for pipes up to 200 mm in diameter and 12 mm for pipes larger than 200 mm in diameter.

Pipe bends shall have a minimum radius of three pipe diameters (3D) for sizes 80 mm and above. Bends shall have a minimum radius of five pipe diameters (5D) for sizes 50 mm and below unless layout constraints determine otherwise. Where necessary, material conducting hoses will be used in place of bends.

Piping will be jointed to allow for rotating of spools. Rotating will extend the life of the pipe spools by allowing even distribution of wear due to abrasion.

Drain and flushing connections shall be provided on all pump suctions and be of the quick-disconnect type. For header sizes 100 mm and smaller, ball type block valves shall be used for both drainage and flushing. For header sizes 150 mm and above, Knife gate type valves shall be used for drainage. Butterfly valves shall be used for flushing. Flushing lines 50 mm and larger will be hard piped. All piping will be self-draining with high point vents and low point drains appropriately located to facilitate maintenance and hydro testing.

Block valves shall be knife gate type fitted with replaceable natural gum rubber sleeves which allow full port flow and eliminate seat cavities preventing packing of the sleeve with solids. On smaller line sizes, <80 mm full-port fully enclosed body style and replaceable natural gum rubber sleeve pinch valves shall be provided.

Piping for high abrasion slurries shall be Carbon Steel extra heavy wall pipe, Standard wall rubber lined pipe or HDPE pipe. Carbon Steel pipe connection can be butt welded or grooved for Victaulic couplings. Flange connection is only recommended for the inlet and outlet of a slurry pump, or as required by the on-line instruments or for maintenance purposes.

Low abrasion slurries shall be Standard wall pipe grooved for Victaulic connections or HDPE pipe with butt fused or flanged connection; butt welded and flange connections shall be used as required by an instrument or for maintenance purposes.

Slurry lines outside of buildings or heated areas shall be either: Carbon Steel extra heavy wall pipe, Carbon Steel Standard wall rubber lined, Standard wall pipe, or HDPE flanged pipe and fittings. Wall thicknesses selected are to suit pressure and corrosion allowance rating of the system.

Piping at pumps shall be arranged to avoid interference with access to pumps, the surrounding maintenance areas, and pull spaces during maintenance. Removable spool pieces are to be provided where required (especially at pump suction and discharge) to permit system maintenance with minimum pipe disassembly.

Suitable supports and anchors shall be provided for piping at pumps such that weight and stresses will not be transmitted to the pump casings. Temporary start-up strainers will be provided on non-slurry pump suctions.

The number and location of sampling connections shall be provided as per P&ID. All sampling points shall have an isolating or sampling valve.

12.5.6 GRAVITY FLOW PIPELINES

Although gravity flow pipeline sizes and velocities are calculated, specified and verified by the Process and Mechanical Engineering groups, gravity flow pipelines shall generally conform to the following guidelines:

- Pipelines carrying slurries will be designed to flow from 3% to 75% full; however they are generally sized 1/3 to 2/3 full of cross-section area.
- Slopes shall be identified on P&ID's with values according to Table 5.1.
- Gravity flow pipeline slopes and sizes shall be determined by appropriate calculation methods or client standards.

12.5.7 SOLUTION PIPING

Pressurised solution lines shall be sized as noted in Table 5.1. Exceptions shall be made for high viscosity fluids, low pressure drop requirements and long lines, where lower velocity would be used to optimise system and operating cost.

All piping shall be self-draining. Drain and vent connections shall be provided at low and high points of the piping system to facilitate maintenance and hydro testing as well as process requirements.

Generally solution piping shall be Standard wall Carbon Steel pipe and butt welded or grooved fittings. Pipe fittings 50 mm and below shall be Class 3000 socket weld or threaded. If solution is corrosive, use appropriate pipe material such as stainless steel or alloy steel.

12.5.8 WATER PIPING

Generally in portable and utility water systems, primary headers shall be "looped" when possible and practicable; so that all branch lines are fed from two directions.

Generally water piping shall be Standard wall Carbon Steel pipe with butt weld or grooved fittings. Pipe fittings 50mm and below shall be Class 3000 threaded.

Block valves shall be butterfly type for 65 mm and above and ball type for 50 mm and below.

Piping supplying safety showers/eyewash stations shall be routed in the middle of the pipe rack and/or covered to minimise heating of the water due to solar radiation.

12.5.9 AIR PIPING

Compressed air piping shall be sized so that the pressure drop along the line shall not exceed 10% of the initial line pressure, with full capacity being delivered at the end of the line. Air piping shall be looped unless site conditions make it impracticable.

All take-offs shall be from the top of the header for horizontal piping.

All instrument air branch piping shall be run to within 6 metres (20 feet) of the instrument and terminated with a valve. Where clusters of instruments occur, a single centrally located valved connection shall be provided.

All plant air piping shall be Standard wall Carbon Steel pipe with butt weld or grooved fittings. Pipe fittings 50 mm (2in.) and below shall be Class 3000 threaded.

All instrument air piping shall be Standard wall Carbon Steel Galvanised pipe with threaded or grooved fittings. Fittings 50 mm (2in.) and below shall be Class 3000 malleable iron threaded. Run out pipe and fittings from branch block valve shall be Stainless Steel tube and fittings or PVC/PP/nylon instrument air tubing with push fit fittings rated to 10 bar pressure.

12.5.10 UTILITY PIPING

Utility stations shall supply plant air and water at convenient locations on all floors such that all parts of the floor can be reached with a 15 metre flexible hose.

All air and water utility stations shall be 25 mm, equipped with 25 mm ball valve and quick disconnect type hose connections.

Utility headers shall be located on the top deck of pipeways whenever possible. The minimum size of process and utility headers on pipeways shall be 50 mm.

12.5.11 STEAM PIPING

Steam piping shall be sized so that the pressure drop along the line shall not exceed 10% of the original line pressure, with full capacity being delivered at the end of the line.

All take-offs shall be from the top of the header for horizontal piping to avoid formation of condensate pockets.

Steam piping shall slope in the direction of flow. Steam traps shall be applied every 90 -240 metres to avoid water hammer. Steam traps shall also be used at the following locations: before regulating valve, main block valve and at the end of main branch.

Drip legs and steam traps shall be provided at all low points and dead ends. Block valves shall be installed on both sides of the steam trap.

Discharge from steam traps shall tie into a lower pressure steam or condensate system.

All steam piping shall be Standard wall Carbon Steel pipe and butt welded fittings. Pipe fittings 50 mm and below shall be Class 3000 socket welded.

To minimise condensation and prevent erosion induced by relative movement, all steam and condensate lines shall be fitted with pipe shoes and shall be fully insulated as indicated by Heat Conservation (HC) on the P&ID's.

12.5.12 PERSONNEL PROTECTION

Eyewash/emergency shower combination shall be provided in areas where operating personnel are subject to hazardous sprays and/or spills and adjacent to all locations where the release of harmful fluids, airborne dust or non-toxic particles occurs in accordance with local codes.

Pipes carrying hazardous chemicals shall have dual containment and safety shields at all flanged and mechanical joints and valves to protect personnel.

Acid, Lime or other pipe lines carrying hazardous liquids shall be located close to grade level whenever possible. These lines shall be identified clearly with signs to avoid unnecessary risks, indicating fluid, pressure and/or temperature.

Personnel protection (PP) shall be mandatory for personnel working on uninsulated lines operating above 60 0C (140 0F) where they constitute a hazard to the operating personnel during normal operating routine.

12.5.13 INSULATION AND HEAT TRACING

Outdoor piping carrying slurry, water or other fluids liable to freeze in the conditions specified in section 3.0 shall be fully insulated and trace heated.

12.5.14 FLEXIBILITY

Allowance for thermal expansion and contractions shall preferably be made by the use of expansion loops and offsets. Expansion provisions shall conform to ICS-23.040.01.

Expansion joints shall be fully capable of withstanding at least 1.5 times all the working stresses imposed on them by pressure and temperature of the fluid and expansion of pipelines without leakage or structural failure.

12.5.15 UNDERGROUND LINES

Avoid underground process piping wherever possible.

All underground pipelines shall be buried 600 mm minimum from top of pipe to ground level. Deeper trench or reinforcement sleeves, according to calculation shall be used in roadway design.

Underground pipelines subject to corrosion shall be protected by yellow jacket or other methods of protection suitable to local conditions.

Underground pipelines shall be located by marker tape buried above the pipe.

12.6 GENERAL PIPING LAYOUT

12.6.1 INSTALLATION

Piping within buildings shall generally be installed in 6 metre random lengths, unless on a pipe rack or trestle where 12 metre lengths (double random, maximum) may be utilised. In highly congested areas or areas where maintaining piping will be difficult, 3 metre (lengths may be used.

Flange bolt holes shall straddle centre lines unless otherwise indicated on the drawings.

Headroom clearance for piping in aisles shall be 5 metres. Clearance of 2.1 metres shall be provided over operating platforms. Minimum clearance of 5 metres for Pipe Rack to road is required.

All slurry and utility valves shall be accessible from floors and operating platforms. Spindle extensions and chain wheel operators are only to be installed where space constraints limit normal access.

Piping shall be routed in piping corridors and grouped together. The arrangement of the piping should allow operations and maintenance to be carried out with minimum effort. Clearance between lines shall be no less than 50 mm.

Piping systems shall be designed to allow for expansion and contraction. Expansion effects due to exposure to direct sunlight shall also be considered.

Piping shall be arranged to maximise inherent flexibility. Expansion joints shall only be used when it is absolutely necessary.

Piping shall not be routed through electrical rooms, through electrical cable trays or immediately above the trays.

All walls and floor penetrations shall be sleeved unless cast in place. These shall be designed on a case by case basis.

All control valves shall have adequate clearance for disassembly without disturbing other equipment or piping.

Manually operated valves shall be oriented so that stems and hand wheels do not project into platform or passageway area. However, valves should be situated so that they are readily accessible.

Valve location above working floor or platform:

- 1st choice – 1 metre to 1.4 metre,
- 2nd choice – 0.6 metre to 1 metre,
- 3rd choice – 1.4 metre to 1.7 metre,

Valves located above 1.7 metre shall be equipped with a chain operator.

Vent and drain connections shall be provided at all high and low points on tanks and piping. Drains shall never be less than 20 mm in diameter. Vents consisting of plugged bosses shall be provided at the high points of all piping for hydrostatic testing. The plugs should be sealed after the hydrostatic test.

All pipe systems and equipment that require draining shall be provided with valve connections.

After installation and before testing, all piping shall be cleaned by flushing with water until free of dirt, grit, welding slag, and foreign materials.

All services requiring metering will have minimum upstream and downstream straight run based on instrument manufacturers' recommendation.

Pockets and dead ends in piping shall be avoided.

In safety and environmental critical applications where absolute and verifiable shut off is required, the use of a double block and bleed or an approved line-blind valve shall be installed.

Pump suction nozzles shall be located away from tank inlet nozzle to avoid short-circuit effect.

Suitable supports and anchors shall be provided for piping at pumps such that weight and stresses will not be transmitted to the pump casings.

Temporary start-up strainers will be provided on non-slurry pump suctions.

The number and location of sampling connections shall be provided as per P&ID. All sampling points shall have an isolating or sampling valve.

Suitable allowances shall be made for future demands on systems by designing pipe racks to have a 10% additional capacity to accommodate future loads.

12.6.2 PIPE IDENTIFICATION

Pipes shall be marked by a system of identification set out in the following standards:

- European Union Directives 67/548/EEC
- European Union Directives 88/379/EEC

Pipes shall be labelled with regard to contents and direction of flow as follows:

- Hazard shall be identified using the following colour codes:

Table 12.3 Classification of Material Hazards and Colour Designations

Service	Background Colour	Colour of Letters
Water	Green BS-12D45, RAL-6003	White
Gas	Yellow BS-08C35, RAL-1007	Black
Air	Light Blue BS-20E51, RAL-5024	Black

Fire Services	Red BS-04F53, RAL-3020	White
Steam	Silver/Grey BS-10A03, RAL-9007	Black
Oil	Brown BS-06C39, RAL-8007	White
Acids & Alkalis	Violet BS-22C37, RAL-4005	White
Electrical	Electrical BS-06E51, RAL-2008	Black
Other Fluids	Black BS-00E53, RAL-9005	White

Table 12.4 Size of Legend Letters and Banding

Outside Diameter of Pipe or Covering mm	Length of Colour Background mm	Size of Letters mm	Width of Banding Tape mm
10 to 32	200	13	25
38 to 51	200	19	25
64 to 150	300	32	50
200 to 250	600	64	100
over 250	800	80	100

Labeling and Color may be either:

Paint and stencil: Pipe shall be painted as per hazardous color code, after which text and flow direction arrows are stenciled in.

Adhesive labels: Hazardous colour code adhesive label with flow direction arrows and banding tape shall be applied on either side of the label.

Location of text and arrows:

- maximum of 12 metre centres on straight pipe
- at all valves
- at all changes in direction
- at fittings for hose or other terminal connection
- at 1.5 metres above floor on vertical pipes
- at 1.5 metres from wall where pipe passes through the wall
- at 1.5 metres from equipment to which pipe is connected.

When the content of a container or a pipe is a controlled product, there shall also be a GHS product identification label specified and attached to the container.

12.7 STRESS ANALYSIS

Pipe stress analysis shall be performed on lines with thermal expansion or lines where its weight, mechanical vibration and/or fluid dynamics may cause excessive stresses.

Pipe stress analysis shall satisfy the requirements of applicable codes as listed in Section 12.2

For pipe supporting guidelines, flexibility and pipe stress, refer to Piping Materials and Methods 12.4

The stress analysis of lines shall be carried out using either Caesar II, AutoPipe, calculation tables or Nomographs. However, Caesar II is recommended.

12.8 VALVES

Piping Division will be responsible for all manual valves.

On/Off activated valves (HV's), control valves and PSV's.

- Valves requiring attention, observation or adjustment during normal plant operation shall be located within reach from grade, platform, permanent ladder or stairway.
- All valves with stem or actuator will be installed with yokes orientated at or above centreline of horizontally installed pipe unless noted otherwise.

Relief valve piping, when discharging to atmosphere, must be provided with a pipe stack ending at least 2.5 metres above any platform or walkway within a 7.5 metres radius. An 8 mm dia. threaded weep hole shall be provided at the bottom of stack to prevent liquid accumulation.

13.0 HYDRO-CLIMATGOLOGICAL

Monthly precipitation (mm) adapted from WAI Chaarat ESIA Chapter 3 Project Description Table 3.10 (September 2017)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Dry year (25 percentile)	1	3	83	82	37	20	6	2	5	24	17	6	286
Average year (50 percentile)	4	9	120	102	56	39	18	11	13	43	39	16	470
Wet year (75 percentile)	10	27	155	158	70	51	32	18	23	64	69	27	704

(Note that these differ from the general values in Table 3.2 of the same document. Table 3.2 states an average annual precipitation of '553 to 1000 mm' (compared with 470 mm above). It also states a minimum monthly average of 9 mm and a maximum monthly average of 69 mm, which comes from the table in document *"20091218 Climatic Information_Климатиче",* understood to average the years 1933-2015 from the Chatkal station. Table 3.2 also states an average annual snow component of precipitation of 500-600 mm; the average year from Table 3.10 above would suggest around 290 mm snow even if it is assumed that all precipitation from October through to April is snow.)

The project climate station at Summer Camp now has over seven years of accumulated data. Annual precipitation totals for the whole years 2011-2016 include a minimum of 285.0 mm (2012), close to the 25-percentile dry year above; and a maximum of 1203.8 mm (2011), well in excess of the 75 percentile wet year above. It is intended to use the 2011 record to represent an 'extreme wet' year in the monthly site-wide water balances.

2011 precipitation (mm) from the Chaarat Summer Camp station ('extreme wet' for water balance)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
'Extreme wet'	2.0	41.2	242.8	91.6	115.6	288.4	53.6	16.0	15.6	66.8	238.2	32.0	1204

Note that three months of 2011 realised over 200 mm precipitation. It is assumed that the totals in March and November were snow. The 288.4 mm in June is the highest monthly total recorded between June 2010 and September 2017. Despite this, the maximum daily precipitation in 2011 was 40.4 mm, only slightly above the

average for 2011-2016 of 35.1 mm – the highest in those years was 50.2 mm in 2016, a year of only 330.4 mm in total.

The above precipitation data are used in this study as the basis for the monthly site wide water balance.

Design precipitation depth-duration-frequency for the project site, adapted from WAI Hydrology Report for Heap Leach Facility Table 2-2 (May 2017)

ARI (years)	AEP (%)	Precipitation Intensity (mm/hr)								
		15 min	30 min	45 min	60 min	2 hrs	3 hrs	24 hrs	48 hrs	72 hrs
5	20	26.4	19.4	15.3	13.1	8.6	6.9	2.4	1.8	1.4
10	10	30.8	22.7	17.9	15.3	10.1	8.0	2.8	2.1	1.7
20	5	34.9	25.7	20.3	17.4	11.5	9.1	3.2	2.4	2.0
50	2	40.3	29.7	23.5	20.1	13.2	10.6	3.7	2.8	2.3
100	1	44.4	32.7	25.8	22.1	14.6	11.6	4.1	3.1	2.6
200	0.5	48.4	35.7	28.2	24.1	15.9	12.7	4.4	3.3	2.9
500	0.2	53.9	39.7	31.4	26.8	17.7	14.1	4.9	3.7	3.2
PMP	PMP	82.0	62.0	50.0	41.0	28.0	23.0	8.0	6.5	5.5

Notes: Includes rainfall and snowmelt. PMP (Probable Maximum Precipitation) is equivalent to a 1 in 100,000 year Average Recurrence Interval (ARI). AEP is Average Exceedance Probability

Note that the general design criterion of a 1 in 100 years 24-hour event is highlighted in the table above as a precipitation intensity of 4.1 mm/hr. This represents a total 1 in 100 years 24-hour precipitation of 98.4 mm. Table 3.2 of the WAI ESIA Chapter 3 erroneously labels the 4.1 mm/hr intensity as the design storm itself. For the diversion channels for the HLF it is recommended that a PMP is used, equivalent to a 24-hour precipitation of 192 mm.

It is noted that the highest daily precipitation recorded at Summer Camp of 50.2 mm is less than a 5-year 24-hour event.

For clarification, the Average Recurrence Interval (ARI) does not mean that the event will not happen in 99 years out of 100; rather, as indicated by the Average Exceedance Probability (AEP) there is a 1% chance of this event occurring in any year.

The ESIA Chapter 3 Table 3.10 also contains monthly average Potential Evaporation data as measured at the mine site 2010-2015, and assumed Runoff Factors.

Monthly evaporation (mm) adapted from WAI Chaarat ESIA Chapter 3 Project Description Table 3.10 (September 2017)

	Month												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total

Potential Evaporation	12	4	21	75	153	184	242	214	141	51	18	13	1128

Runoff Factors are assigned in the same document table as follows:

- Pit walls and floor 1.0
- Process area 1.0
- Waste rock dumps 0.3
- Heap leach pad 0.3 (to be confirmed by Coffey Manchester team)
- Ponds 1.0

For design purposes it is assumed that 1.0 also applies to valley slopes. This is conservative and allows for ground to be effectively frozen with no infiltration assuming an event coinciding with snowmelt. The value of 0.3 applies to the waste dump itself, but water balances may assume that much of the water that infiltrates re-emerges down the valley.

PART B: KAPAN COMPETENT PERSON'S REPORT

CSA Global
Mining Industry Consultants

Competent Persons Report

Polymetal International's Kapan Polymetallic Assets in Armenia

CSA Global Report № R508.2018
5 November 2018

www.csaglobal.com

Report prepared for

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Disclaimers

Purpose of this document

This Report was prepared exclusively for Chaarat Gold Holdings Limited ("the Client") and Numis Securities Limited ("the NOMAD") by CSA Global Pty Ltd ("CSA Global"). The quality of information, conclusions, and estimates contained in this Report are consistent with the level of the work carried out by CSA Global to date on the assignment, in accordance with the assignment specification agreed between CSA Global and the Client.

Results are estimates and subject to change

The interpretations and conclusions reached in this Report are based on current scientific understanding and the best evidence available to the authors at the time of writing. It is the nature of all scientific conclusions that they are founded on an assessment of probabilities and, however high these probabilities might be, they make no claim for absolute certainty.

The ability of any person to achieve forward-looking production and economic targets is dependent on numerous factors that are beyond CSA Global's control and that CSA Global cannot anticipate. These factors include, but are not limited to, site-specific mining and geological conditions, management and personnel capabilities, availability of funding to properly operate and capitalise the operation, variations in cost elements and market conditions, developing and operating the mine in an efficient manner, unforeseen changes in legislation and new industry developments. Any of these factors may substantially alter the performance of any mining operation.

Executive Summary

1.1 Overview and Context

Chaarat Gold Holdings Limited ("Chaarat", or the "Company") engaged CSA Global (UK) Ltd ("CSA Global") to prepare a Competent Persons Report ("CPR") relating to the Kapan Asset (which comprises the Shahumyan underground poly-metallic mine, Armenia) owned by Kapan Mining and Processing CJSC, which is being acquired by the Company from Polymetal International (see the Company's press release of 30 October 2018).

Chaarat is an AIM listed mining company bound by the AIM listing rules.

This report was prepared for Chaarat and Numis Securities Limited ("the NOMAD") by CSA Global. The quality of information, commentary and conclusions set out in this report are consistent with the level of the work carried out by CSA Global to date on the assignment, in accordance with the assignment specification agreed between CSA Global and Chaarat.

As part of this review, CSA Global has reviewed literature, data and information provided by the Company relating to the asset, and a site visit to the Shahumyan Mine was completed by Ian Stockton, Principal Geologist, CSA Global between the 4th and the 8th of September 2018 for the purposes of project familiarisation, ground truthing, review data collection procedures and processes and validation/verification works relating to geology and mining. Visits were made both underground and to the core processing and mine geology areas. A visit was undertaken to the company assay lab and audit was also completed.

Reports from current and previous owners were provided as background and technical information, subsequently reviewed, for the purposes of preparing the CPR report. Information was provided from various departments and included assay data, geology logs and screen capture of various processes and procedures in use on site.

1.2 Tenure

The ground held by Kapan Mining and Processing CJSC in the Kapan area comprises one Mining Licence and one Exploration Licence. The Kapan Exploration License covers 90.7 km^2 with some 12.5 km^2 excised to cover existing populated areas, mine concession, and related infrastructure.

Dundee Precious Metals Kapan operated the Shahumyan Mine concessions under a special mining licence from 2006 until 2016. In an agreement reached in November 2012, DPMK's Shahumyan mine licence was renewed under the Mining Code adopted in late 2011. The license term remained unchanged until 2020.

In 2016 Polymetal International Inc completed purchase of the Kapan project.

The licence was extended to 01 April 2050 together with a mine allotment, based on Order No 381-A of 25 August 2015, issued by Minister of Energy and Natural Resources.

Table 1: Summary Table of Asset

Asset	Holder	Interest (%)	Status	Lease expiry date	Lease area	Comments
Shahumyan Polymetallic Mine	Kapan Mining and Processing CJSC	100	Production	01 April 2050	90.7 km^2	None

1.3 Project Location, Access and Climate

The Kapan project is located 320km by road to the south east of the capital Yerevan in Armenia in the immediate vicinity of Kapan City, with the population of about 36,000 people.

Kapan is accessed by bitumen road and is open all year and is the main cargo route. Kapan has an airport with an asphalt airstrip, but currently it is not operating. Kapan City has a road connecting it to the Islamic Republic of Iran.

The region is typical mountainous ranging from 700m to 3,200m above the sea level. The deposit is located at the south-east end of the Khotarkasar-Arachatzor ridge, between the Vokhchi River and its left tributary, the Khaladge River. The deposit elevations range from 700m to 1100 m above sea level.

The Kapan district is dominated by the mining industry. As well as the Shahumyan deposit and processing facilities there is the Kajaran copper-molybdenum mine and process plant operating in the area and a number of smaller production facilities.

1.4 Regional and Local Geology

The Kapan project is located within the Lesser Caucasus part of the extensive Tethyan orogenic belt (approx. 150 Ma). The Kapan mineral field is located, in the north-western middle Jurassic volcanic belt which are host to the three main mineral occurrences in the district. These include the Central-West copper (Cu) deposit, Central-East gold-copper (Au-Cu) deposit and Shahumyan gold-base metals (Cu-Au-Ag-Zn-Pb) deposit.

The Shahumyan mineralised field is considered to represent a large hydrothermal sulphidation system. Observation of the core from the site visit suggests that the mineralisation may be a structurally controlled carbonate base metal epithermal system in connection with the intrusion of an underlying felsic intrusive body. The middle Jurassic host rocks comprises of a suite of intermediate tuffs, flows, breccias and sub-volcanic intrusions.

Mineralisation is hosted by a suite of sub-parallel veins with up to one hundred and eighty veins. Observation of mineralisation underground and associated mapping demonstrates small scale structural complexity however with a general predictability at the mining scale. Ongoing definition drilling is used to confirm the position of mineralisation.

The Shahumyan mineralization is characterized by narrow sub vertical veins between 0.2m and 2.0 m wide, with a steep dipping and E-W orientation, which contain gold-base metals (Cu-Zn-Pb-Au-Ag) mineralization. The veins are frequently associated with sericite alteration and disseminated mineralization. These zones of altered rocks can reach 25m but usually they are 10-15m thick and occur in the upper deposit horizons.

Ore mineralization is mainly represented by sphalerite, pyrite, chalcopyrite, galena and bornite. Minor assemblages of tennantite, tetrahedrite, enargite, chalcocite, covelline, tellurides, native gold and silver have been identified. The vein gangue minerals include quartz, calcite, gypsum, anhydrite and rhodochrosite. The veins are represented by numerous texture varieties, related to the mineralization stages and tectonic movements.

1.5 Drilling

The focus at the Kapan project by Polymetal has been underground resource definition drilling since 2016. Drilling since Polymetal ownership is as follows.

- 2016 - 403 diamond drill holes for 47,334.2m.
- 2017 - 659 diamond drill holes for 61,670.5 m.

In 2018, 65km of underground drilling is budgeted. As of September 2018, 41.5km of drilling has been completed in 463 drill holes. There are currently 5 drill rigs underground producing NQ core. The primary purpose of the current underground drilling is to confirm the position of interpreted mineralised veins and to convert inferred resources to indicated resources for modelling and mine design purposes. Drilling is typically located on 20m spaced section lines and drilled perpendicular to the interpreted vein position. In 2016 downhole surveys were completed with an IMNN_32A Russian tool and Reflex tool. From 2017 only the IMNN_32A Russian tool was used.

1.6 Sampling and Assaying

All samples from underground drilling are analysed at the Polymetal owned and operated laboratory on the outskirts of Kapan. The building was originally an electronics factory that was converted to an assay lab by SGS for DPMK as a preparation and analytical lab. Polymetal have operated the lab since ownership in 2016. Many of the operating systems from SGS are still being used.

Sample provided to the lab include underground channel samples, underground drill samples and grade control channel samples. The lab provides Fire Assay with AAS for gold and ICP AES analysis for Ag, Cu, Pb and Zn. AAS is used for high-grade Ag, Cu, Pb and Zn.

There are 3 drying ovens with capacity for 115 samples each. Samples are dried at 105 degrees for a minimum of 12 hours, depending on the size and type of samples. Moisture is checked irregularly. The lab dries approximately 250-300 samples per day.

Fire assay is undertaken in a dust free area with extractor fans. Flux and pulp is mixed in a fume cupboard with a range of weights from 10-50g. Below 10g the samples are considered too small. The flux and sample are mixed using a scoop into a crucible, which are re-used.

The AAS instrument is an Agilent Technology 200 series unit which is 6 months old and can read from 11 samples. There are procedures in place for samples over detection limit which involve dilution of samples and re analysing.

1.7 Mineral Resources

The effective date for the current Mineral Resource Estimate is 01 January 2018 and was prepared and disclosed by Polymetal Engineering JSC in accordance with the JORC Code, 2012 Edition. The current Mineral Resource statement is set out in Table 1.

The Mineral Resources set out in the table below are reported at a cut-off grade of 2.5g/t Au Eq.

Table 2: Mineral Resources of the Shahumyan deposit as of 1st January 2018 (Polymetal Engineering JSC)

Mineral Resource Summary (as of January 1, 2018)	Tonnage	Grade					Metal				
	kt	Au (g/t)	Ag (g/t)	Cu (%)	Zn (%)	AuEq (g/t)	Au (koz)	Ag (koz)	Cu (kt)	Zn (kt)	AuEq (koz)
Measured											
Underground mining	180	6.2	95	1.07	4.2	11.6	36	559	1.9	7.8	68
Stockpiles	10	1.8	34	0.41	1.5	3.8	0	6	0	0.1	1
Total Measured Resources	**190**	**6**	**93**	**1.05**	**4.2**	**11.4**	**36**	**565**	**2**	**7.8**	**69**
Indicated											
Underground mining	2180	3.8	73	0.79	3	7.7	265	5094	17.2	65.1	542
Total Indicated Resources	**2180**	**3.8**	**73**	**0.79**	**3**	**7.7**	**265**	**5094**	**17.2**	**65.1**	**542**
Measured+Indicated											
Underground mining	2360	**4**	**74**	**0.81**	**3.1**	**8**	**301**	**5653**	**19.2**	**72.9**	**610**
Stockpiles	10	1.8	34	0.41	1.5	3.8	0	6	0	0.1	1
Total Measured+Indicated Resources	**2370**	4	74	0.81	3.1	8	**301**	**5653**	**19.2**	**72.9**	**610**
Inferred											
Underground mining	8220	**2.9**	**63**	**0.67**	**2.3**	**6.1**	**764**	**16522**	**54.7**	**189.1**	**1614**
Total Inferred Resources	**8220**	**2.9**	**63**	**0.67**	**2.3**	**6.1**	**764**	**16522**	**54.7**	**189.1**	**1614**
Measured+Indicated+Inferred											
Underground mining	10580	**3.1**	**65**	**0.7**	**2.5**	**6.5**	**1065**	**22175**	**73.9**	**262**	**2223**
Stockpiles	10	1.8	34	0.41	1.5	3.8	0	6	0	0.1	1
Total Measured+Indicated Resources+Inferred Resources	**10590**	**3.1**	**65**	**0.7**	2.5	6.5	1065	22181	73.9	262.1	2224

* Discrepancies in the calculations are due to rounding

The figures presented above are both gross and net attributable

The operator is Kapan Mining and Processing CJSC

1.8 Mineral Reserves

The effective date for the Mineral Reserve estimate contained in this report is 1st January 2018 and prepared by Polymetal Engineering JSC. All Reserves in Table 2 are Proven and Probable Mineral Reserves.

Ore Reserves for underground mining were estimated based on Measured and Indicated Mineral Resources, using 2.5 g/t AuEq cut-off grade.

The MSO stope wireframes form the basis of stope ore reserve in conjunction with the ore development considering the selected mining method and equipment size. Mineral Resources were converted to Ore Reserves using MSO stope optimiser and consider the assumed losses, dilution and ore drive development.

Table 3 Ore Reserves of the Shahumyan deposit as of 1st January 2018 (Polymetal Engineering JSC)

Ore Reserves	Tonnage kt	Grade					Metal				
		Au (g/t)	Ag (g/t)	Cu (%)	Zn (%)	AuEq (g/t)	Au (koz)	Ag (koz)	Cu (kt)	Zn (kt)	AuEq (koz)
Proved	**220**	**2.9**	**42**	**0.52**	**2.46**	**5.8**	**20**	**289**	**1.1**	**5.3**	**40**
Underground mining	210	3.0	42	0.53	2.48	5.8	20	283	1.1	5.2	39
Stockpiles	10	1.8	34	0.41	1.53	3.8	0	6	0	0.1	1
Probable	**3 850**	**2.1**	**40**	**0.42**	**1.62**	**4.2**	**254**	**4 905**	**16.3**	**62.4**	**518**
Underground mining	3 850	2.1	40	0.42	1.62	4.2	254	4 905	16.3	62.4	518
Total Proved + Probable	**4 070**	**2.1**	**40**	**0.44**	**1.67**	**4.3**	**274**	**5 194**	**17.4**	**67.7**	**558**
Underground mining	4 060	2.1	40	0.44	1.67	4.3	274	5 189	17.4	67.6	557
Stockpiles	10	1.8	34	0.41	1.53	3.8	0	6	0	0.1	1

* Discrepancies in the calculations are due to rounding

The figures presented above are both gross and net attributable

The operator is Kapan Mining and Processing CJSC

1.9 Metallurgy and Processing

There are two main ore types:

- Pb-Cu-Zn; relatively rich lead content (42%)
- Cu-Zn; with low content of lead (58%).

Main ore minerals are sphalerite, chalcopyrite, galena, and pyrite. Ore-bearing rocks are andesite-dacite and quartz porphyrites.

Chalcopyrite-sphalerite assemblage generates coarse-grained aggregates of these minerals and forms the larger portion of polymetallic veins. Sphalerite is dark brown, black, and light yellow. Main components of the chalcopyrite-sphalerite assemblage are: Zn, Cu, Fe, Sb. Mn, Cd, Ga, Ge, Ag, Bi impurities are observed. Fe, Mn, Cd, Ga, Ge impurities are idiomorphic and typomorphic for sphalerite.

Calcite-tennantite-chalcopyrite-galena assemblage forms growth lines and veinlet-like aggregates, cutting the chalcopyrite-sphalerite assemblage. Main components of this assemblage are Cu, Pb, Ag, S, Fe, Ca. Telluride assemblage comprises the following minerals: altaite, hessite, tellurobismuthite, petzite, native gold, tellurium, tennantite, tetrahedrite, chalcopyrite, sphalerite, and galena. The upper levels of the deposit show an increase in tellurides. Main components of this assemblage are Bi, Fe, Ag, Au, Pb, Cu, Sb, As.

Mineralogical and metallurgical testwork demonstrated that the deposit contains practically only sulphide ore. According to Vniitsvetmet Research Institute, sulphide ores contain zinc (97.5% sphalerite), lead (85% galena), and copper (85% primary sulphides and 11% secondary sulphides).

According to mineralogical and metallurgical testwork, the main ore-forming minerals form four ore varieties (subtypes), namely copper-zinc, copper-lead-zinc, copper-pyrite and zinc-pyrite. In these ore varieties (subtypes), gold tellurides are mainly associated with sphalerite, and silver tellurides are associated with sphalerite, galena and fahl ore.

Due to multiple alternations of various mineral assemblages and aggregates in the ores, it does not appear possible to isolate commercial (metallurgical) ore grades.

The main commercial components in the ores are gold, zinc, copper, silver and lead. The amount of these components in the ores varies within the following ranges (typical distribution):

- Gold – from 1–2 to 10–20 g/t;
- Zinc – from 2–3 to 10–12%;
- Copper – from 0.2–0.5 to 2.0%;
- Silver – from 20–30 to 200 g/t; and more
- Lead – from 0.05 to 0.5–0.7%.

According to the testwork data, native gold predominantly occurs in pyrite, chalcopyrite and galena, and fine-dispersed gold commonly occurs in sulphides, tellurides and quartz. Gold and silver are represented as tellurides as free gold on boundaries of the sulphide minerals. Gold is found in free form as well as tellurides. Main gold-bearing minerals are chalcopyrite, galena, sphalerite and pyrite; and silver is present as tellurides and as isomorphous mixtures in sulphides.

Based on testwork, the preferred process flowsheet for treating underground ore from the Kapan veins is selective flotation to produce separate saleable copper and zinc concentrates with gold and silver credits.

The lead grade in the ore is too low to enable a saleable lead concentrate to be produced. The presence of copper arsenic minerals such as tennantite will likely result in high arsenic grades in the copper concentrate.

Given the high gold and silver recoveries to the copper and zinc concentrates, it does not warrant including a gravity circuit in the flowsheet when treating the Kapan ore types.

Based on testwork the following predicted metallurgical recoveries for the different metals are:

- Copper recoveries of approximately 83–87% to a copper concentrate of 19–23% Cu.
- Gold recoveries to a copper concentrate ranging from 68% to 76%. The grade of gold in the copper concentrate was 200–400 g/t Au, although in practice this will depend on the ratio of copper to gold in the ore.
- Zinc concentrate grades in excess of 60% Zn at recoveries of between 80% and 87% should be achievable.

1.10 Mining Method

The Shahumyan mineralization is characterized by narrow veins (0.2-2.0 m), steeply dipping (70°-85°), east-west orientation, and contain gold-base metals (Cu-Zn-Pb-Au-Ag) mineralization. The veins are frequently identified within the areas and zones of sericite alterations and disseminated mineralization.

The mining method used is narrow vein longhole open stoping, utilising a single vein ‘ore drive’ for drilling, blasting and loading. Two variations of long hole stoping are undertaken at Kapan, ‘bottom up’ and ‘top down’. Top down mining occurs below the 780-access level as mining advance declines down lower into the orebody and is approximately 90% of ore production. Bottom up mining occurs above the 780-access level as mining progresses towards surface and accounts for 10% of ore production. Future mining comprises 60% bottom up and 40% top down mining.

Level nomenclature is in metres elevation above sea level. The natural ground elevation above the mine varies between 900 and 1,000m above sea level.

The Shahumyan deposit lodes average 0.2m in width with a stope minimum mining width of 2.2m. Dilution occurs by two means, primary dilution, the waste contained within the mineralized zone and, secondary dilution, the additional waste created from blast over break. A third factor influencing dilution at Kapan is the material self-mining from the void above the active stope in a top-down mining scenario. Onsite it was reported that this third form of dilution was their largest production issue.

Assumed losses due to loading and transportation of 3% are based on historical mining data – resulting in a recovery of 97% of the stope shape.

1.11 Economic Model

1.11.1 Capital Expenses — General Description

All dollar amounts quoted in this document are US$.

Total estimated project capital expenses were $21.4 million ex VAT, including investment projects — $7.3 million, retrofitting and upgrading of mining equipment — $6.2 million, other — $2.6 million and closure and liquidation — $5.3 million. The capital expenses are given in the table below.

Table 4. Capital Expenses plan - Polymetal case

	Units	Total	2018	2019	2020	2021	2022	2023
Capital costs	**mln $**	**21.4**	12.4	0.4	0.4	2.0	0.4	5.7
New construction/liquidation	mln $	**12.6**	7.3	0.0	0.0	0.0	0.0	5.3
Mining equipment	mln $	**6.2**	4.6	0.0	0.0	1.6	0.0	0.0
Others capital costs	mln $	**2.6**	0.4	0.4	0.4	0.4	0.4	0.4

1.11.2 Operating Expenses Estimation

Operating expenses were estimate for work stages and activities (sheet Cash_costs in TEM). The average specific indicators were calculated based on the 2018 budget. The average specific costs at the main processes per unit of semi-finished product sent to processing are shown in the table below.

Table 5. Average unit cost - Polymetal Case

Development and access workings	$/t	26.68
Ore production — UG mining	$/t	16.76
Ore processing	$/t	15.6
Flotation concentrate treatment (sales expenses)	$/t	117.7
Flotation concentrate transportation (sales expenses)	$/t	110.3
Refining	$/g	0.8
Administrative expenses	‘000 $	4 688
Other expenses	‘000 $	1 284

1.11.3 Ore Production Costs — Underground Mining

Ore underground mining cost was estimated taking into account drifting and stoping activities during 6 years from 2018 till 2023.

Cumulative annual mining/ore production costs can be found in the table below.

Table 6. Cumulative annualised mining cost - Polymetal Case

	Units	Total	2018	2019	2020	2021	2022	2023
Ore production — UG mining	mln $	128.5	25.1	23.5	25.4	26.2	17.3	11.1

1.11.4 Ore Processing Costs

Ore processing cost was estimated over six project years and is presented in the table below.

Table 7. Annualised processing cost - Polymetal Case

	Units	Total	2018	2019	2020	2021	2022	2023
Ore processing	mln $	63.3	9.8	10.9	10.9	10.9	10.9	9.8

Ore processing cost includes material costs estimated based on specific consumption of materials, reagents, spare parts per tonne of processed ore, as well as on material prices (including delivery to the site), power tariffs and process plant payroll expenses.

1.11.5 Cash Costs per Ounce of Metal Equivalent

The table below shows cash costs per ounce of gold equivalent, less processing cost and non-payable metal when concentrates are sold to a third party.

Table 8. Cash Cost per Ounce of Gold Equivalent - Polymetal case

	Units	Total
Total cash cost per oz	**-**	**558.0**
Ore production — UG mining	$/oz	230.3
Ore processing	$/oz	113.5
Royalty	$/oz	40.2
Administrative expenses	$/oz	50.4
Deductions	$/oz	168.3
Total cash cost per oz	**$/oz**	**602.8**

1.11.6 Project NPV and sensitivities – Polymetal Case

Polymetal estimated NPV of the Kapan mine based on the mine schedule and other production parameters, and cost estimations stated above. Table 43 shows sensitivity of the project NPV to gold price fluctuations

Table 9. Kapan Project NPV - Polymetal Case

Gold Price	NPV, '000 $
1 000	117.7
1 050	125.5
1 100	133.3
1 200	148.9
1 250	156.7
1 300	164.4
1 350	172.2

Weighted Average Cost of Capital (WACC) of 8 % per annum was used as a discount rate.

1.12 Environmental

The main law regulating mining in Armenia is the Subsoil Code, which determines:

- Special rights of subsoil use and how to obtain them
- Rights and obligations of the engaged parties and government authorities.

Environmental aspects are dealt with in the Law on Environmental Impact Assessment. Tax Code and Law on Wastes are also applicable, and the Land Code and Water Code regulate surface rights and use of water resources.

The mining industry is regulated by the Ministry of Energy Infrastructures and Natural Resources (MEINR), which grants permissions and supervises mining activity; and the Ministry of Natural Protection, which oversees environmental issues and supervises closure and rehabilitation works.

The mining licence entitles the holder to extract and manage the mineral resources with payment of state fees; nature usage fees; and royalties to the state budget. The mining licence can be granted for a period of up to 50 years, with extension on application to the MEINR.

Deposits of mineral resources are subject to state registration and mined resources must be removed from the state register. The subsoil is exclusively owned by the state, but while the subsoil resources is always state property, the land surface can only be used under land purchase-, usage-, lease- or servitude agreement.

A mining licence is issued only after application for a preliminary environmental impact assessment, which must be obtained before applying for the licence. The mining licence application must also include:

- Receipt demonstrating payment of the state fee for the EIA (Category A - AMD500,000)
- A Waste Management Plan and financial guarantees for implementing the plan
- Mine Closure Plan
- Financial references and guarantees.

The application is then subject to assessment of the impact on the environment, before decision based on review conclusions and an agreement between the Ministry and applicant is concluded.

Polymetal has a Subsoil and Mining Licence “No EKSRA (ՇԱՓՎ)-29/183”, valid until 2050, for the Kapan operation. The licence is for production of 17.8 Mt (C1 reserves of 7,390,600 t and C2 reserves 10,468,400 t) and the licensed mining lease has an area of 378.6 hectares (ha) but is limited to 400 m absolute elevation at depth. The licence conditions provide for mandatory environmental protection measures. As an active mining operation, it has all the necessary additional permits

An Environmental Management System (EMS) was developed and implemented at all Polymetal operations which establishes corporate standards and determines all mandatory environmental requirements. The EMS has been introduced at Kapan to ensure compliance with national legislation, international standards and effective environmental management requirements, and is certified for compliance with ISO 14001 (2006). Update to ISO 14001 (2015) was scheduled in 2018.

The mine is a legacy site from Soviet times and is an intrinsic part of life in Kapan town, with around 933 people employed at the operation. The mine site is on the edge of the town with apparently low environmental impact to local residents, with little noise pollution, few noxious emissions and a favourable dominant wind direction away from the town.

1.13 Conclusions

1.13.1 Geological Understanding

- There is a general understanding of the local geology and vein behaviour within the mine department and the local mineralisation controls are well understood. There is limited focus on the regional geological and near mine environment with day to day activities focussed on short term production orientated activities.

1.13.2 Underground Procedures

- The process of integrating the underground mapping and data through Leapfrog and Surpac software are fit for purpose and follow a logical process. The procedures associated with data collection in the underground environment are reasonable.

1.13.3 Core Processing Procedures

- The core processing procedures have undergone some modification from the original procedures developed by DPMK. Information is well recorded and the work flow from the underground drilling through to integration into mine planning and metallurgy is well structured and well organised.

1.13.4 QAQC Review

- QAQC procedures and practises relating to geological data collection for downstream use in Mineral Resource Estimation are considered fit for purpose.

1.13.5 Mineral Resource Estimate

- The Mineral Resource estimate workflows are considered reasonable and been systematically reviewed for the Kapan deposit in terms of both global model validation checks, and with respect to the top 10 veins (contributing to gold equivalent (AuEq) total contained metal) where detailed review of domain parameters for each of the 246 individual veins would not have been possible.
- The review of the subsets of input data, and of the model parameters, associated with these individual veins are considered representative of the resource, where such assumptions have been made on the robustness of the model from them.
- However, CSA Global considers there are some risks with respect to Mineral Resources, and these are set out below;
    - The Mineral Resources were depleted with the latest Mined to Date (MTD) solid provided by the client, dated 1 June 2018. CSA Global then compared these figures to those quoted in literature received. CSA Global was not able to reproduce the figures as outlined in the report provided. However, CSA Global was able to confirm Metal that forms the basis of the five-year mine plan, to within acceptable confidence limits (±10%).
    - CSA Global finds no issues with the classification method undertaken, and the values assigned in the CLASS field in the block model. Classification was reviewed for the material within the five-year mine plan.
    - Validation of the block model presents a significant risk. The output model histograms show a distinct bimodal distribution for Au, Ag, Cu and Zn where no such trend exists within the input composite data, which is broadly lognormal in distribution. This presents a risk in the ability to plan underground mine development from the model. Grades anticipated from the model may be highly variable on a more localised scale, and at risk within areas impacted by this bimodality in the model. This is further highlighted when reviewing the broad trends in each vein from an overall visual qualitative perspective.

However, visual checks, de-clustered mean statistics and swath plots, indicate a reasonable confidence in the model as a broad predictive tool and show good validation results when comparing the input composite data to the output model blocks, and trends in composite data are mirrored by trends in the block models in sectional review.

- CSA Global considers the input composite data for Kapan as representative of the raw assay data, and reasonable for use in the Mineral Resource estimate.
- CSA Global reviewed the modelled vein mineralisation volumes in cross and plan sections against the raw un-composited sample data. AuEq mineralisation above the 1.5 g/t cut-off grade are incorporated in the respective modelled wireframes when possible and in line with the mineralisation trends. CSA Global reviewed Au, Ag, Cu and Zn raw grades against the wireframe as well and found that overall there appear to be no issues with the approach undertaken.
- The assignment of density to the model based on a regression formula from the estimated sulphur grade in the model presents a moderate risk to the Mineral Resource. Even though using sulphur grade within the regression formula is reasonable for this type of deposit, the underlying assumption is that the sulphur estimate is robust. However, model validation for sulphur was poor, in part due to 60% of the composites having no sulphur data. It would be more appropriate to link density to the AuEq grade, as it is supported by more data and the input variables validate well. CSA Global cannot comment on the appropriateness of the regression formula used as no density data was provided for review.
- Some areas of upside and opportunity may exist at these deposits, but for the most part additional review and sensitivity analysis would be required to confidently convey project upside.

1.13.6 Mining and Reserve Estimation

The following conclusions are made following the technical review of the mine design and production planning:

- CSA Global has concerns over the level of detail presented in the mine design, schedule (development specifically) and sequencing, and considers that the level of accuracy is not commensurate with the requirements of an operating mine requiring short to medium term mine planning.
- The Kapan mine appears to be adequately resourced in terms of personnel and equipment for the sustainable exploitation rate of 700kt/a.
- The Kapan mine appears to employ modern techniques to mine planning and survey, however, refinements and best practices appear to be required.
- Underground engineering planning and equipping appears to be well understood with good practices and modern techniques employed.
- Execution, monitoring, feedback, risk analysis of the engineering, mining and technical support departments is not fully understood at time of writing the report.
- CSA Global has concerns that the EPS scheduling output data is not representative of the Polymetal financial model. The tonnes and grade have reasonably small variances (specifically 2018/2019); however, the ore development to stoping ratio is materially different.
- Survey “as-built” 3D CAD files (stoping specifically) do not appear to be complete for a mature mine like Kapan. It is imperative that an accurate “as-built” plans exist to ensure accurate planning and safety of planned mining activities.

- Mining equipment replacement presented in the Polymetal financial model will not ensure sustainable safe production based on existing equipment age and OEM specification for rebuild and replacement.
- Detail of operating costs for mining presented in the Polymetal financial model is not commensurate for an operating mine (when considering detail presented in the model).
- Plant feed grade and metal recovery are highly interdependent, and a lowering of head grade has a negative compounding effect on cashflows. Unplanned dilution realised during the mining operation can have a material effect on the profitability of the operation.
- Inferred material as presented in the resource block model shows significant potential for the future of Kapan (albeit in limited quantities) and it appears to be easily assessable from current development. Continued, accelerated exploration and access of these areas does not present in the electronic mine plan.

1.13.7 Geotechnical

The following conclusions are drawn from the review of geotechnical information;

- Although the style of deposition is complicated, characterised by stockwork and anastomosing veins, CSA Global acknowledges that adequate consideration of the geological setting of the ore zones and host rocks has been incorporated into geotechnical designs.
- Geotechnical data is collected through drill core logging and scan line mapping of underground development ends. CSA Global considers these methods as typical industry practise.
- CSA Global views the extraction ratio (estimated at 85–90%) to be too aggressive for the rock mass quality reported. Extraction ratios between 70% and 75% appear plausible.
- CSA Global considers the stope sizes adopted and extraction ratios as overly aggressive for the rock mass quality and HR reported. The stope sizes planned may be a large contributor to unplanned dilutions of between 20% and 25%. Based on empirical design guidelines used by Kapan, for unsupported stable stope sizing with sporadic rather than systematic post filling, CSA Global views the designs adopted to be flawed and disconnected from the HR numbers reported. The designed stope sizes do not support the stable HRs reported (<6.1 for 70° veins and 5.2 for 50° veins).
- CSA Global concludes that if production process procedures are strictly adhered to, the proposed operation will have a minor environmental impact and does not pose any hazards in terms of environmental pollution outside the sanitary protection /buffer zone.
- Analyses of both the North and South walls' performance under seismic conditions showed them to have Factor of Safety (FoS) less than the required value of 1.1 for the adverse condition of a MCE as a "High" consequence dam. The analyses indicate that both the North and South embankments of the facility will require stabilisation (buttressing) in order to meet performance requirements during an MCE seismic event.
- It is a risk that the future tailings expansion has not been adequately planned (conceptual level studies) and not properly costed in the five-year plan. The risk is the possibility of inadequate tailings disposal volume to meet production requirements and inadequate capital allowed for the required construction.
- CSA Global's observations from the site visit showed work being undertaken during the visit with significant earthworks, delivery of truck loads of rock and sand and spreading by bulldozer. CSA Global has not seen the design plans for this remedial work. At the time of the visit, no work had started at the south TSF wall.

1.13.8 Metallurgy and Processing

- The mineralogical and metallurgical testwork completed on Kapan ore appears robust and there is a significant number of years production at the mine.
- The plant produces two concentrates using sequential flotation. Following conventional two-stage crushing and grinding by a rod mill/ball mill circuit, the first is a copper/pyrite concentrate containing gold and silver. Next roughing, scavenging and concentrate re-grinding, cleaning is completed in three stages. The scavenger tails are then conditioned prior to zinc rougher and scavenger flotation, with the zinc scavenger tails being the final process tails. Rougher concentrate is cleaned in three stages, with the cleaner tails being recirculated to the previous stage.
- The equipment installed at the process plant is suitable to achieve the design ore processing rate and productivity, as well as specified metal grades in the concentrates and metal recovery rates.

1.13.9 Environmental

The following conclusions are drawn from a review of environmental and social aspects;

- CSA Global comments that while it was stated that there is good management support for environmental work at Kapan, some training is needed to use equipment and for reactive investigation outside the prescribed monitoring requirements.
- The mine is a legacy site from Soviet times and is an intrinsic part of life in Kapan town, with around 933 people employed at the operation. The mine site is on the edge of the town with apparently low environmental impact to local residents, with little noise pollution, few noxious emissions and a favourable dominant wind direction away from the town.
- The lack of definitive ARD and metal leaching testwork is a concern. Comprehensive geochemical characterisation studies allow ARD/ML understanding and prediction and thus implementation of suitable design and mitigation measures, especially if new deposits/ore targets are brought online.
- Recycling of water within the operations is important as the operation has to pay for all abstractions and discharges by volume, and improvement should be a priority.
- The previous Kapan mine owners were exempted from historic mining liabilities, from the old Centralni open pit mine (closed prior to 2004, with rehabilitation activities completed and approved); and from the old waste rock dumps (which have not been rehabilitated and may be a potential source of continuing pollution). The licence and remaining liabilities for these have apparently been returned back the Government of Armenia. There should therefore be no environmental liability beyond closure of the current operation, however full implications of the legal closure requirement should be part of any future permit conditions and negotiations.
- The 2013 updated estimate of US$12 million (±30%) for the TSF closure seems reasonable for the proposed capacity increase and final TSF configuration. Similarly the approximate US$10 million (or AMD 4.1 billion in 2014 prices based on the report exchange rate of AMD414.04/US$) for the rest of the mine closure and rehabilitation is also appropriate, although it is not clear if this includes any provision for employee retraining, livelihood restoration or other social mitigations. These estimates result in a total closure cost estimate in the range of US$19 million to US$22 million or AMD7.9 billion to AMD 9.1 billion in 2014 prices at AMD414.04/US$.

1.13.10 Economic Model

CSA Global draws the following conclusions relating to the economic model;

- The economic model reviewed was provided to CSA Global by Kapan GOK and includes mining, processing and cost parameters provided by Kapan GOK. The modelling appears reasonable, with no significant emissions or errors.
- CSA Global considers the unit operational cost for mining in 2018 period to be in line with the mechanised narrow vein long-hole stoping method. The reduction in unit costs of production as a result of a) a reduction in development requirement in the mine plan for the Ore Reserve portion, and b) the extrapolation of the Inferred Resource that appears to have a significantly reduced cost related to development activities, is a concern, especially given reliance on low-confidence Inferred Mineral Resources.
- CSA Global notes that the ore development to stoping ratio as contained in the Polymetal financial model is not in line with the EPS production report.
- CSA Global considers the plant maintenance capital allowance of <2% is forecasted low and when benchmarked against other concentrator operations, typically should be in the range of 4–8% of operational cost.
- The capital provision for mining equipment replacement is calculated at 4.9% over a five-year forecasted period. CSA Global concludes that this is significantly lower than benchmarked and that calculations indicate 16% is required for the replacement and rebuilding of equipment.
- CSA Global notes that the three-year trailing price average for gold (US$1,240/oz), silver (US$16.60/oz), copper (US$1,240/oz) and zinc (US$2,500/oz) appears reasonable.
- CSA Global considers the on-mine additional costs reasonable for the size of the planned operation.
- CSA Global considers the off-mine costs for concentrate treatment and transport to be in line with operations producing a copper and zinc concentrate.
- CSA Global has not specifically tested the validity of the blended smelting and refining charge and its equivalency to the individual element smelting and reefing terms, however CSA Global recognises that the cost is indicative of determining the smelting and refining costs on the individual elements.

1.14 Recommendations

1.14.1 Geological Understanding

- Whilst the local controls are well understood in terms of short term mine planning there is little longer-term evaluation of the deposit type, structural evaluation and broader geological context. A holistic approach to the geology, structure and deposit type based on a mineral systems approach is recommended by CSA Global. This approach taking the geodynamic, structural architecture, fluid flow and fluid trap into account may provide a longer-term guide to the prospectivity of the project.

1.14.2 Underground Procedures

- There are no significant risks and the underground geological practices are fit for purpose and provide appropriate guidance for the mining department. Consideration of moving to 1:100 scale mapping to include more detail is recommended by CSA Global.

1.14.3 Core Processing Procedures

- Currently core is assayed on a full core basis. CSA Global recommend moving to half core analysis to ensure representative core is maintained for future review. Drill core is currently photographed on a wet core basis. CSA Global recommend moving to photographing core on a dry basis so that future geotechnical evaluation can be considered.
- Density and point load testwork are currently on an irregular basis and CSA Global recommend developing a standard procedure which includes regular measurements.

1.14.4 QAQC Review

- QAQC procedures are fit for purpose though some minor changes to the work flow are recommended. CSA Global recommend the use of crusher blanks in the crushing and pulverising sequence as a means to test for contamination at this point in the analytical process. The use of barcoding is common in the mining industry and is recommended for sample numbering and monitoring.

1.14.5 Resource Estimate

CSA Global sets out the following recommendations relating to the Mineral Resource Estimate;

- Variography should be reviewed and updated for veins where a large amount of new data is available.
- Based on CSA Global's investigation, the overall metal within the portion of the resource that supports the mine schedule is within 10% of that stated in the Polymetal financial model. Bimodality in the model, when compared to input data, can be used to identify areas of potential grade variability in the short-term plan. In these areas, development can be planned to access alternative stopes, either within the defined reserve or by proving-up inferred stopes in the immediate mining area, mined grade presents as lower than planned.
- The density regression requires update and review, CSA Global recommends that a regression using AuEq would be more appropriate as the AuEq grades are supported by well validated estimate variables. Further work, drawing upon historic data, production data and possible regressions with AuEq or other metals should be undertaken to improve how density is informed in the with resource model.
- Proper documentation of all steps within the Mineral Resource estimation should be recorded in the report, so that the estimation is transparent and can be easily reviewed by a third party.

1.14.6 Mining and Reserve Estimation

The following recommendations are made after the technical review of the mine design and production planning:

- CSA suggests that additional sill pillars be inserted into high stopes reducing the maximum height from 50 m to 25 m. This would eliminate the potential for additional dilution but reduce the extraction ratio from 90% to 75% and arguably reduce the reserve.
- Test MSO (and Ore Reserve) sensitivity to far and near wall dilution factors.
- Mining costs are modelled and / or presented in greater detail in conjunction with key driving metric taken from the mining production plan.
- Mine design and scheduling undergo an "overhaul" to correct tie-in with existing development, correct design directions, ensure predecessor linking, apply appropriate resources, levelling and targets and develop a timeframe reporting suitable to an operating mine.

- Build a forecasting operational cost model with sufficient detail to accurately predict costs based on key driving metrics.
- Plan underground exploration drilling "cubbies" to performed infill drilling programme on the Inferred Mineral Resource.
- Commence a "tie-in" modification of the electronic mine plan of the Inferred Resource to increase accuracy of the economic potential of the Inferred Mineral Resources.
- Ensure that electronic conversion of historical development and stoping is available in 3D CAD electronic environment for mine planning and safety purposes.
- Ensure surveying system has the capability and technology to update electronic 3D mine plans for development and stoping activities, this will aid in "mine-to-plan" reconciliation and dilution control.

1.14.7 Tailings Management Facility

CSA Global's recommendations for the tailings management facility (TMF) are as follows.

- An engineering review of the TMF by Golder Associates recommended that the dams be stabilized by constructing rock-fill buttresses. This work has only just begun on the North Embankment. The South embankment has not been started. This work needs to be conducted with an appropriate sense of urgency. Resources need to be allocated so that stabilization can be completed as soon as possible.
- The Kapan Inferred resource is only a potential source of tailings for the TMF. The priority has to be to stabilize the facility such that it can safely accommodate the tailings from the 4 Mt reserve which is the basis for the project value. This work should be conducted under rigorous engineering control. That standard of management should be extended to the ongoing operation of the TMF.

1.14.8 Mineral Processing and Metallurgy

CSA Global's recommendations for mineral processing and metallurgy are as follows.

- Carry out further mineralogy and optimisation of the regrind size to replace some of the zinc and lead units with copper units in the final copper concentrate produced.
- Conduct further cyanidation leach testwork be carried out to determine whether it is economically viable to recover gold and silver reporting to the zinc concentrate ahead of selling a saleable zinc concentrate to the smelter.

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2 Introduction

2.1 Context, Scope and Terms of Reference

Chaarat Gold Holdings Limited ("Chaarat", or the "Company") engaged CSA Global (UK) Ltd ("CSA Global") to prepare a Competent Persons Report ("CPR") relating to the Kapan Asset (which comprises the Shahumyan underground poly-metallic mine, Armenia), being acquired by the Company from Polymetal International (see press release of 30 October 2018).

Chaarat is an AIM listed mining company bound by the AIM listing rules.

This report was prepared for Chaarat and Numis Securities Limited ("the NOMAD")by CSA Global. The quality of information, commentary and conclusions set out in this report are consistent with the level of the work carried out by CSA Global to date on the assignment, in accordance with the assignment specification agreed between CSA Global and Chaarat.

The effective date of this report is deemed to be 1 January 2018. To the knowledge of CSA Global, as informed by Chaarat, there has been no material change in respect of the Kapan Asset since 1 January 2018.

In preparing this report, CSA Global has:

1. Where relevant, made reference to the International Reporting Code used by Polymetal to disclose material information relating to Mineral Resources and Ore Reserves (the JORC Code, 2012 Edition) and, in accordance with the AIM listing rules, the standard adopted for the preparation of the Mineral Resource Statements has been that defined by the terms and conditions given in the JORC Code, 2012 Edition.
2. Relied on the accuracy and completeness of the data provided to it by Chaarat, and Chaarat made CSA Global aware of all material information in relation to the Kapan asset.
3. Independently verified the data used to prepare this report and concludes that the data provide reasonable grounds for CSA Global's conclusions reached in this report.
4. Required that Chaarat provide an indemnity to the effect that Chaarat would compensate CSA Global in respect of preparing the report against any and all losses, claims, damages and liabilities to which CSA Global or its Associates may become subject under any applicable law or otherwise arising from the preparation of the report to the extent that such loss, claim, damage or liability is a direct result of Chaarat or any of its directors or officers knowingly providing CSA Global with any false or misleading information, or Chaarat, or its directors or officers knowingly withholding material information.

2.2 Principal Sources of Information

As part of this review, CSA Global has reviewed literature, data and information provided by the Company relating to the asset, and a site visit to the Shahumyan Mine was completed by Ian Stockton, Principal Geologist, CSA Global between the 4th and the 8th of September 2018 for the purposes of project familiarisation, ground truthing, review data collection procedures and processes and validation/verification works relating to geology and mining. Visits were made both underground and to the core processing and mine geology areas. A visit was undertaken to the company assay lab and audit was also completed.

Reports from current and previous owners were provided as background and technical information, subsequently reviewed, for the purposes of preparing the CPR report. Information was provided from

various departments and included assay data, geology logs and screen capture of various processes and procedures in use on site.

2.3 Authors of the Report – Qualifications, Experience and Competence

CSA Global is a privately owned, mining industry consulting company headquartered in Perth, Western Australia, with regional offices throughout the world. CSA Global provides geological, resource, mining, management and corporate consulting services to the international resources sector and has done so for more than 30 years.

This report has been prepared by a team of consultants sourced from CSA Global's Perth and Horsham (UK) offices. The individuals who have provided input to the report have extensive experience in the mining industry and are members in good standing of appropriate professional institutions. The Consultants preparing this report are specialists in the fields of geology, exploration and Mineral Resource estimation, and Ore Reserve reporting.

Ian Stockton, CSA Global Principal Geologist, is a geologist with over 25 years' experience in the mineral exploration industry ranging from early stage exploration activities, exploration management, strategy development through to mine development and operations. He has been directly involved in the discovery of several important ore deposits including the Nolans and Sarsfield gold deposits (Ravenswood, Queensland), CSA copper mine extensions (Cobar, New South Wales), rejuvenation of the Mount Muro epithermal deposits (Indonesia) and the Saramacca gold deposit (Suriname). His experience covers a diverse background of exploration settings having worked in the Tertiary epithermal deposits in Indonesia, Cretaceous porphyry environment in Serbia, Paleoproterozoic orogenic gold deposits of Suriname, Siluro-Devonian intrusive related gold deposits in north Queensland and the Siluro-Devonian copper gold deposits in the Cobar sedimentary basin. He is a Member of the Australasian Institute of Mining and Metallurgy (MusIMM) and a Fellow of the Australian Institute of Mining (FAIG).

Alister James, CSA Global Principal Mining Engineer, is an engineer with over 18 years' experience in senior operational, project management, commercial & planning roles across mining and agricultural industries in several major multi-national companies. He has significant expertise in asset and project management, mine planning, commercial due diligence and operational improvement.

Galen White, CSA Global (UK) Director and Principal Geologist, is a geologist with over 20 years' experience in the mining industry, with the last 12 years spent in consulting. He has experience in mineral exploration, Mineral Resource estimation and mine geology in a variety of geological settings and in relation to a variety of mineral commodities including gold, silver, base metals, uranium and iron ore across Europe, Africa, Australia, Asia and the Americas. He has completed project reviews, Mineral Resource estimates and audits, due diligence reviews, project management and formal stock exchange reporting. He is a Fellow of the Australasian Institute of Mining and Metallurgy (FAusIMM) and a Fellow of the Geological Society of London.

2.4 Independence

Neither CSA Global, nor the authors of this report, has or has had previously, any material interest in Chaarat, or the mineral properties in which Chaarat has an interest. CSA Global's relationship with Chaarat is solely one of professional association between client and independent consultant.

CSA Global is an independent geological consultancy. Fees are being charged to Chaarat at a commercial rate for the preparation of this report, the payment of which is not contingent upon the conclusions of the report.

No member or employee of CSA Global is, or is intended to be, a director, officer or other direct employee of Chaarat. No member or employee of CSA Global has, or has had, any shareholding in Chaarat.

CSA Global has completed technical work on the Shahumyan Mine, for previous owners (Dundee Precious Metals Inc.) prior to Polymetal taking ownership of the asset, and as such disclosure is required including declaration of any previous reports that the Practitioner has prepared relating to the mineral assets being assessed. To meet this requirement, the reader is advised that CSA Global completed the following work over the asset;

- CSA Global prepared updates to the Mineral Resource estimate and associated NI43-101 Technical Reporting in the years 2013 – 2015, with the most recent technical report having an effective date of 23 March 2015.

This report was not influenced by Chaarat and reflects CSA Global's objective critical analysis and professional judgement.

2.5 Declarations and Consents

This report has been prepared by CSA Global at the request of, and for the sole benefit of Chaarat. Its purpose is to provide a technical assessment of the Kapan asset. It is not intended to serve any purpose beyond that stated and should not be relied upon for any other purpose.

The statements and opinions contained in this report are given in good faith and in the belief that they are not false or misleading. The conclusions are based on the reference date of 30 October 2018 and could alter over time depending on exploration results, mineral prices and other relevant market factors.

This report has been prepared in accordance with the AIM listing rules, specifically the "Guidance note for Mining, Oil and Gas Companies" and the content requirements of Appendix 2 and the summaries set out in Appendices 1 and 3. CSA Global accepts responsibility for this report and confirms that, to the best of its knowledge and belief having taken all reasonable care to ensure that such is the case, the information contained in this report is in accordance with the facts and contains no omission likely to affect its import for the purpose of paragraphs 1.1 and 1.2 of Annex I and paragraphs 1.1 and 1.2 of Annex III of the AIM listing rules.

CSA Global gives its consent to the inclusion of this report set out in Part B of Part IV of the re-admission document of Chaarat (the "Admission Document") and to the references to this report therein in the form and context in which they appear and authorises the contents of this report for the purposes of Schedule Two of the AIM listing rules. CSA Global has reviewed the information contained elsewhere in the Admission Document which relates to the information contained in this report, and confirms that the information is accurate, balanced, complete and not inconsistent with this report.

2.6 Results are Estimates and Subject to Change

The interpretations and conclusions reached in this report are based on current scientific understanding and the best evidence available to the authors at the time of writing. It is the nature of all scientific conclusions that they are founded on an assessment of probabilities and, however high these probabilities might be, they make no claim for absolute certainty.

The ability to achieve forward-looking production and economic targets is dependent on numerous factors that are beyond CSA Global's control and that CSA Global cannot anticipate. These factors include, but are not limited, to changes to site-specific mining and geological conditions, management and personnel capabilities, availability of funding to properly operate and capitalise the operation, variations in cost elements and market conditions, developing and operating the mine in an efficient manner, unforeseen changes in legislation and new industry developments. Any of these factors may substantially alter the performance of any mining operation.

3 Property Description and Tenure

3.1 Access Climate and infrastructure

The Kapan project is located 320km by road to the south east of the capital Yerevan in Armenia in the immediate vicinity of Kapan City, with the population of about 36,000 people (Figure 1 and Figure 2 and Table 10).

Kapan is accessed by bitumen road and is open all year and is the main cargo route. Kapan has an airport with an asphalt airstrip, but currently it is not operating. Kapan City has a road connecting it to the Islamic Republic of Iran.

The region is typical mountainous ranging from 700m to 3,200m above the sea level. The deposit is located at the south-east end of the Khotarkasar-Arachatzor ridge, between the Vokhchi River and its left tributary, the Khaladge River. The deposit elevations range from 700m to 1100 m above sea level.

The Kapan district is dominated by the mining industry. As well as the Shahumyan deposit and processing facilities there is the Kajaran copper-molybdenum mine and process plant operating in the area and a number of smaller production facilities.

Quarries in the area also produce building and facing materials, such as sand, clay, rubble and massive stone. There are some deposits of facing marble (Davidbek, Gheganysh, Darmadzor) and granodiorite (Gyardskoye, Tsavskoye) in the area.

Power supply to the area is provided by a 110kV power transmission line from the Tatevskaya hydroelectric power station. Small hydroelectric power stations, built on the Vokhchi River, serve as additional power supply sources.

Fuel, petroleum products and timber are sourced outside of Kapan. Process water is supplied from the Vokhchi River and its tributaries (such rivers as the Ghekhi, Vachagan, Ditsmayr) and also by the Chanakhchi-Kapan water supply pipeline.

The climate is characterized by long hot summers and short mild winters. The average annual temperature is + 12°C with the average monthly variations from +38°C (July – August) to -15.6°C (January). The average annual precipitation is 530 mm.

Vegetation is sparse with isolated bushes and grass plots are encountered on the mountain slopes.

Table 10: Summary Table of Asset

Asset	Holder	Interest (%)	Status	Lease expiry date	Lease area	Comments
Shahumyan Polymetallic Mine	Kapan Mining and Processing CJSC	100	Production	01 April 2050	90.7 km^2	None

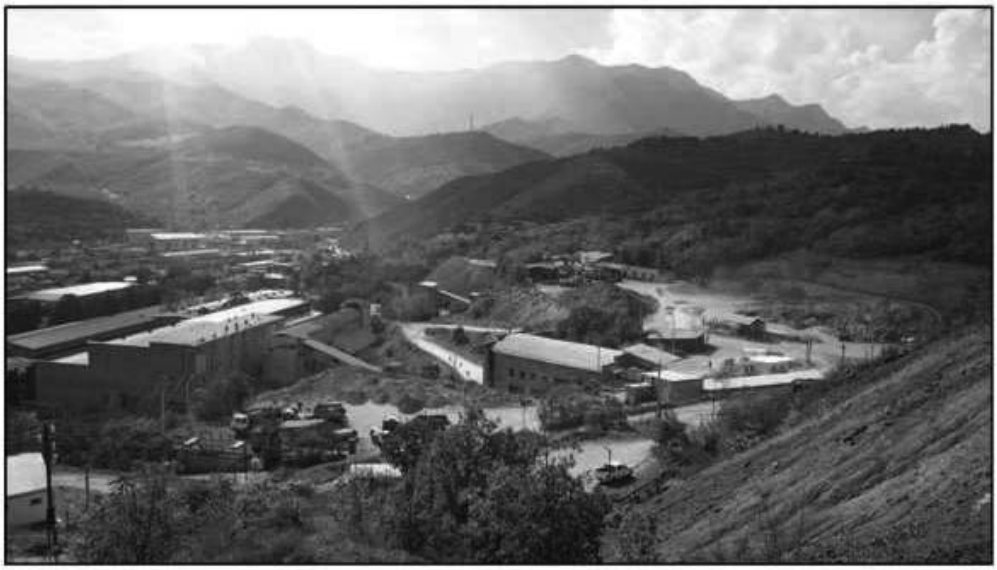

Figure 1: View of the mine site at the Kapan mine and process plant (Polymetal Inc)

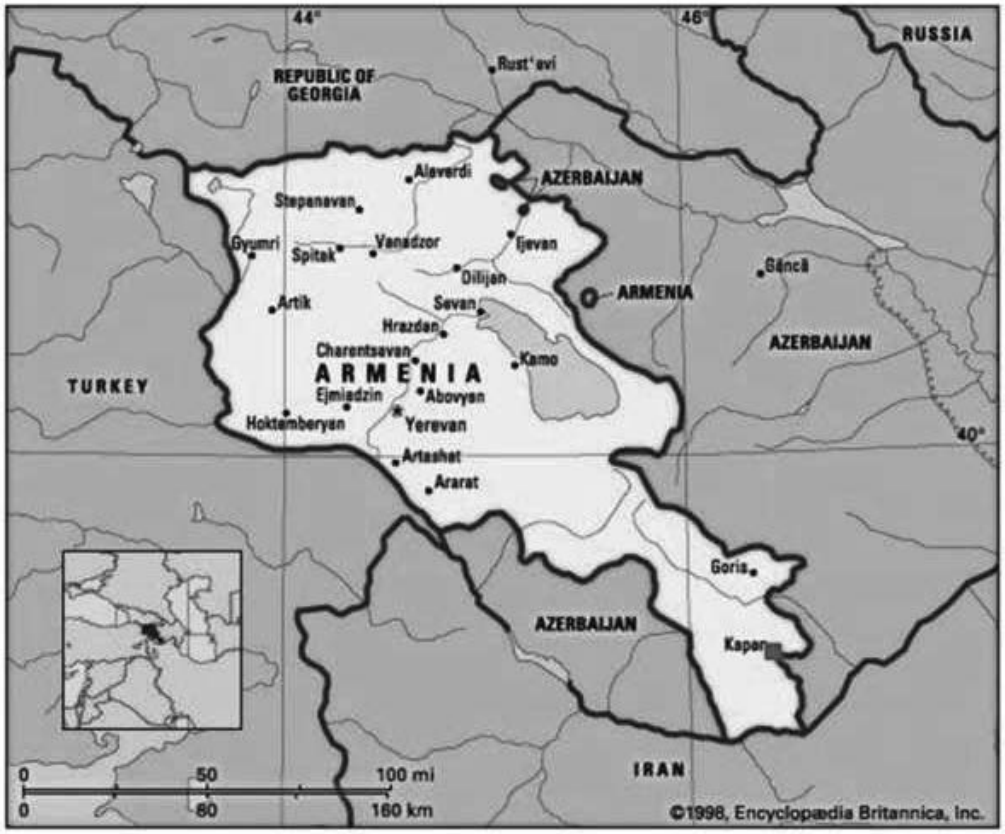

Figure 2: Location map of Armenia and of Kapan (JSC Polymetal, 2018)

4 Property History, Ownership and Licenses

The Kapan mining area is in the south eastern corner of Armenia at latitude and longitude 39°12'26"N 46° 24'17"E, 320 km south of the capital city of Yerevan. The Shahumyan deposit is situated within part of the Tethyan tectonic belt which extends from Southeast Asia to Europe.

The ground held by Kapan Mining and Processing CJSC in the Kapan area comprises one Mining Licence and one Exploration Licence. The Kapan Exploration License covers 90.7 km2 with some 12.5 km2 excised to cover existing populated areas, mine concession, and related infrastructure (Figure 3).

Formal mining at the Shahumyan polymetallic mine started in 1929. Over a period of 1933-1942, four of the largest veins were mined out and 230 kt of ore were produced.

Starting from 1942 various studies were undertaken by the Institute of Geology of the Armenian Academy of Sciences, the Moscow Geological Exploration Institute, the Central Geological Research Institute for Nonferrous and Precious Metals and other research institutions. They studied stratigraphy, tectonics, magmatism, ore field metallogeny, ore body morphology, ore mineralogical type and the deposit genesis.

The mine was owned by the Russian Federal Government State Commission until 1990 followed by the Kapan Ore Mining and Processing Enterprise from 1995 – 2004.

In 2004 the company was privatised and renamed to “Deno Gold Mining Company” (DGMC) and operated under an entity named Vatrin. In 2006 the operation was acquired by Dundee Precious Metals (DPM) by acquiring 80% of Vatrin Investments Ltd. (Vatrin), which held 100% of DGMC. In August 2006, 2010 DPM acquired 100% of Vatrin.

Dundee Precious Metals Kapan operated the Shahumyan Mine concessions under a special mining licence from 2006 until 2016. In an agreement reached in November 2012, DPMK’s Shahumyan mine licence was renewed under the Mining Code adopted in late 2011. The license term remains unchanged until 2020.

In 2016 Polymetal International Inc completed purchase of the Kapan project.

The licence was extended to 01 April 2050 together with a mine allotment, based on Order No 381-A of 25 August 2015, issued by Minister of Energy and Natural Resources.

Figure 3: Location of Shahumyan licence area (modified from Polymetal Inc.)

5 Geology

5.1 Geological Setting

The Kapan project is located within the Lesser Caucasus part of the extensive Tethyan orogenic belt (approx. 150 Ma). The Kapan mineral field is located, in the north-western middle Jurassic volcanic belt which are host to the three main mineral occurrences in the district (Figure 4). These include the Central-West copper (Cu) deposit, Central-East gold-copper (Au-Cu) deposit and Shahumyan gold-base metals (Cu-Au-Ag-Zn-Pb) deposit.

Three key metallogenic events have been distinguished in the Lesser Caucasus.

- The period from Middle Jurassic to Early Cretaceous age relates to the formation of a porphyry-copper occurrence, skarn and epithermal mineralization, the latter may be related to the Kapan area;
- Late Cretaceous period of volcanogenic massive sulphides (VMS) and epithermal deposits formation; and
- Eocene-Miocene period of forming molybdenum-porphyry-copper occurrences and epithermal precious metal deposits.

Magmatism, occurred from the Middle Jurassic to Cretaceous period, resulting in volcanogenic and volcaniclastic rocks developing a volcanic pile up to 6500m thick. Within the Kapan mineral field four igneous events have been identified - Middle Jurassic, Late Jurassic, Early Cretaceous complexes and a Paleogene igneous complex (Figure 4).

The Middle Jurassic complex is represented by tuff lava, lava, breccia and subvolcanic intrusions (Figure 5). No Middle Jurassic intrusive rocks are identified within the Kapan area. The Late-Jurassic-Early Cretaceous igneous rocks overlay dis-conformably on a weathered surface of the Middle Jurassic igneous complex. The Late Jurassic rocks are usually represented by a sequence of volcanogenic and volcaniclastic rocks with residual outcrops of fossil calcareous sandstone and limestone. The Paleogene igneous complex, consisting mainly of andesite breccia and lava flows, dominates in the western part of the Kapan area and overlies dis-conformably the earlier Cretaceous rocks of the Late Jurassic to Early Cretaceous igneous complex.

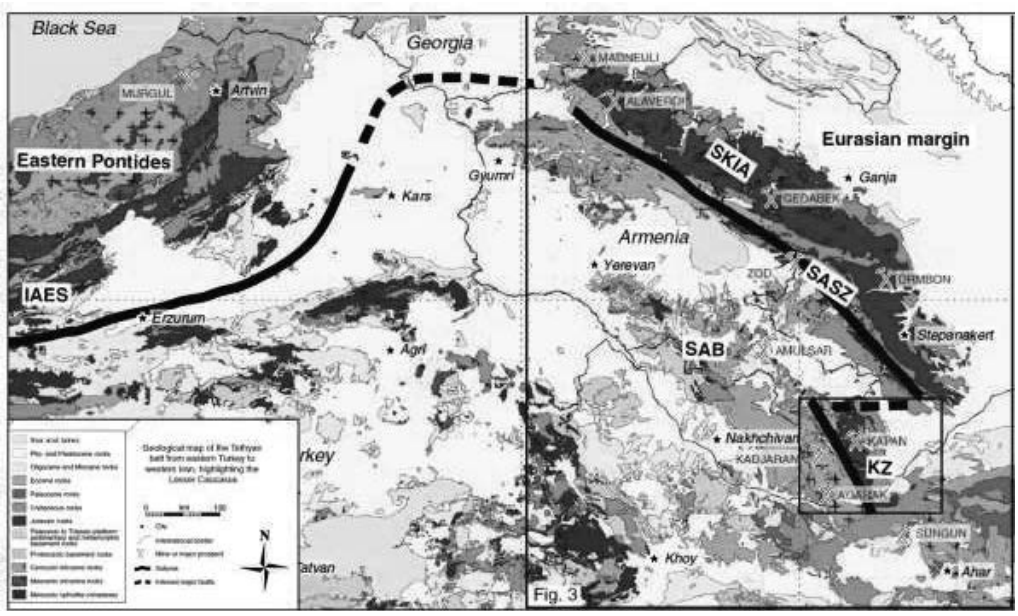

Figure 4: *Schematic geological map of the Lesser Caucasus region highlighting the Lesser Caucasus, Mesozoic and Cenozoic intrusive rocks and ophiolites* (Modified after Mederer et al 2013.).

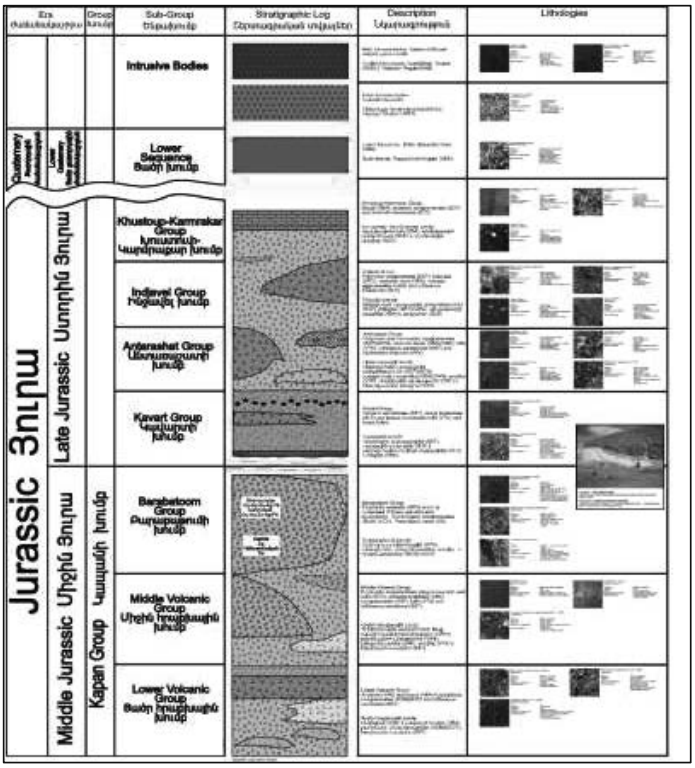

Figure 5: Stratigraphic column developed by Dundee Precious Metals for the Kapan polymetallic mine

5.2 Mineralisation

The Shahumyan mineralised field is considered to represent a large hydrothermal sulphidation system. Observation of the core from the site visit suggests that the mineralisation may be a structurally controlled carbonate base metal epithermal system in connection with the intrusion of an underlying felsic intrusive body. The middle Jurassic host rocks comprises of a suite of intermediate tuffs, flows, breccias and sub-volcanic intrusions (Figure 5).

Mineralisation is hosted by a suite of sub-parallel veins with up to one hundred and eighty veins. Observation of mineralisation underground and associated mapping demonstrates small scale structural complexity however with a general predictability at the mining scale. Ongoing definition drilling is used to confirm the position of mineralisation.

Current drill core in the progress of being logged and sampled was laid out on the core racks from the underground drilling. Since drill core is whole sampled and assayed, there is no previous drill core to review. Drill core on the racks was well pieced together, clean and marked up for logging and processing.

The Shahumyan mineralization is characterized by narrow sub vertical veins between 0.2m and 2.0 m wide, with a steep dipping and E-W orientation, which contain gold-base metals (Cu-Zn-Pb-Au-Ag) mineralization (Figure 6 and Figure 7). The veins are frequently associated with sericite alteration and disseminated mineralization. These zones of altered rocks can reach 25m but usually they are 10-15m thick and occur in the upper deposit horizons.

Ore mineralization is mainly represented by sphalerite, pyrite, chalcopyrite, galena and bornite. Minor assemblages of tennantite, tetrahedrite, enargite, chalcocite, covelline, tellurides, native gold and silver have been identified. The vein gangue minerals include quartz, calcite, gypsum, anhydrite and rhodochrosite. The veins are represented by numerous texture varieties, related to the mineralization stages and tectonic movements.

Figure 6: Mineralisation from definition drilling in September 2018 with Sphalerite and chalcopyrite).

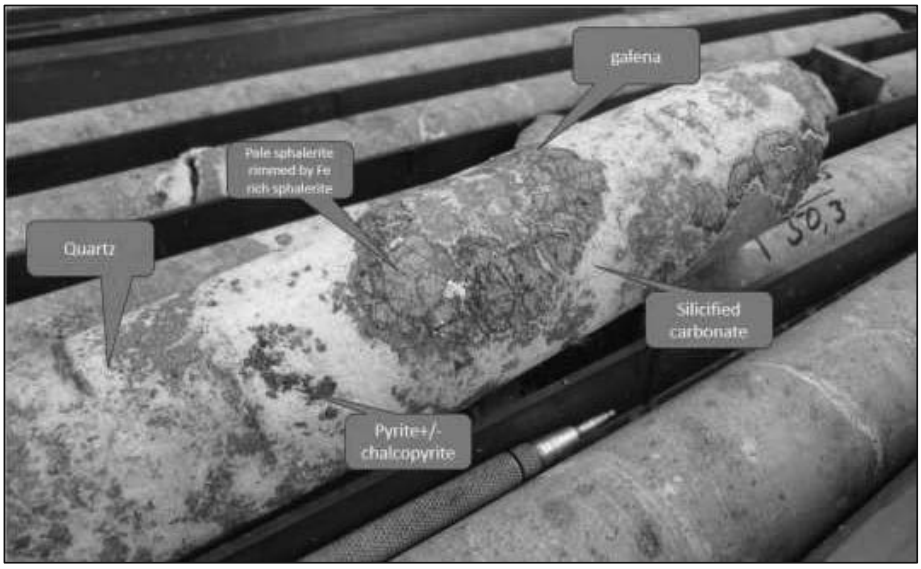

Figure 7: Fragments of pale sphalerite rimmed by Fe sphalerite in a matrix of silicified carbonate

5.3 Structure

The Shahumyan gold-base metals mineralization is confined to the flat north-east limb of the Kapan brachyanticline or dome. Numerous regional faults are recorded as being tectonically active through geological history. The fault length varies within a wide range from 1.0 km to 3.0 km. The faults are accompanied by smaller shear and opening-mode fractures, controlling the mineralization.

There are flaws or omissions in the existing interpreted structural architecture of the deposit (Davis, 2006). Additionally, previous mapping campaigns by historical Soviet operators and more recently by external contractors appear to have conflicting models (Tate, 2012). Dundee commenced building a geological and structural model. No updated structural synthesis was provided by the current owner.

5.4 Alteration

A distinct zonation of secondary alterations exists at the Shahumyan deposit ranging from argillic thorough to propylitic alteration. The intensity of alteration is related to the main faults and vein formation. Argillization, silicification and pyritization are most common in the stockworks with Argillization associated with mineralisation. Feldspar replacement by sericite is common.

Three main groups of secondary alteration occurrences were identified in the immediate vicinity of veins.

- Alteration zonation is common with quartz-sericite-pyrite-illite ± kaolinite occurrences are the proximal to the mineralization. The zone thickness is approximately 1.5-2 times larger, compared to the vein thickness (argillization and phyllitization).
- Alteration changes further away from the veins to illite-chlorite-pyrite-sericite ± carbonate. The altered rock halo is 1-3 times larger than the vein thickness (phyllite-propyllite alteration occurrences).
- Distal alteration consists of propylitic alteration comprising chlorite, carbonate, epidote, illite ± pyrite.

The age for alunite-bearing hydrothermal rocks is 156.1±0.79M years, corresponds to the starting time of the initial argillization stage in the upper parts of the Shahumyan deposit (Mederer et al, 2012).

5.5 Deposit Type

According to Dharani Raja Yarra (2013) the veins comprise of small bends, extensional jogs, soft and hard linked step-overs, pinch and swell structures and cymoid loops. These features are observed along both strike and down-dip of individual veins and contain higher metal grades relative to the rest of the vein. Along strike and down-dip connectivity of these structural features define high-grade ore-shoots within mineralized veins. Three main hydrothermal stages associated with mineralization are defined:

Stage 1. Pyrite and fine-grained quartz ±chlorite;

Stage 2a and b. Pyrite, chalcopyrite, sphalerite, galena, sulfosalts, Au-Ag tellurides, fine and coarse white quartz, ±calcite;

Stage 3. Calcite, quartz, pyrite.

Au-Ag-Pb tellurides are associated with localized brecciation. Tellurides are predominantly present in fractured sphalerite, pyrite, chalcopyrite and galena. Based on textures and fluid inclusion studies, Au-Ag-Pb tellurides are linked to boiling mechanisms.

The epithermal event at The Shahumyan deposit is characterised by punctuated periods of hydrothermal brecciation interspersed with more quiescent periods when coarsely banded vein material was precipitated. Localized brecciation provide increased fluid permeability and ideal fluid pathways for mineralizing fluids. Localized brecciation corresponds with continued propagation or re-opening of the fracture-vein system. Localized boiling is interpreted to be the primarily driver for Au-Ag telluride precipitation.

According to Tate (2012) the mineralogy, scale, distribution of veins and secondary alteration are characteristic of the upper levels of a large-scale porphyry systems with the Shahumyan vein system, representing a lower carbonate zone within the entire system. The Central copper stockwork deposit represents lower transient parts of a high sulphide epithermal zone proximal to the porphyry system.

In addition to the mineralogy described by Yarra (2013) additional minerals such as dickite, anhydrite, bismuth, tennantite and tellurides have been described by Mederer 2012. The presence of these minerals suggests the possible presence of a high sulphidation overprint or precursor to the main carbonate base metal epithermal mineralisation. Although this is a relatively subdued feature, it may indicate a nearby intrusive source.

6 Surface Exploration

Records of surface exploration prior to DPMK are limited with the main exploration focus of previous operators on the underground mine workings. The following is summarised from the 2015 NI43-101 report.

In 2007 DPKM commenced exploration on near mine and regional exploration targets within a 15 km radius of the Kapan focussing on projects related to the Centralni (Cu) and Shahumyan (Au-Ag-Cu-Pb-Zn) hydrothermal systems. DPMK systematically evaluated all prospects within the near mine area that may have been blind or have limited surface footprints.

From 2010 to 2014 the summary of exploration activities are summarised in Table 11

Table 11: Summary of DPKM exploration activities 2010-2014

Type of Work	Details	2010			2011				2012				2013				2014			
		Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Environmental baseline studies, analysis and assessment	–	■	■	■	■	■	■	■												■
Geochemical regional stream sediments samples assaying	509 Samples						■	■												■
Geological mapping and rock sampling	1,634 Samples				■	■	■	■						■		■	■	■	■	
Channel sampling	1,336 Samples													■	■			■	■	■
Laboratory analysis of the regional lithogeochemical soil samples	19,501 Samples				■	■	■	■						■	■	■	■	■	■	■
Core samples assaying	272,564 Samples			■	■	■	■	■	■	■	■	■	■	■	■	■	■			
Bulk density analysis	58,059 Samples			■	■	■	■	■	■	■	■	■	■	■	■	■	■			
Preliminary resources evaluation	–							■	■											
Annual information report to the SNCO Geological Fund	–			■				■				■				■				■
Report to the Agency of Mineral Resources	–								■											

6.1.1 *Satellite Imagery Acquisition and Interpretation*

Various satellite image packages were acquired by DPMK including;

- Shuttle Radar Terrain Model (SRTM), a moderate resolution radar topography data set that provides excellent regional topography and has been utilized over the project for the interpretation of broad structural trends.
- ASTER technology, which measures reflected spectral data from rock forming minerals (e.g. micas, vegetation water) and assists in establishing alteration haloes and is used to target mineralisation

6.1.2 *DPMK Airborne Geophysics - 2007*

A helicopter borne Versatile Time Domain Electromagnetic ("VTEM") survey was completed by Geotech Ltd of Canada between July and August 2007. A total of 3877-line kilometres at a line-spacing of 80 m were flown across for an approximate surface area of 280 km2.

6.1.3 *DPMK Stream Sediment Sampling*

Stream sediment sampling was completed in 2011.The planned density of sampling was 1 sample per square kilometre, though in high priority areas this was reduced to 1 sample per approximately 3/5 square kilometre. Samples were submitted for BLEG analysis.

The results of stream BLEG sampling identified Cu, Au and Ag anomalies and potential sources were prioritized for follow-up work.

6.1.4 DPMK Soil Sampling

Soil sampling was conducted in prospective areas at 50 m intervals along lines oriented north-south with a line spacing of 200 m east-west. In non-prospective areas line spacing was widened to 400 m. A soil sampling orientation program was conducted across known mineralisation boundaries at the Shahumyan Project to determine which size fraction was most suited to exploration at the licence area. It was found that no significant differences in geochemical response existed between the size fractions when viewed as a mineralisation vector, and that the un-sieved samples were as representative as sieved samples. Due to this, samples collected throughout the rest of the campaigns were submitted un-sieved for analysis. The samples were collected from the B-Horizon by digging a pit wherever possible. Samples were submitted for fire assay for gold analysis. Analysis for 51 base metal and pathfinder elements was by two acid digest followed by an ICP-MS/AES finish.

6.1.5 Mapping

In 2006, Dr Brett Davis, then Group Structural Geologist for Dundee Precious Metals (DPM), visited the Shahumyan mine with the aim of reviewing the geological model and paragenetic and structural history (Davis,2006). During the visit the majority of working faces underground were visited.

- The Soviet vein interpretation used at the mine-site is strongly focused towards a single linked system of vein-bearing structures. Models do not consider orientation data and there appears to be some discrepancy in the south of the Shahumyan where veins are modelled as dipping northwards as opposed to the more likely scenario of two separate veins dipping south.
- No geological reconciliation of the veins has been attempted to validate the interpretation/model.
- Vein-parallel structures are not shown on plans. In contrast to this, low-dipping structures are commonly seen but not included in the interpretation.
- Despite the relatively monotonous nature of the host rock there is sufficient variation in rock types to establish a working stratigraphy at the Shahumyan mine.
- Mineralisation appears to be restricted to units below the major roof thrust surface. Exploration should target this surface regionally.

6.1.6 Regional Geological and Structural Mapping- Jigsaw Geoscience

Regional 1:10,000 and 1:5,000 geology and structural mapping was conducted by the Jigsaw Geoscience Pty Ltd., over two campaigns during 2007. Four QuickBird 1:10,000 images were utilised as a base for mapping and data was captured in MapInfo desktop GIS software. Deliverables provided include rock chip samples, photographs and a GIS database. The results of these tasks were used for development of a regional geological model.

In 2011 two additional mapping campaigns were undertaken by Jigsaw with the aim of extending the mapping completed in 2007 and to provide DPMK with an updated regional

6.1.7 Regional exploration

During the 2014 field season, exploration activities included geological mapping, stream sediment sampling, regional soil sampling, trenching and rock sampling. Several new zones of alteration and mineralization were identified, including the Antarashat prospect, a zone of quartz-sericite-pyrite

alteration that was mapped along a stream for approximately 150 metres. Channel samples of a gossanous zone, exposed in a nearby road-cut, average 1.7 g/t gold over eight metres and is open in both directions.

6.1.8 Review of Geological Mapping by GeoMap

Geomap was engaged by DPMK to review previous geological maps and models generated by both historical Soviet geologists and more recently by Jigsaw (Geomap,2012). This review was focused on the Kapan area surrounding the Shahumyan deposit; an area of approximately 11x7 km. The mapping led to a new geological interpretation generated by modifying the Jigsaw shape files as these were the only digital geological model available.

Conclusions from this study were:

- Soviet maps are the most accurate with respect to rock type identification and accuracy.
- Stratigraphic relationships remain unresolved in all previous models.
- Mineralisation, scale and distribution of veins and alteration are consistent with the upper parts of a large porphyry style hydrothermal system of which Shahumyan represents the base mental carbonate zone with mineralisation developed in a series of tension arrays responding to strike slip movement on north-trending structures.
- Exploration at Shahumyan should target mineralisation down-dip of current veins.
- Centralni stockworks represent the lower transition parts of a high sulphidation epithermal zone with open pit potential.
- Abundant alteration at Barabatum indicates potential for currently unidentified mineralisation.
- There is potential for apron mineralisation in contact breccias and potential skarn mineralisation where the SSC-L limestone unit intersects the mineralisation system, most likely in the vicinity of the Centralni underground workings.

No exploration activities have been undertaken in the Kapan surface environs since Polymetal gained ownership in 2016.

7 Drilling

7.1 Historical Drilling

7.1.1 DPMK Drilling 2007 to 2010

DPMK undertook surface diamond drilling and RC drilling between July 2007 and 2010. A total 636 diamond drill holes and 141 RC drill holes were completed for 199,357 m and 15,132 m respectively. DPMK also completed approximately 408 underground diamond holes for a total of 98,107 m.

Historical drill data in the database includes 1,750 underground diamond drill holes totalling 282,229 m and 1,013 m of undifferentiated underground grade control data.

DPMK drill data collected includes RQD, core and RC recoveries, core photography and geological logging, typically using personal Tablet computers running Field Marshall software; a Micromine™ interface.

7.1.2 DPMK Drilling to 2010 - 2016

Between 2010 and 2016 prior to the takeover by Polymetal, Dundee completed 443 surface diamond drill holes for 151,903.3m, 83 RC drill holes for 9,399m and 805 underground diamond drill holes for 16,4513.5m. No further surface exploration drill holes were completed after DPMK.

7.2 Polymetal Drilling

7.2.1 Polymetal Drilling 2016 to 2018

The focus at the Kapan project by Polymetal has been underground resource definition drilling since 2016. Drilling since Polymetal ownership is as follows.

- 2016 - 403 diamond drill holes for 47,334.2m.
- 2017 - 659 diamond drill holes for 61,670.5 m.

In 2018, 65km of underground drilling is budgeted. As of September 2018, 41.5km of drilling has been completed in 463 drill holes. There are currently 5 drill rigs underground producing NQ core. The primary purpose of the current underground drilling is to confirm the position of interpreted mineralised veins and to convert inferred resources to indicated resources for modelling and mine design purposes (Figure 8). Drilling is typically located on 20m spaced section lines and drilled perpendicular to the interpreted vein position (Figure 9). In 2016 downhole surveys were completed with an IMNN_32A Russian tool and Reflex tool. From 2017 only the IMNN_32A Russian tool was used.

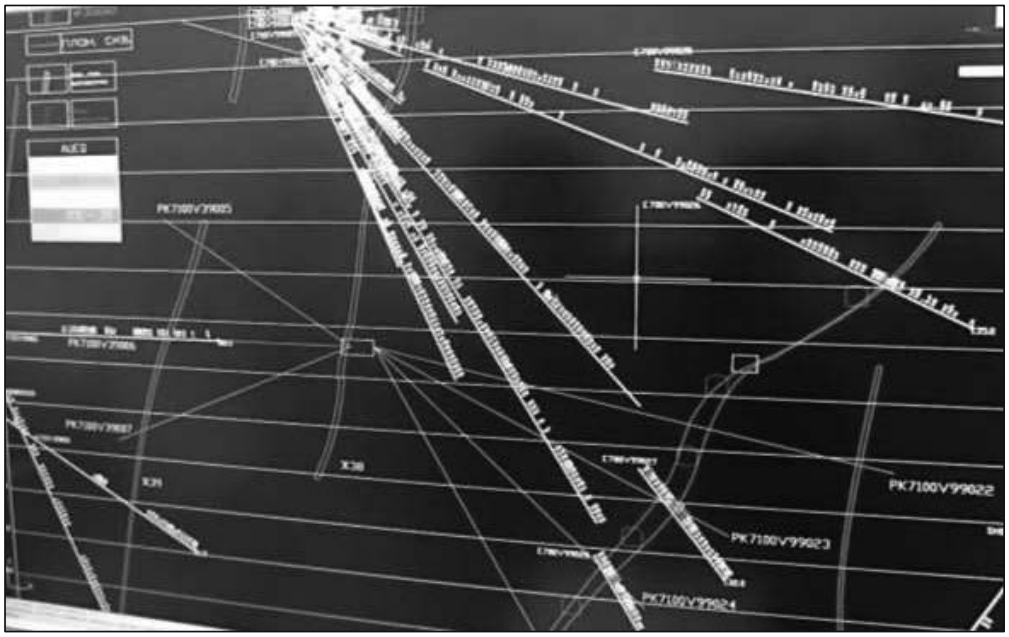

Figure 8: Cross sections demonstrating planned drilling (pink) to test vein positions (screenshot from Polymetal Inc 2018).

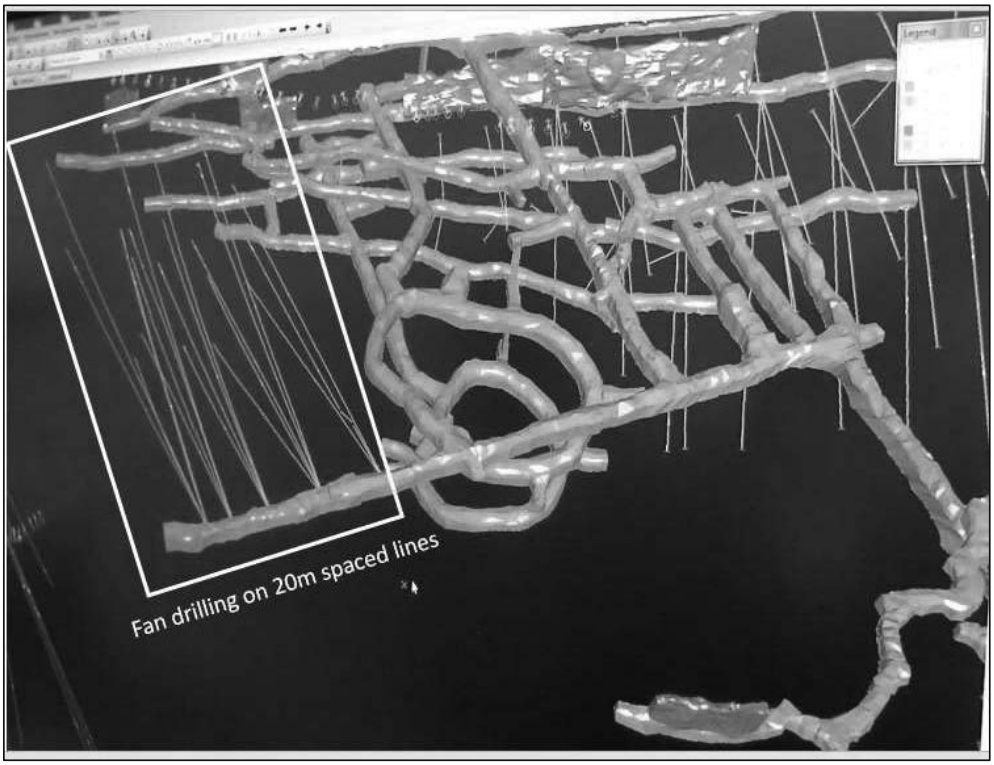

Figure 9: Example of drill positioning and fan drilling extensions to mineralisation (screenshot from Polymetal Inc 2018).

7.2.2 Core logging and processing

Core logging, sampling and storage is undertaken approximately 500m from the main administration and mining office in the Kapan town area in a separate facility (Figure 10).

Drill core is transported daily to the core storage for subsequent logging. The core trays are closed with covers for transportation in order to prevent any core movements relative to the initial placement. Core is photographed in wet condition only, using a semi-automatic digital camera (Figure 11). The diamond core recovery is measured in the course of core marking prior to logging and cutting. In addition to core recovery, several geotechnical parameters are recorded including roughness, fracture fill and frequency of fractures.

The process of photography for dry core has been discontinued since DPMK.

All data entry is entered directly into Field Marshall software with four fields populated including mineralisation, structure, structure veins (this is where there is only a vein) and geotechnical information.

Core is logged for lithology, mineralisation, alteration and structure. Sampling is undertaken on the mineralisation and a minimum of 2m either side of mineralised intervals. The minimum sampling interval is 25cm and the maximum is 1m. Whole core is assayed and as such no remaining mineralisation is remaining in the tray once sampled. This removes any possible future work or checks on the core.

In addition, water displacement measurements are taken for density determinations on well-formed vein material and variably on host rock (*Figure 12*). Point load testing is also taken on samples at irregular intervals (Figure 13). The results are then incorporated into the block models.

Material for metallurgical test work is collected at regular intervals. Coarse reject samples are received back from the lab and composited to 8kg samples. Metallurgical test work is completed at the lab in Kapan and the metallurgical results are then incorporated into the block models.

The workflow process from drill planning through to implementation and logging processes are similar to the processes implemented by DPMK and re considered good practice by CSA Global. There are two areas where Polymetal have modified the work flow. Polymetal now assay full core which is not industry standard and prevents future checks or additional studies. The other area is where Polymetal no longer undertake dry core photography, a practice that means geotechnical reviews, usually complete on dry core cannot be undertaken as per standard industry procedures.

Figure 10: View of the geology buildings and historical core storage (blue trays, foreground) – CSA Global visit September 2018.

Figure 11: Core photography room. CSA Global visit September 2018.

Figure 12: Density measurement weigh balance. CSA Global visit September 2018.

Figure 13: Point load balance. CSA Global visit September 2018.

8 Underground Geological Procedures

The process of delineating and developing along the ore drives is by geological control using the following process.

- During the ore development mining geologists map each mining face for geology, mineralisation and structure and provide direction for mining.
- After the drive faces has been mapped, surveyors mark up the general position of the veins on the back from the geologist's information. This data is entered into Surpac for general planning purposes and is used as a base map for the geologist (Figure 14).
- The geologist uses the base map and generates a more detailed map recording the geology, mineralisation and structural properties of the ore drives at 1:250 scale (Figure 15).
- The detailed geology map is imported and registered into LeapFrog software to interpret in 3D (Figure 16).
- Where the mineralisation exhibits complex structure or continuity is uncertain, ore raises are excavated between levels or as far as required and mapped by the geologist. This process provides guidance particularly for stope design (Figure 17).

CSA Global consider this process appropriate for the style and type of narrow vein mining being undertaken.

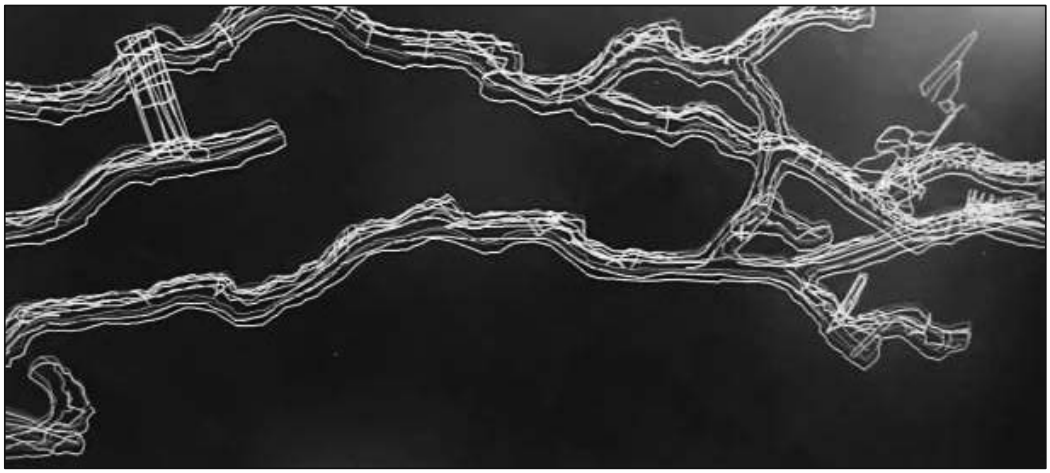

Figure 14: Surpac level plan. Yellow string is initial mineralisation survey pick up (screenshot from Polymetal Inc 2018)

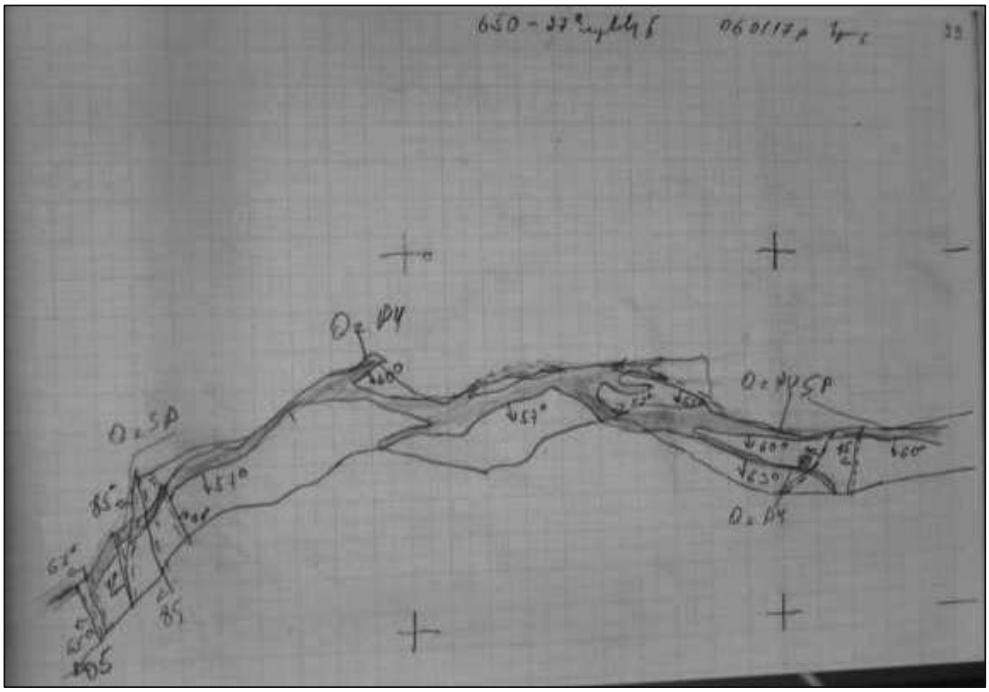

Figure 15: Detailed geology map of the 650-level ore drive at 1:250 scale. (screenshot from Polymetal Inc 2018).

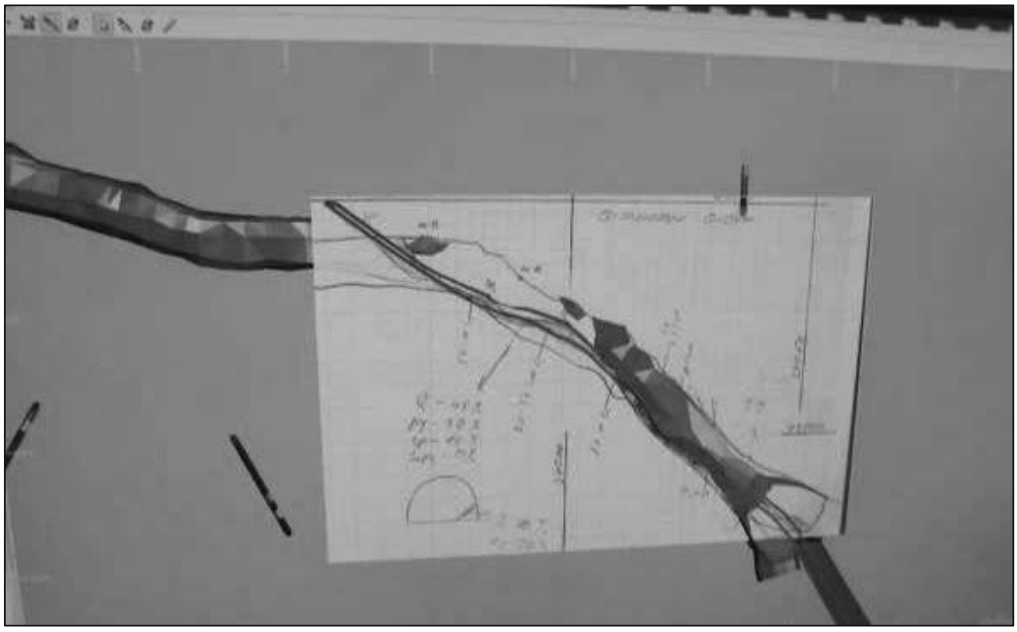

Figure 16: level map imported into leapfrog software for 3D viewing with other data sets. (screenshot from Polymetal Inc 2018).

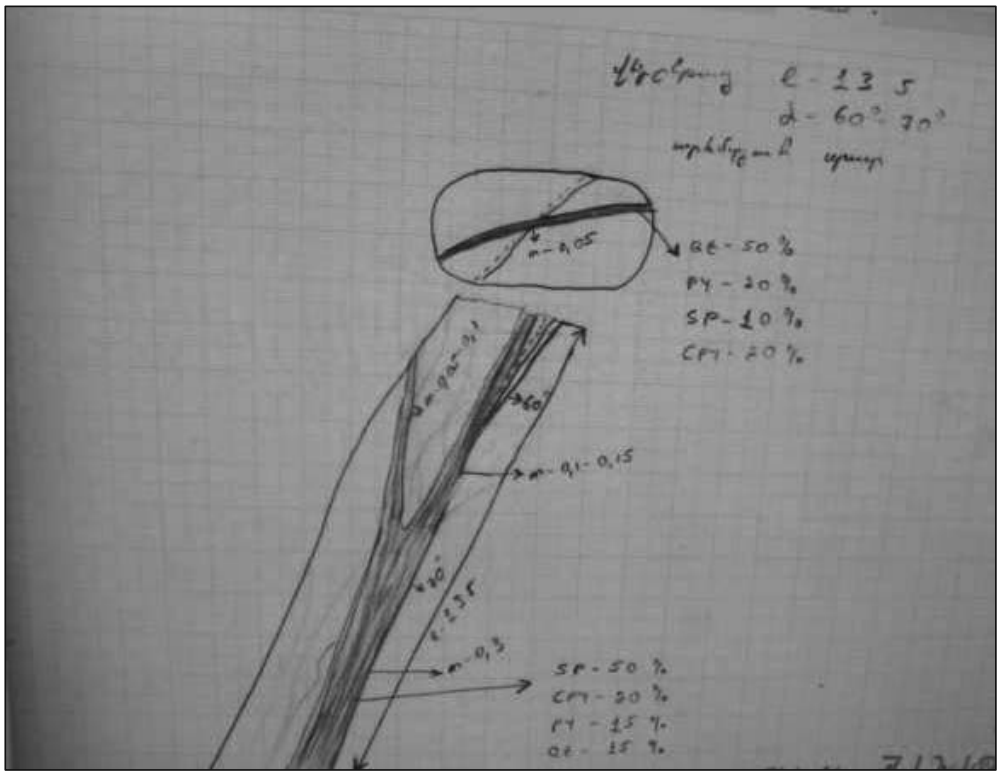

Figure 17: Detailed geological raise map to confirm structural orientation for stope design (screenshot from Polymetal Inc 2018).

9 Sampling and Assaying

A site visit was made to the lab in Kapan, belonging to the operation. The visit was guided by the Assistant Lab Manager Nazine Nuzidjajan (employee since 2003) and the Fire Assay Manager, Ayvazyan Srtem. No physical documentation was permitted to be provided and no photos were allowed to be taken in the lab.

All samples from underground drilling are analysed at the Polymetal owned and operated laboratory on the outskirts of Kapan. The building was originally an electronics factory that was converted to an assay lab by SGS for DPKM as a preparation and analytical lab. Polymetal have operated the lab since ownership in 2016. Many of the operating systems from SGS are still being used.

Sample provided to the lab include underground channel samples, underground drill samples and grade control channel samples. The lab provides Fire Assay with AAS for gold and ICP AES analysis for Ag, Cu, Pb and Zn. AAS is used for high-grade Ag, Cu, Pb and Zn.

9.1.1 Sample Receipt

Samples are received in a specific area, separated from the sample preparation area. This area is clean of dust and covers approximately 20m x 20m. The chief technician is responsible for managing this area. There were limited samples at the time in this area however there is ample working space and bench top areas.

When samples are received, they are matched against the dispatch sheet and mis-matches are advised. Grade control and definition drilling samples are separated, and ventilation is adequate. The lab does not use barcoding.

9.1.2 Drying

There are 3 drying ovens with capacity for 115 samples each. Samples are dried at 105 degrees for a minimum of 12 hours, depending on the size and type of samples. Moisture is checked irregularly. The lab dries approximately 250-300 samples per day.

Samples are kept in the original sample bags in calico bags and pans are not used. Samples on racks have space between them. When drill holes are being dried each drill hole is stored on a single trolley to avoid sample mixing. Housekeeping is good. There was little activity in the drying area at the time of the visit.

9.1.3 Ventilation

The ventilation and availability of compressed air is considered good.

9.1.4 Crushing, Splitting and Pulverising

There are three Rocklabs primary jaw crushers that are less than six months old and in very good condition. The crushing collection area is free of chips with some dust. The particle throughput is 95% passing 2mm and the collection draw is a tight fit. Samples are logged onto paper. Cleaning of the crusher area is with compressed air. No crusher blanks are used. After crushing samples are deposited back into the same bag.

There are three Rocklabs ring mill secondary crushers, less than six months old and in good condition. Each unit comes with its own ventilation unit. No crusher blanks are used.

Samples are split to a 50:50 split on a rocklabs riffle splitter. Splitting is an open area (not under a hood) and cleaning is with compressed air. The receiving bins are clear of dust and damage.

There are three FLSmidth - Essa® LM5 Pulverising Mills each of which is one month old. These are clean and well ventilated. Every 10th sample is tested passing 95% passing 200#. Cleaning is undertaken on irregular basis using sand (stored under the table). Frequency of insertion depends on the observations of the technician.

Sample recording is at the table behind the pulveriser. The pulp weight collected is 500g which are scooped and put into paper bags and stored in coffin boxes. Weights are recorded to one decimal place with an error of +/- 10gms

9.1.5 Weighing

Weighing is undertaken with Essae digital weighing machine which is calibrated each morning before shift and operated by the technician. Cleaning is undertaken after each sample.

9.1.6 Fire Assay

Fire assay is undertaken in a dust free area with extractor fans. Flux and pulp is mixed in a fume cupboard with a range of weights from 10-50g. Below 10gms the samples are considered too small. The flux and sample are mixed using a scoop into a crucible, which are re-used.

9.1.7 Furnaces

There are four furnaces with temperature ranges up to 1100 degrees Celsius +/-10 degrees Celsius. Each furnace can hold 50 samples. Each batch of samples includes 2 standards and one blank.

9.1.8 AAS Analysis

The AAS instrument is an Agilent Technology 200 series unit which is 6 months old and can read from 11 samples. There are procedures in place for samples over detection limit which involve dilution of samples and re analysing.

9.1.9 ICP Analysis

The ICP instrument is a optima 8300 Perkin Elmer. Instrument is 5 years old and can read over 50 samples for 39 elements with varying detection limits depending on the element. When samples are over the detection limit, they are diluted and re-assayed.

9.1.10 QAQC procedures

The laboratory would not disclose the documentation associated with the QAQC procedures, citing confidentiality of the procedure. CSA Global considers this somewhat strange. According to the Assistant Lab Manager, the procedures are the same as per the original SGS protocols, except for the internal standards, which unlike the SGS protocols are unknown to the operator.

In 2015-2016, routine sample random re-assay was carried out in Analytic State Laboratory in Yerevan, however it is unsure whether this process continues.

The process of chain of custody was observed with samples transported by the geologist to the lab and signed off as being received by the lab.

10 Mineral Resources

The effective date for the current Mineral Resource Estimate is 01 January 2018 and was prepared and disclosed by Polymetal Engineering JSC in accordance with the JORC Code, 2012 Edition The current Mineral Resource statement is set out in (Table 12)

The Mineral Resources set out in the table below are reported at a cut-off grade of 2.5g/t Au Eq.

Table 12: Mineral Resources of the Shahumyan deposit as of 1st January 2018 (Polymetal Engineering JSC)

Mineral Resource Summary (as of January 1, 2018)	Tonnage	Grade					Metal				
	kt	Au (g/t)	Ag (g/t)	Cu (%)	Zn (%)	AuEq (g/t)	Au (koz)	Ag (koz)	Cu (kt)	Zn (kt)	AuEq (koz)
Measured											
Underground mining	180	6.2	95	1.07	4.2	11.6	36	559	1.9	7.8	68
Stockpiles	10	1.8	34	0.41	1.5	3.8	0	6	0	0.1	1
Total Measured Resources	**190**	**6**	**93**	**1.05**	**4.2**	**11.4**	**36**	**565**	**2**	**7.8**	**69**
Indicated											
Underground mining	2180	3.8	73	0.79	3	7.7	265	5094	17.2	65.1	542
Total Indicated Resources	**2180**	**3.8**	**73**	**0.79**	**3**	**7.7**	**265**	**5094**	**17.2**	**65.1**	**542**
Measured+Indicated											
Underground mining	2360	**4**	**74**	**0.81**	**3.1**	**8**	**301**	**5653**	**19.2**	**72.9**	**610**
Stockpiles	10	1.8	34	0.41	1.5	3.8	0	6	0	0.1	1
Total Measured+Indicated Resources	**2370**	4	74	0.81	3.1	8	**301**	**5653**	**19.2**	**72.9**	**610**
Inferred											
Underground mining	8220	**2.9**	**63**	**0.67**	**2.3**	**6.1**	**764**	**16522**	**54.7**	**189.1**	**1614**
Total Inferred Resources	**8220**	**2.9**	**63**	**0.67**	**2.3**	**6.1**	**764**	**16522**	**54.7**	**189.1**	**1614**
Measured+Indicated+Inferred											
Underground mining	10580	**3.1**	**65**	**0.7**	**2.5**	**6.5**	**1065**	**22175**	**73.9**	**262**	**2223**
Stockpiles	10	1.8	34	0.41	1.5	3.8	0	6	0	0.1	1
Total Measured+Indicated Resources+Inferred Resources	**10590**	**3.1**	**65**	**0.7**	2.5	6.5	1065	22181	73.9	262.1	2224

* Discrepancies in the calculations are due to rounding

The figures presented above are both gross and net attributable

The operator is Kapan Mining and Processing CJSC

10.1 Competent Persons Review of Mineral Resources

10.1.1 Introduction and Review Workflow

CSA Global received and reviewed two versions of the Mineral Resource Estimate (MRE) of the Shahumyan polymetallic deposit. These are the November 2017 MRE, on which the Mine Plan and Polymetal financial model is based, and the June 2018 MRE, which is the latest update of the Kapan deposit and based on the January 2018 Polymetal Mineral Resource Estimate.

The workflow was approached in two stages;

- Stage 1 – Review of the 2018 MRE (Table 12), to assess the reasonableness of the current estimate and classification and provide comment. The review was focussed on the top ten veins globally, comprising ~20% of the total gold equivalent (AuEq) accumulated metal.
- Stage 2 – Review of the 2017 MRE, focusing on material contributing to the next five years of the Mine Plan.

Stage 1 – 2018 MRE

The Stage 1 review of the 2018 MRE followed a systematic workflow that reviewed both the global confidence in the model, as well as undertaking spot checks on various veins within each of the broad domain areas. CSA Global identified an appropriate distribution of veins for spot check reviews by defining the top ten veins by total accumulated metal for the AuEq grade field (Table 13). The spatial distribution of these veins is shown in Figure 19. These veins represent around 20% of the total contained metal in the 2018 model. Thus, findings on review work carried out on these veins as reported by CSA Global must be considered in context of this.

The review of the subsets of input data, and of the model parameters, associated with these individual veins are considered representative of the Mineral Resource as a whole, where such assumptions have been made on the robustness of the model from them.

Table 13: List of top 10 veins contributing to the AuEq contained metal as reported in the 2018 MRE provided

Vein	Kt	AuEq Koz	% of total Mineral Resource
17	296	69	2.7%
511	293	64	2.5%
99	287	63	2.4%
22	327	61	2.4%
20	165	53	2.1%
5013	198	44	1.7%
11	129	44	1.7%
62	112	43	1.7%
6	165	42	1.6%
46	194	42	1.6%
T10 Vein Subtotal	**2,165**	**525**	**20.4%**
TOTAL RESOURCE	**11,894**	**2,575**	

**Kt and AuEq Koz are reported in line with the proportional factor supplied in the block model*

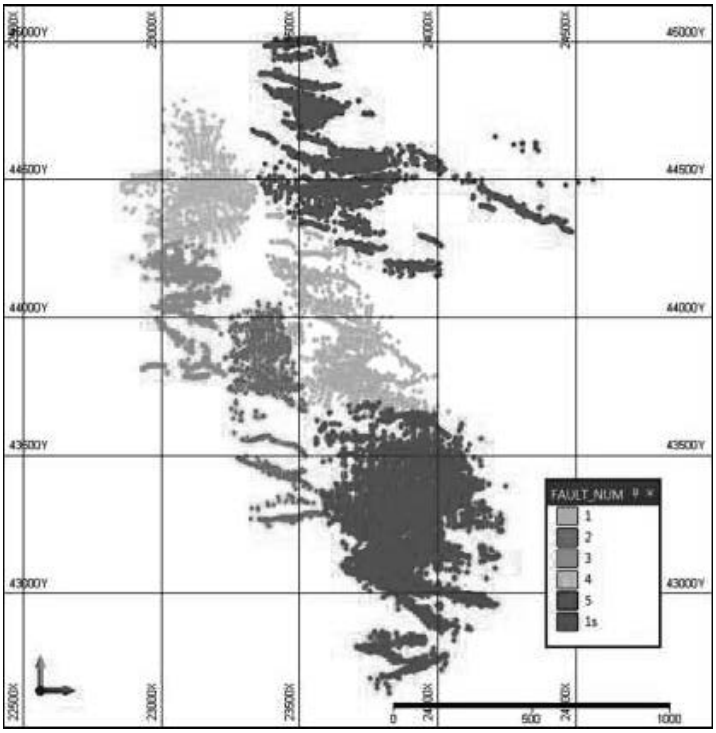

Figure 18: Domains identified at the Kapan deposit, as determined by the developed fault network (Polymetal, 2018)

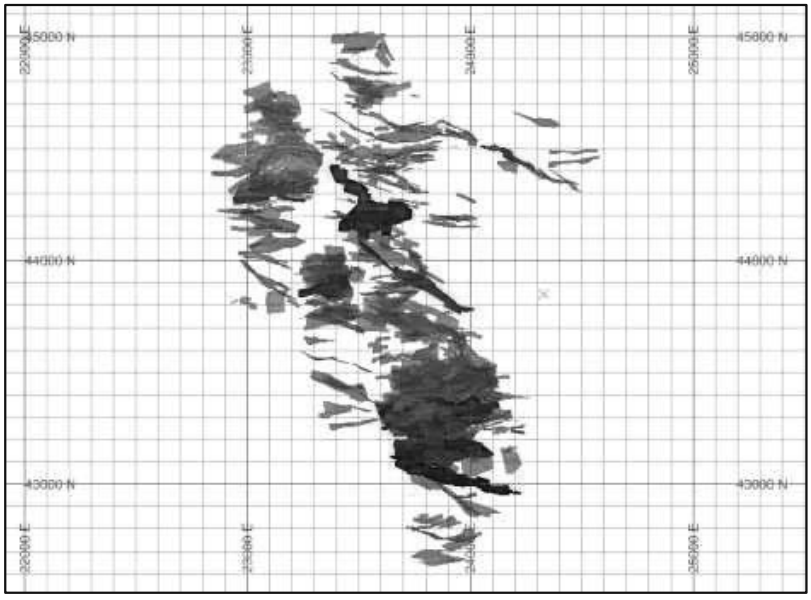

Figure 19: Coloured wireframes represent top 10 veins within the global 2018 MRE by accumulated metal for the AuEq (g/t) grade field (CSA Global).

The following areas of review were completed during Stage 1;

- Overview deposit geology and domaining
- Audit trail
- Data load-up
- Statistical evaluation, compositing and top-cutting
- Geostatistical review (variography)
- Block model construction
- Grade interpolation
- Block model validations completed by CSA Global
- Mineral Resource classification review.

10.1.2 Stage 2 – 2017 MRE within Five-Year Mine Plan

The Stage 2 FFA focused on those areas within the 2017 MRE that contribute to the next five years of the Mine Plan, as defined by the planned stopes and development from 2018 to 2023 (*Figure 20*). A risk profile has been quantified for the contained metal within this timeframe.

The following areas of review were completed during Stage 2 and are the framework of the following subsections which are split primarily on review of the Mineral Resource within the five-year Mine Plan and then the quantification of the resource at risk against said Mine Plan:

- Grade interpolation
- Block model validations completed by CSA Global
- Mineral Resource classification review
- Review of the Mine Plan model against the Mine Plan
- Communication of risk and “at risk” metal (if any)
- Potential upside or opportunity.

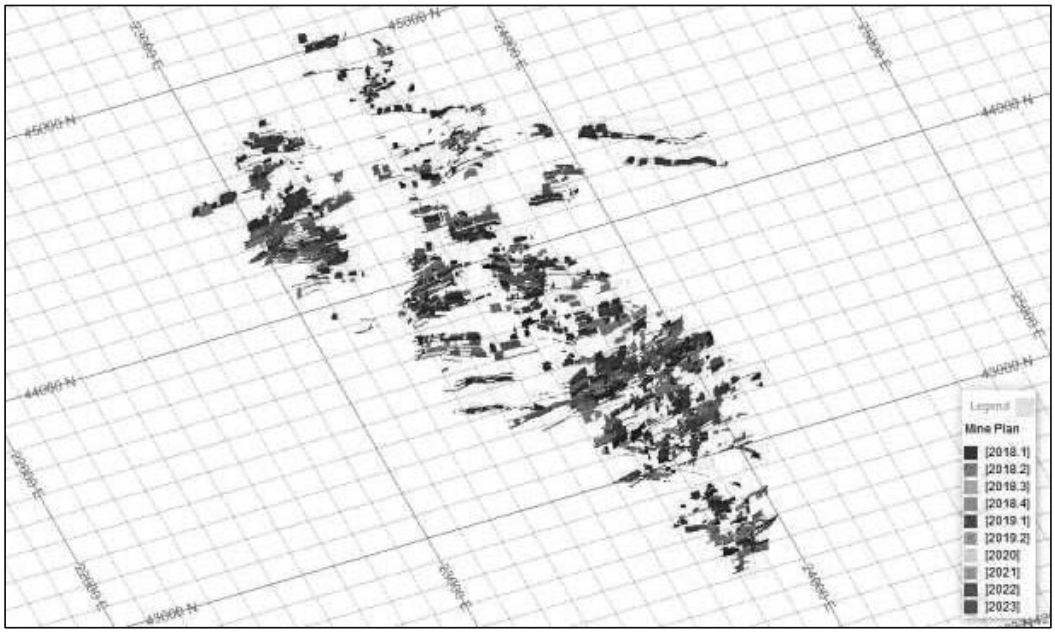

Figure 20: 2017 MRE – blocks within the five-year Mine Plan (stopes and development), coloured on the scheduled periods (2018 to 2023)

10.1.3 Review - Stage 1 – 2018 MRE

Generally, visual checks, de-clustered mean statistics and swath plots show good validation results when comparing the input composite data to the output model blocks. The model swath plots for Au and Cu below (*Figure 21* and *Figure 22*), show good correlation against both the naïve and de-clustered input mean grades when assessed globally. Trends in composite data are also broadly mirrored by trends in the block models in sectional review (*Figure 23*). However, the output model histograms show a distinct bimodal distribution for Au, Ag, Cu and Zn where no such trend exists within the input composite data which is broadly lognormal in distribution (bottom right image in *Figure 21* and *Figure 22*). These findings are comparable when reviewing all grade fields used in the calculation of the AuEq field (Au, Ag, Cu and Zn), when reviewed globally and in the spot checks carried out on vein 6 and vein 17.

Table 14 provides a breakdown of the input naïve and de-clustered mean grades against the block model for all the swath plot analysis carried out. Noted is that the performance to both the naïve and de-clustered mean grades worsens when assessed per vein versus comparison on all veins (global).

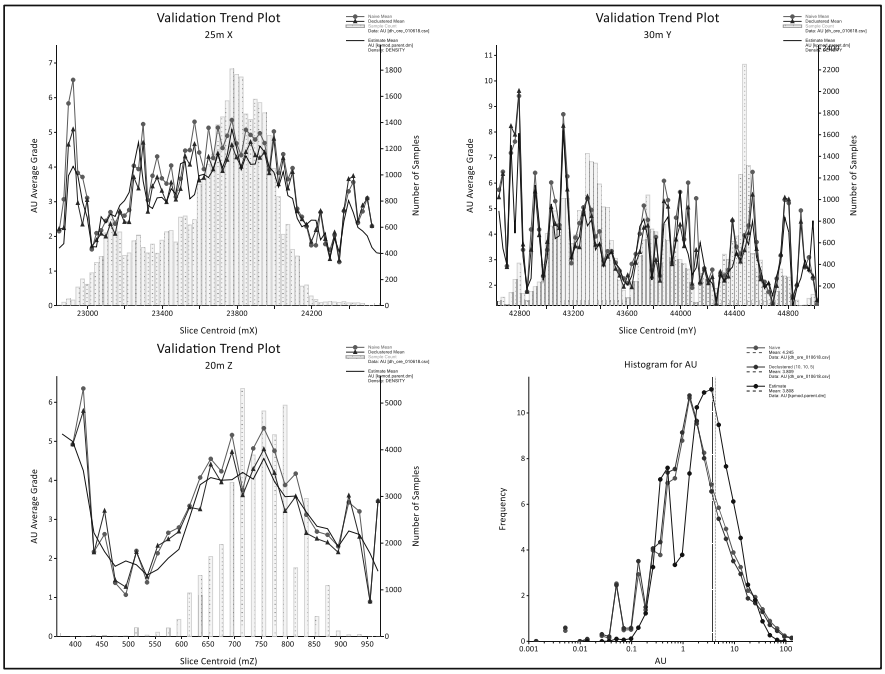

Figure 21: Swath plots and histogram for 2018 MRE – global Au g/t naïve mean (red) and de-clustered mean (blue) input estimation composite, and block model (black). Note the bimodal distribution of the block model histogram.

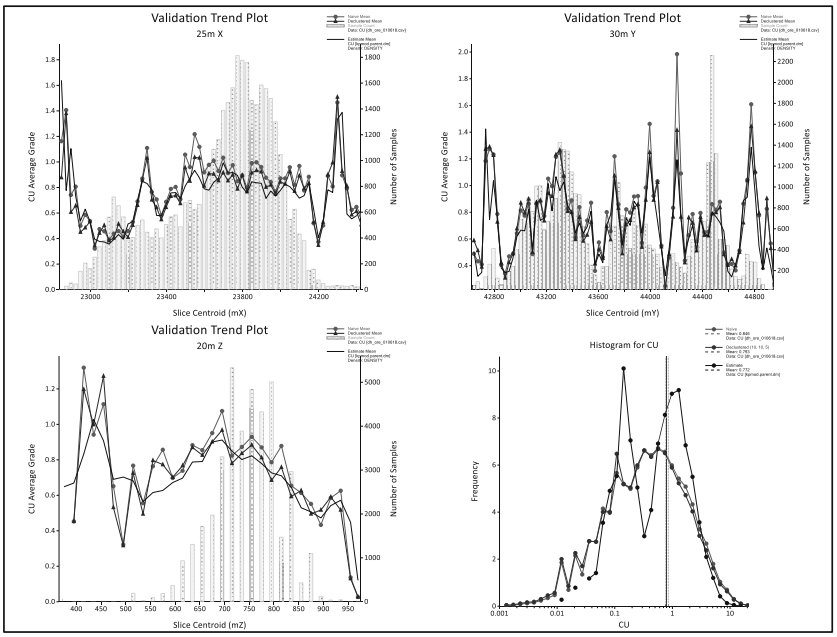

Figure 22: Swath plots and histogram for 2018 MRE – global Cu % naïve mean (red) and de-clustered mean (blue) input estimation composite, and block model (black). Note the bimodal distribution of the block model histogram.

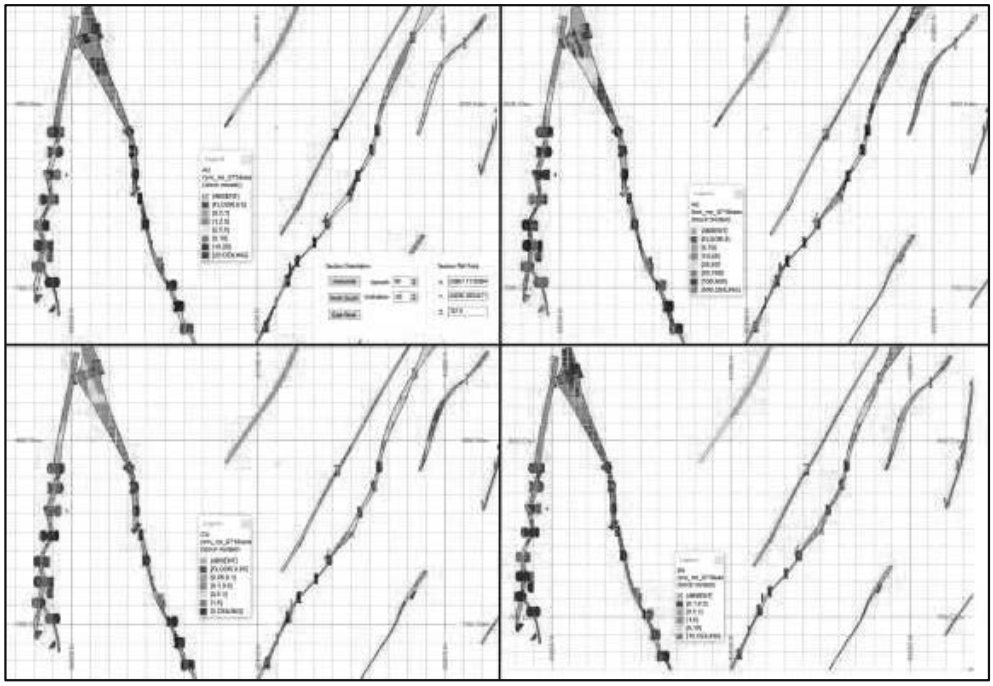

Figure 23: Sectional review of 2018 block model against input estimation composite file for Au (top-left), Ag (top-right), Cu (bottom-left) and Zn (bottom-right); clipping is between 10 m and 20 m

Table 14: Results of naïve and de-clustered mean input grades (Au, Ag, Cu and Zn), against the 2018 model for global swath plot analysis, as well as for vein 6 and 17

Grade	Type	Mean			Model % difference	
		Naïve	**De-clustered**	**Model**	**vs Naive**	**vs De-clustered**
Au (g/t)	Global	4.24	3.81	3.81	-10	0
	Vein 6	4.02	3.83	3.34	-17	-13
	Vein 17	4.13	3.69	3.35	-19	-9
Ag (g/t)	Global	76.25	70.27	69.88	-8	-1
	Vein 6	67.10	63.35	59.29	-12	-6
	Vein 17	75.28	68.96	62.12	-17	-10
Cu (%)	Global	0.85	0.79	0.77	-9	-3
	Vein 6	0.77	0.79	0.73	-5	-8
	Vein 17	1.04	0.96	0.87	-16	-9
Zn (%)	Global	3.60	3.31	3.30	-8	0
	Vein 6	4.01	3.60	3.41	-15	-5
	Vein 17	3.47	3.12	2.97	-15	-5
			Average % difference		**-13**	**-6**

Although comparable values for the de-clustered mean input grade to the model indicates a reasonable confidence in it as a broad predictive tool, the bimodality may present a risk in the ability to plan underground mine development from the model. Grades anticipated from the model may be highly variable on a more localised scale.

10.1.4 Review - Stage 2 – 2017 MRE within Five-Year Mine Plan

Due to the restriction of the model blocks by the five-year Mine Plan stopes and developments, it was not possible to undertake a global statistical comparison of the input estimation composites against the output MRE. **However, the same validation issues as found during the review of the 2018 MRE were observed in veins 17 and 20 (the largest metal contributors to the material within the Mine Plan) during both visual and statistical review**.

10.1.5 Estimation Parameters

The same estimation methodology was used for the 2017 and 2018 MREs. Estimation was performed by means of an Ordinary Kriged interpolation method for Au, Ag, Cu, Zn, Pb and S, using dynamic anisotropy to control search orientations. The VEIN field code number was used to domain data for estimation purposes. Veins were assigned to one of six broad domains (1, 1s, 2, 3, 4 and 5) defined by fault surfaces for the determination of appropriate estimation parameters, and where individual vein datasets were large enough, these were further refined on a vein by vein basis. A hard boundary was used between individual veins, which is considered appropriate by CSA Global following boundary analysis.

CSA Global reviewed the search neighbourhood parameters assigned to the 2018 model estimate against those used in the 2014 estimate. Only one search volume parameter was assigned due to dynamic anisotropy being used to control search orientations, which is acceptable practice.

10.1.6 Variography

Variogram parameters were reported as not having been reviewed for either the 2017 or 2018 MRE, and instead were taken from those performed by Dundee Precious Metals (DPM) in 2014, as reviewed by CSA Global at the time. Veins that did not have sufficient data for generation of useable variograms were instead assigned the variogram parameters from the nearest orebody (vein) that could be analysed from within their assigned domain. Only 28 orebody veins showed variograms of acceptable quality as per findings of the previous review.

CSA Global reviewed the reported variogram parameters for Au, Ag, Cu and Zn for some of the veins against the 2018 input estimation composites. Particular attention was given to vein 17 and vein 20 in relation to the 2017 MRE, using the 2017 input estimation composites The results are shown in *Figure 24* to *Figure 27*.

Updating the variography for vein 17 and remodelling the variography for vein 20 (previously based on Vein 2010), resulted in lower nuggets and shorter ranges for each structure in all directions. The higher nugget effects and longer ranges, as modelled in the variograms used in both the 2017 and 2018 MREs, will smooth out the kriging weights. This will lead to smoother estimates that have higher kriging variances and thus lower confidence.

CSA Global comments that it may have been more appropriate to update the variography study given there appears to have been a significant increase in available data points since 2014. However, it is noted that the broad overall orientations and variogram models reviewed appear reasonable for use in the estimate, and do not present a significant risk.

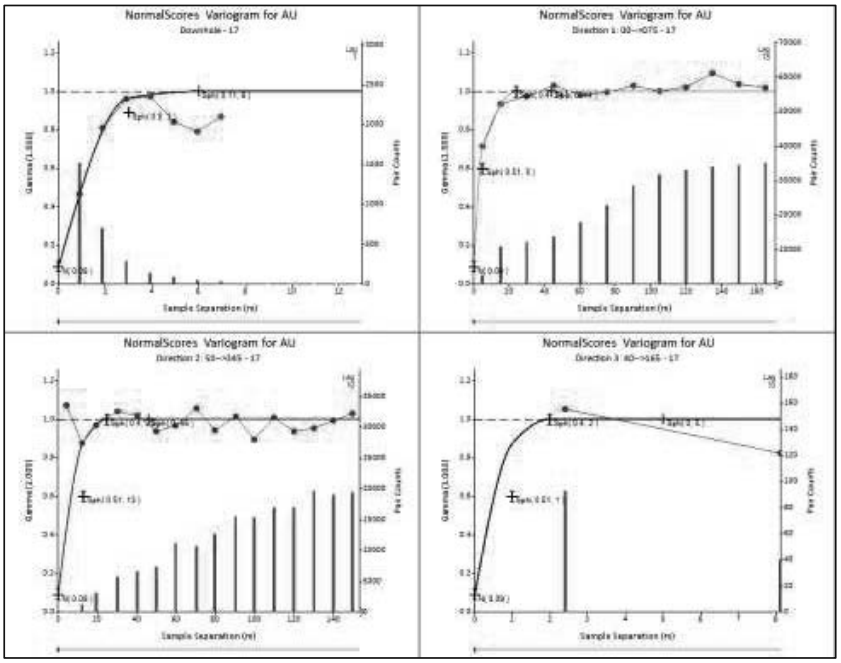

Figure 24: Vein 17 variography, completed by CSA Global, based on the 2017 data as used in the 2017 MRE

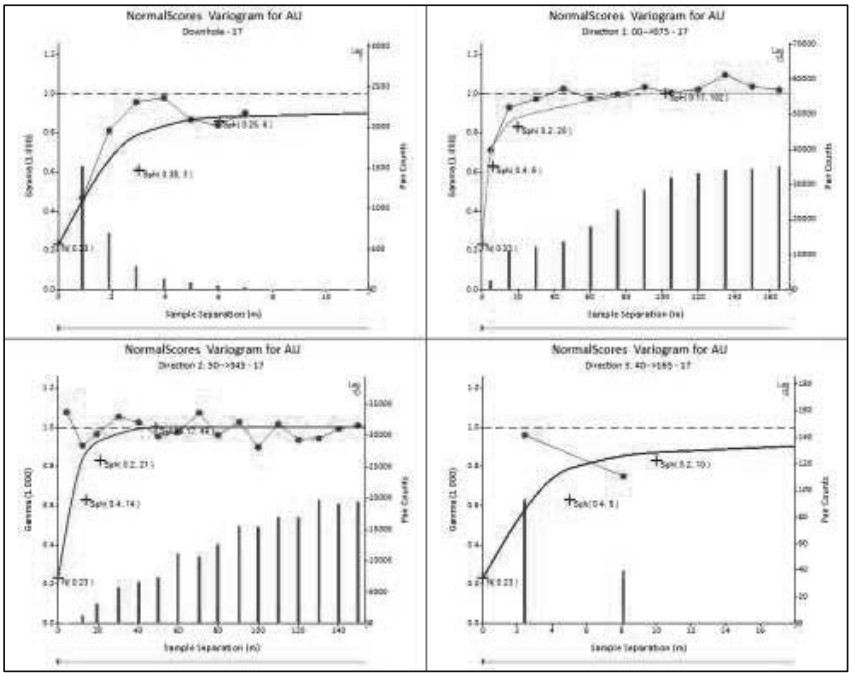

Figure 25: Vein 17 variography, applying the parameters as detailed in the 2018 CPR, shown with the 2017 data as used in the 2017 MRE

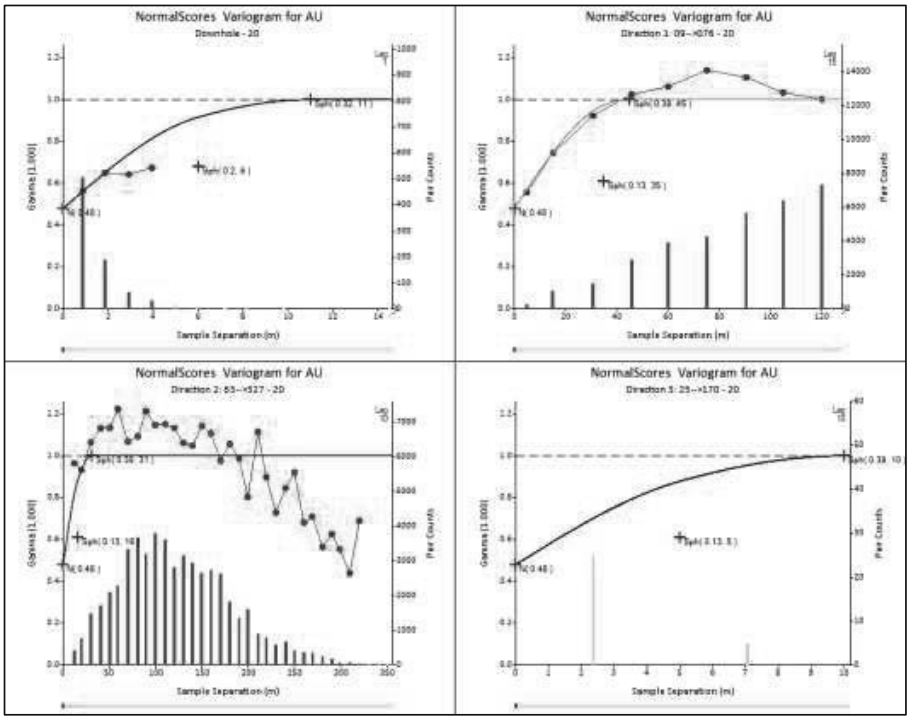

Figure 26: Vein 20 variography, completed by CSA Global, based on the 2017 data as used in the 2017 MRE

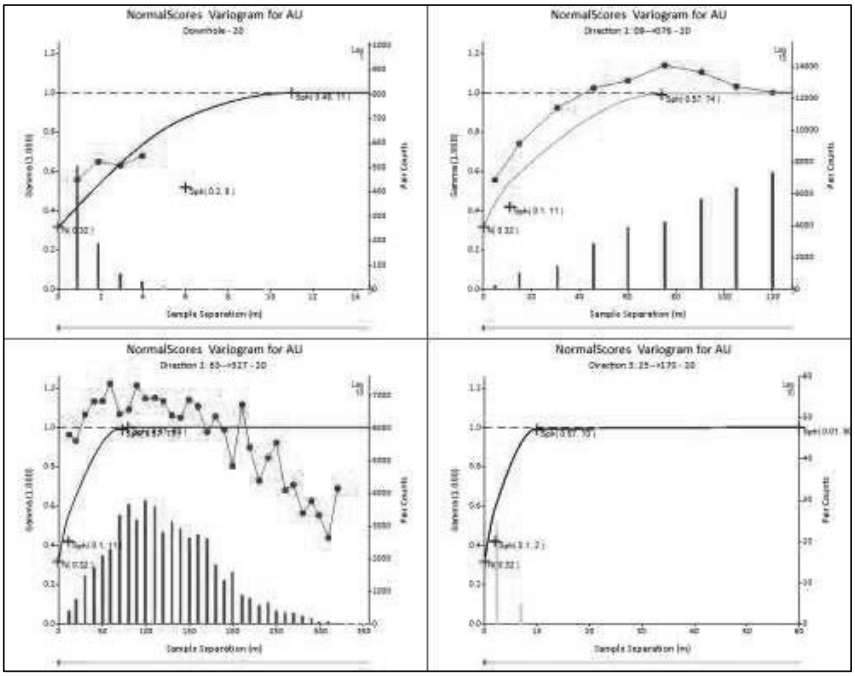

Figure 27: Vein 20 variography, applying the parameters for vein 2010, as detailed in the 2018 CPR, shown with the 2017 data as used in the 2017 MRE

10.1.7 Kriging Neighbourhood Analysis (KNA)

KNA was undertaken by CSA Global in order to assess the appropriateness of the minimum and maximum number of samples used per search pass, the maximum samples per drill hole/channel used, octants and block discretisation. The findings of this review suggest that the criteria adopted appear reasonable but could be refined further.

10.1.8 Top-Cuts

Top-cuts were applied to the composited drill hole data and reviewed (in general) on a domain-by-domain basis. Occasionally, where it was warranted, individual veins of notable sample size were assessed separately. It has been acknowledged in the 2018 MRE that historically channel sampling has been selective of the higher-grade material, whereas drill holes were sampled right across the orebody (veins). Consequently, different top-cutting criteria have been chosen for channel samples and drill holes. **CSA Global agrees with this approach.**

Spot checks on the top-cutting parameters outlined in the report for both channel samples and drill holes for veins in each of the broad domain areas revealed that whilst top-cuts for channel samples have a relatively low impact on mean grades for Au, Ag, Cu and Zn (ranging from 0% to -8%), their influence on drill holes is much higher (ranging from -11% to -55%). In some cases, the drop of grades by means of top-cutting is justified by the presence of extremely high-grade outliers, but **for the most part CSA Global found top-cut values for drill holes to be reasonable, if somewhat conservative.**

10.1.9 Compositing

The 2018 dataset was used in the review of the appropriateness of the compositing methodology. Review of the length field in the 2018 raw loaded data confirmed that compositing to 1 m is appropriate for Kapan. CSA Global undertook compositing of the raw data at this length using various options to assess the impact of residual lengths in the dataset. CSA Global was able to reproduce a post compositing length plot that confirmed that residuals were included in the input estimation composite file provided. The impact of residuals below 0.5 m is shown in the plot below. The residuals have a mean grade of 12.24 AuEq g/t (5,546 samples) versus 7.58 AuEq g/t for samples above 0.5 m in length (31,481 samples). The residuals represent some 15% of the raw dataset reviewed.

CSA Global also reviewed the grade distributions for the different data types in the raw data file prior to estimation, and within the estimation composites

CSA Global considers the input composite data for Kapan as representative of the raw assay data, and reasonable for use in the MRE.

10.1.10 Mineralisation and Geology Wireframes

The criteria for the selection of ore intervals in both the 2017 and 2018 MRE is based on previous studies as determined in the 2014 DPM NI 43-101 MRE report. The wireframes were updated in accordance with the following parameters:

- Gold equivalent cut-off grade of 1.5 g/t.
- Minimum mining thickness of 2 m.
- Maximum waste dilution thickness (provided that the minimum cut-off grade is maintained) 6 m.

Extrapolation of wireframes between ore-bearing and waste mine workings/drill holes was undertaken at half the sample spacing distance, but not to exceed 20 m. And open mineralisation was also not extrapolated further than 20 m along the ore strike/dip direction.

In some instances, geological data was used to inform the design/continuity of wireframes in areas below the 1.5 g/t AuEq cut-off. These were included in order to maintain overall orebody continuity.

CSA Global reviewed the modelled vein mineralisation volumes in cross and plan sections against the raw un-composited sample data. AuEq mineralisation above the 1.5 g/t cut-off grade (specified in the 2018 CPR), are incorporated in the respective modelled wireframes when possible and in line with the mineralisation trends (*Figure 28*).

CSA Global reviewed Au, Ag, Cu and Zn raw grades against the wireframe as well (*Figure 29*) and found that overall there appear to be no issues with the approach undertaken.

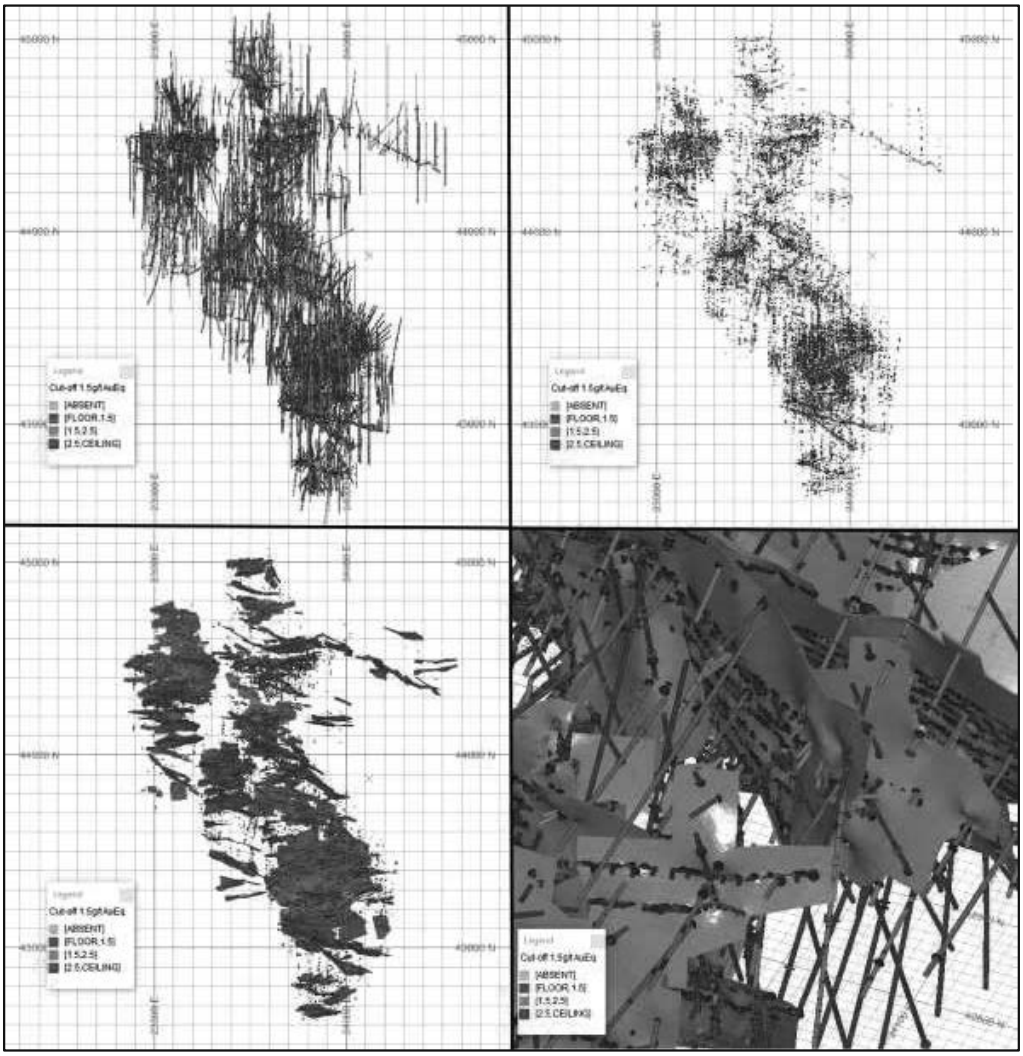

Figure 28: Review of mineralisation wireframes (grey) against AuEq cut-offs of 1.5 g/t and 2.5 g/t

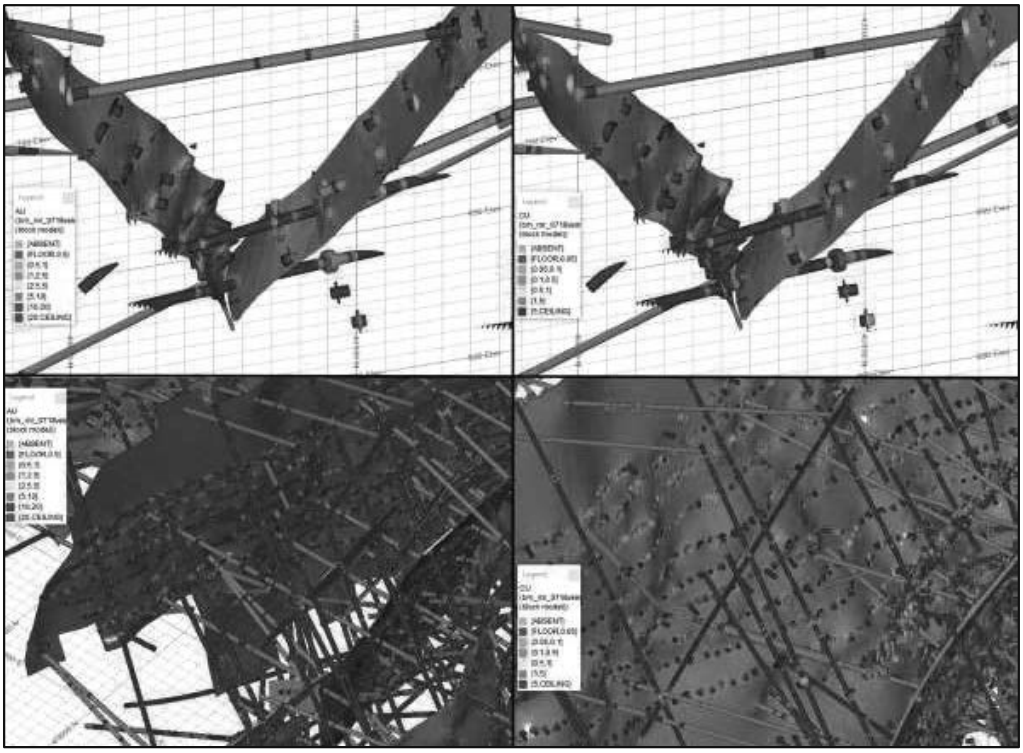

Figure 29: Mineralisation wireframes (grey), reviewed against Au g/t, and Cu % fields in raw un-composited assay file

10.1.11 Density

Density is applied to each block using a regression with sulphur, detailed below:

- If the content of S is >=19.8 %, then Density = exp[0.2587x+0.4835], where x=ln (sulphur content)
- If the content of S is S>1 or S <19.8 %, then Density = exp[0.0114169x^6-0.0891652x^5+0.26951043x^4-0.38060004x^3+0.23832052x^2+0.0052027x+0.9070334], where x=ln (sulphur content)
- If the content of S is <1%, then Density=2.64 t/m^3
- If the Density is <2.64 t/m^3, then Density=2.64 t/m^3
- Dyke Density=2.65 t/m^3.

The application of density using a regression with sulphur is reasonable for this type of deposit, assuming the sulphur estimate is robust. However, CSA Global has observed poor validation of the sulphur estimate and have identified that 61% of the intervals within the input composite file do not contain sulphur values. **It would be better if density is linked to AuEq grade rather than S grade, as the estimates for Au, Ag, Cu, Pb and Zn are more robust.**

10.1.12 Classification

The criteria for resource classification are based on the cumulative results of geostatistical analysis (grade variation), structure continuity interpretation, search ellipsoid volume, number of samples used for block estimation, kriging variance and exploration grid spacing. These factors were considered when constructing classification wireframes.

The Measured Mineral Resource category was assigned to portions of the ore bodies in the following cases

- In the areas of current mine development workings, informed by both channel sampling data and drilling data and where the data spacing is less than 20x20 m.

The Indicated category was assigned to the portions of the ore bodies in the following cases:

- In the areas with the exploration grid spacing up to 20×20 m, provided there was enough confidence in the continuity of the ore body mineralization between the drill holes.
- In the areas of extrapolation to up to 30 m distance from the last sublevel drift in down-dip/up-dip direction of the ore body, provided there was enough confidence in the continuity of its mineralization. The intersections of extrapolation areas by exploration drillholes are not required in this case.
- In the areas of extrapolation to up to 30 m distance from the last sublevel drift in the down-dip/up-dip direction of the ore body. In case of any doubts in continuity of this ore body mineralization, the exploration grid spacing of not more than 20-30 m is required to classify the mineralization as an Indicated Mineral Resource.

The Inferred category was assigned to the portions of the ore bodies if they could not be classified as an Indicated Mineral Resource.

Visual review of the 2018 MRE against the 2018 classification wireframes suggests the broad classification methodology adopted, is reasonable (*Figure 30* and *Figure 31*).

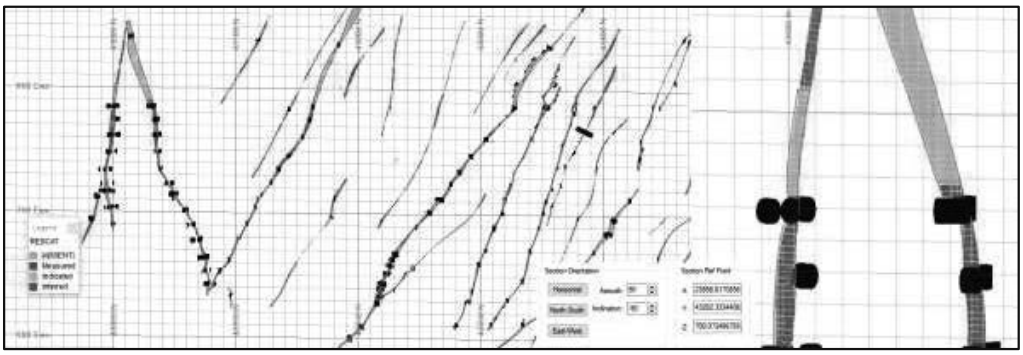

Figure 30: Section through Kapan 2018 MRE showing classification based on CLASS field

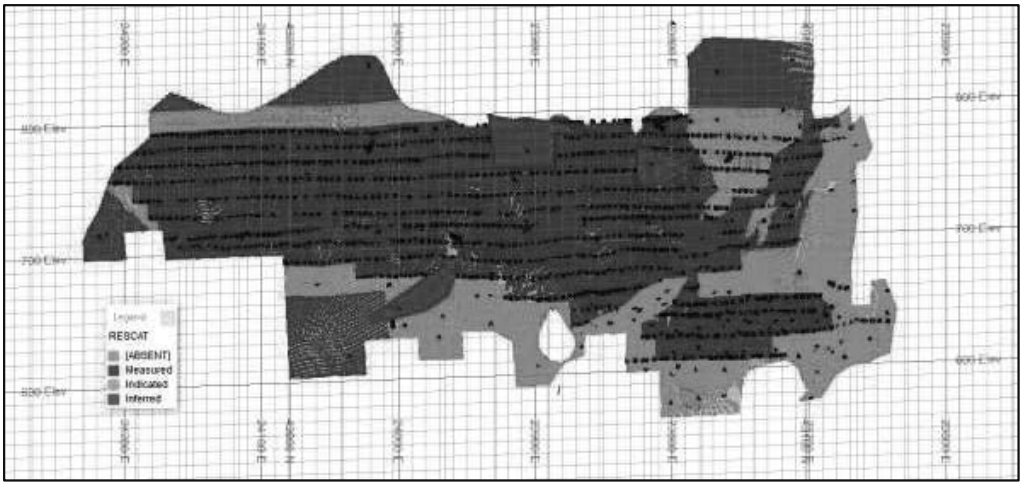

Figure 31: 3D view of example Kapan 2018 MRE vein showing classification criteria around channel sample data and drill holes

11 Mining

11.1 Introduction

The Shahumyan underground mine is 100% owned by Kapan Mining and Processing CJSC and located adjacent to the town of Kapan in south eastern Armenia. The mine produces a polymetallic ore containing gold, silver, copper and zinc.

Mining of the Shahumyan deposit first took place in the 1920's. Historically, the mine was developed and mined using handheld methods. Today, the mine utilises mechanised methods as yearly ore production approaches 700,000 tonnes.

11.2 Deposit Characteristics

The Shahumyan mineralization is characterized by narrow veins (0.2-2.0 m), steeply dipping (70°-85°), east-west orientation, and contain gold-base metals (Cu-Zn-Pb-Au-Ag) mineralization. The veins are frequently identified within the areas and zones of sericite alterations and disseminated mineralization.

11.3 Geotechnical

Geotechnical conditions at Kapan are managed through the 'Ground Control Management Plan 2015'. The objective of this document is to provide a comprehensive description of how ground control issues are dealt with onsite. Geotechnical data is collected through drill core logging and mapping of underground development.

The current geotechnical design criteria used at Kapan can be summarised as follows: -

- Stope height is approximately 50 m.
- Rib pillars, nominally 6m wide are placed every 50-60 m along strike to provide hangingwall support.
- Rib pillar spacing can vary as pillars are preferentially left in lower grade areas.
- Mineralised pillars, 15m in length are left above crosscut/ore drive intersections.

Additional information relating to geotechnical considerations in set out in Section 12.

11.3.1 Rock Mass Classification

Rock mass characterisation for the Shahumyan Deposit are summarised in Table 15.

Table 15 Estimate of rock mass properties, GCMP 2015

Parameter	Value
Geological Strength Index (GSI)	55 – 65
Rock Quality Designation (RQD)	60 – 80
Intact Rock Strength (IRS)	80 – 120MPa
Number of Joint Sets (Jn)	3 sets to 3 sets plus random
Joint Spacing (Js)	Moderately to widely spaced (0.2 – 2.0m)
Joint Waviness (Jm)	Straight to curved
Joint Roughness (Jr)	Rough planar to rough undulating
Joint Persistence (Jp)	2 – 6m
Joint Alteration (Ja)	None to surface staining
Joint Aperture (Jap)	Tight to slightly open
Water Condition (Jw)	Dry to damp
Weathering	Unweathered to slightly weathered
Joint Orientation	Favourable to fair

11.3.2 Ground Support

Provided in Table 16 is a summary of ground support standards used for common development at the Kapan Mine.

Table 16 Ground Support standards

Opening	Standard
Capital Drives	2.4m long non-galvanised split sets at 1.4m centres and mesh across backs
Cross Cut Drives	2.4m non-galvanised split sets and mesh
Ore Drives	1.7m mechanical anchor ungrouted bolts or 1.8m split sets and mesh
Intersection	3-way and 4-way intersections comprise two categories, intersection between capital drives and access cross-cuts; and, intersection between access cross-cuts and vein drives. Both utilize 2.4m and 1.8m split sets and vary according to drive width. The intersection between the capital drive and access cross-cut is additionally supported with 6.0 m cable-bolts spaced between 1.5 to 2.0 m.
Stope Hangingwall	Cable bolts are cement grouted and seven wire plain steel 15mm diameter. They are installed in fans along the stope hanging wall to limit dilution.

11.4 Hydrology and Hydrogeology

The mine does not have any issues with hydrogeology. (Ground Control Management Plan 2015). On the underground inspections CSA Global did not see any excess water pooling in active work areas.

11.5 Mining Method

The mining method used is narrow vein longhole open stoping, utilising a single vein 'ore drive' for drilling, blasting and loading. Two variations of long hole stoping are undertaken at Kapan, 'bottom up' and 'top down'. Top down mining occurs below the 780-access level as mining advance declines down lower into the orebody and is approximately 90% of ore production. Bottom up mining occurs above the 780-access

level as mining progresses towards surface and accounts for 10% of ore production. Future mining comprises 60% bottom up and 40% top down mining.

Level nomenclature is in metres elevation above sea level. The natural ground elevation above the mine varies between 900 and 1,000m above sea level.

The narrow vein longhole stope mining method used at Kapan features:

- Sub levels are mined at between 12-15m intervals
- Cross cuts are driven from the decline to intersect perpendicular to each mineralised lode
- From this central intersection with the mineralised lode, ore drives are developed east and west along the vein, nominally 3.0m by 3.0m, irrespective of vein width, to facilitate mechanised loading and hauling.
- At the end of the ore drive, a slot raise is excavated to the sub level above.
- A minimum of two parallel blast holes are drilled to the level above. Minimum planned mining width is 2.2m. Blast holes are drilled at 64mm diameter. All drill holes are surveyed for accuracy.
- 2-4 rings are then charged using ANFO (ammonium nitrate fuel oil) and fired.
- Loading is undertaken from the lower ore drive using a remote loader. Tramming distance can be up to 200m.
- Stope panel design height is 50m (3-4 levels), with rib pillars 6m long and planned every 50 to 60m along strike to provide hanging wall support. Pillar locations can vary, as pillars are placed in waste or low-grade areas where practical.
- Cavity monitoring survey (CMS) is used to map completed stope voids to assist in calculation of dilution.
- Depending on the ground conditions there are 5 different drill patterns used. Blastholes are drilled nominally on 1m spacing with 1,2 or 3 holes drilled in each ring.
- Cable bolts holes are drilled in fans at 2m ring spacing by the production drill rig to stabilise the hangingwall. Cable bolts vary in length from 6 to 12m depending on the direction of drilling and dip of the orebody. Generally, there are 3 holes in a fan. All cable bolt holes are cement grouted.
- Mineralised pillars, approximately 15m wide, are left above the intersection of the access cross cuts and vein drives.
- Bottom up stoping requires backfill placed in the lower level before progressing up onto the next level. This backfill is sourced from Decline/Incline waste development and provides support to the host rock reducing ground failures, reduces waste haulage trucking resources, and lessens the surface footprint of waste placement on stockpiles.
- Top down stoping areas can be used as opportune backfilling locations once the stoping block is complete.

11.6 Mining Dilution and Recovery

The Shahumyan deposit lodes average 0.2m in width with a stope minimum mining width of 2.2m. Dilution occurs by two means, primary dilution, the waste contained within the mineralized zone and, secondary dilution, the additional waste created from blast over break. A third factor influencing dilution at Kapan is the material self-mining from the void above the active stope in a top-down mining scenario. Onsite it was reported that this third form of dilution was their largest production issue.

Assumed losses due to loading and transportation of 3% are based on historical mining data – resulting in a recovery of 97% of the stope shape.

CSA understands that dilution is a significant issue at the Kapan Mine. An onsite stope reconciliation study is underway by the technical team to address the issue. Reduced dilution will likely improve mined grade and compliance to metal scheduled.

11.7 Mining Design

The mine is accessed via two adits, from the south, adit 9 and from the north, adit 6. These two accesses link together underground at the 780 level. The main offices and process plant are located adjacent to the south adit.

Access points for Kapan are shown in Figure 32.

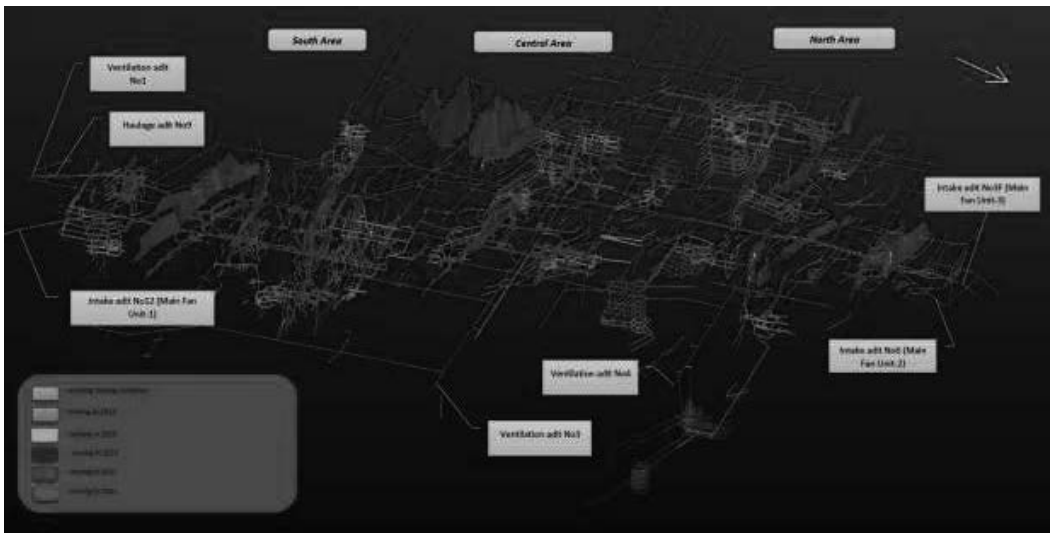

Figure 32 Access points for Kapan Underground (Polymetal Engineering, 2018)

Main workings underground have minimum cross sections areas and presented in Table 17:-

Table 17 Main working drive cross sectional area

Opening	Cross Sectional Area (m^2)
Main Haulage Adits, Declines	19.0
Lateral Crosscut Drives	17.3
Ore Drives	10.0
Ventilation Drives	11.5
Ventilation Raises	5.0

11.8 Mine Services

11.8.1 Mine Ventilation

The mine is currently ventilated by four primary fans located on 3 separate fan sites. These fans produce 450m^3 of total air flow. There is a further fourth primary fan carried as a spare. The fan locations are presented in Figure 33.

Main fan 1 consists of two Atlas Copco Serpent AVH180.500 fans operating in parallel and located in adit 12. These fans are designed to provide 188m^3/s of total airflow. Air is supplied to the 710RL vent and water

collecting level. Airflow is then split via declines No.1 and No.9 In order to ventilate the mining blocks of the south area. Exhaust air is removed via vent raise No.4 and No. 9

Main fan 2 and 3 are Atlas Copco Serpent AVH180.500 fan and deliver 131m^3/s each at mine pressure drop of 2,200Pa. These fans provide fresh air via adits 6 and 3 to ramp 7. The main air flow is distributed to ventilate stopes and development workings in the North and Central areas of the mine.

CSA considers 450m^3 of primary ventilation sufficient for the scheduled mine development and production.

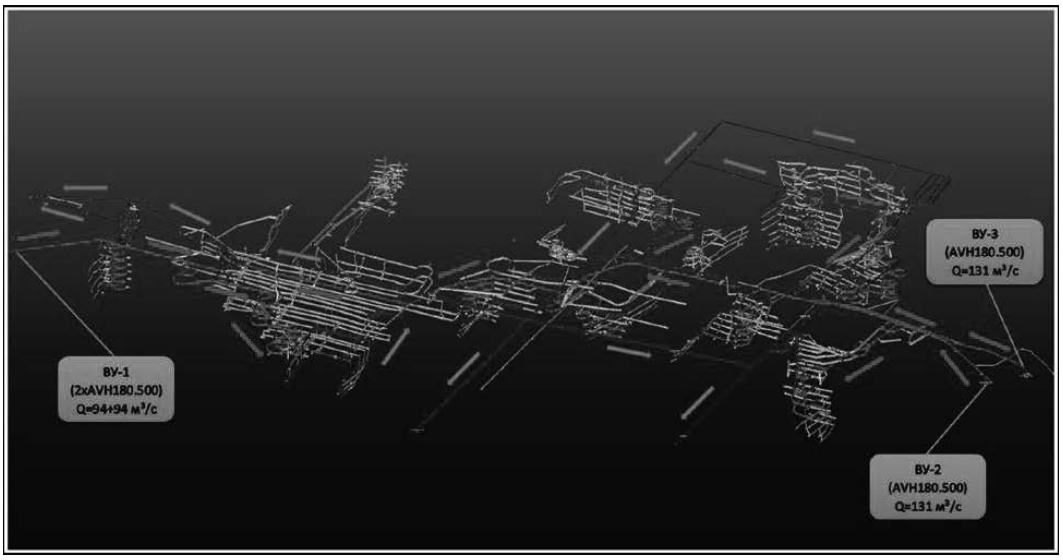

Figure 33 Schematic of Kapan main ventilation infrastructure (Polymetal Engineering, 2018)

11.8.2 Pumping & Dewatering

CSA Global understands from previous work that the maximum water inflow to the underground mine will not exceed 425 m^3/hour (Polymetal Engineering, 2018), and as such is not considered a wet mine. A portion of the mine water with a flow rate of 70 m^3/hour will be used for the process plant needs. Table 18 summarises the expected maximum groundwater inflow quantities at Kapan mine.

Table 18 Maximum groundwater inflows (Polymetal Engineering, 2018)

Area	Groundwater inflow (m^3/hr)
South area	150
Central area	135
North area	140
Total	425

The mine dewatering system operates using intermediate pump stations, with pump capacity ranging from 8–37 kW. Sumps across the mine collect and settle the dirty water. Water flows across the three working areas are as follows:

- The South area dewatering system has two central pump houses, the existing TsNS-1 at the +680 m level and a designed TsNS-2 at the +610 m level and a local pump stations for water pumping from lower levels to the TsNS water collecting sumps.
- The Central area dewatering system consists of TsNS-3 central pump house at the +710 m level and additional designed local pump stations. These will be required as the mine deepens for pumping water from the levels below the TsNS pump station and from isolated zones in the Central area.
- The North area dewatering system plans for construction of two independent pump houses (i.e. TsNS-4 and TsNS-5), with water pumping to the sumps in adit no. 4. As the mining areas are extended and new levels mined, the local pump stations will pump water to the TsNS collecting sumps.

All access and development workings are driven at a specified gradient, ensuring water flow towards the collection sumps of the main pump houses and local pump stations.

Water pumped out of the underground workings is delivered to the main surface sump designated for the mine water collection and treatment.

CSA Global understands that the collection and centralised pumping plan is currently under refinement with the establishment of centralised and efficient pumping chambers. The mine appears to have a proactive approach to designing and maintaining the underground dewatering system.

11.8.3 Water Supply

The plant and mine water supply requirements are currently provided by the recirculation of water from the TMF and from underground water inflows. Makeup water when required is taken from the Voghdji River that flows through the town.

Mine water is gravity fed from tanks installed on surface and reticulated down the decline and along each level through poly pipe. Larger consumers of water underground are handheld mining, twin boom Atlas Copco Boomer 282, Sandvik DD210 (development), DL210 (production) Drills, stope and dust suppression.

CSA Global understands that there is no evidence of water shortages.

11.8.4 Power Supply

Power used on site is supplied by the Russian owned “Electric Networks of Armenia” CJSC. Power supplied at 35 kV is transformed at Shahumyan Mine to 6 kV for site distribution. Power supply via the 35/6 kV main step-down substation “Plant” is provided by a 35 kV power transmission line from the main step-down substation. The 35/6 kV main step-down substation contains three transformers of 4,000 kVa, 35/6 kV (two operating, one standby).

CSA Global understands that the installed energy supply and distribution is not a constraint at current mine production rates.

11.8.5 Mine Air Supply

Compressed air supply underground is provided by three compressors providing approximately 320m^3. With the implementation of mechanised drilling and reduction in airleg operations, compressed air requirements are estimated to be 80-90m^3.

CSA Global understands that as the mine transitions to further mechanised methods of extraction, compressed air demand is likely to decrease over time.

11.9 Mine Equipment

The Kapan mine utilises mechanised narrow vein long-hole stoping for ore extraction and trackless mechanised transport to surface. The mining cycle consists of the following key production areas:

- Trackless mechanised development (drilling, blasting, supporting, loading and hauling).
- Mechanised long-hole stoping (drilling, blasting, supporting, loading, hauling and backfilling).

The mining cycle consists of the following activities:

1. Drilling.
2. Blasting.
3. Support drilling and bolt/cable anchor installation.
4. Loading.
5. Hauling.
6. Backfilling of waste into open stopes.

11.9.1 Drilling

At Kapan, the drilling activity is separated into short shot-hole (development), long-shot-hole (production) and support drilling. Different mechanised drilling machines are required for each of these sub-activities.

Development drilling is performed by a mix of single boom and twin boom drill-rigs. Single boom drill rigs are reserved for smaller cross-sectional area drives such as the ore drives, and twin boom drill-rigs are used in the larger primary development headings and Declines.

Support drilling is performed by a single DS311 capable of drilling long anchor holes for installation of cable anchors.

Production drilling is performed by various original equipment manufacturer (OEM) long-hole capable machines.

CSA Global considers the number of long-hole machines adequate for the planned stoping quantities.

11.9.2 Blasting

At Kapan, the blasting activity is supported by utility vehicles modified for the purposes of transporting and charging of shot-holes.

CSA Global considers the current number of charging units to be sufficient for the planned production and development.

11.9.3 Loading and Backfilling

The loading of blasted ore and waste as well as the backfilling of open stopes with waste material is achieved using two classes of LHDs. Ore drive development and backfilling of waste into the open stopes utilise a 3.5-t class LHD due to the smaller cross-sectional area of the ore drives to minimise dilution.

The loading of waste in the larger cross-sectional primary development drives is achieved utilising a 7.0-t class LHD.

CSA Global considers the current number of LHD units of each type to be sufficient for the planned development, ore handling and backfilling requirements.

11.9.4 Hauling

Transport of ore to surface is achieved by the loading of broken ore into 33-t diesel haul trucks and hauling via the main Decline.

CSA Global considers the current number of hauling units to be sufficient for the planned development, ore handling and backfilling requirements.

11.9.5 Ancillary/Support Equipment

Ancillary equipment fleet at Kapan consist of various utility vehicle modified for transport of equipment, consumable and stores in and out of the mine. In addition to the utility vehicle fleet, a dozer for the maintenance of underground haul roads is available on site.

CSA Global considers the current number of ancillary units to be adequate for the current mine operations; however, the number of ancillary support units may increase as the mine matures.

11.9.6 Kapan Equipment Summary

The Kapan mine equipment is summarised in Table 19 below

Table 19 Kapan Mobile Equipment, (CSA Fatal Flaw Analysis 2018)

Equipment type	No.	Average engine hours
LHDs		
ST7	9	8,934
LH-203	4	3,482
LH307	1	4,526
ST2G	1	7,138
R 1300G	1	19,244
Haul trucks		
MT2010	3	11,834
MT436B	7	7,679
Drill rig – short hole		
Boomer 282	2	4,119
DD210	6	679
Drill rig – support drilling		
DS311	1	1,233
Drill rig – long-hole		
Simba 1254	1	644
Stope Mate	2	NA
DL210	4	191
Ancillary and support equipment		
Utilift MF540	1	1,961
Utilift 6330X	1	3,161
Utimec 164 PER	2	3,163
Multimec 6600	1	3,106
Charmec MF605DA	1	3,940
Charmec 6305X	1	1,957
D65EX-16	1	4,639
TOTAL	**50**	-

11.10 Mine Personnel

The labour workforce required at Kapan mine are separated into several departmental categories based on the type of business function they provide, namely:

- External part-time workers
- Contract employees
- Management
- Mining staff
- Enrichment
- Production staff
- Repair and maintenance staff
- Transport staff
- Other staff.

The Mining Department functional department provides the technical support to the underground mining operation in addition to the machine operators and engineering maintenance staff. Table 20 summarises the mining departmental workforce at Kapan mine.

The underground workforce operates on a continuous operation calendar (365 days per year) on a 3 x 8-hour shift arrangement.

Table 20 Mining Department Workforce Summary (CSA Fatal Flaw Analysis 2018)

Mining Department Workforce	No. of staff
Mine Management and Engineering	
Mine Manager	1
Chief Engineer	1
Engineer	1
Administrative Assistant	1
Ventilation Supervisor	1
Underground Supervisor	1
Underground Assistant Supervisor	2
Mine Foreman	15
Drill and Blast Supervisor	1
Drill and Blast Foreman	1
Storekeeper - UG Explosives Magazine	2
Chief Mechanical Engineer	1
Equipment Repair and Maintenance Foreman	1
Subtotal	**29**
Underground Workers and Machine Operators	
Lamp-room Worker	9
Ventilation Officer	6
LHD Operator	39
Haul Truck Operator	30
Boomer 282/Sandvik DD210 Drill-rig Operator	33
Sandvik DL210 Drill-rig Operator	15
Timberman	18
Sandvik DS311 Rock Bolting Machine Operator	6
Scaletec MC Roof Scaling Machine Operator	3
Normet Utilift Utility Vehicle Operator	9
Normet Utimec Utility Vehicle Operator	6
Normet Multimec Utility Vehicle Operator	3
Underground Mine Worker – General	84
Shot-firer	27
Assistant Shot-firer	9
Normet Charmec Charging Machine Operator	15
Explosives Distributing Officer	9
Explosives Preparation Assistant	6
Grinder	3
Electrician – Mining Machines	6
Mechanic Fitter – Mining Machines	6
Subtotal	**342**
GRAND TOTAL – MINING DEPARTMENT	**371**

CSA Global considers the mining workforce labour number to be adequate for the planned production profile thus ensuring safe and sustainable production considering the shift arrangements and machine count.

The Kapan mine total workforce is summarised in Table 21.

Table 21 Kapan Mine Total Labour list (CSA Fatal Flaw Analysis 2018)

Department	No. of staff
External part-time workers	0
Contract employees	4
Management	96
Mining staff	342
Enrichment	106
Production staff	158
Repair and maintenance staff	116
Transport staff	43
Other staff	68
Total	933

11.11 Mine Production and Capacity

The underground mine output is scheduled to be 625,000t for year ending December 18 and 700,000t for year ending December 2019.

The underground mine operates:

- Working days per year – 365
- Working shifts per year – 3
- Underground Shift Duration (hrs) – 8

The expected mine life according to the schedule is 5 years

11.12 Production Schedule

The underground mining schedule for the Shahumyan deposit is presented in Table 22. A graphical representation of the mining schedule is presented in Figure 34.

Table 22 Production Schedule

Commodity	Units	Total	2018	2019	2020	2021	2022	2023
Ore	kt	4 060	630	700	700	700	700	630
Au content	g/t	2.1	2.2	2.4	2.1	2.0	1.9	2.0
Au metal	kg	8 516	1 380	1 669	1 480	1 427	1 304	1 256
Ag content	g/t	40	38	43	40	37	41	39
Ag metal	t	161	24	30	28	26	29	24
Cu content	%	0.44	0.35	0.47	0.40	0.41	0.52	0.40
Cu metal	kt	17.4	2.2	3.3	2.8	2.9	3.6	2.5
Zn content	%	1.67	1.75	1.58	1.74	1.45	1.63	1.87
Zn metal	kt	67.6	11.0	11.0	12.2	10.1	11.4	11.8
Development and ore body access workings	'000 m3	825	198	161	186	197	76	7
	kt	2 268	545	442	511	541	208	19

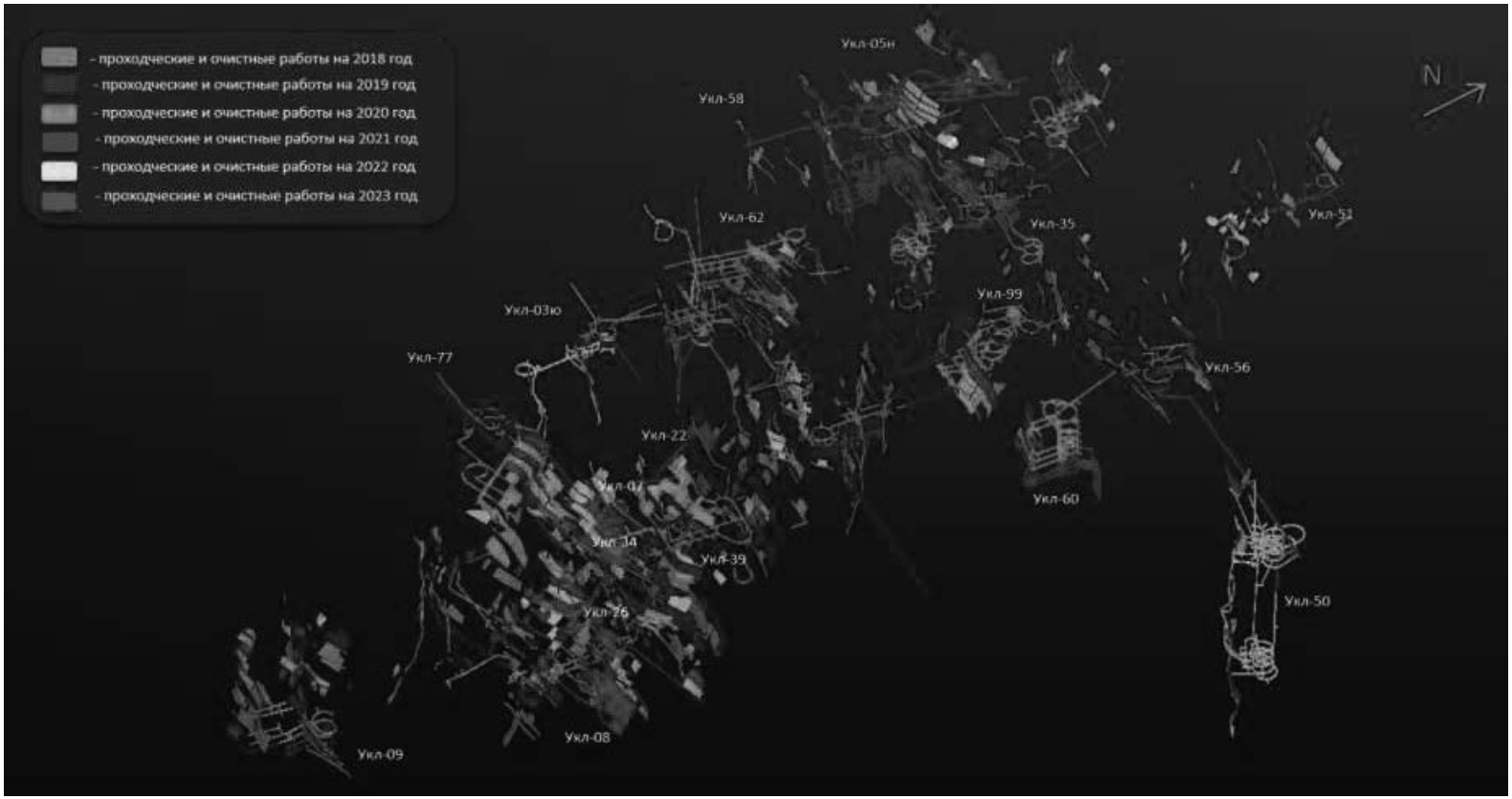

Figure 34 Mining Sequence (Polymetal Engineering, 2018)

11.13 Emergency Preparedness

A surface storage of fire-fighting materials is provided near the entry of adit no. 1 at the mine site. All the main operating areas and working levels are provided with underground fire-fighting gear, fire extinguishers and other fire-fighting means, and a fire alarm system is provided.

Additional measures in place at the Kapan mine include:

- A positioning control system is in place at the mine, which allows for the personnel location control and the information output to the mine dispatcher.
- A local telecommunication network providing a reliable fire alarm.
- The fire alarm system sensors are connected to the data collection devices. The sensor signals are transmitted to the dispatcher control panel.
- Communication and signalling system enabling transmission of commands to the fire-fighting teams and informs the service personnel.
- The security alarm system integrated into the telecommunications network.
- All underground workers are provided with PPE and self-rescue breathing apparatuses.
- A safety management system focused on active hazard revealing and risk management. Employees undergo safety training according to their positions and functions. The mine prepares an action plan on accident localisation, response and post-accident recovery at a hazardous production facility is prepared every half-year.
- All the employees are trained in emergency preparedness and escape routes and instructed as to the duties and rules of conduct in case of emergency (with signed acknowledgement).
- All mining operations, including drilling, blasting and haulage are carried out according to the prepared certificates, schemes, plans, which are prepared based on the legislative instruments of the Republic of Armenia and other regulatory documents effective on its territory.
- The ventilation and dust suppression system checks are carried out according to the schedule, approved by the mine Chief Ventilation Engineer. The air condition in the underground workings is also checked.
- The underground mining equipment and devices have conformance certificates and permissions for use.

Emergency response procedures have been determined and a mine rescue team has been trained and equipped with all the required means. Regular drills are provided regarding evacuation and other emergency response actions.

12 Geotechnical

CSA Global has completed a geotechnical review based on desktop assessments of documents provided by Kapan; these documents in no order of priority include:

- Report on Mineral Resource and Ore Reserve Estimation at the Shahumyan Gold-polymetallic Deposit as of 01.01.2018, JSC Polymetal Management Company and JSC Polymetal Engineering (2018)
- Ground control management plan (GCMP), Version 10, Converted to English (2015)
- Plans and sections provided in various appendices.

The review is focused on high-level aspects that pose fatal and/or material flaws, to the operation meeting its forecast business plan. Geotechnical aspects that formed part of the review included inter alia:

- Knowledge and understanding of the geological aspects of the orebody and host rock related to geotechnical domaining and design
- Appropriateness and representativity of information used to inform geotechnical designs
- Appropriateness of mining methods
- Adequate stope and pillar sizing
- Fit for purpose ground stabilisation measures.

12.1.1 Geological and Mine Setting

This section contains the geotechnical high-level review of the Shahumyan gold polymetallic deposit. The deposit is in typical mountainous terrain, the area being characterised by terrain heights reaching 700 m to 3,200 m above the sea level. Typically for Kapan, mineralisation is hosted in veins which often present as closely spaced anastomosing vein structures, displaying a broadly east-west strike and steep (70–85°) dip to the north or south. The strike length of the mineralised bodies varies from several tens to several hundreds of metres, and average vein width is 0.7–1.5 m. The down-dip extent of the veining varies from 100 m to 200 m, and rarely extends beyond 300 m down dip. The mineralisation at Kapan occurs in altered dacite, andesite and basaltic host rocks. The main ore minerals are chalcopyrite, sphalerite and minor galena, along with gold and silver.

Mineralisation styles include massive sulphide veining, stock work and network veining and disseminated styles. The Mets-Magarin, Khalaj, Khotanan, Bashkend, Central and Western-Shahumyan fractures have all been identified as fluid pathways for mineralisation, in which the Kapan deposit is hosted. Three major faults (Shahumyan West, Central and East) subdivide the deposit into three zones. The faults strike northwest-southeast, dipping between 40° and 60° to the northeast. A typical plan view of the mine clipped to the 750 mRL level is shown in Figure 35.

Although the style of deposition is complicated, characterised by stockwork and anastomosing veins, **CSA Global acknowledges that adequate consideration** of the geological setting of the ore zones and host rocks has been incorporated into geotechnical designs. **CSA Global strongly suggests that Kapan considers planning regional pillars** (buffer zones) against the six major faults that subdivide the mine. Operationally, this would equate to stopes mining to within 10–15 m of major fault systems and being stopped rather than stopes terminating at the intersection of veins and the major faults. This approach will control the ingress of water into the mine and maintain mine wide-stability, should extraction ratios exceed 80–90% in certain sections of the operation.

CSA Global suggests that Kapan develop a ground control hazard plan based on the following parameters:

- Maintaining the regional subdivision of the mine based on major structural lineaments (faults and dykes)

- Incorporate the frequency and spacing of vein structures for local section scale hazard plans
- Contour Q ratings and superimpose onto structural hazard plans

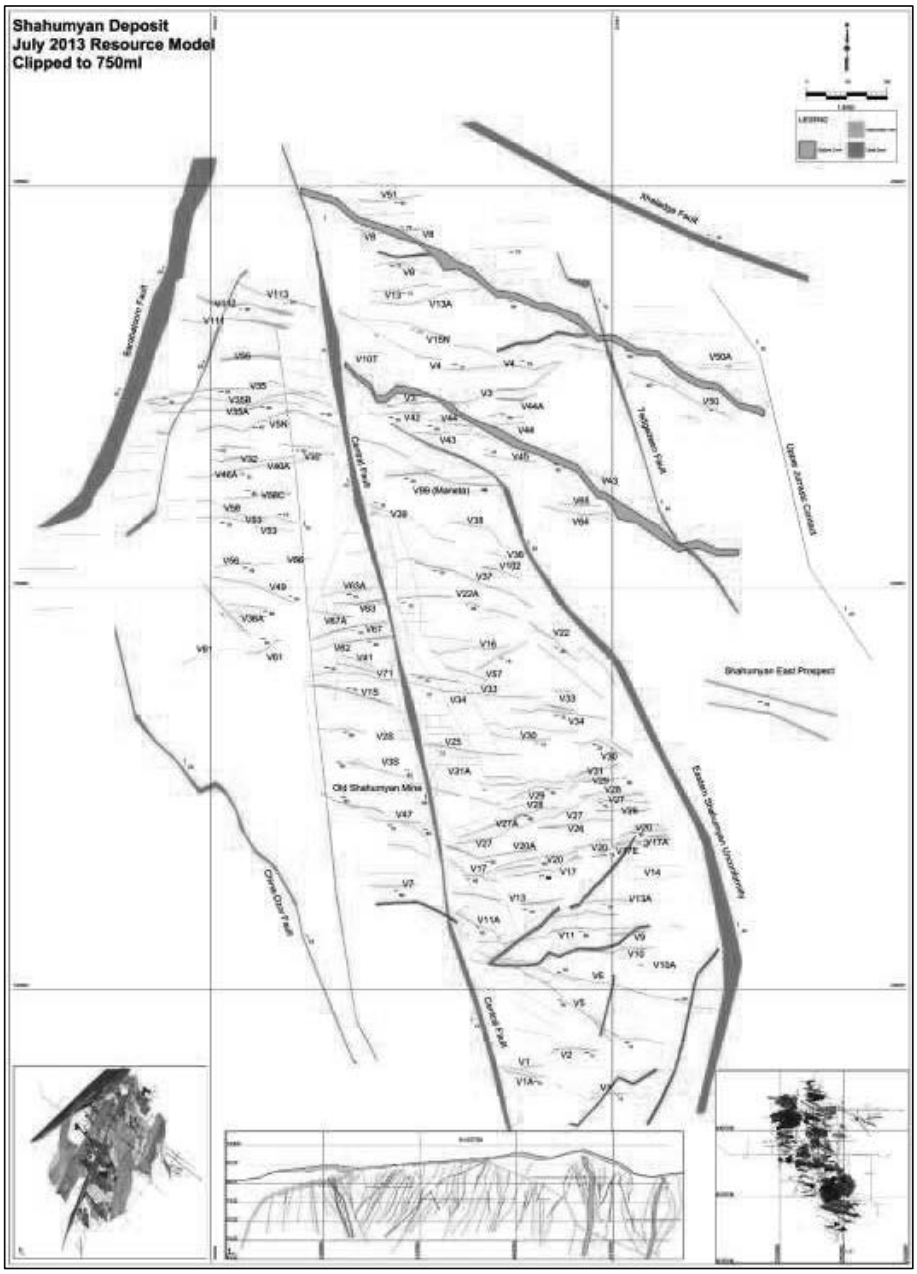

Figure 35: Major structural features within the Kapan mineralisation (purple – major faults; blue – gabbro dykes; green – interpreted ore veins)

12.1.2 Geotechnical Data that Supports Design

Geotechnical data is collected through:

- Drill core logging
- Scan line mapping of underground development ends.

These methods are **accepted by CSA Global as typical industry practice**.

The documents provided do not report the inclusion of strong ground motion (earthquakes) in geotechnical design.

12.1.3 Geotechnical Design Elements for Stopes

Optimal stope sizes have been derived using well-establish empirical design charts based on the original Mathew (1980) open stope design charts, which have been subsequently revised by several studies. Kapan calculates stability numbers and critical hydraulic radii (HR) for two conditions i.e. 70° and 50° dipping veins (Table 23 to Table 25). The stope sizes obtained are:

- Stope height is currently 50 m. Rib pillars, nominally 6 m wide, are left at 50–60 m along strike to provide hangingwall support. However, the pillar size and spacing can vary as pillars are preferentially left in areas of low grade.
- Mineralised pillars, approximately 15 m wide, are left above the intersection of the access crosscuts and vein drives.

Table 23: Geotechnical parameters used to derive stability numbers

Average Q'	70° Dipping Vein	50° Dipping Vein
Q'	8.75	8.75
UCS (Mpa)	100	100
Sigma 1	8.24	8.24
Stress:strength	12.14	12.14
Factor A	1	1
Angle between stope face and daylighting joint	0	0
Factor B	0.2	0.2
Potential Failure Mode	Slabbing	Slabbing
Dip of Stope Face	70	50
Dip of Critical Joint	45	45
Factor C	6	4
N = Q' x A x B x C	10.41	7.25

Source: GCMP, 2015

Table 24: Geotechnical parameters reported in JORC compliant documents (JORC, 2018)

Parameter	Value
UCS (MPa)	50
RQD (%)	90
JN	2
JR	2
JA	3
JW	1
Q	122
RMR	45
GSI	61
CAT	3,8

Table 25: Critical hydraulic radii (GCMP, 2015)

Stability condition	HR (70° vein)	HR (50° vein)
Stable without support	<6.1	<5.2
Unsupported transitional	6.1 to 8.8	5.2 to 7.6
Stable with support	8.8 to 11.2	7.6 to 10.2
Supported transitional	11.2 to 13.1	10.2 to 12.3
Unstable with support	>13.1	>12.3

Source: GMCP, 2015

Based on empirical design guidelines used by Kapan, for unsupported stable stope sizing with sporadic rather than systematic post filling, **CSA Global views the designs adopted by Kapan as overly aggressive, materially flawed and disconnected from the HR** numbers reported. The designed stope sizes do not support the stable HRs reported (<6.1 for 70° veins and 5.2 for 50° veins).

CSA Global views the extraction ratio (estimated at 85–90%) to be too aggressive for the rock mass quality reported. Extraction ratios between 70% and 75% appear plausible. CSA Global supports the reported rib and sill pillar dimensions of 6 m and 4 m respectively, in lieu of stoping widths being narrow (0.5 m to 3.0 m).

12.1.4 Ground Stabilisation Measures

Split sets (friction bolts) and mechanically-anchored bolts are installed as primary support in all development ends. These are installed using handheld air-legs and roof-bolting jumbos. If cable bolts are required, the production long hole drilling equipment is used. Cable bolts are installed in the stope hangingwall mainly to limit dilution. The bolts are cement grouted seven wire plain steel strand cable (15 mm diameter). The maximum length of the bolts is 12 m.

CSA Global supports the ground stabilising strategies reported but advises the operation to ensure that friction bolts maintain their operational longevity in LOM excavations. If friction bolts are prone to corrosion, then Kapan should consider using resin bolts for LOM excavations but continue split sets in short to medium term development ends.

CSA Global considers the stope sizes adopted and extraction ratios as overly aggressive for the rock mass quality and HR reported. The stope sizes planned may be a large contributor to unplanned dilutions of between 20% and 25%. Based on empirical design guidelines used by Kapan, for unsupported stable stope sizing with sporadic rather than systematic post filling, **CSA Global views the designs adopted to be materially flawed and disconnected from the HR numbers reported. The designed stope sizes do not support the stable HRs reported (<6.1 for 70° veins and 5.2 for 50° veins).**

CSA Global would suggest the following revisions and adaptations to be implemented by the operation:

- The stope heights between sill pillars to be reduced to between 20 m and 30 m as opposed to 50 m. The exaggerated stope heights may be the cause of unplanned dilutions reported to be 20–25% (GCMP, 2015).
- To recalculate stope sizes based on the “stable lines” on empirical charts since waste filling is sporadic and unsystematic.
- If waste filling is systematic, recalculate the HR based on revised strength to stress ratios for the “A-parameter” since waste fill offers back support and reduces the exposed strike length.
- Calculate the stope stand-up time for filled and unfilled options.

12.1.5 Groundwater Input

CSA Global reviewed available technical reports and associated information relating to groundwater flow.

For Kapan, aquifers were identified based on geological core exploration drilling, ranging from alluvial-type aquifers (boulder pebbles, volcanic rocks) to a non-homogeneous fractured volcanic rock aquifer system. **The depths to groundwater levels are well-known**. The hydraulic conductivity for each aquifer was based on typical ranges and representative values. This information could be used to determine (through analytical groundwater flow equations) the anticipated groundwater inflows into underground mining areas and adits, dewatering of aquifers, as well as groundwater baseflow interaction with the local river systems (e.g. Vokhchi River and Khaladzh River). To a certain extent the aquifer hydraulic parameters could be calibrated against observed groundwater inflows into some underground mining areas.

Mine water quality is very superficially described in the reports. The chemical composition at the upper underground mining levels is sulphate-hydrocarbonate (total mineralisation of 0.6–1.5 g/dm³), while 80 m deeper the chemical composition is calcium-sodium-sulphate (total mineralisation increased to 4.2 g/dm³). However, the water pH is similar for both shallow and deeper mining (ranging between 6.0 and 7.5).

Very limited information on waste streams could be found; limited descriptions, maps and flow diagrams of e.g. waste dumps and mine/plant water dams. This is problematic in terms of mine closure costs, if such waste streams must be mitigated, removed or managed after the cessation of mining. Groundwater quality impact predictions, impact assessment methodologies, etc. could not be found for the current operational phase, nor for the post-closure phase. **As far as could be determined, groundwater level and quality impact areas have not been delineated.**

No water monitoring protocols could be found (e.g. frequency, water quality parameters, water quality guidelines, reporting format).

The hydrogeological conditions were described as “simple for mine development”; maximum underground mine inflows will not exceed 300 m³/h for Kapan, for which a discharge permit was issued.

Underground mining will be utilised at the Kapan area, because it generally has a lower environmental impact than open pit mining. However, surface activities such as waste rock dumps and tailings facilities will remain on surface, which require rehabilitation after mining.

CSA Global concludes that provided that production process procedures are strictly adhered to, the proposed operation will have a minor environmental impact and does not virtually pose any hazards in terms of environmental pollution outside the sanitary protection /buffer zone.”

Based in the descriptions of the aquifer types, aquifer parameters, and observed groundwater seepages into underground, **groundwater inflow predictions into the underground appeared to be realistic.**

12.1.6 Tailings Management Facility

The existing Geghanush Tailings Management Facility (TMF) was originally developed during the early 1960s and operated between 1962 and 1983. Up to 4.6 Mm^3 of tailings was deposited on the 28 m high Geghanush TMF by 1983, when the tailings stream was diverted to the larger Kadjaran tailing facility at Artsvanik. The Geghanushi TMF was only re-commissioned in 2006, following the design and implementation of a culvert to divert the Geghanush River.

The Geghanush TMF is located in a steep sided north-south valley and has a relatively short length of northern and southern embankment wall at either end, approximately 750 m apart, with tailings being deposited alternatively from both the northern and the southern sides. In the valley below the northern wall is the town of Kapan (population 34,000 in 2016) the gold processing plant and associated infrastructure.

The northern embankment wall was raised in April 2012, and together with the southern wall, previously raised, the TMF apparently had a further life of 10 years with a 2012 throughput of 600,000 t/a. Annual

embankment raises are planned, in order to increase the combined throughput of the Process Plant to 1 Mt/a,

During December 2013 the previous owners, DPM, asked Golder Associates to investigate the engineering, stability and cost implications of extending the life of the Geghanush TMF for the deposition of an additional 5.4 Mt or approximately 3.4 Mm^3 of tailings, at an average annual deposition tonnage of approximately 600 kt/a. At this annual deposition rate the TMF is expected to be used until about 2023. The TMF had a potential tailings capacity of 11 Mm^3 at a closure wall height of approximately 50 m.

The current Geghanush TMF is at 821.5 m above sea level (ASL) and the current plan is to increase the final height up to level 850 m ASL, a further +28.5 m.

12.1.7 Slope Stability/Seismicity and impact on Geghanush TMF

Based on Golder Associates data, received from the Institute of Geological Sciences, at the National Academy of Sciences of Armenia in 2013, a Maximum Credible Earthquake (MCE) horizontal seismic coefficient of 0.27g was adopted for use in the preliminary stability analysis carried out for the Annual TMF Audit for 2013. However, in a subsequent detailed seismic assessment carried out by Georisk CJSC in their report titled "Engineering Geology and Geophysical Studies of the Geghanush Tailings Dump" dated 2014, it is stated that the horizontal peak ground acceleration (PGA) mean value for 10,000 years return periods (which corresponds to the 1.0E-4 annual exceedance probability) is 0.31g, and for 85% confidence level the value is 0.44g.

Analyses of both the North and South walls' performance under **seismic conditions** showed them to have **Factor of Safety (FoS) less than the required value of 1.1** for the adverse condition of a MCE as a "High" consequence dam. The analyses indicate that **both the North and South embankments of** the facility **will require stabilisation (buttressing)** in order to meet performance requirements during an MCE seismic event.

As part of the overall upgrade of the Geghanush TMF, waste rock buttresses are currently (September 2018) being installed on **the northern embankment, but not yet on the southern embankments of the facility,** to safeguard the long-term stability thereof. These buttresses will need to be raised and extended as the TMF is raised vertically using the centreline method of wall construction. Advantages of this method (versus upstream deposition) include more time for tailings consolidation, as well as reducing the risk of tailings liquefaction and the predicted levels of wall settlement under pseudo-static (seismic) conditions.

Based on the stability review work carried out by Golder the Geghanush TMF is defined as: "at least a 'high' consequence dam and **probably a 'very high' consequence dam"**. As such, the minimum factor of safety during operations should be 1.5 (normally 1.3) and a **minimum of 1.1 for the MCE** (normally 1.0). The **southern wall has a FoS (Section D) of only 0,719** and the **northern wall (section C2) at 0,945** both well under the required 1,1 for pseudo-static seismic conditional.

The stability analyses indicates that **only under normal operating (static) conditions** the factors of safety against slope failure of both the North and South walls are **above the prescribed value of 1.5 and thus satisfactory.**

Analyses of both the North and South walls' performance under **pseudo-static (seismic) conditions** showed them to have factors of safety **less than the required value of 1.1** for the adverse condition of a MCE for a "High" to "Very High" consequence dam. The results for a MCE seismic event are based on the peak horizontal seismic coefficient of only 0.27g. The analyses indicate that both the North and South embankments of the facility **will require urgent stabilisation (buttressing) in order to meet performance requirements during an MCE seismic event**. **Until this buttressing work has been fully completed, the facility has a residual seismic risk of failure. At present the butress (September 2018) is still well below the required level on the northern wall and it has not been started on the southern wall.**

According to the preliminary results of stability calculations (also apparently performed by MIT for Polymetal), into stability the actual position of the Northern Wall, the **nature of the TMF collapse during seismic action passes through a complex surface, along the clay base, significantly capturing the beach zone of the tailings as well.**

Prior to construction of the buttress to the same elevation (top) elevation as the TMF – the probability of failure of the TMF is the same as the probability of occurrence of a significant seismic event which could trigger a failure.

According to the Global Seismic Hazard Map, Armenia and the Kapan area, is a High to Very High risk seismic area.

It is a risk that the future tailings expansion has not been adequately planned (conceptual level studies) and not properly costed in the five-year plan. The risk is the possibility of inadequate tailings disposal volume to meet production requirements and inadequate capital allowed for the required construction.

13 Processing and Saleable Metals

There are two main ore types:

- Pb-Cu-Zn; relatively rich lead content (42%)
- Cu-Zn; with low content of lead (58%).

13.1 Mineralogy

The Shahumyan polymetallic deposit is regarded as a source of ore feed for the polymetallic section of the Kapan Process Plant. The orebodies are represented by 2–3 ÷ 100 m thick veins and stockworks.

Gold-polymetallic ores have a widely varied mineralogy.

Main ore minerals are sphalerite, chalcopyrite, galena, and pyrite. Ore-bearing rocks are andesite-dacite and quartz porphyrites.

Chalcopyrite-sphalerite assemblage generates coarse-grained aggregates of these minerals and forms the larger portion of polymetallic veins. Sphalerite is dark brown, black, and light yellow. Main components of the chalcopyrite-sphalerite assemblage are: Zn, Cu, Fe, Sb. Mn, Cd, Ga, Ge, Ag, Bi impurities are observed. Fe, Mn, Cd, Ga, Ge impurities are idiomorphic and typomorphic for sphalerite.

Calcite-tennantite-chalcopyrite-galena assemblage forms growth lines and veinlet-like aggregates, cutting the chalcopyrite-sphalerite assemblage. Main components of this assemblage are Cu, Pb, Ag, S, Fe, Ca. Telluride assemblage comprises the following minerals: altaite, hessite, tellurobismuthite, petzite, native gold, tellurium, tennantite, tetrahedrite, chalcopyrite, sphalerite, and galena. The upper levels of the deposit show an increase in tellurides. Main components of this assemblage are Bi, Fe, Ag, Au, Pb, Cu, Sb, As.

Mineralogical and metallurgical testwork demonstrated that the deposit contains practically only sulphide ore. According to Vniitsvetmet Research Institute, sulphide ores contain zinc (97.5% sphalerite), lead (85% galena), and copper (85% primary sulphides and 11% secondary sulphides).

According to mineralogical and metallurgical testwork, the main ore-forming minerals form four ore varieties (subtypes), namely copper-zinc, copper-lead-zinc, copper-pyrite and zinc-pyrite. In these ore varieties (subtypes), gold tellurides are mainly associated with sphalerite, and silver tellurides are associated with sphalerite, galena and fahl ore.

Due to multiple alternations of various mineral assemblages and aggregates in the ores, it does not appear possible to isolate commercial (metallurgical) ore grades.

The main commercial components in the ores are gold, zinc, copper, silver and lead. The amount of these components in the ores varies within the following ranges (typical distribution):

- Gold – from 1–2 to 10–20 g/t;
- Zinc – from 2–3 to 10–12%;
- Copper – from 0.2–0.5 to 2.0%;
- Silver – from 20–30 to 200 g/t; and more
- Lead – from 0.05 to 0.5–0.7%.

According to the testwork data, native gold predominantly occurs in pyrite, chalcopyrite and galena, and fine-dispersed gold commonly occurs in sulphides, tellurides and quartz. Gold and silver are represented as tellurides as free gold on boundaries of the sulphide minerals. Gold is found in free form as well as tellurides. Main gold-bearing minerals are chalcopyrite, galena, sphalerite and pyrite; and silver is present as tellurides and as isomorphous mixtures in sulphides.

Based on testwork, the preferred process flowsheet for treating underground ore from the Kapan veins is selective flotation to produce separate saleable copper and zinc concentrates with gold and silver credits.

The lead grade in the ore is too low to enable a saleable lead concentrate to be produced. The presence of copper arsenic minerals such as tennantite will likely result in high arsenic grades in the copper concentrate.

Given the high gold and silver recoveries to the copper and zinc concentrates, it does not warrant including a gravity circuit in the flowsheet when treating the Kapan ore types.

13.2 Predicted Metallurgical Recoveries

Based on testwork the following predicted metallurgical recoveries for the different metals are:

- Copper recoveries of approximately 83–87% to a copper concentrate of 19–23% Cu.
- Gold recoveries to a copper concentrate ranging from 68% to 76%. The grade of gold in the copper concentrate was 200–400 g/t Au, although in practice this will depend on the ratio of copper to gold in the ore.
- Zinc concentrate grades in excess of 60% Zn at recoveries of between 80% and 87% should be achievable.

13.3 Processing Flowsheet

Current process flowsheet comprises:

- Two/three-stage ore feed crushing to -25 mm (80%)
- Three-stage crushed ore grinding to 70% of -75 µm (Stage 1 – rod milling, Stages 2 and 3 – ball milling)
- Copper flotation including: intermediate, rougher and scavenger flotation
- Regrinding of rougher intermediate flotation concentrate, and rougher flotation concentrate to 90% -75 µm and three stages of cleaning
- Zinc flotation including: rougher flotation, scavenger flotation and three stages of cleaning
- Concentrate thickening in conventional thickeners
- Concentrate filtration in drum vacuum filters
- Tailings discharge to a tailings storage facility (TSF).

The equipment installed at the process plant is suitable to achieve the design ore processing rate and productivity, as well as specified metal grades in the concentrates and metal recovery rates.

13.4 Historical Plant Operations Performance

The Kapan Plant treated material from the underground Central operation, commencing in 1953 when some 300,000 t of material grading 1.72% Cu were processed (Deno Gold, 2006). This ramped up to over 1 Mt (supplemented by 35–45% of the feed being produced from an open pit) by 1972 which continued at this rate until 1985 when the open pit ceased production. The underground operation ended its continuous phase of operation in 1997 having produced a combined mill feed of 29.5 Mt and some 2.2 Mt of copper concentrate (grading between 18% Cu and 20% Cu). The material was noticeably extremely "clean" (chalcopyrite being the principal copper mineral), and metallurgical recovery was generally above 90%.

The rate of mineralised material processed from the Shahumyan mine processed since 2003 is presented in Table 26 to Table 29 (DPMK, 2014). It should be noted that in the years before 2008 the plant was also treating remnant material from the Central underground mine before it was finally closed, and also various quantities of material (highly oxidised) stockpiled around the mining licence from the earlier exploration

adits and mine excavation activities since the 1930s. One-hundred percent of underground Shahumyan mineralised material commenced in 2008, before operations were suspended for two quarters, after the collapse of metal prices during the world financial crisis. Operations recommenced in April 2009.

Table 26: Historical treatment of Shahumyan mineralised material (tonnes and head grade)

Material processed		Head grades treated			
Year	Tonnes	Au g/t	Ag g/t	Cu %	Zn %
2003	251,418	1.65	26.0	0.25	1.24
2004	310,966	2.07	29.5	0.26	1.05
2005	256,363	1.42	27.9	0.24	1.47
2006	211,982	1.37	31.6	0.26	1.54
2007	263,469	1.46	34.7	0.23	1.44
2008	239,229	1.91	46.7	0.34	2.07
2009	218,235	2.36	47.0	0.35	2.08
2010	428,865	2.33	42.1	0.34	2.22
2011	521,769	1.77	33.8	0.27	1.81
2012	509,419	1.56	32.2	0.25	1.67
2013	465,894	1.85	34.3	0.27	1.68
2014	402,602	1.97	39.5	0.28	1.54

Table 27: Historical treatment of Shahumyan mineralised material (copper concentrate produced)

Year	Copper concentrate		Metal recovery (%)		
	Tonnes	Grade (% Cu)	Au	Ag	Cu
2003	3,337	14.0	54.8	58.3	74.6
2004	4,960	12.4	68.0	68.8	76.4
2005	3,763	13.5	58.3	61.2	82.0
2006	2,402	16.3	54.0	48.8	72.1
2007	2,276	19.9	58.1	58.6	75.9
2008	3,322	20.5	68.9	68.8	84.5
2009	3,155	22.0	74.2	73.7	90.6
2010	6,396	20.5	72.9	74.1	90.9
2011	6,475	19.7	68.6	69.7	90.4
2012	5,508	20.2	68.0	68.8	87.9
2013	5,650	18.8	69.7	69.8	85.0
2014	4,548	21.4	68.2	70.2	85.9

Table 28: Historical treatment of Shahumyan mineralised material (zinc concentrate produced)

Year	Zinc concentrate		Metal recovery (%)		
	Tonnes	Grade (% Cu)	Au	Ag	Zn
2004	3,486	53.3	7.5	8.0	56.9
2005	4,802	52.9	14.7	14.0	67.5
2006	3,897	52.6	16.0	14.2	62.5
2007	4,872	52.9	15.9	13.3	68.0
2008	7,451	53.7	14.2	13.6	81.0
2009	6,989	59.5	15.3	14.1	91.5
2010	14,361	60.3	17.9	16.7	90.9
2011	14,622	57.8	16.6	16.6	89.7
2012	11,347	61.7	17.5	16.4	82.5
2013	11,995	57.8	18.3	18.2	88.6
2014	9,082	60.2	14.1	13.5	87.9

Table 29: Historical gold and silver production in Cu and Zn concentrates produced

Year	Combined recovery		Contained ounces	
	Gold	Silver	Au	Ag
2003	66.8	71.5	8,902	150,202
2004	75.6	76.8	15,654	226,440
2005	72.9	75.2	8,540	172,697
2006	70.0	63.0	6,537	135,855
2007	74.0	71.9	9,187	211,052
2008	83.1	82.4	12,210	296,033
2009	89.6	87.8	14,836	289,692
2010	90.8	90.8	29,215	527,362
2011	85.3	86.2	25,474	492,137
2012	85.5	85.1	21,843	449,081
2013	88.0	88.0	24,359	452,762
2014	82.3	83.7	18,883	359,921

13.5 Recent Plant Operations Performance

Recent plant performance for 2017 and H2 2018 is summarised in Table 30 to Table 32.

Table 30: Recent treatment of Shahumyan mineralised material (tonnes and head grade)

Material processed		Head grades treated			
Year	Tonnes	Au g/t	Ag g/t	Cu %	Zn %
2017	529,918	2.23	38.9	0.30	1.30
2018*	312,000	1.94	33.5	0.31	1.40

**2018 results to date; inclusive for June end*

The budget ore tonnes to be processed in 2018 are 625,000 t. Results for H1 2018 show that the actual and budget tonnes processed are 311,997 t and 301,182 t respectively; variance of 104%. The outlook for 2018 is 636,000 t.

It is unclear what the reason for the budget tonnes set at 625,000 t for 2018 when the plant has a rated annual capacity of 700,000 t. Perhaps ore supply from the underground mine is the issue.

Table 31: Recent treatment of Shahumyan mineralised material (copper and zinc concentrates produced)

Year	Copper concentrate		Zinc concentrate	
	Tonnes	Grade (% Cu)	Tonnes	Grade (% Zn)
2014	4,548	21.4	9,082	60.2
2017	1,304	-	4,794	-
2018*	793	-	2,962	-

**2018 results to date; inclusive for June end*

Table 32: Recent gold and silver production in copper and zinc concentrates produced

Year	Combined recovery		Contained ounces	
	Gold	Silver	Au	Ag
2017	83.6	83.0	25,268	426,823
2018*	83.4	83.3	14,171	235,886

**2018 results to date; inclusive for June end*

13.5.1 Process Plant Upgrades and Improvements

The Kapan process plant has undergone a number of process plant upgrades including:

- Reduction of the feed size to the rod mill from top size of 45–50 mm down to a maximum top size of 25 mm
- Ball mills have been changed from grate discharge type to more efficient overflow mills
- Diameter of the rods have been increased to reduce the mill circulating load to ⌀100–125 mm
- Ball addition has been modified to include a mixture of ⌀40–60 mm
- The spiral classifiers have been replaced with hydrocyclones
- Increased mill discharge density to 70–75% solids to improve grinding in the mills
- Addition of flash flotation cell in the copper circuit.

There are still some process improvements to consider increasing production rates at the Kapan concentrator:

- Reduce the feed size to the rod mill to 100% -12 mm by operating the tertiary crusher in closed circuit with a screen
- Consider removal of the clay fraction from ore by wet screening the fines fraction.

13.6 Current Processing

The plant produces two concentrates using sequential flotation. Following conventional two-stage crushing and grinding by a rod mill/ball mill circuit, the first is a copper/pyrite concentrate containing gold and silver. Next roughing, scavenging and concentrate re-grinding, cleaning is completed in three stages. The scavenger tails are then conditioned prior to zinc rougher and scavenger flotation, with the zinc scavenger tails being the final process tails. Rougher concentrate is cleaned in three stages, with the cleaner tails being recirculated to the previous stage.

The capacity of the current milling circuit is 2,100 t/d while that of the flotation section is in the range of 2,300 t/d. Copper recovery to the final copper concentrate ranges between 85% and 89% to a grade of 20% to 25% Cu. Gold and silver recoveries into the copper concentrate typically range between 70% and 75%, with the grade of gold in the copper concentrate typically between 90 g/t and 110 g/t. Zinc recovery to final concentrate ranges between 85% and 92% (depending on head grades) with grades between 58% Zn and 63% Zn. These contain a further 10–15% of the gold, bringing overall gold recovery to 80–85%.

Copper concentrate, shipped in bulk bags, is transported by truck to Yerevan, and shipped onwards by rail to Poti port in neighbouring Georgia. Zinc concentrates follow the same route, but are shipped in bulk from site, and in containers from Yerevan.

Final tailings are pumped to the current tailings management facility (TMF). This is located in a valley and has a north and south wall. A decant tower reclaims water which flows by gravity back to the mill. Current water usage in the mill consists of 70% reclaim water from the TMF and 30% fresh makeup water.

Summary of the production schedule for the life of mine can be found in Table 33.

Table 33. Concentrate production plan as suggested by Polymetal

Concentrate Production	Units	Total	2018	2019	2020	2021	2022	2023
Copper concentrate	kt	79.5	10.047	15.291	13.039	12.894	16.664	11.583
Au metal	t	5.92	0.99	1.19	1.02	0.98	0.88	0.86
Ag metal	t	112.04	17.24	21.71	19.17	17.95	19.37	16.60
Cu metal	kt	15.40	1.89	2.99	2.49	2.52	3.31	2.20
Zn metal	kt	5.6	0.92	0.89	0.97	0.86	1.03	0.88
Zinc concentrate	kt	98.4	16.1	17.2	15.9	15.9	17.0	16.2
Au metal	t	1.01	0.16	0.20	0.17	0.17	0.16	0.15
Ag metal	t	19.15	2.84	3.68	3.28	3.11	3.41	2.84
Cu metal	kt	0.9	0.11	0.17	0.14	0.14	0.18	0.13
Zn metal	kt	56.6	9.28	9.30	10.24	8.32	9.49	9.97
Total concentrates production:	kt	178.0	26.2	32.5	29.0	28.8	33.7	27.8
Au metal	t	6.94	1.15	1.39	1.20	1.15	1.04	1.01
Ag metal	t	131.18	20.08	25.39	22.45	21.06	22.78	19.43
Cu metal	kt	16.3	2.00	3.15	2.63	2.66	3.49	2.33
Zn metal	kt	62.2	10.20	10.19	11.22	9.19	10.52	10.85

14 Environmental and Social

14.1 Regulatory Framework

The main law regulating mining in Armenia is the Subsoil Code, which determines:

- Special rights of subsoil use and how to obtain them
- Rights and obligations of the engaged parties and government authorities.

Environmental aspects are dealt with in the Law on Environmental Impact Assessment. Tax Code and Law on Wastes are also applicable, and the Land Code and Water Code regulate surface rights and use of water resources.

The mining industry is regulated by the Ministry of Energy Infrastructures and Natural Resources (MEINR), which grants permissions and supervises mining activity; and the Ministry of Natural Protection, which oversees environmental issues and supervises closure and rehabilitation works.

The mining licence entitles the holder to extract and manage the mineral resources with payment of state fees; nature usage fees; and royalties to the state budget. The mining licence can be granted for a period of up to 50 years, with extension on application to the MEINR.

Deposits of mineral resources are subject to state registration and mined resources must be removed from the state register. The subsoil is exclusively owned by the state, but while the subsoil resources is always state property, the land surface can only be used under land purchase-, usage-, lease- or servitude agreement.

A mining licence is issued only after application for a preliminary environmental impact assessment, which must be obtained before applying for the licence. The mining licence application must also include:

- Receipt demonstrating payment of the state fee for the EIA (Category A - AMD500,000)
- A Waste Management Plan and financial guarantees for implementing the plan
- Mine Closure Plan
- Financial references and guarantees.

The application is then subject to assessment of the impact on the environment, before decision based on review conclusions and an agreement between the Ministry and applicant is concluded.

It should be noted that in 2017 Armenia applied to join the Extractive Industries Transparency Initiative (EITI) as a candidate country. EITI promotes open and accountable management of oil, gas, and mineral resources. Subsequently, amendments have been drafted to the Subsoil Code, the purpose of which is to harmonise current national legislation with the EITI standards.

14.1.1 Licences and Permits

Polymetal has a Subsoil and Mining Licence "No EKSRA (ՇԱՓՎ)-29/183", valid until 2050, for the Kapan operation. The licence is for production of 17.8 Mt (C1 reserves of 7,390,600 t and C2 reserves 10,468,400 t) and the licensed mining lease has an area of 378.6 hectares (ha) but is limited to 400 m absolute elevation at depth. The licence conditions provide for mandatory environmental protection measures. As an active mining operation, it has all the necessary additional permits. Status of the licences and permits are given below.

Table 34: Permitting status

Licence/Permit	Issuing Department	Status
Subsoil and Mining Licence "No EKSRA (ՇԱԹՎ)-29/183"	Minister of Energy and Natural Resources	Dated 25 August 2013, and effective to 14 July 2020. Was extended to end of mine life (2050) on Order No. 381-A of 25 August 2015. Valid until 1 April 2050.
Stationary Source Emissions Permit no. 000086	Ministry of Natural Protection	Valid since 26 June 2017, a perpetual permit, until production capacity changes or other emission sources appear.
Water Consumption and Disposal Permit no. 000122	Ministry of Natural Protection – Water Code	Dated 1 June 2016. Valid to 1 June 2018. Preparation of new permit application is in progress.
Waste Disposal Permit no. 06-17	Ministry of Natural Protection – Waste Generation Standards and Disposal Limits	Dated 5 April 2017. Valid to 5 April 2018. Preparation of new permit application is in progress.

There are also 54 health and safety licences, required for every registered "dangerous object", including all lifting equipment, process plant and underground items, explosives storage and the TSF. These licences are valid for the LOM but need to be validated by the authorities every year.

14.1.2 Environmental Management

An Environmental Management System (EMS) was developed and implemented at all Polymetal operations which establishes corporate standards and determines all mandatory environmental requirements. The EMS has been introduced at Kapan to ensure compliance with national legislation, international standards and effective environmental management requirements, and is certified for compliance with ISO 14001 (2006). Update to ISO 14001 (2015) was scheduled in 2018.

The Kapan operation has developed and implemented a site Environmental Policy, which is posted on the website and accessible to all company personnel and stakeholders. The Environmental Policy is based on national legislation related to environmental protection, management and industrial hygiene. Key priorities are for environmental protection and conservation of biodiversity and cover all stages of operations. The company also has a social policy based on disclosure and engagement, transparency with unrestricted access to corporate information, and social programs that are consistent, needs-focused and efficiently allocate funds.

Operation managers are responsible for environmental performance, regulatory compliance and implementation of mitigation measures. The EMS includes training for personnel required to implement the environmental policies, and those positions whose activities may have the greatest impact on the environment, and relevant environmental safety training.

There is an annual site audit and inspection by the regulators. They have to give written warning at least 10 days in advance but may come in three days if there has been an incident or exceedance of limits.

Site environmental management structure and capacity has been reviewed. Currently at site, there is an HSE Manager who has a team of three environmental and five health and safety officers. The environmental team has reduced from seven, three years ago. As well as regular monitoring activities, the site environmental team undertakes daily assessments and internal audits with spot checks at different departments. The team also runs annual environmental training, depending on the level and experience of the employee and environment awareness is part of the initial induction training.

CSA Global comments that while it was stated that there is good management support for environmental work at Kapan, some training is needed to use equipment and for reactive investigation outside the prescribed monitoring requirements.

14.1.3 Environmental Tax

The legislated approach to environmental protection in Armenia is through payment of fees or penalty tax, for:

- Environmental damage (from emissions, discharges, waste production and disposal, and importing or selling of goods harmful to the environment)
- Utilisation of natural resources (including surface water, groundwater, mineral water, soil and rock resources, and biological resources).

Payment for pollution of the environment with harmful substances is calculated on the basis of the volume of emissions, water discharge or wastes ejected into the environment, and the level of hazard, in the reporting period, usually quarterly. Different tax rates are defined for each type of harmful substance, and limits established by law are used to define breach of allowed dosages.

Nature utilisation payments are aimed at effective and targeted use of State-owned natural resources and providing remuneration for such use. These payments are based on the recorded amount of the resource used in the reporting period. Generally, there is an allowed usage volume that is described in the conditions of the permits under the Mining Code, Water Code and other legal acts, and different rates apply for exceeding them (and sanctions may also be applied).

14.1.4 Environmental Impact Assessment

To obtain a mining licence, an Environmental Impact Assessment (EIA) must be conducted, procedures for which are set out in the Law of Environmental Impact Assessment, and subject to public consultations. The resulting permit then includes the environmental protection obligations and conditions relating to management and monitoring to mitigate negative effects on the environment.

No environmental and social impact assessment (ESIA) studies or reports have been seen during this review, although it is understood that additional EIA studies have to be undertaken for all new Project activities or extensions. Given how long the mine and plant has been operating, and the Soviet legacy, it is unlikely that there is a record of pre-mining baseline conditions. However, DPM conducted baseline environmental studies over the Kapan licence area in 2007, using both internal staff and local and international consultants. Studies included climate, air quality and noise, hydrology and groundwater studies, water quality, aquatic ecosystems, terrestrial flora and fauna, socio-economic and community survey, and cultural history and archaeology. Subsequent impact assessment concluded that the mining operations did impact various physical measured parameters, but that impacts to local communities were minimal. Dundee then implemented an E&S management plan and monitoring program, with regular reporting internally and to the relevant authorities. It is not clear if Polymetal has undertaken any EIA studies since takeover.

An operational EMP was not seen during the site visit, but discussions suggested that the monitoring program and mitigation measures are heavily prescribed, and requirements described in detail as part of the permit conditions. Every three years, external consultants do a survey of the site conditions following a tendering process. Analysis and assessment are based on changes from the last survey as there are no clear baseline conditions recorded.

Armenian legislation requires submission of a five-year Environmental Action Plan (EAP) for the operation, with proposed costs, to the Ministry of Nature Protection, until 2021. Following the ISO 14001 EMS, the Kapan operation also produces an annual costed EAP which for 2017 was nearly AMD213M, on top of regular environmental costs. Neither EAPs have been seen during this review.

14.2 Environmental and Social Setting

Mining at the Shahumyan deposit started in 1863 with construction of a copper smelter and on small mining leases. In the early 1900s, the concessions were amalgamated by a French company and regular mining at the Shahumyan mine started in 1929 and has continued periodically since then. The town of Kapan was established based on the mine and other mining enterprises in the area.

The population of Syunik Province has been decreasing, although there has been some stabilisation in recent years. Less than 40% of the province area is physically suitable for habitation and 89% of the population lives in towns and urban centres usually located in valleys. Mining and processing are the basis of the economy in the area with two major copper-molybdenum operations as well as the Kapan mine and processing plant among the largest industrial enterprises of Armenia.

Kapan has a population of about 34,000 (2016) and is accessed by generally good quality asphalt roads, north from Yerevan and also south to Iran. There is an old airport that has not operated since the conflict with Azerbaijan in 1994 but is in the process of being refurbished by the Kajaran mining operation and due to be operational in 2019. Economically, the Kapan district is very dependent on a well-developed mining industry, with the Kajaran copper-molybdenum operations and a number of smaller production facilities as well as the Polymetal Shahumyan mine. The area produces various building materials of sand, aggregate, marble and polished granodiorite.

The mine is a legacy site from Soviet times and is an intrinsic part of life in Kapan town, with around 933 people employed at the operation. The mine site is on the edge of the town with apparently low environmental impact to local residents, with little noise pollution, few noxious emissions and a favourable dominant wind direction away from the town.

The deposit area is disturbed as a result of the long-term development of the Kapan deposit, including from historical open pit mining; subsidence of the land surface from underground mine caving; waste rock dumps from old open pit and underground mining; and land take for disposal of process plant tailings.

14.3 Environmental Monitoring

Water monitoring requirements are given in the environmental permit which describes where samples are collected and what parameter analyses are required. These include pH, TSS, TDS, BOD/COD, various metals and sulphides. Samples are collected from 13 surface water sites around the TSF, plant area, along the Khaladzh River above and below Project activities, and from the Vokhchi River both upstream and downstream of Kapan. There are four groundwater sample collection sites at piezometers on the north and south TSF dams, although groundwater sampling only started under Polymetal in 2018. Bottled 1.50-litre samples are sent to Yerevan for external, independent analysis with a turnaround time for results of two to three weeks. It was stated while at site that sampling frequency is to increase to weekly next year. Reporting both internal and to regulators is quarterly. Quarterly reporting is to determine fees and charges for discharge/abstraction payments; and statistics are gathered for annual reports.

There are five dust monitoring sites, three around the TSF and two within the plant site area. Measurements are not taken by the operation, with all monitoring of air quality by government inspectors. Dust surveys are undertaken roughly once a month, except over the winter. The regulatory limit is 0.5 mg/m^2 and results seen (for the last 12 months) are well below this. There is some concern over laboratory QAQC as some analyses have come back as zero for the plant area. In addition to the mine monitoring, there are local municipal stations in the city that constantly monitor air quality.

There is no regular noise monitoring at Kapan as this is not required for the permit. Specialists were brought in for a one-off survey in 2017 and found no exceedances of state limits. It is not clear where or when these tests were undertaken.

The environmental department does not carry out any biodiversity monitoring, but tendered external site monitoring undertaken every three years assesses changes in site condition. The last survey in 2017 found no particular change in vegetation but identified reduction in fish populations in the river below the TSF, apparently because spawning fish cannot navigate up the diversion tunnel around the TSF.

14.3.1 Waste Management and Storage

The Project does not have any landfills. All non-mineral wastes generated during operation, are collected, sorted and stockpiled at suitable storage areas at the plant site until collected by subcontracted, licensed, specialist waste management companies. Hazardous wastes (Hg lamps, lead-acid batteries, and laboratory waste) are kept in ventilated storage with a concrete floor and warning signs. All hazardous materials are stored in surface storage.

A waste register is kept as fees are payable for all waste production, storage and disposal, although charges for non-mineral wastes are only for site storage exceeding 12 months. Until 2017, mining waste rock and tailings were not regulated under waste management, but new regulations now include mine rock and tailings in the waste inventory, and fee charges for every tonne of waste rock and tailings deposited at surface have been introduced. This excludes any backfilled waste material.

Reactive and toxic substances and hazardous materials are stored in protected warehouses with concrete floors and warning signs. The explosives magazine is isolated, located some distance from site infrastructure. None of these storage facilities were seen during the site visit.

14.3.2 Geochemistry

This review has not seen any reports on geochemical testing of ore, waste rock or tailings. It was suggested during site discussions that acid rock drainage (ARD) is unlikely at the Project as there is a low sulphide content and adequate carbonate material to counter any acid generation. Initially it was stated that all water monitoring since 2014 shows pH around neutral pH 7-8. However, water monitoring results for the last six months seen on site show that at least one of the surface water sampling points is acidic with around pH3.6 and high electrical conductivity (EC), total dissolved solids (TDS) and most metals. This site is downstream from old adits and legacy waste rock dumps at the north mine. Results for one groundwater sample site on the southern TSF dam wall also show ≤pH6, and distinct high EC, TDS and metal values.

CSA Global: The lack of definitive ARD and metal leaching (ML) testwork is a concern. Comprehensive geochemical characterisation studies allow ARD/ML understanding and prediction and thus implementation of suitable design and mitigation measures, especially if new deposits/ore targets are brought online.

14.3.3 Water Resources

The operation currently recycles all the TMF decant water back for use in the plant. Some 70 m^3/hr of mine dewatering water is also used at the plant, with excess discharged to the river, following treatment, as per the current discharge permit and for a fee. Existing water treatment is to be refurbished and/or replaced so that all underground mine water can be used at the plant, as currently abstracted river water is used to make-up water demand shortfalls at the plant and for other operational needs. Project process and drinking water is from the Khaladzh River headwaters, with additional process intake from the Vokhchi River and the Chanakhchi-Kapan water pipeline. Abstracted fresh water make-up is apparently within the permitted usage volumes.

There is also a settling pond which is used to treat mine waters from Adit no. 1, together with emergency discharges of plant recycle water as necessary. The settling pond removes suspended solids and oil products before water is discharged to the Khalandzh River. The site water management system is not

clear but dirty waste water from the site is discharged to the municipal sewage network via gravity collection headers at approximately 520 m^3/day.

CSA Global: Recycling of water within the operations is important as the Project has to pay for all abstractions and discharges by volume, and improvement should be a priority.

14.3.4 Biodiversity

The review has not seen any biodiversity baseline studies, although it is understood that aquatic and terrestrial ecology studies were carried out by DPM in 2007. Fauna in Armenia is highly diverse given the country's relatively small geographic size, owing to the varied habitats created by the mountainous terrain. Armenia is also important for migratory animals, with about 350 different bird species recorded in the country. About a quarter of the animal species in Armenia are internationally endangered and populations are declining due to poaching and habitat loss.

Southern Armenia remains the last stronghold of the Caucasian leopard (also known as Persian leopard) which is "endangered" on the IUCN Red List of Threatened Species and it is believed that there are only 15–20 individuals present in Armenia. The Syrian brown bear is known in the Kapan area, but the population is thought to be down to 150 in the wild. The Syunik area also has Caucasian lynx, mouflon (thought to be the ancestor for all modern domestic sheep breeds), Bezoar ibex, a number of threatened eagle species, the Armenian tortoise and Armenian Mountain viper, all of which have severely declined, and the Sevan trout which has almost disappeared.

CSA Global: While it is unlikely that these animals would venture near the Project area, given the human activity, with noise, dust and traffic, some scavenger/opportunistic species may be tempted by food availability, especially during winter.

14.4 Social

The Project is an integral part of the local Kapan community, with so many people directly employed, involved in associated goods and service provisions or benefiting from the salaried workforce. Local stakeholders include Kapan town and four rural settlements that neighbour mine facilities, including the TSF.

The village of Geghanush is accessed by the public road that crosses the TSF north dam wall and located 1–2 km west and southwest from the TSF. The population of Geghanush village is 160, most occupied with farming or working in Kapan. There is a school at the village with 40 pupils, some of which come from Kapan as there are more relaxed rules on attendance. It has a spring with good quality drinking water and there is regular dust monitoring at the village.

14.5 Health and Safety

The main legislation for health and safety regulations in Armenia are the Subsoil Code, the Law on the State Regulation of the Maintenance of Technical Security (Law on Technical Security), and the Labour Code. A site health and workplace safety management system was developed to identify, assess and control industrial risks, to protect health of employees, ensure workplace safety and to determine safe standard operating procedures (SOPs) for activities and use of buildings and equipment. The system meets the requirements of ILO-OSH 2001, OHSAS 18001 and GOST P12.0.007-2009.

The Health and Safety Policy uses a systematic approach to industrial risk management based on the nature and scale of employee exposure. Safe working conditions are promoted by organising personnel training and certification; safer work execution practices; use of personal protection equipment; timely repairs and upgrading of equipment; and internal audits of H&S performance. Pre-employment medical examinations are undertaken, with regular check-ups of all personnel.

The Managing Director, Chief Mine Engineer, all leading specialists and a health and safety engineer are certified in industrial and workplace safety. All employees are provided with personal protection equipment according to their job locations and activities. Field units are also provided with communication and signalling aids, safety equipment, life-saving appliances, medical supplies and maps before mobilisation. A fire safety officer is appointed at each work site in each unit. Health and safety induction and training is all done internally, and there are daily department meetings to plan required activities and schedule site operation checks. There is monthly internal reporting and quarterly reporting to different authorities. Every department at the Project has to keep a safety register of incidents, actions taken and plans for improvement. There is also a register of all employees to record annual safety training updates.

A safety induction was conducted at the start of the site visit and area-appropriate PPE provided. Although required PPE is supposed to be mandatory at all times, it was noted that this did not seem to be consistently enforced. Fire prevention and protection was emphasised, with equipment available at all areas of the operation, checked every month, and with single-use extinguishers replaced as needed. The underground mine signalling system was described, and self-rescuers provided. Stench gas is used for alerting of emergencies and there are equipped safety chambers. There is a tag-in/tag-out system for the whole mine site as well as for going underground, and alcohol breathalyser checks for drivers entering site.

Certificates and licence conditions were seen during the site visit for the many H&S "dangerous object" licences held for the operation. Annual validation of each of these licences requires expert assessment with a technical and safety passport system used for approval. Site mine rescue and medical provisions are now subcontracted, also under licence.

Accident statistics for 2014 to 2017 were made available and are as follows.

Table 35: Accident statistics (2014 to 2017)

Rate of accidents	2014	2015	2016	2017
Fatal injuries	1	0	0	0
Lost time injuries	5	7	2	4
Medical treatment injuries	6	9	7	5
First aid	13	10	8	7
All injuries	**25**	**26**	**17**	**16**
Lost time injury frequency rate	0.66	0.8	0.27	0.44
Fatal injury frequency rate	0.1	0	0	0

It does not appear that near-misses are recorded.

The recent fatality in March 2018 is still under investigation but is thought to have resulted from asphyxiation from blasting fumes due to premature re-entry. Discussions with the H&S Manager suggested that the fatality has given rise to many changes in the mine. The ventilation system was already undergoing revision before the fatality but has been re-assessed and implementation speeded up. Subcontracted mine rescue now undertake air checks after blasting and a new SOP for blasting procedures and re-entry is being developed.

There is no requirement to monitor, assess or provide training for community H&S as this is undertaken by government authorities and medical.

14.6 Emergency Response Plan

No Emergency Response Plan has been seen, but site personnel stated that emergency containment and response actions and rescue services are being developed. Analysis of potential emergencies during mining identified drilling and blasting operations as the most hazardous component, while at the TSF,

spillage or failure of hydraulic structures due to climatic or seismic conditions could cause hydrodynamic emergency. Potential emergencies at the TSF include:

- Slurry release due to rupture of distribution pipeline
- Overfilling and overflow of dam crest
- Dam wall seepage accompanied by soil outwash
- Dam downstream slope instability
- Dam failure due to seismic event, military actions, or act of terror etc.

CSA Global: This review has not seen any modelling of dam failure consequences which could be used to help prepare the Emergency Response Plan.

14.7 Mine Closure and Reclamation

Under the Subsoil Code, mines must have a closure plan, which is initially submitted with the application to obtain the licence. The closure plan has to include physical mine closure; progressive and final revegetation; an employee social mitigation plan; and a post-closure monitoring plan. Mandatory financial contributions have to be made, calculated by Government authorities, into a natural protection fund (NPF) to support the plan. The closure plan has to be finalised and approved two years before mine closure.

Little mine site revegetation has been undertaken in the country as the large mines in Armenia have not yet reached the closure stage and the Ministry has had little success in enforcing this activity with small mines at end of mine life. However, natural regrowth seems to occur fairly rapidly on tailings seen during the site visit, and where license holders have failed to undertake proper closure activities, the Ministry of Natural Protection may undertake rehabilitation using the NPF.

The previous Kapan mine owners were exempted from historic mining liabilities, from the old Centralni open pit mine (closed prior to 2004, with rehabilitation activities completed and approved); and from the old waste rock dumps (which have not been rehabilitated and may be a potential source of continuing pollution). The licence and remaining liabilities for these have apparently been returned back the Government of Armenia. There should therefore be no environmental liability beyond closure of the current operation, however full implications of the legal closure requirement should be part of any future permit conditions and negotiations.

Mine closure will include the following technical measures:

- Underground – Ensure stability of mine workings to prevent development of sinkholes and surface subsidence; prevent contamination of aquifers; prevent escape of noxious gases into surface facilities or atmosphere; and seal all access to underground workings.
- Surface – Remediate and prevent future soil erosion; enclose hazardous areas; rehabilitate disturbed land; prevent flooding from mine landforms; protect buildings, structures and underground and surface utility lines located in the footprint of the closed facility.
- Maintain the monitoring and survey control networks and ensure safe work conditions during decommissioning and demolition of facilities.

Caving sinkholes are to be filled with rock, potential future sinkhole locations enclosed, and underground mine access points blocked with masonry or concrete bulkheads. Decommissioned facilities will be made safe with dismantling of the equipment, demolition of buildings as required and reclamation of land for future use. Planned rehabilitation covers mine workings, process plant and admin site, TSF, water ponds and haul roads.

Final closure of the TSF will entail profiling and cladding of embankments for erosion control and maintenance of hydraulic structures. Once consolidated enough to support earthmoving equipment, the

TSF surface is to be capped with a 250 mm layer of topsoil. The current plan includes revegetation, and an irrigation system is to be installed to support vegetation growth.

Estimated costs for mine closure seen during review include those given in the CSA Global 2015 NI 43-101 for DPMK, in turn based on a Technical Memo prepared by Golder Associates. The Polymetal financial model describes closure requirements but does not give specific costs. The Golder estimates were based on standard TSF closure cost assumptions, including use of local materials, supplies and construction rates by suitably qualified contractors (or from other equivalent projects) with allowances for monitoring and maintenance of permanent facilities after closure. The NI43-101 mine closure cost estimates for all the facilities was given as US$12 million , including around US$2.6 million (±30%) for the TSF.

However, a Golder Technical Memo dated December 2013, gives updated closure estimates for an extended TSF allowing for disposal capacity to 2025, with two options for the post-closure water management, as shown below.

Table 36: 2025 Closure cost estimates – breakdown (Golders, Dec 2013)

Activity	Cost (US$)
Option 1	
Capping, revegetation, infrastructure, monitoring and maintenance	7,719,000
Continued use of tunnel	1,751,000
Option 1 Total costs	**9,470,000**
Option 2	
Capping, revegetation, infrastructure, monitoring and maintenance	8,068,000
Closure of tunnel and construction of spillway	3,810,000
Option 1 Total costs	**11,878,000**

A further Golder Associates Mine Closure Study report dated May 2014, excluding the TSF, was also reviewed and showed a considerable amount of detail, with risk assessment, current conditions, potential impacts and proposed work required. Mine closure cost estimates from this study varied from US$9.3 to US$10.2 for unscheduled and scheduled mine closures.

The report included costs (amounting to around US$600,000) and proposed further studies for closure of 12 identified WRDs, liability for which could not be defined. The report stated that the extent of rehabilitation liabilities, particularly for the WRDs and building needed to be defined as these could have significant impact on cost estimates.

CSA Global comments that the 2013 updated estimate of US$12 million (±30%) for the TSF closure seems reasonable for the proposed capacity increase and final TSF configuration. Similarly the approximate US$10 million (or AMD 4.1 billion in 2014 prices based on the report exchange rate of AMD414.04/US$) for the rest of the mine closure and rehabilitation is also appropriate, although it is not clear if this includes any provision for employee retraining, livelihood restoration or other social mitigations. These estimates result in a total closure cost estimate in the range of US$19 million to US$22 million or AMD7.9 billion to AMD 9.1 billion in 2014 prices at AMD414.04/US$.

CSA Global also concur with the Golder report, and reiterate the importance of getting clarity on what the legal rehabilitation liabilities are for various components of the mining area.

15 Economic Analysis

CSA Global has reviewed the financial model prepared by Polymetal for the Kapan project. All dollar values are quoted as US$.

15.1 Polymetal base case

In order to assess the economic effect from mining of non-ferrous metals at the Kapan Mine, a technical and economic model was constructed for the projected period — 6 years (hereinafter — TEM), from 2018 to 2023. All estimates in the model are in US dollars. Cash flows are predicted in real prices.

15.1.1 Key Assumptions

Macroeconomic Indicators

The key macroeconomic indicators of TEM are given in the table below (Table 37).

Table 37. Macroeconomic Parameters - Polymetal case

Indicators			Notes
Gold price	$/oz	1 200	Gold prices were assumed based on the average annual price forecast — 1200 $/oz; the gold price is fixed for the entire forecast period.
Silver price	$/oz	16	Silver prices were assumed based on the average annual price forecast — 16 $/oz; the silver price is fixed for the entire forecast period.
Copper price	$/tonne	5 500	Copper prices were assumed based on the average annual price forecast — 5500 $/t; the copper price is fixed for the entire forecast period.
Zinc price	$/tonne	2 200	Zinc prices were assumed based on the average annual price forecast — 2200 $/te; the zinc price is fixed for the entire forecast period.
AMD/USD	-	490	
Royalties — gold, silver, copper and zinc	%	4	In accordance with the law

The WACC is assumed at 8% and it was assumed for the TEM purposes that all prices for resources, services and equipment are shown exclusive of VAT.

15.1.2 Capital Expenses Estimation

Capital Expenses — General Description

Total estimated project capital expenses were $21.4 million ex VAT, including investment projects — $7.3 million, retrofitting and upgrading of mining equipment — $6.2 million, other — $2.6 million and closure and liquidation — $5.3 million. The capital expenses are given in the table below (Table 38).

Table 38. Capital Expenses plan - Polymetal case

	Units	Total	2018	2019	2020	2021	2022	2023
Capital costs	**mln $**	**21.4**	12.4	0.4	0.4	2.0	0.4	5.7
New construction/liquidation	mln $	**12.6**	7.3	0.0	0.0	0.0	0.0	5.3
Mining equipment	mln $	**6.2**	4.6	0.0	0.0	1.6	0.0	0.0
Others capital costs	mln $	**2.6**	0.4	0.4	0.4	0.4	0.4	0.4

Investment Projects Expenses

Investment projects expenses of Kapan Mine and Process Plant were estimated based on similar projects, implemented by Polymetal OJSC. The investment expenses take into account the delivery of tangible assets, customs duties and tax payments, contractor works and services of engineering companies. Costs of capital construction facilities include contingencies and construction of temporary buildings — 10% of construction expenses.

Mining Equipment Expenses

The capital costs associated with mining equipment acquisition are predicted based on the plan of the required mining equipment fleet, in accordance with the changing mining scope and average equipment service life.

Mining equipment acquisition expenses were estimated based on the existing 2017 market prices for mining equipment, including delivery to the mine site.

The period of equipment operation in the underground mine corresponds to the average equipment life; therefore, underground mining equipment depreciation is charged proportionally to the mined ore tonnages.

Other Capital Expenses

Retrofitting and upgrading of the process plant includes expenses of minor equipment acquisition — pumps, tanks, etc.

Liquidation expenses comprise capital expenses of mine workings and dumps closure, equipment disassembly and buildings dismantling, allowances and compensations paid to the personnel in case of the mine and plant liquidation.

15.1.3 Operating Expenses Estimation

Operating expenses were estimate for work stages and activities (sheet Cash_costs in TEM). The average specific indicators were calculated based on the 2018 budget. The average specific costs at the main processes per unit of semi-finished product sent to processing are shown in the table below (Table 39).

Table 39. Average unit cost - Polymetal Case

Development and access workings	$/t	-	-	26.68
Ore production — UG mining	$/t	-	-	16.76
Ore processing	$/t	-	-	15.6
Flotation concentrate treatment (sales expenses)	$/t	-	-	117.7
Flotation concentrate transportation (sales expenses)	$/t	-	-	110.3
Refining	$/g	-	-	0.8
Administrative expenses	'000 $	-	-	4 688
Other expenses	'000 $	-	-	1 284

Ore Production Costs — Underground Mining

Ore underground mining cost was estimated taking into account drifting and stoping activities during 6 years from 2018 till 2023.

Cumulative annual mining/ore production costs can be found in (Table 40).

Table 40. Cumulative annualised mining cost - Polymetal Case

	Units	Total	2018	2019	2020	2021	2022	2023
Ore production — UG mining	mln $	128.5	25.1	23.5	25.4	26.2	17.3	11.1

Ore Processing Costs

Ore processing cost was estimated over six project years and is presented in the table below (Table 41).

Table 41. Annualised processing cost - Polymetal Case

	Units	Total	2018	2019	2020	2021	2022	2023
Ore processing	mln $	63.3	9.8	10.9	10.9	10.9	10.9	9.8

Ore processing cost includes material costs estimated based on specific consumption of materials, reagents, spare parts per tonne of processed ore, as well as on material prices (including delivery to the site), power tariffs and process plant payroll expenses.

Concentrates Transportation and Processing Cost

Unit cost of concentrate processing corresponds to the actually existing price rates for transportation and processing of concentrate, produced at Kapan Mine and Process Plant. The price rates were applied based on the existing contracts of concentrates supply.

Administrative Expenses

Administrative expenses include salaries of the administrative and service personnel, road and air transportation of the personnel, meals at the camp, travel expenses to the place of vacation, power, heat and water supply expenses for administrative and auxiliary areas. The estimate was made based on the expert's opinion and estimated costs at similar operations.

Cash Costs per Ounce of Metal Equivalent

The table (Table 42) shows cash costs per ounce of gold equivalent, less processing cost and non-payable metal when concentrates are sold to a third party.

Table 42. Cash Cost per Ounce of Gold Equivalent - Polymetal case

	Units	Total
Total cash cost per oz	**-**	**558.0**
Ore production — UG mining	$/oz	230.3
Ore processing	$/oz	113.5
Royalty	$/oz	40.2
Administrative expenses	$/oz	50.4
Deductions	$/oz	168.3
Total cash cost per oz	**$/oz**	**602.8**

15.1.4 Project NPV and sensitivities – Polymetal Case

Polymetal estimated NPV of the Kapan mine based on the mine schedule and other production parameters, and cost estimations stated above. Table 43 shows sensitivity of the project NPV to gold price fluctuations and Table 44 shows the NPV sensitivity to operating cost variations.

Table 43. Kapan Project NPV - Polymetal Case – Sensitivity to gold price

Gold Price	NPV, '000 $
1 000	117.7
1 050	125.5
1 100	133.3
1 200	148.9
1 250	156.7
1 300	164.4
1 350	172.2

Table 44. Kapan Project NPV - Polymetal Case – Sensitivity to operating cost variation

OPEX	NPV, '000 $
-15 %	178.2
-10 %	168.4
-5 %	158.6
0 %	148.9
5 %	139.1
10 %	129.3
15 %	119.6

Weighted Average Cost of Capital (WACC) of 8 % per annum was used as a discount rate for the above sensitivity analysis..

The sensitivity to the WACC was tested by Polymetal and is shown in

Table 45. Kapan Project NPV - Polymetal Case - WACC Sensitivity

WACC	NPV, k$
6%	159.0
7%	153.8
8%	148.9
9%	144.3
10%	139.8
11%	135.6
12%	131.5

15.2 CSA Global Review

As a part of the review of the Polymetal financial model, CSA Global has reviewed some of the technical and cost aspects, whilst inputs relating to equity, debt, interest rates and macroeconomic assumptions have been taken as presented.

Several input lines in the Polymetal financial model have been inputted as values with little reference to source of data.

The economic model reviewed was provided to CSA Global by Kapan GOK and includes mining, processing and cost parameters provided by Kapan GOK. The modelling appears reasonable, with no significant emissions or errors. Re view comments in key areas are set out below.

15.2.1 Financial Valuation

The following key comments are derived from a review of the Polymetal financial valuation as presented in "Kapan_model_25.06.18_2P+MR(c) RCH (Inc. royalty, TC breakdown).xlsx" discounted cash flow model.

Exchange Rate

No exchange rate conversion is applied as part of the financial analysis. All costs and revenues were calculated in US dollars (US$). However, where appropriate a rate of exchange of 490 AMD to 1 US$ is used.

Mining Production Target and Processing Limit

The processing tonnage limit of approximately 2,100 t/d equates to a maximum throughput rate of approximately 750 kt/a. The selected process throughput rate of 700 kt/a has been used in the Polymetal financial model.

Operational Cost

Mining costs are derived from a 2018 rate of US$26.7/t ore development. The fixed/variable ratio of 28%:72% has been used to derive a fixed cost annual sum of US$5.1 million/year equating to US$7.5/t ore development. This fixed cost is carried forward until 2021 whence it changes to 50% or US$2.6 million/year. CSA Global concludes that the rationale behind the significant fixed cost reduction is related to the significant drop in ore development tonnages between 2021 and 2022.

A further US$16.8/t ROM ore is calculated as part of the mining cost.

The operational costs were obtained from the Polymetal financial model and are summarised in Table 46 and Table 47 below.

Table 46: Direct operational cost – absolute terms

Operating cost	Units	2018	2019	2020	2021	2022	2023	2024	2025	5-year total
Underground mining	US$M	28.5	25.2	26.7	27.2	18.2	14.7	16.2	16.2	**125.9**
Processing	US$M	9.8	11.0	11.0	11.0	10.9	10.9	10.9	10.9	**53.6**
Concentrate transportation cost	US$M	2.9	3.6	3.2	3.2	3.7	3.2	1.8	1.8	**16.6**
Overheads	US$M	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	**23.4**
Other	US$M	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	**6.4**
Total	**US$M**	**47.1**	**45.8**	**46.8**	**47.4**	**38.8**	**34.8**	**34.9**	**34.9**	**225.9**

CSA Global considers the unit operational cost for mining in 2018 period to be in line with the mechanised narrow vein long-hole stoping method. The reduction in unit costs of production as a result of a reduction in development requirement in the mine plan for the Ore Reserve portion, and the

extrapolation of the Inferred Resource that appears to have a significantly reduced cost related to development activities and is a concern.

Table 47: Direct operational costs – unit cost terms

Operating cost	Units	2018	2019	2020	2021	2022	2023	2024	2025	5-year average
Underground mining	US$/t milled	45.7	35.9	37.9	38.8	26.2	21.0	23.2	23.2	36.7
Processing	US$/t milled	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6
Concentrate transportation cost	US$/t milled	4.6	5.1	4.6	4.5	5.3	4.6	2.6	2.6	4.8
Overheads	US$/t milled	7.5	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.8
Other	US$/t milled	2.1	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9
Total	**US$/t milled**	**75.4**	**65.2**	**66.6**	**67.5**	**55.7**	**49.7**	**49.9**	**49.9**	**65.9**

CSA Global concludes that the ore development to stoping ratio as contained in the Polymetal financial model is not in line with the EPS production report (Figure 36).

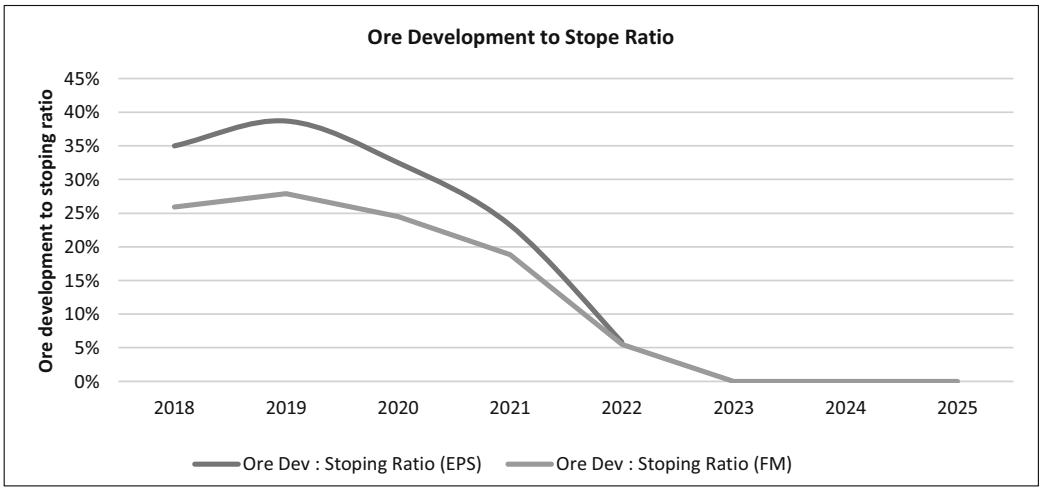

Figure 36: Ore development to stoping ratio comparison

Capital Expenditure Cost

The capital expenditure costs were obtained from the Polymetal financial model and are summarised in Table 48.

Table 48: Capital cost used in the Polymetal Financial Model

Total Capital	2018	2019	2020	2021	2022	2023	2024	2025	Total
Investment projects	7,337								**7,337**
Plant maintenance	669	175	175	175	175	175	175	175	**1,894**
Mining equipment	4,621			1,563			1,563		**7,747**
Other	426	426	426	426	426	426	427	428	**3,410**
Total Cost (US$ x 1,000)	**13,052**	**601**	**601**	**2,164**	**601**	**601**	**2165**	**603**	**20,388**

Plant maintenance is 6.8% of plant operational cost in 2018 and thereafter is 1.6% for the remaining LOM.

CSA Global considers the plant maintenance capital allowance of <2% is forecasted low and when benchmarked against other concentrator operations typically should be in the range of 4–8% of operational cost.

The capital provision for mining equipment replacement is calculated at 4.9% over a five-year forecasted period. CSA Global concludes that this is significantly lower than benchmarked and calculations that indicate 16% is required for the replacement and rebuilding of equipment.

Significant capital expenditure is allocated in FY 2018. Items that are budgeted include mining equipment and construction works.

Metal Prices

The metal price forecast used in the Polymetal financial valuations is detailed in Table 49.

Table 49: Metal price forecast

Metal price	Units	2018	2019	2020	2021	2022	2023	2024	2025	2026
Gold price	$/oz	1,271	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300
Silver price	$/oz	17.2	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0
Copper price	$/t	6,528	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500
Zinc price	$/t	2,962	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000

CSA Global notes that the three-year trailing price average for gold (US$1,240/oz), silver (US$16.60/oz), copper (US$1,240/oz) and zinc (US$2,500/oz).

Processing Recovery and Metal Payability

Processing recoveries of the metals to concentrate are shown in Table 50.

Table 50: Processing metallurgical recovery and metal payability

Metallurgical recovery	Units	2018	2019	2020	2021	2022	2023	2024	2025	2026
Cu concentrate										
Au	%	71.6%	70.8%	69.1%	68.6%	67.7%	68.2%	66.3%	66.3%	66.3%
Ag	%	71.5%	70.8%	69.1%	68.6%	67.7%	68.2%	66.3%	66.3%	66.3%
Cu	%	86.0%	90.0%	87.8%	87.9%	91.5%	87.1%	82.1%	82.1%	82.1%
Zn	%	8.3%	8.0%	8.0%	8.5%	9.0%	8.0%	7.5%	7.5%	7.5%
Zn concentrate										
Au	%	11.8%	12.1%	11.8%	11.8%	11.9%	11.8%	11.8%	11.8%	11.8%
Ag	%	11.8%	12.0%	11.8%	11.9%	11.9%	11.8%	11.8%	11.8%	11.8%
Cu	%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Zn	%	84.3%	83.7%	84.1%	82.1%	83.3%	83.3%	80.0%	80.0%	80.0%
Share of metal payable in copper concentrate										
Au	%	97.0%	97.0%	97.0%	97.0%	97.0%	97.0%	97.0%	97.0%	97.0%
Ag	%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%
Cu	%	96.5%	96.5%	96.5%	96.5%	96.5%	96.5%	96.5%	96.5%	96.5%
Zn	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Share of metal payable in zinc concentrate										
Au	%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%
Ag	%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%
Cu	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Zn	%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%

On-Mine Additional Costs

Estimated On-mine general and administrative (G&A) costs for the Polymetal financial valuation was US$4.7 million per annum or US$6.70/t milled. An additional cost of US$1.3 million/year or US$1.84/t milled.

CSA Global considers the on-mine additional costs reasonable for the size of the planned operation.

Off-Mine Additional Costs

The estimated concentrate treatment and transport charges. A concentrate transport cost of US$110.3/dmt$_{conc}$ and a concentrate treatment charge of US$93.3/dmt$_{conc}$ has been applied in the Polymetal financial valuation.

CSA Global considers the off-mine costs for concentrate treatment and transport to be in line with operations producing a copper and zinc concentrate.

Smelting and Refining Terms

The estimated smelting and refining terms of metal in concentrate used in the Polymetal financial valuation are US$0.62/g Au$_{eqv.}$ CSA Global considers the gold refining charge of ~US$20/oz well above international charges for gold refining that typically is in a range of US$4–8/oz. However, CSA Global recognises that no additional smelting and refining charges are allowed for in the Polymetal financial model for Ag, Cu and Zn and that the 0.62/g Au$_{eqv}$ is applied as a blended smelting and refining charge.

CSA Global has not specifically tested the validity of the blended smelting and refining charge and its equivalency to the individual element smelting and reefing terms; however, CSA Global recognises that the cost is indicative of determining the smelting and refining costs on the individual elements.

Selling Cost and Royalty

A 4% government royalties on all metals based on attributable revenue was used in the Polymetal financial model. In addition to the base royalty calculation and additional royalty is calculated based on the cash margin in a particular period. The additional royalty component is based on 8% times the percentage cash margin applied to the net income after allowable deductions.

A separate DPM royalty calculation in made in the model is based on a 2% discount of the Net Smelter Return (NSR) allowing for discounts of concentrate transport, concentrate treatment and refining cost on the NSR calculation; however, it appears to form an alternate view not the primary reporting valuation.

Discount Rate

The Polymetal financial valuation using a discount rate derived from a Weighted Average Cost of Capital (WACC) of 10 % for purposes of calculating discounted future cashflows. The basis of the calculation for the WACC is not understood at the time of writing this report; however, CSA Global understands that 10% is typical of minerals project valuation in stable mineral extraction regions.

ROM Production Inputs

A comparison of the ROM production inputs is presented in the following Figure 37 to Figure 41.

The extension of the production profile (yellow bars from 2024 onwards) is an assumption of the inclusion of new Mineral Resources due to additional exploration drilling and infill drilling of the Inferred resources. Tonnages within the first five years closely match the tonnages presented in the EPS scheduling file, however, they are not an exact match. In addition, the ratio of development ore tonnage to stoping tonnage presented in the Polymetal financial model appears to be materially different from the EPS scheduling file.

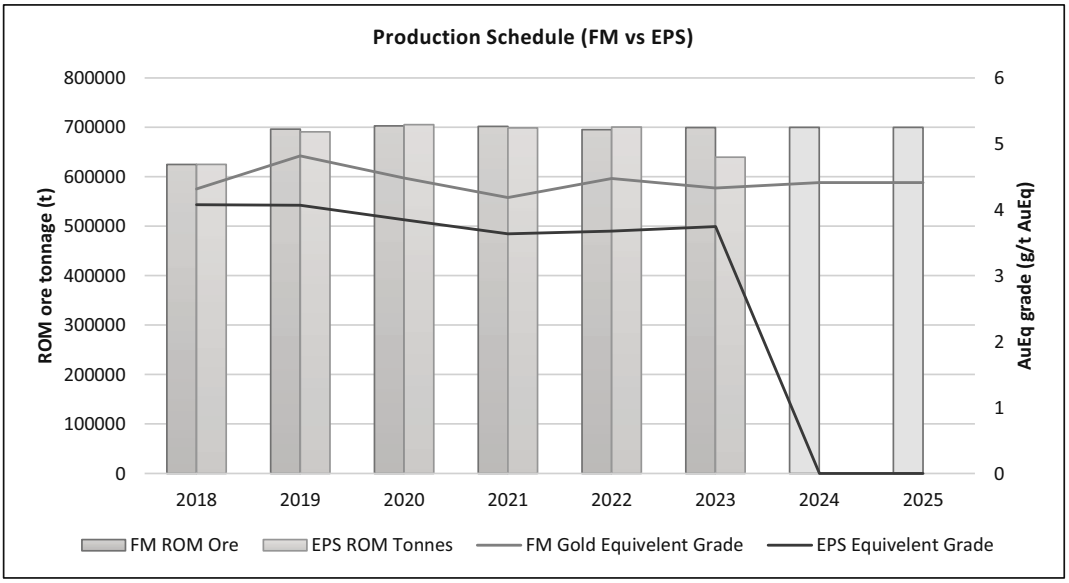

Figure 37: Comparison of EPS production schedule and cash flow model

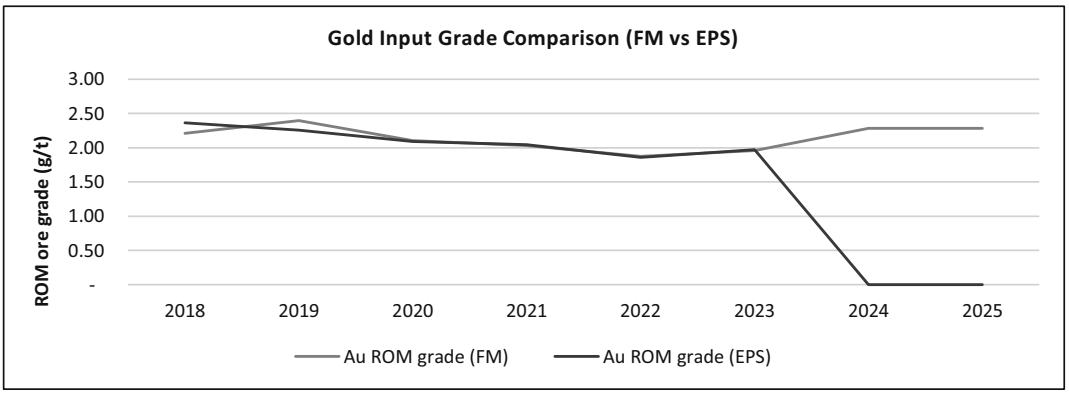

Figure 38: Gold input grade comparison

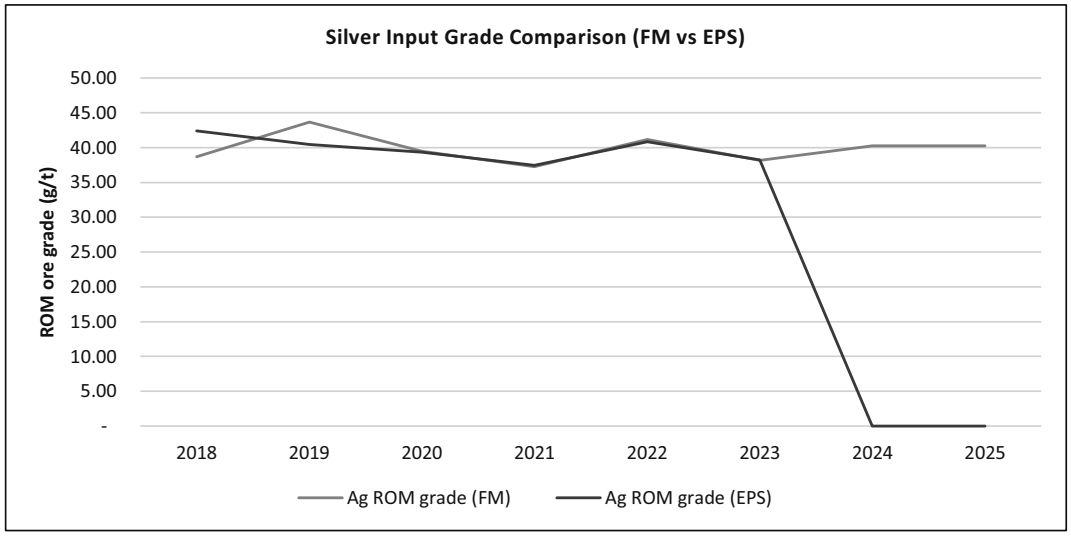

Figure 39: Silver input grade comparison

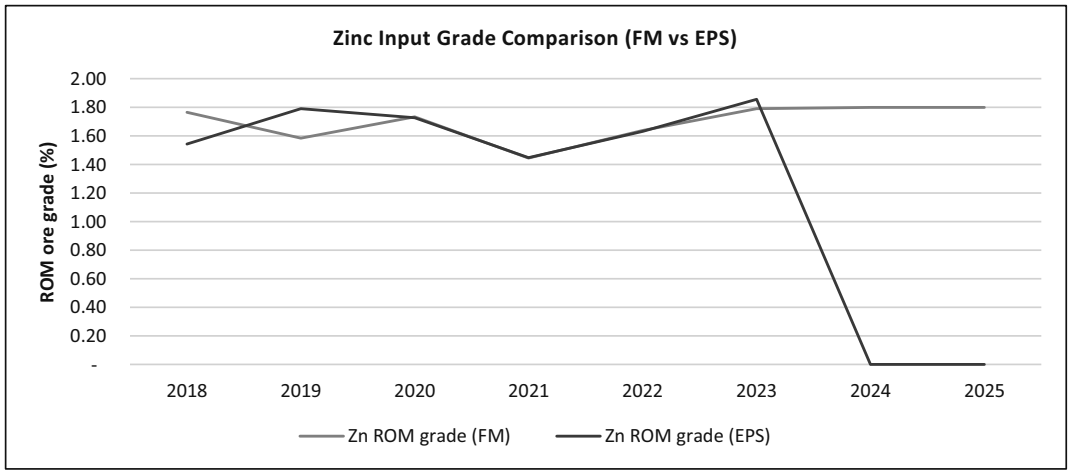

Figure 40: Zinc input grade comparison

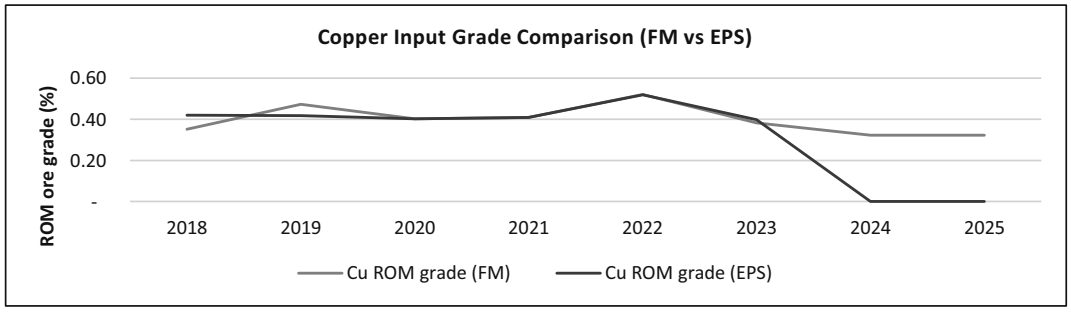

Figure 41: Copper input grade comparison

The ROM input grade comparisons for the individual metal appear to be closely matched with a slight anomaly between 2018 and 2019.

Recovery and Mass Pull of Concentrate Streams

Mass pull and recovery formulae are not readily available in the Polymetal financial model; however, the following information was received from Kapan GOK:

- Copper Concentrate Stream:
  - Mass Pull of Cu Concentrate Stream is based on a targeted 20% Cu in concentrate grade
  - Gold recovery in Cu concentrate is calculated as 0.05967 x (Cu % Feed Grade) + 0.56512
  - Silver recovery in Cu concentrate is calculated as 0.05967 x (Cu % Feed Grade) + 0.56512
  - Copper recovery in Cu concentrate is calculated as 0.31475 x (Cu % Feed Grade) + 0.75079.
- Zinc Concentrate Stream:
  - Mass Pull of Zn Concentrate Stream is based on a targeted 60% Zn in concentrate grade
  - Gold recovery in Zn concentrate is calculated as 0.0295 x (Zn % Feed Grade) + 0.0843
  - Silver recovery in Zn concentrate is calculated as 0.0002 x (Zn % Feed Grade) + 0.1181
  - Zinc recovery in Zn concentrate is calculated as 0.0553 x (Zn % Feed Grade) + 0.7425.

The actual mass pull and recovery calculations are not precisely the same as would be determined using the formulae presented above, however, the difference is immaterial.

The change in input grade ratio of zinc and copper particularly between 2018 and 2020 (shown in Figure 42) results in a change in mass pull split of the two concentrates produced.

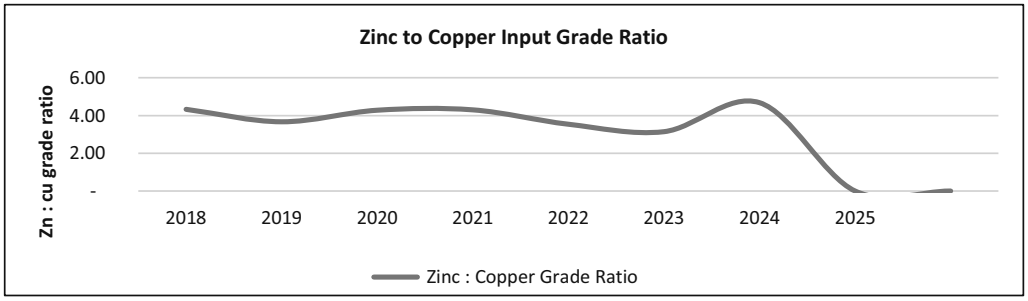

Figure 42: Zinc to copper input grade ratio

15.2.2 Cash Flow

The cash flow model is presented in Table 51 below.

Table 51: Cash flow model

Kapan	Unit	Total	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Mining															
Underground mining															
Capital development activities	Kt	-													
Stope development	Kt	**3,250**	345	677	442	511	541	208	19	100	100	200	200	200	50
Underground mining (including pre-production mining)	Kt	**8,232**	527	625	696	703	702	695	700	700	700	700	700	700	610
Au grade	g/t	**1.9**	2.21	2.21	2.40	2.11	2.03	1.87	1.96	2.28	2.28	2.81	2.76	2.76	2.59
Ag grade	g/t	**37.4**	38.75	38.66	43.66	39.48	37.25	41.14	38.17	40.24	40.24	59.69	59.41	59.41	55.73
Cu content	%	**0.3**	0.30	0.35	0.47	0.40	0.41	0.52	0.38	0.32	0.32	0.39	0.37	0.37	0.35
Zn content	%	**1.4**	1.31	1.76	1.58	1.73	1.44	1.64	1.79	1.80	1.80	1.67	1.57	1.57	1.48
Au content	t	**15.36**	1.16	1.38	1.67	1.48	1.43	1.30	1.37	1.15	1.15	1.15	1.15	1.15	1.00
Ag content	t	**307.6**	20.4	24.2	30.4	27.8	26.2	28.6	26.7	24.5	24.5	24.5	24.5	24.5	21.3
Cu content	Kt	**26.7**	1.6	2.2	3.3	2.8	2.9	3.6	2.7	1.6	1.6	1.6	1.6	1.6	1.4
Zn content	Kt	**111.5**	6.9	11.0	11.0	12.2	10.1	11.4	12.5	7.4	7.4	7.4	7.4	7.4	6.4
Ore for processing	Kt	**8,237**	530	625	702	703	702	695	700	700	700	700	700	700	610
Au grade	g/t	**1.9**	2.23	2.21	2.40	2.11	2.03	1.87	1.96	1.64	1.64	1.64	1.64	1.64	1.64
Ag grade	g/t	**37.4**	38.55	38.56	43.67	39.48	37.25	41.14	38.17	34.99	34.99	34.99	34.99	34.99	34.99
Cu content	%	**0.3**	0.30	0.35	0.47	0.40	0.41	0.52	0.38	0.22	0.22	0.22	0.22	0.22	0.22
Zn content	%	**1.4**	1.30	1.76	1.58	1.73	1.44	1.64	1.79	1.05	1.05	1.05	1.05	1.05	1.05
Au content	t	**15.37**	1.18	1.38	1.68	1.48	1.43	1.30	1.37	1.15	1.15	1.15	1.15	1.15	1.00
Ag content	t	**307.8**	20.4	24.1	30.7	27.8	26.2	28.6	26.7	24.5	24.5	24.5	24.5	24.5	21.3
Cu content	Kt	**26.7**	1.6	2.2	3.3	2.8	2.9	3.6	2.7	1.6	1.6	1.6	1.6	1.6	1.4
Zn content	Kt	**111.6**	6.9	11.0	11.1	12.2	10.1	11.4	12.5	7.4	7.4	7.4	7.4	7.4	6.4
Processing															
Underground ore	Kt	**8,237**	530	625	702	703	702	695	700	700	700	700	700	700	610
Au grade	g/t	**1.9**	2.23	2.21	2.40	2.11	2.03	1.87	1.96	1.64	1.64	1.64	1.64	1.64	1.64
Ag grade	g/t	**37.4**	38.55	38.56	43.67	39.48	37.25	41.14	38.17	34.99	34.99	34.99	34.99	34.99	34.99
Cu content	%	**0.3**	0.30	0.35	0.47	0.40	0.41	0.52	0.38	0.22	0.22	0.22	0.22	0.22	0.22
Zn content	%	**1.4**	1.30	1.76	1.58	1.73	1.44	1.64	1.79	1.05	1.05	1.05	1.05	1.05	1.05
Au content	t	**15.37**	1.18	1.38	1.68	1.48	1.43	1.30	1.37	1.15	1.15	1.15	1.15	1.15	1.00
Ag content	t	**307.8**	20.4	24.1	30.7	27.8	26.2	28.6	26.7	24.5	24.5	24.5	24.5	24.5	21.3

Kapan	Unit	Total	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Cu content	Kt	**26.7**	1.6	2.2	3.3	2.8	2.9	3.6	2.7	1.6	1.6	1.6	1.6	1.6	1.4
Zn content	Kt	**111.6**	6.9	11.0	11.1	12.2	10.1	11.4	12.5	7.4	7.4	7.4	7.4	7.4	6.4
Au recovery into copper concentrate	%		66.6	71.6	70.8	69.1	68.6	67.7	68.2	66.3	66.3	66.3	66.3	66.3	66.3
Ag recovery into copper concentrate	%		65.0	71.5	70.8	69.1	68.6	67.7	68.2	66.3	66.3	66.3	66.3	66.3	66.3
Cu recovery into copper concentrate	%		81.9	86.0	90.0	87.8	87.9	91.5	87.1	82.1	82.1	82.1	82.1	82.1	82.1
Zn recovery into copper concentrate	%		0.0	8.3	8.0	8.0	8.5	9.0	8.0	7.5	7.5	7.5	7.5	7.5	7.5
Copper concentrate yield	%		1.3	1.6	2.2	1.9	1.8	2.4	1.7	0.9	0.9	0.9	0.9	0.9	0.9
Au recovery into zinc concentrate	%		7.2	11.8	12.1	11.8	11.8	11.9	11.8	11.8	11.8	11.8	11.8	11.8	11.8
Ag recovery into zinc concentrate	%		4.5	11.8	12.0	11.8	11.9	11.9	11.8	11.8	11.8	11.8	11.8	11.8	11.8
Cu recovery into zinc concentrate	%		0.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Zn recovery into zinc concentrate	%		69.6	84.3	83.7	84.1	82.1	83.3	83.3	80.0	80.0	80.0	80.0	80.0	80.0
Zinc concentrate yield	%		1.8	2.6	2.5	2.3	2.3	2.4	2.5	1.4	1.4	1.4	1.4	1.4	1.4
Copper concentrate	Kt	**117.3**	7.1	9.97	15.3	13.1	12.9	16.6	11.6	6.4	6.4	6.4	6.4	6.4	5.6
Au content	t	**10.46**	0.79	0.99	1.19	1.02	0.98	0.88	0.93	0.76	0.76	0.76	0.76	0.76	0.66
Ag content	t	**208.98**	13.28	17.24	21.71	19.17	17.95	19.37	18.21	16.23	16.23	16.23	16.23	16.23	14.15
Cu content	Kt	**23.10**	1.30	1.89	2.99	2.49	2.52	3.31	2.32	1.29	1.29	1.29	1.29	1.29	1.12
Zn content	Kt	**8.9**	-	0.92	0.89	0.97	0.86	1.03	1.00	0.55	0.55	0.55	0.55	0.55	0.48
Zinc concentrate	Kt	**157.2**	9.6	16.0	17.2	16.0	16.0	16.9	17.4	9.8	9.8	9.8	9.8	9.8	8.6
Au content	t	**1.82**	0.08	0.16	0.20	0.17	0.17	0.16	0.16	0.14	0.14	0.14	0.14	0.14	0.12
Ag content	t	**36.43**	0.92	2.84	3.68	3.28	3.11	3.41	3.15	2.89	2.89	2.89	2.89	2.89	2.52
Cu content	Kt	**1.3**	-	0.11	0.17	0.14	0.14	0.18	0.13	0.08	0.08	0.08	0.08	0.08	0.07
Zn content	Kt	**91.7**	4.79	9.28	9.30	10.24	8.32	9.49	10.44	5.89	5.89	5.89	5.89	5.89	5.13
Total concentrate production:	**Kt**	**274.5**	**16.742**	**25.955**	**32.6**	**29.1**	**28.9**	**33.5**	**29.0**	**16.3**	**16.3**	**16.3**	**16.3**	**16.3**	**14.2**
Au content	t	**12.28**	0.87	1.15	1.39	1.20	1.15	1.04	1.10	0.89	0.89	0.89	0.89	0.89	0.78
Ag content	t	**245.41**	14.20	20.08	25.39	22.45	21.06	22.78	21.37	19.12	19.12	19.12	19.12	19.12	16.67
Cu content	Kt	**24.4**	1.30	2.00	3.15	2.63	2.66	3.49	2.46	1.37	1.37	1.37	1.37	1.37	1.192

Kapan	Unit	Total	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Zn content	Kt	**100.6**	4.79	10.20	10.19	11.22	9.19	10.52	11.44	6.44	6.44	6.44	6.44	6.44	5.61
Total concentrate production for sales:	**Kt**	**274.5**	**16.7**	**26.0**	**32.6**	**29.1**	**28.9**	**33.5**	**29.0**	**16.3**	**16.3**	**16.3**	**16.3**	**16.3**	**14.2**
Au content	t	**11.51**	0.9487	1.08	1.31	1.12	1.08	0.97	1.03	0.84	0.84	0.84	0.84	0.84	0.73
Ag content	t	**224.32**	15.65	16.98	23.38	20.67	19.39	20.96	19.67	17.59	17.59	17.59	17.59	17.59	15.33
Cu content	Kt	**22.2**	1.29	1.76	2.88	2.40	2.43	3.20	2.24	1.24	1.24	1.24	1.24	1.24	1.08
Zn content	Kt	**77.5**	4.68	7.49	7.91	8.71	7.08	8.07	8.87	5.01	5.01	5.01	5.01	5.01	4.36
GE production in copper concentrate	t	**16.20**	1.13	1.46	1.87	1.60	1.55	1.59	1.48	1.13	1.13	1.13	1.13	1.13	0.99
GE production in zinc concentrate	t	**7.31**	0.37	0.72	0.76	0.79	0.66	0.73	0.79	0.49	0.49	0.49	0.49	0.49	0.43
Total GE production in concentrates	t	**23.52**	1.50	2.17	2.63	2.39	2.22	2.32	2.27	1.62	1.62	1.62	1.62	1.62	1.41
Total GE production in concentrates	Koz	**756.1**	48.3	69.9	84.5	76.9	71.3	74.7	73.0	52.1	52.1	52.1	52.1	52.1	45.4
Total GE production (payable)	t	**23.46**	1.71	2.11292	2.63	2.39	2.22	2.32	2.27	1.62	1.62	1.62	1.62	1.62	1.41
Total GE production (payable)	Koz	**754.2**	54.8	67.9	84.5	76.9	71.3	74.7	73.0	52.1	52.1	52.1	52.1	52.1	45.4
Financials															
Concentrate treatment charge	US$M	**-25.61**	-1.97	-2.42	-3.04	-2.72	-2.70	-3.12	-2.71	-1.52	-1.52	-1.52	-1.52	-1.52	-1.32
Refining	US$M	**-10.03**	-1.39	-0.90	-1.16	-0.99	-0.96	-0.99	-0.92	-0.70	-0.70	-0.70	-0.70	-0.70	-0.61
Deductions	**US$M**	**-35.6**	**-3.36**	**-3.32**	**-4.20**	**-3.71**	**-3.66**	**-4.11**	**-3.62**	**-2.22**	**-2.22**	**-2.22**	**-2.22**	**-2.22**	**-1.93**
Au	US$M	**480.9**	38.8	45.1	54.7	46.9	45.0	40.6	43.0	35.0	35.0	35.0	35.0	35.0	30.5
Ag	US$M	**122.6**	8.7	9.3	12.8	11.3	10.6	11.5	10.7	9.6	9.6	9.6	9.6	9.6	8.4
Cu	US$M	**144.4**	8.4	11.4	18.7	15.6	15.8	20.8	14.6	8.1	8.1	8.1	8.1	8.1	7.0
Zn	US$M	**232.5**	13.9	22.5	23.7	26.1	21.2	24.2	26.6	15.0	15.0	15.0	15.0	15.0	13.1
Revenue	**US$M**	**944.8**	**66.3**	**85.0**	**105.7**	**96.3**	**89.0**	**93.0**	**91.3**	**65.5**	**65.5**	**65.5**	**65.5**	**65.5**	**57.1**
Cost															
Mining	US$M	**241.2**	21.1	28.5	25.2	26.7	27.2	18.2	14.7	16.2	16.2	18.1	18.1	18.1	13.8
Processing	US$M	**128.8**	8.2	9.8	11.0	11.0	11.0	10.9	10.9	10.9	10.9	10.9	10.9	10.9	9.5
Concentrate transportation cost	US$M	**30.3**	1.8	2.9	3.6	3.2	3.2	3.7	3.2	1.8	1.8	1.8	1.8	1.8	1.6
Royalty	US$M	**116.5**	6.8	10.2	14.1	12.3	10.8	12.8	12.9	7.6	7.6	7.3	7.3	7.2	6.4
Overheads	US$M	**56.3**	4.4	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
Other	US$M	**15.4**	3.4	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Operating expenses	**US$M**	**588.4**	**45.7**	**57.3**	**59.9**	**59.1**	**58.2**	**51.6**	**47.7**	**42.6**	**42.5**	**44.2**	**44.2**	**44.0**	**37.2**

Kapan	Unit	Total	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Total cash cost	**US$M**	**608.6**	**45.6**	**59.4**	**62.8**	**61.6**	**60.5**	**54.4**	**50.0**	**43.5**	**43.4**	**45.1**	**45.1**	**45.0**	**37.8**
EBITDA	**US$M**	**356.4**	**20.7**	**27.7**	**45.8**	**37.1**	**30.8**	**41.4**	**43.6**	**22.9**	**23.0**	**21.3**	**21.3**	**21.5**	**19.9**
EBITDA margin	%	38%	31%	33%	43%	39%	35%	45%	48%	35%	35%	33%	33%	33%	35%
D&A	US$M	**58.0**	8.8	7.0	3.9	3.9	4.0	4.2	4.3	4.3	4.8	4.9	5.0	6.1	5.7
Mining equipment	US$M	**41.7**	5.2	4.8	3.0	3.0	3.0	3.1	3.2	3.2	3.5	3.5	3.5	4.3	3.8
Plant	US$M	**16.3**	3.6	2.2	0.9	0.9	1.0	1.0	1.1	1.2	1.3	1.4	1.5	1.8	2.0
Profit tax	US$M	**63.4**	0.7	3.7	9.0	7.1	5.8	8.0	8.5	4.0	3.9	3.5	3.5	3.3	3.0
CAPEX	**US$M**	**29.6**	**26.1**	**13.1**	**0.6**	**0.6**	**2.2**	**0.6**	**0.6**	**2.2**	**0.6**	**0.6**	**2.2**	**0.6**	**5.9**
Construction (liquidation)	US$M	**12.6**	3.8	7.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.3
Plant maintenance	US$M			0.7	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Mining equipment	US$M	**9.3**	16.3	4.6	0.0	0.0	1.6	0.0	0.0	1.6	0.0	0.0	1.6	0.0	0.0
Other	US$M	**5.1**	6.0	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
PPE (b-o-p)			29.5	36.7	42.1	38.6	35.1	33.1	29.4	25.5	23.2	18.8	14.4	11.4	5.7
Mining equipment			17.1	32.4	32.3	29.3	26.3	24.9	21.8	18.6	17.0	13.5	10.0	8.1	3.8
Plant			12.5	4.3	9.8	9.3	8.8	8.2	7.6	6.9	6.2	5.3	4.4	3.3	2.0
Free cash flow	**US$M**	**263.3**	**-6.1**	**10.9**	**36.2**	**29.4**	**22.9**	**32.8**	**34.6**	**16.8**	**18.5**	**17.2**	**15.7**	**17.6**	**11.0**
NPV (JORC reserves)	**US$M**	**114.4**													
NPV (assuming reasonable resource conversion)	**US$M**	**157.6**													
Total cash cost/oz															
Mining	US$/oz	**318.9**	435.8	408.5	298.5	346.7	382.0	244.1	200.9	311.3	311.3	348.2	348.2	348.2	302.9
Processing	US$/oz	**170.3**	169.7	139.9	129.8	142.9	154.0	145.6	149.8	210.1	210.1	210.1	210.1	210.1	210.1
Royalty	US$/oz	**154.1**	140.8	145.7	167.1	160.1	151.6	171.3	176.8	146.6	145.6	140.7	140.4	137.8	140.2
Overheads	US$/oz	**74.4**	91.1	67.1	55.5	61.0	65.8	62.8	64.2	90.0	90.0	90.0	90.0	90.0	103.2
Deductions	US$/oz	**47.1**	69.6	47.6	49.7	48.2	51.3	55.0	49.6	42.6	42.6	42.6	42.6	42.6	42.6
Total cash cost/oz	**US$/oz**	**764.9**	**906.9**	**808.8**	**700.5**	**758.9**	**804.8**	**678.8**	**641.3**	**800.5**	**799.5**	**831.5**	**831.2**	**828.6**	**798.9**

16 Mineral Reserves

The effective date for the Mineral Reserve estimate contained in this report is 1st January 2018 and prepared by Polymetal Engineering JSC. All Reserves in Table 52, are Proven and Probable Mineral Reserves.

Ore Reserves for underground mining were estimated based on Measured and Indicated Mineral Resources, using 2.5 g/t AuEq cut-off grade.

The MSO stope wireframes form the basis of stope ore reserve in conjunction with the ore development considering the selected mining method and equipment size. Mineral Resources were converted to Ore Reserves using MSO stope optimiser and consider the assumed losses, dilution and ore drive development.

CSA Global considers this an appropriate methodology for defining Ore Reserves.

Table 52 Ore Reserves of the Shahumyan deposit as of 1st January 2018 (Polymetal Engineering JSC)

Ore Reserves	Tonnage kt	Grade					Metal				
		Au (g/t)	Ag (g/t)	Cu (%)	Zn (%)	AuEq (g/t)	Au (koz)	Ag (koz)	Cu (kt)	Zn (kt)	AuEq (koz)
Proved	**220**	**2.9**	**42**	**0.52**	**2.46**	**5.8**	**20**	**289**	**1.1**	**5.3**	**40**
Underground mining	210	3.0	42	0.53	2.48	5.8	20	283	1.1	5.2	39
Stockpiles	10	1.8	34	0.41	1.53	3.8	0	6	0	0.1	1
Probable	**3 850**	**2.1**	**40**	**0.42**	**1.62**	**4.2**	**254**	**4 905**	**16.3**	**62.4**	**518**
Underground mining	3 850	2.1	40	0.42	1.62	4.2	254	4 905	16.3	62.4	518
Total Proved + Probable	**4 070**	**2.1**	**40**	**0.44**	**1.67**	**4.3**	**274**	**5 194**	**17.4**	**67.7**	**558**
Underground mining	4 060	2.1	40	0.44	1.67	4.3	274	5 189	17.4	67.6	557
Stockpiles	10	1.8	34	0.41	1.53	3.8	0	6	0	0.1	1

* Discrepancies in the calculations are due to rounding

The figures presented above are both gross and net attributable

The operator is Kapan Mining and Processing CJSC

17 Conclusions

17.1 Geological Understanding

- There is a general understanding of the local geology and vein behaviour within the mine department and the local mineralisation controls are well understood. There is limited focus on the regional geological and near mine environment with day to day activities focussed on short term production orientated activities.

17.2 Underground Procedures

- The process of integrating the underground mapping and data through Leapfrog and Surpac software are fit for purpose and follow logical processes. The procedures associated with data collection in the underground environment are reasonable.

17.3 Core Processing Procedures

- The core processing procedures have undergone some modification from the original procedures developed by DPMK. Information is well recorded and the work flow from the underground drilling through to integration into mine planning and metallurgy is well structured and well organised.

17.4 QAQC Review

- QAQC procedures and practises relating to geological data collection for downstream use in Mineral Resource Estimation are considered fit for purpose.

17.5 Mineral Resource Estimate

- The Mineral Resource estimate workflows are considered reasonable and been systematically reviewed for the Kapan deposit in terms of both global model validation checks, and with respect to the top 10 veins (contributing to gold equivalent (AuEq) total contained metal) where detailed review of domain parameters for each of the 246 individual veins would not have been possible.
- The review of the subsets of input data, and of the model parameters, associated with these individual veins are considered representative of the resource as a whole, where such assumptions have been made on the robustness of the model from them.
- However, CSA Global considers there are some risks with respect to Mineral Resources, and these are set out below;
    - The Mineral Resources were depleted with the latest Mined to Date (MTD) solid provided by the client, dated 1 June 2018. CSA Global then compared these figures to those quoted in literature received. CSA Global was not able to reproduce the figures as outlined in the report provided. However, CSA Global was able to confirm Metal that forms the basis of the five-year mine plan, to within acceptable confidence limits (±10%).
    - CSA Global finds no issues with the classification method undertaken as a whole, and the values assigned in the CLASS field in the block model. Classification was reviewed for the material within the five-year mine plan.
    - Validation of the block model presents a significant risk. The output model histograms show a distinct bimodal distribution for Au, Ag, Cu and Zn where no such trend exists within the input composite data, which is broadly lognormal in distribution. This presents a risk in the ability to plan underground mine development from the model. Grades anticipated from the model may be highly variable on a more localised scale, and at risk

within areas impacted by this bimodality in the model. This is further highlighted when reviewing the broad trends in each vein from an overall visual qualitative perspective. However, visual checks, de-clustered mean statistics and swath plots, indicate a reasonable confidence in the model as a broad predictive tool and show good validation results when comparing the input composite data to the output model blocks, and trends in composite data are mirrored by trends in the block models in sectional review.

- CSA Global considers the input composite data for Kapan as representative of the raw assay data, and reasonable for use in the Mineral Resource estimate.
- CSA Global reviewed the modelled vein mineralisation volumes in cross and plan sections against the raw un-composited sample data. AuEq mineralisation above the 1.5 g/t cut-off grade are incorporated in the respective modelled wireframes when possible and in line with the mineralisation trends. CSA Global reviewed Au, Ag, Cu and Zn raw grades against the wireframe as well and found that overall there appears to be no issues with the approach undertaken.
- The assignment of density to the model based on a regression formula from the estimated sulphur grade in the model presents a moderate risk to the Mineral Resource. Even though using sulphur grade within the regression formula is reasonable for this type of deposit, the underlying assumption is that the sulphur estimate is robust. However, model validation for sulphur was poor, in part due to 60% of the composites having no sulphur data. It would be more appropriate to link density to the AuEq grade, as it is supported by more data and the input variables validate well. CSA Global cannot comment on the appropriateness of the regression formula used as no density data was provided for review.
- Some areas of upside and opportunity may exist at these deposits, but for the most part additional review and sensitivity analysis would be required to confidently convey project upside.

17.6 Mining and Reserve Estimation

The following conclusions are made following the technical review of the mine design and production planning:

- CSA Global has concerns over the level of detail presented in the mine design, schedule (development specifically) and sequencing, and considers that the level of accuracy is not commensurate with the requirements of an operating mine requiring short to medium term mine planning.
- The Kapan mine appears to be adequately resourced in terms of personnel and equipment for the sustainable exploitation rate of 700kt/a.
- The Kapan mine appears to employ modern techniques to mine planning and survey, however, refinements and best practices appear to be required.
- Underground engineering planning and equipping appears to be well understood with good practices and modern techniques employed.
- Execution, monitoring, feedback, risk analysis of the engineering, mining and technical support departments is not fully understood at time of writing the report.
- CSA Global has concerns that the EPS scheduling output data is not representative of the Polymetal financial model. The tonnes and grade have reasonably small variances (specifically 2018/2019); however, the ore development to stoping ratio is materially different.

- Survey "as-built" 3D CAD files (stoping specifically) do not appear to be complete for a mature mine like Kapan. It is imperative that an accurate "as-built" plans exist to ensure accurate planning and safety of planned mining activities.
- Mining equipment replacement presented in the Polymetal financial model will not ensure sustainable safe production based on existing equipment age and OEM specification for rebuild and replacement.
- Detail of operating costs for mining presented in the Polymetal financial model is not commensurate for an operating mine (when considering detail presented in the model).
- Plant feed grade and metal recovery are highly interdependent, and a lowering of head grade has a negative compounding effect on cashflows. Unplanned dilution realised during the mining operation can have a material effect on the profitability of the operation.
- Inferred material as presented in the resource block model shows significant potential for the future of Kapan (albeit in limited quantities) and it appears to be easily assessable from current development. Continued, accelerated exploration and access of these areas does not present in the electronic mine plan.

17.7 Geotechnical

The following conclusions are drawn from the review of geotechnical information;

- Although the style of deposition is complicated, characterised by stockwork and anastomosing veins, CSA Global acknowledges that adequate consideration of the geological setting of the ore zones and host rocks has been incorporated into geotechnical designs.
- Geotechnical data is collected through drill core logging and scan line mapping of underground development ends. CSA Global considers these methods as typical industry practise.
- CSA Global views the extraction ratio (estimated at 85–90%) to be too aggressive for the rock mass quality reported. Extraction ratios between 70% and 75% appear plausible.
- CSA Global considers the stope sizes adopted and extraction ratios as overly aggressive for the rock mass quality and HR reported. The stope sizes planned may be a large contributor to unplanned dilutions of between 20% and 25%. Based on empirical design guidelines used by Kapan, for unsupported stable stope sizing with sporadic rather than systematic post filling, CSA Global views the designs adopted to be flawed and disconnected from the HR numbers reported. The designed stope sizes do not support the stable HRs reported (<6.1 for 70° veins and 5.2 for 50° veins).
- CSA Global concludes that provided that production process procedures are strictly adhered to, the proposed operation will have a minor environmental impact and does not virtually pose any hazards in terms of environmental pollution outside the sanitary protection /buffer zone.
- Analyses of both the North and South walls' performance under seismic conditions showed them to have Factor of Safety (FoS) less than the required value of 1.1 for the adverse condition of a MCE as a "High" consequence dam. The analyses indicate that both the North and South embankments the facility will require stabilisation (buttressing) in order to meet performance requirements during an MCE seismic event.
- It is a risk that the future tailings expansion has not been adequately planned (conceptual level studies) and not properly costed in the five-year plan. The risk is the possibility of inadequate tailings disposal volume to meet production requirements and inadequate capital allowed for the required construction.

- CSA Global's observations from the site visit showed work being undertaken during the visit with significant earthworks, delivery of truck loads of rock and sand and spreading by bulldozer. CSA Global has not seen the design plans for this remedial work. At the time of the visit, no work had started at the south TSF wall.

17.8 Metallurgy and Processing

- The mineralogical and metallurgical testwork completed on Kapan ore appears robust and there is a significant number of years production at the mine.
- The plant produces two concentrates using sequential flotation. Following conventional two-stage crushing and grinding by a rod mill/ball mill circuit, the first is a copper/pyrite concentrate containing gold and silver. Next roughing, scavenging and concentrate re-grinding, cleaning is completed in three stages. The scavenger tails are then conditioned prior to zinc rougher and scavenger flotation, with the zinc scavenger tails being the final process tails. Rougher concentrate is cleaned in three stages, with the cleaner tails being recirculated to the previous stage.
- The equipment installed at the process plant is suitable to achieve the design ore processing rate and productivity, as well as specified metal grades in the concentrates and metal recovery rates.

17.9 Environmental

The following conclusions are drawn from a review of environmental and social aspects;

- CSA Global comments that while it was stated that there is good management support for environmental work at Kapan, some training is needed to use equipment and for reactive investigation outside the prescribed monitoring requirements.
- The mine is a legacy site from Soviet times and is an intrinsic part of life in Kapan town, with around 933 people employed at the operation. The mine site is on the edge of the town with apparently low environmental impact to local residents, with little noise pollution, few noxious emissions and a favourable dominant wind direction away from the town.
- The lack of definitive ARD and metal leaching testwork is a concern. Comprehensive geochemical characterisation studies allow ARD/ML understanding and prediction and thus implementation of suitable design and mitigation measures, especially if new deposits/ore targets are brought online.
- Recycling of water within the operations is important as the Project has to pay for all abstractions and discharges by volume, and improvement should be a priority.
- The previous Kapan mine owners were exempted from historic mining liabilities, from the old Centralni open pit mine (closed prior to 2004, with rehabilitation activities completed and approved); and from the old waste rock dumps (which have not been rehabilitated and may be a potential source of continuing pollution). The licence and remaining liabilities for these have apparently been returned back the Government of Armenia. There should therefore be no environmental liability beyond closure of the current operation, however full implications of the legal closure requirement should be part of any future permit conditions and negotiations.
- The 2013 updated estimate of US$12 million (±30%) for the TSF closure seems reasonable for the proposed capacity increase and final TSF configuration. Similarly the approximate US$10 million (or AMD 4.1 billion in 2014 prices based on the report exchange rate of AMD414.04/US$) for the rest of the mine closure and rehabilitation is also appropriate, although it is not clear if this includes any provision for employee retraining, livelihood restoration or other social mitigations.

These estimates result in a total closure cost estimate in the range of US$19 million to US$22 million or AMD7.9 billion to AMD 9.1 billion in 2014 prices at AMD414.04/US$.

17.10 Economic Model

CSA Global draws the following conclusions relating to the economic model;

- The economic model reviewed was provided to CSA Global by Kapan GOK and includes mining, processing and cost parameters provided by Kapan GOK. The modelling appears reasonable, with no significant emissions or errors.
- CSA Global considers the unit operational cost for mining in 2018 period to be in line with the mechanised narrow vein long-hole stoping method. The reduction in unit costs of production as a result of a) a reduction in development requirement in the mine plan for the Ore Reserve portion, and b) the extrapolation of the Inferred Resource that appears to have a significantly reduced cost related to development activities, is a concern, especially given reliance on low-confidence Inferred Mineral Resources.
- CSA Global notes that the ore development to stoping ratio as contained in the Polymetal financial model is not in line with the EPS production report.
- CSA Global considers the plant maintenance capital allowance of <2% is forecasted low and when benchmarked against other concentrator operations, typically should be in the range of 4–8% of operational cost.
- The capital provision for mining equipment replacement is calculated at 4.9% over a five-year forecasted period. CSA Global concludes that this is significantly lower than benchmarked and that calculations indicate 16% is required for the replacement and rebuilding of equipment.
- CSA Global notes that the three-year trailing price average for gold (US$1,240/oz), silver (US$16.60/oz), copper (US$1,240/oz) and zinc (US$2,500/oz) appears reasonable.
- CSA Global considers the on-mine additional costs reasonable for the size of the planned operation.
- CSA Global considers the off-mine costs for concentrate treatment and transport to be in line with operations producing a copper and zinc concentrate.
- CSA Global has not specifically tested the validity of the blended smelting and refining charge and its equivalency to the individual element smelting and reefing terms, however CSA Global recognises that the cost is indicative of determining the smelting and refining costs on the individual elements.

18 Recommendations

18.1 Geological Understanding

- Whilst the local controls are well understood in terms of short term mine planning there is little longer term evaluation of the deposit type, structural evaluation and broader geological context. A holistic approach to the geology, structure and deposit type based on a mineral systems approach is recommended by CSA Global. This approach taking the geodynamic, structural architecture, fluid flow and fluid trap into account may provide a longer term guide to the prospectivity of the project.

18.2 Underground Procedures

- There are no significant risks and the underground geological practices are fit for purpose and provide appropriate guidance for the mining department. Consideration of moving to 1:100 scale mapping to include more detail is recommended by CSA Global.

18.3 Core Processing Procedures

- Currently core is assayed on a full core basis. CSA Global recommend moving to half core analysis to ensure representative core is maintained for future review. Drill core is currently photographed on a wet core basis. CSA Global recommend moving to photographing core on a dry basis so that future geotechnical evaluation can be considered.
- Density and point load testwork are currently on an irregular basis and CSA Global recommend developing a standard procedure which includes regular measurements.

18.4 QAQC Review

- QAQC procedures are fit for purpose though some minor changes to the work flow are recommended. CSA Global recommend the use of crusher blanks in the crushing and pulverising sequence as a means to test for contamination at this point in the analytical process. The use of barcoding is common in the mining industry and is recommended for sample numbering and monitoring.

18.5 Resource Estimate

CSA Global sets out the following recommendations relating to the Mineral Resource Estimate;

- Variography should be reviewed and updated for veins where a large amount of new data is available.
- Based on CSA Global's investigation, the overall metal within the portion of the resource that supports the mine schedule is within 10% of that stated in the Polymetal financial model. Bimodality in the model, when compared to input data, can be used to identify areas of potential grade variability in the short-term plan. In these areas, development can be planned to access alternative stopes, either within the defined reserve or by proving-up inferred stopes in the immediate mining area, mined grade presents as lower than planned.
- The density regression requires update and review, CSA Global recommends that a regression using AuEq would be more appropriate as the AuEq grades are supported by well validated estimate variables. Further work, drawing upon historic data, production data and possible regressions with AuEq or other metals should be undertaken to improve how density is informed in the with resource model.

- Proper documentation of all steps within the Mineral Resource estimation should be recorded in the report, so that the estimation is transparent and can be easily reviewed by a third party.

18.6 Mining and Reserve Estimation

The following recommendations are made after the technical review of the mine design and production planning:

- CSA suggests that additional sill pillars be inserted into high stopes reducing the maximum height from 50 m to 25 m. This would eliminate the potential for additional dilution but reduce the extraction ratio from 90% to 75% and arguably reduce the reserve.
- Test MSO (and Ore Reserve) sensitivity to far and near wall dilution factors.
- Mining costs are modelled and / or presented in greater detail in conjunction with key driving metric taken from the mining production plan.
- Mine design and scheduling undergo an "overhaul" to correct tie-in with existing development, correct design directions, ensure predecessor linking, apply appropriate resources, levelling and targets and develop a timeframe reporting suitable to an operating mine.
- Build a forecasting operational cost model with sufficient detail to accurately predict costs based on key driving metrics.
- Plan underground exploration drilling "cubbies" to performed infill drilling programme on the Inferred Mineral Resource.
- Commence a "tie-in" modification of the electronic mine plan of the Inferred Resource to increase accuracy of the economic potential of the Inferred Mineral Resources.
- Ensure that electronic conversion of historical development and stoping is available in 3D CAD electronic environment for mine planning and safety purposes.
- Ensure surveying system has the capability and technology to update electronic 3D mine plans for development and stoping activities, this will aid in "mine-to-plan" reconciliation and dilution control.

18.7 Tailings Management Facility

CSA Global's recommendations for the tailings management facility (TMF) are as follows.

- An engineering review of the TMF by Golder Associates recommended that the dams be stabilized by constructing rock-fill buttresses. This work has only just begun on the North Embankment. The South embankment has not been started. This work needs to be conducted with an appropriate sense of urgency. Resources need to be allocated so that stabilization can be completed as soon as possible.
- The Kapan Inferred resource is only a potential source of tailings for the TMF. The priority has to be to stabilize the facility such that it can safely accommodate the tailings from the 4 Mt reserve which is the basis for the project value. This work should be conducted under rigorous engineering control. That standard of management should be extended to the ongoing operation of the TMF.

18.8 Mineral Processing and Metallurgy

CSA Global's recommendations for mineral processing and metallurgy are as follows.

- Carry out further mineralogy and optimisation of the regrind size to replace some of the zinc and lead units with copper units in the final copper concentrate produced.

- Conduct further cyanidation leach testwork be carried out to determine whether it is economically viable to recover gold and silver reporting to the zinc concentrate ahead of selling a saleable zinc concentrate to the smelter.

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20 Abbreviations and Units of Measurement

AMD	Armenian Dram
ARD/ML	Acid Rock Drainage and Mineral Leach
°	degree(s)
°C	degrees Celsius
3D CAD	three-dimensional Computer Aided Drawing
BDL	below detection limit
Chaarat	Chaarat Gold Holdings Limited
cm	centimetre(s)
CPR	Competent Persons Report
CRM	certified reference material
CSA Global	CSA Global Pty Ltd
DPMK	Dundee Precious Metals Kapan
E&S	environmental and social
EAP	environmental action plan
g	grams
g/t	grams/tonne
EIA	Environmental Impact Assessment
EC	electrical conductivity
EPS	Earnings Per Share
FOS	Factor of Safety
Ha	Hectare
km	kilometres
km^2	square kilometres
kt	thousand tonnes
Kt/a	Thousands of tonnes per annum
koz	thousand ounces
MEINR	Ministry of Infrastructure and Natural Resources
m	metre(s)
M	million(s)
m^2	square metre(s)
m^3	cubic metre(s)
mm	millimetre(s)
Mm^3	million cubic metres
Mt	million tonnes

MTD	Mined to Date
Polymetal	Polymetal International (and its relevant subsidiaries)
PPE	personal protective equipment
QAQC	quality assurance and quality control (for sampling and assaying)
RC	reverse circulation
TSF/TMF	Tailings Storage Facility/Tailings Management Facility
US$	United States of America dollars
$/t	Dollars per tonnes

21 Glossary

Below are brief descriptions of some terms used in this report. For further information or for terms that are not described here, please refer to internet sources such as Wikipedia www.wikipedia.org

AAS:	Atomic absorption spectroscopyis a spectroanalytical procedure for the quantitative determination of chemical elements using the absorption of optical radiation (light) by free atoms in the gaseous state. In analytical chemistry the technique is used for determining the concentration of a particular element (the analyte) in a sample to be analysed.
Ag	Chemical symbol for the metal element Silver
Altaite	A lead Telluride (PbTe), yellow-white mineral with metallic lustre from the same group of minerals as galena.
Anastomosing	A network of multiple branching and diverging features i.e. veins, channels, cavities etc
Andesite	Extrusive igneous, volcanic rock of intermediate composition with 57-63% silica. They are rich in plagioclase feldspar, pyroxene, biotite or amphibole and often found in lava flows.
Amphibolite:	A metamorphic crystalline rock consisting mainly of amphiboles and some plagioclase.
Amphibolite facies:	The set of metamorphic mineral assemblages (facies) which is typical of regional metamorphism between 450°C and 700°C.
Anhydrite	Evaporite mineral forming extensive layered deposits in sedimentary basins where large volumes of sea water have been evaporated or as a vein mineral in hydrothermal deposits. The chemical composition is $CaSO_4$.
Argillic alteration:	Argillic alteration is hydrothermal alteration of wall rock which introduces clay minerals including kaolinite, smectite and illite. The process generally occurs at low temperatures.
ARD	Acid Rock Drainage
ASTER	Advanced Spaceborne Thermal Emission and Reflection Radiometer. High resolution infrared red and thermal imaging captured from space of the earths suface.
AuEq	Gold (Au) Equivalent, calculations to compare similar metal deposits with different metal ratios in gold terms.
Batholith:	A large, generally discordant plutonic mass that has more than 40 square miles (100 km^2) of surface exposure and no known floor.
Batters and berms:	Technical terms for the components of a final pit wall. The slope batters are typically 10–20 m high vertically and have slopes between 40° and 70°. The horizontal berms between the batters are typically 5–10 m wide.

BLEG	Bulk Leach Extractable Gold – geochemical sampling/analysis tool using cyanide to extract gold from a sample.
Brachyanticline:	A short anticlinal fold of layers of rock having an oval cross section. The layers of rock that form the brachyanticline slope away from the central portion of its crest on all sides
Bi	Chemical symbol for the metal element Bismuth
Bornite	Copper iron sulfide mineral also known as peacock ore due to the iridescent tarnishing.
C1 Resources	Russian system for classification of a resource as an indicated resource
C2 Resources	Russian system for classification of a resource as an inferred resource
Ca	Chemical symbol for the element Calcium
Calcite	Calcium carbonate rock forming mineral, it is found in most rock types and forms a major constituent of limestone and marble.
Carbonate	A class of sedimentary rocks composed primarily of >50% carbonate minerals (carbon-oxygen compounds) most commonly calcite, aragonite and dolomite.
Chalcocite	Copper iron sulphide mineral forming copper ore. The mineral is opaque with a metallic lustre.
Chalcopyrite	Copper iron sulphide mineral forming copper ore. The mineral has a brassy, opaque colour with metallic lustre.
CLASS	field Block Model Classification field in the block model
Copper	Chemical metal element with a orange/brown metallic colour. The metal is soft, malleable and highly ductile forms chemical compounds in minerals
Covelline	A rare copper sulphide mineral with a rich indigo blue colour. Also known as Covellite.
Cretaceous period:	Geologic period and system that spans 79 million years from the end of the Jurassic Period 145 million years ago (mya) to the beginning of the Paleogene Period 66 mya.
Cu	Chemical symbol for the metal element Copper
Dacite	Felsic, igneous intrusive rock of intermediate composition. It is fine grained and found in lava flows, dykes, sills and pyroclastic debris. The common constituents are quartz and feldspars with minor occurrences of biotite, hornblende and augite.
Dickite	Aluminium silicate clay mineral with hydrothermal origins
Epithermal Deposit:	Epithermal gold deposits are a type of lode deposit that contain economic concentrations of gold, silver and in some cases base metals including copper, lead and zinc. Gold is the principal commodity of epithermal deposits.
EAP	Environmental Action Plan

EC	Electrical Conductivity
EMP	Environmental Management Plan
E&S	Environmental and sustainability Management Plan
Enargite	Copper arsenic sulfur mineral which can produce copper ore. It is found in low-moderate grade hydrothermal and epithermal vein deposits. Its colour is opaque, steel grey to black with a metallic lustre.
E-W	East – West (orientation)
Fahl	Group of ore minerals, chalcopyrite, bournonite, sphalerite, galena and an Ag-Hg amalgam
Fe	Chemical symbol for the metal Iron
Felsic	Division of igneous rocks that are rich in silica minerals usually >65%
FoS	Factor of Safety is a term describing the load carrying capability of a system beyond the expected or actual loads. Essentially, the factor of safety is how much stronger the system is than it needs to be for an intended load
Galena	Lead sulphide mineral and a common ore for lead. It is a dark grey, opaque mineral with metallic lustre
Gangue	A mining term for the commercially worthless material surrounding or mixed with the ore or mineral of interest.
GIS	Geographical Information System
Gossanous	Intensely oxidised, weathered or decomposed rock where the sulphide minerals oxidise resulting in a highly ferruginous rock.
Gypsum	Very soft, calcium sulfate dihydrate mineral. It is an evaporite mineral with a silky lustre commonly found in layered sedimentary deposits
H&S	Health and safety
Hessite	Silver telluride mineral which is opaque, lead grey in colour and is very soft with a metallic lustre.
ICP:	Inductively coupled plasma atomic emission spectroscopy (ICP-AES), also referred to as inductively coupled plasma optical emission spectrometry (ICP-OES), is an analytical technique used for the detection of chemical elements
Indicated Resource	(JORC) Australian Code for the Reporting of Exploration Results where the mineral resource has an assumed continuity and a higher level of confidence
Inferred Resource	(JORC) Australian Code for the Reporting of Exploration Results where the mineral resource has an implied continuity and low level of confidence
Inductively Coupled	Plasma-Mass spectrometry/Atomic Emission Spectroscopy – An analysis technique to determine the concentrations of major elements in a material

Jurassic period:	The Jurassic period spanned 56 million years from the end of the Triassic Period 201.3 million years ago (Mya) to the beginning of the Cretaceous Period 145 Mya.
LOM	Life Of Mine. The expected time in which, through the employment of the available capital, the ore reserves will be extracted
Measured Resource	(JORC) Australian Code for the Reporting of Exploration Results where the mineral resource has undergone further testing to declare the estimate has a high level of confidence.
MCE	Maximum Critical Earthquake coefficient
Mln$	Million US dollars
Mtd	Mined to date
MRE	Mineral Resource Estimate
MSO	Mine Shape Optimiser – Datamine program for designing stopes
NPV	Net Present Value
NQ Core	Diamond drilling core samples with a diameter of 47.6mm
OEM	Original Equipment Manufacturer
Orogenic:	An orogen or orogenic belt develops when a continental plate crumples and is pushed upwards to form one or more mountain ranges; this involves a series of geological processes collectively called orogenesis.
Ore raises:	In underground mining, a raise refers to a vertical or inclined excavation that leads from one level, or drift, to another.
Palaeogene	Geological period of time spanning 43 million years from the end of the Cretaceous Period (66mya) and the beginning of the Neogene (23.03mya).
Pb	Chemical symbol for the metal element Lead
PGA	Peak Ground Acceleration is equal to the maximum ground acceleration that occurred during earthquake shaking at a location.
Petzite	Gold silver telluride mineral deposited in hydrothermal environments. It is opaque with a grey colour and metallic lustre often found with minor copper and mercury.
Propylitic alteration:	Propylitic alteration is the chemical alteration of a rock, caused by iron and magnesium bearing hydrothermal fluids, altering biotite or amphibole within the rock groundmass. It typically results in epidote–chlorite–albite alteration and pyrite.
PPE	Personal Protection Equipment
Pyrite	Iron sulphide mineral also known as fool's gold. Crystals form a characteristic cubic habit with a bright metallic lustre and brassy colour.
Quartz	Silicon dioxide mineral and the most abundant mineral on the earth occurring in most geological environments. Crystals are clear-white/grey and range from translucent-opaque.

Rhodochrosite	Manganese carbonate mineral ranging in colour from red to pink. It is often found in metamorphic and sedimentary rocks and can be a source of manganese ore.
S	Chemical symbol for the element Sulphur
Sulphidation	High temperature hydrothermal fluids introduce highly oxidised sulphur and sulphide ions into a material
Silicification	A material becomes saturated with silica which replaces the original composition forming quartz, chalcedony or opal.
Sericite:	A silicate mineral which is fine grained and fibrous similar to muscovite mica, commonly found in schists.
Sphalerite:	Zinc sulphide mineral and a common source of ore for zinc. It is found in hydrothermal conditions or where contact metamorphism has taken place. It comes I a range of colours and lustres.
SRTM	Shuttle Radar Topography Mission (digital elevation models)
SSC	Sericite – Silica – Chlorite alteration
TDS	Total Dissolved Solids
Tethyian:	The Tethyan orogenic belt stretches from the Alps, through the Carpathians and Balkans, Taurides and Caucasus, Zagros, Makran, and Himalayas, to Indochina and into the southwest Pacific Ocean
Tellurides	A mineral compound with the element Tellurium.
Tellurobismuthite	A bismuth telluride mineral It has a dark grey colour with a metallic lustre and is very soft.
Tennantite	Copper arsenic sulfur mineral formed in hydrothermal veins and through contact metamorphism. It is opaque and steel grey in colour with metallic lustre.
Tetrahedrite	Copper antimony sulfate mineral forming distinctive triangular shaped crystals. It is opaque, dark grey in colour with a metallic lustre.
Tuff	A volcanic rock made from ash and pyroclastic material ejected from a volcano. Upon settling, it is consolidated into a solid rock through compaction and consolidation.
UG mining	Underground Mining
VMS	Volcanic Massive Sulphide
VTEM	Versatile Time Domain Electromagetic System
WACC	Weighted Average Cost of Capital is the rate a company is expected to pay on average to all its security holders to finance its assets

Zn	Chemical symbol for the metal element Zinc


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YEARS
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PART V

HISTORICAL FINANCIAL INFORMATION

SECTION A OF PART A OF PART V

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14 December 2018

Numis Securities Limited
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EC4M 7LT

Dear Sirs

Chaarat Gold Limited (the "Company") and its subsidiary undertakings (together, the "Group")

Kapan Mining and Processing Company CJSC ("Kapan")

INTRODUCTION

We report on the financial information set out in Section B of Part A of Part V. This financial information has been prepared for inclusion in the admission document dated 14 December 2018 of the Company (the "Admission Document") on the basis of the accounting policies set out in note 1 to the financial information. This report is required by paragraph (a) of Schedule Two of the AIM Rules for Companies and is given for the purpose of complying with that paragraph and for no other purpose.

RESPONSIBILITIES

The directors of the Company are responsible for preparing the financial information in accordance with International Financial Reporting Standards as adopted by the European Union

It is our responsibility to form an opinion on the financial information and to report our opinion to you.

Save for any responsibility arising under paragraph (a) of Schedule Two of the AIM Rules for Companies to any person as and to the extent there provided, to the fullest extent permitted by the law we do not assume any responsibility and will not accept any liability to any other person for any loss suffered by any such other person as a result of, arising out of, or in connection with this report

or our statement, required by and given solely for the purposes of complying with Schedule Two of the AIM Rules for Companies consenting to its inclusion in the Admission Document.

BASIS OF OPINION

We conducted our work in accordance with Standards for Investment Reporting issued by the Auditing Practices Board in the United Kingdom. Our work included an assessment of evidence relevant to the amounts and disclosures in the financial information. It also included an assessment of significant estimates and judgements made by those responsible for the preparation of the financial information and whether the accounting policies are appropriate to the entity's circumstances, consistently applied and adequately disclosed.

We planned and performed our work so as to obtain all the information and explanations which we considered necessary in order to provide us with sufficient evidence to give reasonable assurance that the financial information is free from material misstatement whether caused by fraud or other irregularity or error.

Our work has not been carried out in accordance with auditing or other standards and practices generally accepted in the United States of America or other jurisdictions outside the United Kingdom and accordingly should not be relied upon as if it had been carried out in accordance with those standards and practices.

OPINION

In our opinion, the financial information gives, for the purposes of the Admission Document, a true and fair view of the state of affairs of Kapan as at each of 31 December 2015, 2016 and 2017 and of its results, cash flows, changes in equity for the years then ended in accordance with International Financial Reporting Standards as adopted by the European Union.

DECLARATION

For the purposes of Paragraph (a) of Schedule Two of the AIM Rules for Companies we are responsible for this report as part of the Admission Document and declare that we have taken all reasonable care to ensure that the information contained in this report is, to the best of our knowledge, in accordance with the facts and contains no omission likely to affect its import. This declaration is included in the Admission Document in compliance with Schedule Two of the AIM Rules for Companies.

Yours faithfully

BDO LLP

SECTION B OF PART A: HISTORICAL FINANCIAL INFORMATION ON KAPAN

STATEMENT OF FINANCIAL POSITION

In thousands of US Dollars	Note	31 December 2015	31 December 2016	31 December 2017
ASSETS				
Non-current				
Property, plant and equipment	7	43,095	45,665	60,323
Intangible assets	8	724	479	427
Non-current VAT recoverable		66	–	–
Deferred income tax asset	25	4,039	4,970	3,154
Non-current prepayments	9	–	3,188	956
Deferred VAT receivable		190	131	2,713
Total non-current assets		**48,114**	**54,433**	**67,573**
Current				
Inventories	10	12,040	10,178	9,785
Commodity derivative contracts, net	27	5,456	–	–
Trade and other receivables	11	9,805	4,671	10,441
Current income tax prepayments		1,538	975	–
Deferred VAT receivable		833	190	143
Cash and cash equivalents	12	3,172	6,991	7,503
Total current assets		**32,844**	**23,005**	**27,872**
TOTAL ASSETS		**80,958**	**77,438**	**95,445**
EQUITY				
Share capital	13	63,467	63,498	63,498
Equity reserve		9,151	9,151	9,151
Share premium	13	–	4,469	4,469
Accumulated deficit		(19,182)	(22,210)	(16,537)
Currency translation reserve	3	(1,170)	(1,211)	(1,248)
TOTAL EQUITY		**52,266**	**53,697**	**59,333**
LIABILITIES				
Non-current				
Provisions for asset retirement obligations	15	4,866	7,408	9,399
Other provisions for liabilities and charges	17	8,587	3,273	–
Deferred VAT payable		190	131	2,713
Total non-current liabilities		**13,643**	**10,812**	**12,112**
Current				
Borrowings	14	–	3,750	10,809
Trade and other payables	16	14,126	3,002	8,160
Other provisions for liabilities and charges	17	90	5,987	4,388
Deferred VAT payable		833	190	143
Current income tax payable		–	–	500
Total current liabilities		**15,049**	**12,929**	**24,000**
TOTAL LIABILITIES		**28,692**	**23,741**	**36,112**
TOTAL LIABILITIES AND EQUITY		**80,958**	**77,438**	**95,445**

STATEMENT OF PROFIT OR LOSS AND OTHER COMPREHENSIVE INCOME

In thousands of US Dollars	Note	2015	2016	2017
Revenue	18	36,832	38,944	66,022
Cost of sales	19	(35,452)	(28,479)	(48,196)

Gross profit		**1,380**	**10,465**	**17,826**
Other operating income	20	2,345	95	678
Distribution costs	21	(1,688)	(1,631)	(2,186)
General and administrative expenses	22	(9,496)	(7,670)	(4,598)
Other operating expenses	23	(8,084)	(4,022)	(2,558)
Operating profit/(loss)		(15,543)	(2,763)	9,162
Finance income		1	4	36
Finance costs	24	(8,670)	(1,055)	(1,494)
Profit/(Loss) before income tax		(24,212)	(3,814)	7,704
Income tax (expense)/credit	25	3,225	786	(2,031)
PROFIT/(LOSS) FOR THE YEAR		**(20,987)**	**(3,028)**	**5,673**
Other comprehensive loss:				
Items that may be reclassified subsequently to profit or loss:				
Effect of translation to presentation currency		(575)	(41)	(37)
Other comprehensive loss for the year		**(575)**	**(41)**	**(37)**
TOTAL COMPREHENSIVE INCOME/(LOSS) FOR THE YEAR		**(21,562)**	**(3,069)**	**5,636**

STATEMENT OF CHANGES IN EQUITY

In thousands US Dollars	Note	Share capital	Equity reserve	Share premium	Accumulated deficit	Currency translation reserve	Total
Balance at 1 January 2015		**1,648**	**–**	**–**	**(122,826)**	**(595)**	**(121,773)**
Loss for 2015		–	–	–	(20,987)	–	(20,987)
Other comprehensive loss for 2015		–	–	–	–	(575)	(575)
Total comprehensive loss for 2015		–	–	–	(20,987)	(575)	(21,562)
Shares issued	13	195,601	–	–	–	–	195,601
Reclassification to equity reserve	13	(9,151)	9,151	–	–	–	–
Reduction of accumulated deficit through ordinary share capital	13	(124,631)	–	–	124,631	–	–
Balance at 31 December 2015		**63,467**	**9,151**	**–**	**(19,182)**	**(1,170)**	**52,266**
Loss for 2016		–	–	–	(3,028)	–	(3,028)
Other comprehensive loss for 2016		–	–	–	–	(41)	(41)
Total comprehensive loss for 2016		–	–	–	(3,028)	(41)	(3,069)
Shares issued	13	31	–	4,469	–	–	4,500
Balance at 31 December 2016		**63,498**	**9,151**	**4,469**	**(22,210)**	**(1,211)**	**53,697**
Profit for 2017		–	–	–	5,673	–	5,673
Other comprehensive loss for 2017		–	–	–	–	(37)	(37)
Total comprehensive income/(loss) for 2017		–	–	–	5,673	(37)	6,662
Balance at 31 December 2017		**63,498**	**9,151**	**4,469**	**(16,537)**	**(1,248)**	**59,333**

STATEMENT OF CASH FLOWS

In thousands of US Dollars	Note	2015	2016	2017
Cash flows from operating activities				
Profit/(loss) before income tax		(24,212)	(3,814)	7,704
Adjustments for:				
Depreciation of property, plant and equipment	19, 21, 22	7,110	6,125	11,358
Amortisation of intangible assets	19, 21, 22	158	157	185
Net loss on disposal of property, plant and equipment and intangible assets	23	14	507	50
Net loss on disposal of inventories	23	–	1,591	–
Write-off of inventories	23	93	167	55
Change in inventory provision	23	4,106	–	–
Write-off of prepayments	23	334	93	114
Net gain on commodity derivative contracts	20	(2,157)	–	–
Change in provisions for other liabilities and charges	17	8,249	590	1,026
Interest income		(1)	(4)	(36)
Revenue from MTM adjustment		210	(491)	(1,964)
Unwinding of the present value discount on provision for asset retirement obligations	24	824	940	1,103
Net loss on financial assets	23	–	832	–
Interest expense	24	7,653	64	343
Foreign exchange losses, net	20, 23, 24	320	(26)	(319)
Operating cash flows before working capital changes		**2,701**	**6,731**	**19,619**
(Increase)/Decrease in trade and other receivables		8,817	8,038	(8,938)
Decrease/(Increase) in inventories		(139)	113	336
Increase/(Decrease) in trade and other payables		(560)	(5,967)	5,985
Decrease in commodity derivative contracts		–	(2,359)	–
Changes in working capital		**8,118**	**(175)**	**2,617**
Interest paid		(12,330)	(14)	(33)
Interest received		1	4	36
Net cash from/(used in) operating activities		**(1,510)**	**6,546**	**17,005**
Cash flows from investing activities				
Purchase of property, plant and equipment		(9,399)	(11,616)	(23,946)
Purchase of intangible assets		(159)	(143)	(135)
Proceeds from sale of property, plant and equipment and intangible assets		45	931	873
Net cash used in investing activities		**(9,513)**	**(10,828)**	**(23,208)**
Cash flows from financing activities				
Proceeds from borrowings		–	3,677	17,305
Repayment of borrowings		–	–	(10,498)
Proceeds from issuance of ordinary shares		13,443	4,500	–
Net cash from financing activities		**13,443**	**8,177**	**6,807**
Effect of exchange rate changes on cash and cash equivalents		(789)	(76)	(92)
Cash and cash equivalents at the beginning of the year	**12**	**1,541**	**3,172**	**6,991**
Cash and cash equivalents at the end of the year	**12**	**3,172**	**6,991**	**7,503**

NOTES TO THE FINANCIAL INFORMATION

1. Kapan Mining and Processing Company CJSC and its Operations

This financial information has been prepared for the years ended 31 December 2017, 2016 and 2015 for Kapan Mining and Processing Company CJSC (the "Company").

The Company was incorporated and is domiciled in the Republic of Armenia. The Company is a joint stock company limited by its shares and was set up in accordance with regulations of the Republic of Armenia.

As of 31 December 2015, the Company's immediate parent company was Vatrin Investment Ltd and ultimate parent company was Dundee Precious Metals Inc.

On 28 April 2016 the Company was acquired by PMTL Holding Ltd and renamed to Kapan Mining and Processing Company CJSC from Dundee Precious Metals Kapan CJSC.

As of 31 December 2016 and 2017 the Company's immediate parent company was PMTL Holding Ltd and ultimate parent company was Polymetal International Plc.

Principal activity. The Company's principal business activity is the extraction of complex ore and production of copper-gold-silver and zinc concentrates within the Republic of Armenia. The Company's manufacturing facilities are primarily based in Kapan town.

Registered address and place of business. The Company's registered address is #4, Gortsaranain Street, Kapan 3302, Syunik Region, Republic of Armenia.

2. Operating Environment of the Company

The Republic of Armenia displays certain characteristics of an emerging market. The legal, tax and regulatory frameworks continue to develop and are subject to frequent changes and varying interpretations, refer to Note 26. The Armenian economy was growing in 2017, after overcoming the economic recession of 2015 and 2016. The economic environment of the Republic of Armenia is significantly influenced by the level of business activity in the Russian Federation and significant cash movements flow from the Russian Federation to the Republic of Armenia. Therefore, a decline in business activity, stock market volatility and other risks experienced in the Russian Federation could have a flow-on negative effect on the financial and corporate sectors of the Republic of Armenia. The Russian economy is negatively impacted by low oil prices, ongoing political tension in the region and international sanctions against certain Russian companies and individuals, all of which contributed to the country's economic recession characterised by a decline in gross domestic product.

The financial markets continue to be volatile and are characterised by frequent significant price movements and increased trading spreads.

These events may have a further significant impact on the Company's future operations and financial position, the effect of which is difficult to predict. The future economic and regulatory situation and its impact on the Company's operations may differ from management's current expectations.

3. Summary of Significant Accounting Policies

Basis of preparation. This financial information has been prepared in accordance with

International Financial Reporting Standards ("IFRS") under the historical cost convention as modified by financial instruments categorised at fair value through profit or loss. The principal accounting policies applied in the preparation of this financial information are set out below. These policies have been consistently applied to all the periods presented.

This financial information has been prepared for the purposes of management of PMTL Holding Ltd and Polymetal International Plc, in the context of sale of the Company to Chaarat Gold Holdings Limited.

Financial instruments – key measurement terms. Depending on their classification, financial instruments are carried at fair value or amortised cost as described below.

Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. The best evidence of fair value is

price in an active market. An active market is one in which transactions for the asset or liability take place with sufficient frequency and volume to provide pricing information on an ongoing basis.

Fair value of financial instruments traded in an active market is measured as the product of the quoted price for the individual asset or liability and the quantity held by the entity. This is the case even if a market's normal daily trading volume is not sufficient to absorb the quantity held and placing orders to sell the position in a single transaction might affect the quoted price.

Valuation techniques such as discounted cash flow models or models based on recent arm's length transactions or consideration of financial data of the investees are used to fair value certain financial instruments for which external market pricing information is not available. Fair value measurements are analysed by level in the fair value hierarchy as follows: (i) level one are measurements at quoted prices (unadjusted) in active markets for identical assets or liabilities, (ii) level two measurements are valuations techniques with all material inputs observable for the asset or liability, either directly (that is, as prices) or indirectly (that is, derived from prices), and (iii) level three measurements are valuations not based on solely observable market data (that is, the measurement requires significant unobservable inputs). Transfers between levels of the fair value hierarchy are deemed to have occurred at the end of the reporting period. Refer to Note 31.

Transaction costs are incremental costs that are directly attributable to the acquisition, issue or disposal of a financial instrument. An incremental cost is one that would not have been incurred if the transaction had not taken place. Transaction costs include fees and commissions paid to agents (including employees acting as selling agents), advisors, brokers and dealers, levies by regulatory agencies and securities exchanges, and transfer taxes and duties. Transaction costs do not include debt premiums or discounts, financing costs or internal administrative or holding costs.

Amortised cost is the amount at which the financial instrument was recognised at initial recognition less any principal repayments, plus accrued interest, and for financial assets less any write-down for incurred impairment losses. Accrued interest includes amortisation of transaction costs deferred at initial recognition and of any premium or discount to maturity amount using the effective interest method. Accrued interest income and accrued interest expense, including both accrued coupon and amortised discount or premium (including fees deferred at origination, if any), are not presented separately and are included in the carrying values of related items in the statement of financial position.

The effective interest method is a method of allocating interest income or interest expense over the relevant period so as to achieve a constant periodic rate of interest (effective interest rate) on the carrying amount. The effective interest rate is the rate that exactly discounts estimated future cash payments or receipts (excluding future credit losses) through the expected life of the financial instrument or a shorter period, if appropriate, to the net carrying amount of the financial instrument. The effective interest rate discounts cash flows of variable interest instruments to the next interest reprising date except for the premium or discount, which reflects the credit spread over the floating rate specified in the instrument, or other variables that are not reset to market rates. Such premiums or discounts are amortised over the whole expected life of the instrument. The present value calculation includes all fees paid or received between parties to the contract that are an integral part of the effective interest rate.

Financial instruments – key measurement terms. Depending on their classification, financial instruments are carried at fair value or amortised cost as described below.

Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. The best evidence of fair value is price in an active market. An active market is one in which transactions for the asset or liability take place with sufficient frequency and volume to provide pricing information on an ongoing basis.

Fair value of financial instruments traded in an active market is measured as the product of the quoted price for the individual asset or liability and the quantity held by the entity. This is the case even if a market's normal daily trading volume is not sufficient to absorb the quantity held and placing orders to sell the position in a single transaction might affect the quoted price.

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instruments for which external market pricing information is not available. Fair value measurements are analysed by level in the fair value hierarchy as follows: (i) level one are measurements at quoted prices (unadjusted) in active markets for identical assets or liabilities; (ii) level two measurements are valuations techniques with all material inputs observable for the asset or liability, either directly (that is, as prices) or indirectly (that is, derived from prices); and (iii) level three measurements are valuations not based on solely observable market data (that is, the measurement requires significant unobservable inputs). Transfers between levels of the fair value hierarchy are deemed to have occurred at the end of the reporting period. Refer to Note 31.

Transaction costs are incremental costs that are directly attributable to the acquisition, issue or disposal of a financial instrument. An incremental cost is one that would not have been incurred if the transaction had not taken place. Transaction costs include fees and commissions paid to agents

(including employees acting as selling agents), advisors, brokers and dealers, levies by regulatory agencies and securities exchanges, and transfer taxes and duties. Transaction costs do not include debt premiums or discounts, financing costs or internal administrative or holding costs.

Amortised cost is the amount at which the financial instrument was recognised at initial recognition less any principal repayments, plus accrued interest, and for financial assets less any write-down for incurred impairment losses. Accrued interest includes amortisation of transaction costs deferred at initial recognition and of any premium or discount to maturity amount using the effective interest method. Accrued interest income and accrued interest expense, including both accrued coupon and amortised discount or premium (including fees deferred at origination, if any), are not presented separately and are included in the carrying values of related items in the statement of financial position.

The effective interest method is a method of allocating interest income or interest expense over the relevant period so as to achieve a constant periodic rate of interest (effective interest rate) on the carrying amount. The effective interest rate is the rate that exactly discounts estimated future cash payments or receipts (excluding future credit losses) through the expected life of the financial instrument or a shorter period, if appropriate, to the net carrying amount of the financial instrument. The effective interest rate discounts cash flows of variable interest instruments to the next interest reprising date except for the premium or discount, which reflects the credit spread over the floating rate specified in the instrument, or other variables that are not reset to market rates. Such premiums or discounts are amortised over the whole expected life of the instrument. The present value calculation includes all fees paid or received between parties to the contract that are an integral part of the effective interest rate.

Classification of financial instruments. The Company classifies the financial instruments into classes that reflect the nature of information and take into account the characteristics of those financial instruments. The classification made can be seen in the table below:

Category as defined by IAS 39		Classes as defined by the Company
Financial assets	Loans and receivables	Trade and other receivables Cash and cash equivalents
	Financial assets at fair value through profit and loss	Commodity derivative contracts
Financial liabilities	Financial liabilities carried at amortised cost	Borrowings Trade and other payables

Trade and other receivables. Trade and other receivables are carried at amortised cost using the effective interest method.

Cash and cash equivalents. Cash and cash equivalents include cash in hand, deposits held at call with banks, and other short-term highly liquid investments with original maturities of three months or less. Cash and cash equivalents are carried at amortised cost using the effective interest method.

Commodity derivative contracts. Commodity derivative contracts are carried at their fair value. They are carried as assets when fair value is positive and as liabilities when fair value is negative. Changes in the fair value of derivative instruments are included in profit or loss for the year. The Company does not apply hedge accounting.

Borrowings. Borrowings are carried at amortised cost using the effective interest method.

Trade and other payables. Trade payables are accrued when the counterparty performs its obligations under the contract and are carried at amortised cost using the effective interest method.

Initial recognition of financial instruments. Financial instruments are initially recorded at fair value plus transaction costs. Fair value at initial recognition is best evidenced by the transaction price. A gain or loss on initial recognition is only recorded if there is a difference between fair value and transaction price, which can be evidenced by other observable current market transactions in the same instrument, or by a valuation technique, whose inputs include only data from observable markets.

All purchases and sales of financial assets that require delivery within the time frame established by regulation or market convention ("regular way" purchases and sales) are recorded at trade date, which is the date that the Company commits to deliver a financial asset. All other purchases are recognised when the entity becomes a party to the contractual provisions of the instrument.

Derecognition of financial assets. The Company derecognises financial assets when: (a) the assets are redeemed or the rights to cash flows from the assets otherwise expire; or (b) the Company has transferred the rights to the cash flows from the financial assets or entered into a qualifying pass-through arrangement while: (i) also transferring substantially all the risks and rewards of ownership of the assets; or (ii) neither transferring nor retaining substantially all risks and rewards of ownership but not retaining control.

Control is retained if the counterparty does not have the practical ability to sell the asset in its entirety to an unrelated third party without needing to impose additional restrictions on the sale.

Impairment of financial assets carried at amortised cost. Impairment losses are recognised in profit or loss when incurred as a result of one or more events ("loss events") that occurred after the initial recognition of the financial asset and which have an impact on the amount or timing of the estimated future cash flows of the financial asset or group of financial assets that can be reliably estimated. If the Company determines that, no objective evidence exists that impairment was incurred for an individually assessed financial asset, whether significant or not, it includes the asset in a group of financial assets with similar credit risk characteristics and collectively assesses them for impairment.

The primary factors that the Company considers in determining whether a financial asset is impaired are its overdue status and realisability of related collateral, if any. The following other principal criteria are also used to determine whether there is objective evidence that an impairment loss has occurred:

– any portion or instalment is overdue and the late payment cannot be attributed to a delay caused by the settlement systems;

– the counterparty experiences a significant financial difficulty as evidenced by its financial information that the Company obtains;

– the counterparty considers bankruptcy or a financial reorganisation;

– there is adverse change in the payment status of the counterparty as a result of changes in the national or local economic conditions that impact the counterparty; or

– the value of collateral, if any, significantly decreases as a result of deteriorating market conditions.

If the terms of an impaired financial asset held at amortised cost are renegotiated or otherwise modified because of financial difficulties of the counterparty, impairment is measured using the original effective interest rate before the modification of terms.

Impairment losses are always recognised through an allowance account to write down the asset's carrying amount to the present value of expected cash flows (which exclude future credit losses that have not been incurred) discounted at the original effective interest rate of the asset. The calculation of the present value of the estimated future cash flows of a collateralised financial asset reflects the cash flows that may result from foreclosure less costs for obtaining and selling the collateral, whether or not foreclosure is probable.

If, in a subsequent period, the amount of the impairment loss decreases and the decrease can be related objectively to an event occurring after the impairment was recognised (such as an improvement in the debtor's credit rating), the previously recognised impairment loss is reversed by adjusting the allowance account through profit or loss for the year.

Uncollectible assets are written off against the related impairment loss provision after all the necessary procedures to recover the asset have been completed and the amount of the loss has been determined. Subsequent recoveries of amounts previously written off are credited to impairment loss account within the profit or loss for the year.

Property, plant and equipment. Property, plant and equipment are stated at cost, less accumulated depreciation and provision for impairment, where required.

Costs of minor repairs and day-to-day maintenance are expensed when incurred. Cost of replacing major parts or components of property, plant and equipment items are capitalised and the replaced part is retired.

At the end of each reporting period, management assesses whether there is any indication of impairment of property, plant and equipment. If any such indication exists, management estimates the recoverable amount, which is determined as the higher of an asset's fair value less costs of disposal and its value in use. The carrying amount is reduced to the recoverable amount and the impairment loss is recognised in profit or loss for the year. An impairment loss recognised for an asset in prior years is reversed where appropriate if there has been a change in the estimates used to determine the asset's value in use or fair value less costs of disposal.

Gains and losses on disposals are determined by comparing proceeds with carrying amount and are recognised in profit or loss for the year within other operating income or costs.

Depreciation. Land and construction in progress are not depreciated. Mining properties are depreciated based on unit of production method. Depreciation on other items of property, plant and equipment is calculated using the straight-line method to allocate their cost to their residual values over their estimated useful lives:

	Useful lives in years
Buildings	15 – 20
Structures	16 – 20
Plant and equipment	2 – 10
Fixture and fittings	15 – 20
Motor vehicles	2 – 7
Other	2 – 10

The residual value of an asset is the estimated amount that the Company would currently obtain from disposal of the asset less the estimated costs of disposal, if the asset were already of the age and in the condition expected at the end of its useful life. The assets' residual values and useful lives are reviewed, and adjusted if appropriate, at the end of each reporting period.

Activities prior to the acquisition of the mineral rights are pre-exploration. Pre-exploration costs are expensed and include such costs as initial technical and economical assessment of a project, geological model definition of minerals and its evaluation, and overheads associated with the pre-exploration activities.

Intangible assets. The Company's intangible assets have definite useful lives and primarily include capitalised computer software and licences. Acquired computer software licences, are capitalised on the basis of the costs incurred to acquire and bring them to use.

Capitalised computer software and licenses are amortised on a straight-line basis over expected useful lives of 3 to 10 years. If impaired, the carrying amount of intangible assets is written down to the higher of value in use and fair value less costs of disposal.

Income taxes. Income taxes have been provided for in the financial information in accordance with legislation enacted or substantively enacted by the end of the reporting period. The income tax expense comprises current tax and deferred tax and is recognised in profit or loss for the year except if it is

recognised in other comprehensive income or directly in equity because it relates to transactions that are also recognised, in the same or a different period, in other comprehensive income or directly in equity.

Current tax is the amount expected to be paid to, or recovered from, the taxation authorities in respect of taxable profits or losses for the current and prior periods. Taxable profits or losses are based on estimates if financial statements are authorised prior to filing relevant tax returns. Taxes other than on income are recorded within operating expenses.

Deferred income tax is provided using the balance sheet liability method for tax loss carry forwards and temporary differences arising between the tax bases of assets and liabilities and their carrying amounts for financial reporting purposes. In accordance with the initial recognition exemption, deferred taxes are not recorded for temporary differences on initial recognition of an asset or a liability in a transaction other than a business combination if the transaction, when initially recorded, affects neither accounting nor taxable profit.

Deferred tax balances are measured at tax rates enacted or substantively enacted at the end of the reporting period, which are expected to apply to the period when the temporary differences will reverse or the tax loss carry forwards will be utilised. Deferred tax assets for deductible temporary differences and tax loss carry forwards are recorded only to the extent that it is probable that future taxable profit will be available against which the deductions can be utilised.

Uncertain tax positions. The Company's uncertain tax positions are reassessed by management at the end of each reporting period. Liabilities are recorded for income tax positions that are determined by management as more likely than not to result in additional taxes being levied if the positions were to be challenged by the tax authorities. The company has undergone a tax audit by the Armenian tax authorities for the periods of 2014 to 2017. The initial findings of the tax audit have been accepted by the Company and all findings are recognised as tax provisions in the financial statements. Whilst the tax audit is complete, subject to settlement, it is possible that the tax authorities may identify additional amounts payable as a result of further inspections. The company has not made any provisions for potential payments as a result of the ongoing investigation.

The assessment is based on the interpretation of tax laws that have been enacted or substantively enacted by the end of the reporting period and any known court or other rulings on such issues. Liabilities for penalties, interest and taxes other than on income are recognised based on management's best estimate of the expenditure required to settle the obligations at the end of the reporting period.

Inventories. Inventories are recorded at the lower of cost and net realisable value. For concentrate and ore stock piles the net realisable value represents the estimated selling price for that product based on 6-month forward metal prices and applicable contract terms, less estimated costs to complete production and selling costs, including royalties. The estimated costs to complete and selling costs are obtained from current production budgets, approved for the reporting year. Cost of finished goods is determined on the weighted average basis and cost of other inventories on first in first out basis. For consumables and spare parts the net realisable value represents the estimated selling price less all estimated costs of completion and costs to be incurred in marketing, selling and distribution. The company's policy is to write-down to nil the items that were not moving for more than twelve months.

The cost of finished goods and work in progress comprises raw material, direct labour, other direct costs and related production overheads (based on normal operating capacity) but excludes borrowing costs. Net realisable value is the estimated selling price in the ordinary course of business, less the estimated cost of completion and selling expenses.

Prepayments. Prepayments are carried at cost less provision for impairment. A prepayment is classified as non-current when the goods or services relating to the prepayment are expected to be obtained after one year, or when the prepayment relates to an asset, which will itself be classified as non-current upon initial recognition. Prepayments to acquire assets are transferred to the carrying amount of the asset once the Company has obtained control of the asset and it is probable that future economic benefits associated with the asset will flow to the Company. Other prepayments are written off to profit or loss when the goods or services relating to the prepayments are received.

If there is an indication that the assets, goods or services relating to a prepayment will not be received, the carrying value of the prepayment is written down accordingly and a corresponding impairment loss is recognised in profit or loss for the year.

Share capital. Ordinary shares are classified as equity. Incremental costs directly attributable to the issue of new shares are shown in equity as a deduction, net of tax, from the proceeds. Any excess of the fair value of consideration received over the par value of shares issued is recorded as share premium in equity.

Equity reserve. Equity reserve was formed as part of additional shares issued during the year ended 31 December 2015 as 15% of non-distributed profit after decrease of nominal value of shares.

Value added tax. Output value added tax related to sales is payable to tax authorities on the delivery of goods or services to customers. Input VAT is generally recoverable against output VAT upon receipt of the VAT invoice. The tax authorities permit the settlement of VAT on a net basis. VAT related to sales and purchases is recognised in the statement of financial position on a gross basis and disclosed separately as an asset and liability.

Deferred VAT. According to the Law on VAT of the Republic of Armenia the payment of VAT for specified goods is allowed to be deferred from one to three years depending on the customs value of the imported goods. The input deferred VAT arising on the payment of the non-current/current payable is presented as a non-current/current deferred VAT receivable in the corresponding amount. As of each reporting period the Company assesses the settlement periods of import VAT based on the deferral granted on import date. If the remaining period till the deferral term is more than 12 months then the VAT is classified as non-current, in other cases it is classified as current.

Capitalisation of borrowing costs. Borrowing costs directly attributable to the acquisition, construction or production of assets that necessarily take a substantial time to get ready for intended use or sale (qualifying assets) are capitalised as part of the costs of those assets, if the commencement date for capitalisation is on or after 1 January 2009.

The commencement date for capitalisation is when: (a) the Company incurs expenditures for the qualifying asset; (b) it incurs borrowing costs; and (c) it undertakes activities that are necessary to prepare the asset for its intended use or sale. Capitalisation of borrowing costs continues up to the date when the assets are substantially ready for their use or sale.

The Company capitalises borrowing costs that could have been avoided if it had not made capital expenditure on qualifying assets. Borrowing costs capitalised are calculated at the group's average funding cost (the weighted average interest cost is applied to the expenditures on the qualifying assets), except to the extent that funds are borrowed specifically for the purpose of obtaining a qualifying asset. Where this occurs, actual borrowing costs incurred less any investment income on the temporary investment of those borrowings are capitalised.

Provisions for liabilities and charges. Provisions for liabilities and charges are non-financial liabilities of uncertain timing or amount. They are accrued when the Company has a present legal or constructive obligation as a result of past events, it is probable that an outflow of resources embodying economic benefits will be required to settle the obligation, and a reliable estimate of the amount of the obligation can be made.

Asset retirement obligations. Estimated costs of dismantling and removing an item of property, plant and equipment (asset retirement obligations) are added to the cost of the item either when an item is acquired or as the item is used during a particular period for purposes other than to produce inventories during that period. Changes in the measurement of an existing asset retirement obligation that result from changes in the estimated timing or amount of the outflows, or from changes in the discount rate alter the previously recognised revaluation surplus or deficit for an asset carried at valuation or adjust the cost of the related asset in the current period for assets carried under the cost model.

Foreign currency translation. The functional currency of the Company is the currency of the primary economic environment in which the Company operates and this is the national currency of the Republic of Armenia, Armenian Drams ("AMD"). The financial information is presented in US Dollars ("USD"), which is the Company's presentation currency. The presentation currency of the

Company is the US dollar because the presentation in US dollars is convenient for the users of the financial information.

Monetary assets and liabilities are translated into the Company's functional currency at the official exchange rate of the Central Bank of the Republic of Armenia (the "CBA") at the respective end of the reporting period. Foreign exchange gains and losses resulting from the settlement of the transactions and from the translation of monetary assets and liabilities into the Company's functional currency at year-end official exchange rates of the CBA are recognised in profit or loss. Translation at year-end rates does not apply to non-monetary items that are measured at historical cost.

Non-monetary items measured at fair value in a foreign currency, including equity investments, are translated using the exchange rates at the date when the fair value was determined. Effects of exchange rate changes on non-monetary items measured at fair value in a foreign currency are recorded as part of the fair value gain or loss.

The results and financial position of the Company are translated into the presentation currency as follows:

(i) assets and liabilities for each statement of financial position are translated at the closing rate at the end of the respective reporting period;

(ii) income and expenses are translated at average exchange rates (unless this average is not a reasonable approximation of the cumulative effect of the rates prevailing on the transaction dates, in which case income and expenses are translated at the dates of the transactions);

(iii) components of equity are translated at the historic rate; and

(iv) all resulting exchange differences are recognised in other comprehensive income.

At 31 December 2017 the principal rate of exchange used for translating foreign currency balances was USD 1 = AMD 484.10 (31 December 2016: USD 1 = AMD 483.94, 31 December 2015: USD 1 = AMD 483.75, 1 January 2015: USD 1 = AMD 474.97). The principal average rate of exchange used for translating income and expenses was USD 1 = AMD 482.63 (2016: USD 1 = AMD 480.32, 2015 USD 1 = AMD 477.95).

Revenue recognition. Revenue is derived principally from the sale of copper and zinc concentrate and is measured at the fair value of consideration received or receivable, after deducting discounts.

Revenue from the sale of copper and zinc concentrate is recognised when the risks and rewards of ownership are transferred to the buyer, the Company retains neither a continuing degree of involvement nor control over the goods sold, the amount of revenue can be measured reliably, and it is probable that the economic benefits associated with the transaction will flow to the Company.

The Company sells copper and zinc concentrate under pricing arrangements where final prices are determined by quoted market prices in a period subsequent to the date of sale. Concentrate sales are initially recorded based on forward prices for the expected date of final settlement. Revenue is recorded at the time of shipment, which is also when risks and rewards pass to the buyer. Revenue is calculated based on the copper and zinc content in the concentrate and using the forward London Bullion Market Association (LBMA) or London Metal Exchange (LME) price to the estimated final pricing date, adjusted for the specific terms of the relevant agreement. Until final settlement occurs, adjustments to revenue are made to take into account the changes in metal quantities upon receipt of new information and assay. Revenue is presented net of refining and treatment charges which are subtracted in calculating the amount to be invoiced.

The Company's sales of copper and zinc concentrate are based on a provisional price and as such, contain an embedded derivative that is required to be separated from the host contract for accounting purposes. The host contract is the receivable from the sale of the concentrate at the forward exchange price at the time of sale. The embedded derivative, which does not qualify for hedge accounting, is measured at FVTPL with changes in its fair value recognised within revenue in the consolidated income statement for each period prior to the final settlement.

Royalty. Royalties are paid to the state budget for the use of precious metals. Royalty is paid by the producers of metal concentrate or mixture, or any final product obtained by the use of concentrate or

mixture. The base of royalties is calculated from the supply of concentrates of precious metals for the period. The royalty rate is determined by a formula 4% + (profit before taxation) × 100 / (revenue from the supply of concentrates × 8). Royalty expenses are included in cost of sales and royalty payable is recognised in trade and other payables.

Employee benefits. Wages, salaries, paid annual leave and sick leave and bonuses are accrued in the year in which the associated services are rendered by the employees of the Company.

Offsetting. Financial assets and liabilities are offset and the net amount reported in the statement of financial position only when there is a legally enforceable right to offset the recognised amounts, and there is an intention to either settle on a net basis, or to realise the asset and settle the liability simultaneously.

4. Critical Accounting Estimates and Judgements in Applying Accounting Policies

The Company makes estimates and assumptions that affect the amounts recognised in the financial information and the carrying amounts of assets and liabilities within the next financial year. Estimates and judgements are continually evaluated and are based on management's experience and other factors, including expectations of future events that are believed to be reasonable under the circumstances. Management also makes certain judgements, apart from those involving estimations, in the process of applying the accounting policies. Judgements that have the most significant effect on the amounts recognised in the financial information and estimates that can cause a significant adjustment to the carrying amount of assets and liabilities within the next financial year include:

Tax legislation. Tax and customs legislation of the Republic of Armenia is subject to varying interpretations. Refer to Note 26.

I***nitial recognition of related party transactions.*** In the normal course of business the Company enters into transactions with its related parties. IAS 39 requires initial recognition of financial instruments based on their fair values. Judgement is applied in determining if transactions are priced at market or non-market interest rates, where there is no active market for such transactions. The basis for judgement is pricing for similar types of transactions with unrelated parties and effective interest rate analyses. Details of related party balances are disclosed in Note 32.

Recoverability of deferred tax asset. Deferred tax assets are reviewed at each reporting date and reduced to the extent that it is no longer probable that sufficient taxable profit will be available to allow all or part of the deferred tax asset to be utilised. There is an application of judgement in assessing the amount, timing and probability of future taxable profits and repatriation of retained earnings. These factors affect the determination of the appropriate rates of tax to apply and the recoverability of deferred tax assets. These judgements are influenced, *inter alia*, by factors such as estimates of future production, commodity lines, operating costs, future capital expenditure and dividend policies. If actual results differ from these estimates or if these estimates must be adjusted in future periods, the financial position, results of operations and cash flows may be negatively affected.

Deferred tax assets arising from tax losses carried forward recognised as of 31 December 2016 was fully offset against taxable income generated during the year ended 31 December 2017.

Provision of asset retirement obligations. Mining, processing, development and exploration activities are subject to various laws and regulations governing the protection of the environment. The Company recognises a liability for its rehabilitation obligations in the period when a legal and/or constructive obligation is identified. The liability is measured at the present value of the estimated costs required to rehabilitate operating locations based on the risk free nominal discount rates. A corresponding increase to the carrying amount of the related asset is recorded and depreciated in the same manner as the related asset. The nature of these restoration and rehabilitation activities includes: i) dismantling and removing structures; ii) rehabilitating mines and tailing dams; iii) dismantling operating facilities; iv) closure of plant and waste sites; and v) restoration, reclamation and re-vegetation of affected areas. The liability is accreted over time to its expected future settlement value. The accretion expense is recognised in finance cost in the statements of profit or loss. The Company assesses its rehabilitation provisions at each reporting date. The rehabilitation liability and related assets are adjusted at each reporting date for changes in the discount rates and in the estimated amount, timing and cost of the work to be carried out. Any reduction in the rehabilitation liability and therefore any deduction in the

related rehabilitation asset may not exceed the carrying amount of that asset. If it does, any excess over the carrying value is immediately credited to net loss. Significant estimates and assumptions are made by management in determining the nature and costs associated with the rehabilitation liability. The estimates and assumptions required include estimates of the timing, extent and costs of rehabilitation activities, technology changes, regulatory changes, and changes in the discount and inflation rates. These uncertainties may result in future expenditures being different from the amounts currently provided.

Revenue presentation. Revenue from concentrate sales is presented gross of royalties (mining taxes). Royalties are imposed under government authority and the amounts payable are based on a percentage from revenue, rather than taxable income and as such are not accounted for under IAS 12. The Company also considered that the percentage of royalty varies depending on profitability of the Company as described in Note 3 and the revenue subject to royalty is calculated following specific tax rules and hence may significantly differ from the revenue recognised in this financial information. On that basis, the Company concluded that it would not be appropriate to present revenue net of royalties. Accordingly, the Company recognises royalty in respect of concentrate sales within cost of sales. Refer to Note 19.

Assessment of indicators of impairment of operating assets. The Company is required to conduct an impairment test where there is an indication of impairment of an asset or a cash-generating unit. Judgement is required in the assessment of whether indicators of impairment (or its reversal) exist. Operating and economic assumptions, which could affect the valuation of assets using discounted cash flows, are updated regularly as part of the Company's planning and forecasting processes. Significant judgement is required to determine whether any economic or operating assumptions represent significant changes in the economic value of an asset or CGU. Discounted cash flow models are prepared on the basis of such assumptions to determine whether there are any indicators of impairment or impairment reversal.

In addition, indicators for impairment reversal must be assessed for assets previously impaired. Any change to operational plans or assumptions, economic parameters, or the passage of time, could result in an impairment reversal, or further impairment, if an indicator is identified.

In making the assessment for impairment indicators, assets that do not generate independent cash inflows are allocated to an appropriate cash-generating unit. Management necessarily applies judgement in allocating assets that do not generate independent cash inflows to appropriate cash-generating units, and also in estimating the timing and value of underlying cash flows within the value-in-use calculation.

The following are the sources of estimation uncertainty that carry the most significant risk of material effect on next year's accounts, being items where actual outcomes in the next 12 months could vary significantly from the estimates made in determining the reported amount of an asset or liability.

Cash flow projections for impairment testing. Expected future cash flows used in discounted cash flow models are inherently uncertain and could materially change over time. They are significantly affected by a number of factors including ore reserves, together with economic factors such as commodity prices, exchange rates, discount rates and estimates of production costs and future capital expenditure.

Ore reserves and mineral resources. Recoverable reserves and resources are based on the proven and probable reserves and resources in existence. Reserves and resources are incorporated in projected cash flows based on ore reserve statements and exploration and evaluation work undertaken by appropriately qualified persons. Mineral resources, adjusted by certain conversion ratio, are included where management has a high degree of confidence in their economic extraction, despite additional evaluation still being required prior to meeting the required confidence to convert to ore reserves.

Commodity prices. Commodity prices are based on latest internal forecasts, benchmarked against external sources of information. The Company currently use a flat real long-term gold and silver price of USD 1,200 per ounce (2016: USD 1,200, 2015: USD 1,100) and USD 16 per ounce (2016: USD 16, 2015: USD 14), respectively.

Foreign exchange rates. Foreign exchange rates are based on latest internal forecasts, benchmarked with external sources of information.

Discount rates. The Company used a post-tax real discount rate of 9.0% (2016: 9.0%, 2015: 9.0%) in USD. Cash flow projections used in fair value less costs of disposal impairment models are discounted based on this rate.

Operating costs, capital expenditure and other operating factors. Cost assumptions incorporate management experience and expectations, as well as the nature and location of the operation and the risks associated there with. Underlying input cost assumptions are consistent with related output price assumptions. Other operating factors, such as the timelines of granting licences and permits are based on management's best estimate of the outcome of uncertain future events at the balance sheet date.

Ore reserves. An ore reserve estimate is an estimate of the amount of product that can be economically and legally extracted from the Company's properties. Ore reserve estimates are used by the Company in the calculation of: depletion of mining assets using the units-of-production method; impairment charges and in forecasting the timing of the payment of decommissioning and land restoration costs. Also, for the purpose of impairment review and the assessment of the timing of the payment of decommissioning and land restoration costs, management may take into account mineral resources in addition to ore reserves where there is a high degree of confidence that such resources will be extracted.

In order to calculate ore reserves, estimates and assumptions are required about geological, technical and economic factors, including quantities, grades, production techniques, recovery rates, production costs, transport costs, commodity demand, commodity prices, discount rates and exchange rates. Estimating the quantity and/or grade of ore reserves requires the size, shape and depth of ore bodies to be determined by analysing geological data such as the logging and assaying of drill samples. This process may require complex and difficult geological judgements and calculations to interpret the data.

Ore reserve estimates may change from period to period as additional geological data becomes available during the course of operations or if there are changes in any of the aforementioned assumptions. Such changes in estimated reserves may affect the Company's financial results and financial position in a number of ways, including the following:

- asset carrying values due to changes in estimated future cash flows;
- depletion charged in the statement of profit or loss and other comprehensive income where such charges are determined by using the units-of-production method;
- provisions for decommissioning and land restoration costs where changes in estimated reserves affect expectations about the timing of the payment of such costs;
- carrying value of deferred tax assets and liabilities where changes in estimated reserves affect the carrying value of the relevant assets and liabilities.

Ore reserves are subject to the annual re-estimation.

5. Adoption of New or Revised Standards and Interpretations

The following amended standards became effective from 1 January 2017, but did not have a material impact on the Company.

- Disclosure Initiative – Amendments to IAS 7 (issued on 29 January 2016 and effective for annual periods beginning on or after 1 January 2017). The new disclosures are included in Note 14.
- Recognition of Deferred Tax Assets for Unrealised Losses – Amendment to IAS 12 (issued on 19 January 2016 and effective for annual periods beginning on or after 1 January 2017).
- Amendments to IFRS 12 included in Annual Improvements to IFRSs 2014-2016 Cycle (issued on 8 December 2016 and effective for annual periods beginning on or after 1 January 2017).

6. New Accounting Pronouncements

Certain new standards and interpretations have been issued that are mandatory for the annual periods beginning on or after 1 January 2018 or later, and which the Company has not early adopted.

IFRS 9 "Financial Instruments" (amended in July 2014 and effective for annual periods beginning on or after 1 January 2018). Key features of the new standard are:

- Financial assets are required to be classified into three measurement categories: those to be measured subsequently at amortised cost, those to be measured subsequently at fair value through other comprehensive income (FVOCI) and those to be measured subsequently at fair value through profit or loss (FVPL).
- Classification for debt instruments is driven by the entity's business model for managing the financial assets and whether the contractual cash flows represent solely payments of principal and interest (SPPI). If a debt instrument is held to collect, it may be carried at amortised cost if it also meets the SPPI requirement. Debt instruments that meet the SPPI requirement that are held in a portfolio where an entity both holds to collect assets' cash flows and sells assets may be classified as FVOCI. Financial assets that do not contain cash flows that are SPPI must be measured at FVPL (for example, derivatives). Embedded derivatives are no longer separated from financial assets but will be included in assessing the SPPI condition.
- Investments in equity instruments are always measured at fair value. However, management can make an irrevocable election to present changes in fair value in other comprehensive income, provided the instrument is not held for trading. If the equity instrument is held for trading, changes in fair value are presented in profit or loss.
- Most of the requirements in IAS 39 for classification and measurement of financial liabilities were carried forward unchanged to IFRS 9. The key change is that an entity will be required to present the effects of changes in own credit risk of financial liabilities designated at fair value through profit or loss in other comprehensive income.
- IFRS 9 introduces a new model for the recognition of impairment losses – the expected credit losses (ECL) model. There is a 'three stage' approach which is based on the change in credit quality of financial assets since initial recognition. In practice, the new rules mean that entities will have to record an immediate loss equal to the 12-month ECL on initial recognition of financial assets that are not credit impaired (or lifetime ECL for trade receivables). Where there has been a significant increase in credit risk, impairment is measured using lifetime ECL rather than 12-month ECL. The model includes operational simplifications for lease and trade receivables.
- Hedge accounting requirements were amended to align accounting more closely with risk management. The standard provides entities with an accounting policy choice between applying the hedge accounting requirements of IFRS 9 and continuing to apply IAS 39 to all hedges because the standard currently does not address accounting for macro hedging.

Based on an analysis of the Company's financial assets and financial liabilities as at 31 December 2017 and on the basis of the facts and circumstances that exist at that date, the management of the Company is not expecting a significant impact on its financial statements from the adoption of the new standard on 1 January 2018.

IFRS 15, Revenue from Contracts with Customers (issued on 28 May 2014 and effective for the periods beginning on or after 1 January 2018). The new standard introduces the core principle that revenue must be recognised when the goods or services are transferred to the customer, at the transaction price. Any bundled goods or services that are distinct must be separately recognised, and any discounts or rebates on the contract price must generally be allocated to the separate elements. When the consideration varies for any reason, minimum amounts must be recognised if they are not at significant risk of reversal. Costs incurred to secure contracts with customers have to be capitalised and amortised over the period when the benefits of the contract are consumed.

Amendments to IFRS 15, Revenue from Contracts with Customers (issued on 12 April 2016 and effective for annual periods beginning on or after 1 January 2018). The amendments do not change the underlying principles of the Standard but clarify how those principles should be applied. The amendments clarify how to identify a performance obligation (the promise to transfer a good or a service to a customer) in a contract; how to determine whether a company is a principal (the provider of a good or service) or an agent (responsible for arranging for the good or service to be provided); and how to determine whether the revenue from granting a licence should be recognised at a point in time or over time. In addition to the clarifications, the amendments include two additional reliefs to reduce cost and complexity for a company when it first applies the new standard.

In accordance with the transitional provisions in IFRS 15 the Company has elected simplified transition method with the effect of transition to be recognised as at 1 January 2018 in the financial information for the year ending 31 December 2018 which will be the first year when the Company will apply IFRS 15.The Company has assessed the impact of IFRS 15 and expects that the standard will have no significant effect, when applied, on the financial information of the Company.

IFRS 16, Leases (issued on 13 January 2016 and effective for annual periods beginning on or after 1 January 2019). The new standard sets out the principles for the recognition, measurement, presentation and disclosure of leases. All leases result in the lessee obtaining the right to use an asset at the start of the lease and, if lease payments are made over time, also obtaining financing. Accordingly, IFRS 16 eliminates the classification of leases as either operating leases or finance leases as is required by IAS 17 and, instead, introduces a single lessee accounting model. Lessees will be required to recognise: (a) assets and liabilities for all leases with a term of more than 12 months, unless the underlying asset is of low value; and (b) depreciation of lease assets separately from interest on lease liabilities in the statement of profit or loss and other comprehensive income. IFRS 16 substantially carries forward the lessor accounting requirements in IAS 17. Accordingly, a lessor continues to classify its leases as operating leases or finance leases, and to account for those two types of leases differently. The Company is currently assessing the impact of the new standard on its financial information.

IFRS 17 "Insurance Contracts" (issued on 18 May 2017 and effective for annual periods beginning on or after 1 January 2021). IFRS 17 replaces IFRS 4, which has given companies dispensation to carry on accounting for insurance contracts using existing practices. As a consequence, it was difficult for investors to compare and contrast the financial performance of otherwise similar insurance companies. IFRS 17 is a single principle-based standard to account for all types of insurance contracts, including reinsurance contracts that an insurer holds. The standard requires recognition and measurement of groups of insurance contracts at: (i) a risk-adjusted present value of the future cash flows (the fulfilment cash flows) that incorporates all of the available information about the fulfilment cash flows in a way that is consistent with observable market information; plus (if this value is a liability) or minus (if this value is an asset); (ii) an amount representing the unearned profit in the group of contracts (the contractual service margin). Insurers will be recognising the profit from a group of insurance contracts over the period they provide insurance coverage, and as they are released from risk. If a group of contracts is or becomes loss-making, an entity will be recognising the loss immediately. The new standard is not expected to have any material impact on the Company's financial information.

IFRIC 22 "Foreign currency transactions and advance consideration" (issued on 8 December 2016 and effective for annual periods beginning on or after 1 January 2018). This interpretation considers how to determine the date of the transaction when applying the standard on foreign currency transactions, IAS 21. The interpretation applies where an entity either pays or received consideration in advance for foreign currency-denominated contracts.

The interpretation specifies that the date of transaction is the date on which the entity initially recognizes the non-monetary asset or non-monetary liability arising from the payment or receipt of advance consideration. If there are multiple payments or receipts in advance, the Interpretation requires an entity to determine the date of transaction for each payment or receipt of advance consideration. The Company is currently assessing the impact of the interpretation on its financial information.

IFRIC 23 "Uncertainty over Income Tax Treatments" (issued on 7 June 2017 and effective for annual periods beginning on or after 1 January 2019). IAS 12 specifies how to account for current and deferred tax, but not how to reflect the effects of uncertainty. The interpretation clarifies how to apply the recognition and measurement requirements in IAS 12 when there is uncertainty over income tax treatments. An entity should determine whether to consider each uncertain tax treatment separately or together with one or more other uncertain tax treatments based on which approach better predicts the resolution of the uncertainty. An entity should assume that a taxation authority will examine amounts it has a right to examine and have full knowledge of all related information when making those examinations. If an entity concludes it is not probable that the taxation authority will accept an uncertain tax treatment, the effect of uncertainty will be reflected in determining the related taxable profit or loss, tax bases, unused tax losses, unused tax credits or tax rates, by using either the most likely amount or the expected value, depending on which method the entity expects to better predict the resolution of the uncertainty.

An entity will reflect the effect of a change in facts and circumstances or of new information that affects the judgements or estimates required by the interpretation as a change in accounting estimate.

Examples of changes in facts and circumstances or new information that can result in the reassessment of a judgement or estimate include, but are not limited to, examinations or actions by a taxation authority, changes in rules established by a taxation authority or the expiry of a taxation authority's right to examine or re-examine a tax treatment. The absence of agreement or disagreement by a taxation authority with a tax treatment, in isolation, is unlikely to constitute a change in facts and circumstances or new information that affects the judgements and estimates required by the Interpretation. The Company is currently assessing the impact of the interpretation on its financial information.

Plan Amendment, Curtailment or Settlement - Amendments to IAS 19 (issued on 7 February 2018 and effective for annual periods beginning on or after 1 January 2019). The amendments specify how to determine pension expenses when changes to a defined benefit pension plan occur. When a change to a plan - an amendment, curtailment or settlement - takes place, IAS 19 requires to remeasure net defined benefit liability or asset. The amendments require to use the updated assumptions from this remeasurement to determine current service cost and net interest for the remainder of the reporting period after the change to the plan. Before the amendments, IAS 19 did not specify how to determine these expenses for the period after the change to the plan. By requiring the use of updated assumptions, the amendments are expected to provide useful information to users of financial statements. The Company is currently assessing the impact of the amendments on its financial information.

The following other new pronouncements are not expected to have any material impact on the Company when adopted:

- Sale or Contribution of Assets between an Investor and its Associate or Joint Venture – Amendments to IFRS 10 and IAS 28 (issued on 11 September 2014 and effective for annual periods beginning on or after a date to be determined by the IASB).
- Amendments to IFRS 2, Share-based Payment (issued on 20 June 2016 and effective for annual periods beginning on or after 1 January 2018).
- Applying IFRS 9 Financial Instruments with IFRS 4 Insurance Contracts – Amendments to IFRS 4 (issued on 12 September 2016 and effective, depending on the approach, for annual periods beginning on or after 1 January 2018 for entities that choose to apply temporary exemption option, or when the entity first applies IFRS 9 for entities that choose to apply the overlay approach).
- Transfers of Investment Property – Amendments to IAS 40 (issued on 8 December 2016 and effective for annual periods beginning on or after 1 January 2018).
- Annual Improvements to IFRSs 2014-2016 cycle – Amendments to IFRS 1 an IAS 28 (issued on 8 December 2016 and effective for annual periods beginning on or after 1 January 2018).
- Prepayment Features with Negative Compensation – Amendments to IFRS 9 (issued on 12 October 2017 and effective for annual periods beginning on or after 1 January 2019).
- Long-term Interests in Associates and Joint Ventures – Amendments to IAS 28 (issued on 12 October 2017 and effective for annual periods beginning on or after 1 January 2019.
- Annual Improvements to IFRSs 2015-2017 cycle - Amendments to IFRS 3, IFRS 11, IAS 12 and IAS 23 (issued on 12 December 2017 and effective for annual periods beginning on or after 1 January 2019).

Unless otherwise described above, the new standards and interpretations are not expected to affect significantly the Company's financial information.

7. Property, Plant and Equipment

Movements in the carrying amount of property, plant and equipment were as follows:

In thousands of US Dollars	Land and buildings	Mining properties	Structures	Plant and equipment	Fixture and fittings	Motor vehicles	Other	Construction in progress	Total
COST									
Balance as at 1 January 2015	**5,622**	**22,978**	**4,506**	**35,349**	**1,632**	**2,132**	**1,205**	**1,739**	**75,163**
Additions	–	–	–	2,242	–	2	–	8,168	10,412
Disposals	–	–	–	(1,734)	(2)	(68)	(17)	–	(1,821)
Changes in estimates of asset retirement obligations	–	(986)	(613)	–	–	–	–	–	(1,599)
Transfers	–	6,993	84	107	58	9	–	(7,251)	–
Effect of translation to presentation currency	(102)	(491)	(75)	(651)	(30)	(38)	(22)	(42)	(1,451)
Balance as at 31 December 2015	**5,520**	**28,494**	**3,902**	**35,313**	**1,658**	**2,037**	**1,166**	**2,614**	**80,704**
Additions	–	49	–	1,250	–	7	–	7,936	9,242
Disposals	–	–	(21)	(5,471)	(16)	(462)	(156)	(62)	(6,188)
Changes in estimates of asset retirement obligations	–	580	983	–	–	–	–	–	1,563
Transfers	2	7,652	222	(17)	46	239	53	(8,197)	–
Effect of translation to presentation currency	(3)	(73)	(10)	18	(1)	–	–	2	(67)
Balance as at 31 December 2016	**5,519**	**36,702**	**5,076**	**31,093**	**1,687**	**1,821**	**1,063**	**2,293**	**85,254**
Additions	–	–	–	20,461	–	–	4	5,829	26,294
Disposals	–	(687)	(39)	(3,847)	–	(500)	(319)	(90)	(5,482)
Changes in estimates of asset retirement obligations	–	311	586	–	–	–	–	–	897
Transfers	67	1,951	–	43	–	51	104	(2,216)	–
Effect of translation to presentation currency	(1)	(18)	(4)	(61)	(1)	–	1	(12)	(96)
Balance as at 31 December 2017	**5,585**	**38,259**	**5,619**	**47,689**	**1,686**	**1,372**	**853**	**5,804**	**106,867**
DEPRECIATION									
Balance as at 1 January 2015	**(2,008)**	**(4,197)**	**(2,140)**	**(20,415)**	**(397)**	**(1,767)**	**(953)**	**–**	**(31,877)**
Depreciation charge	(142)	(2,364)	(204)	(5,008)	(168)	(157)	(115)	–	(8,158)
Disposals	–	–	–	1,686	1	67	15	–	1,769
Effect of translation to presentation currency	38	105	41	411	10	34	18	–	657
Balance as at 31 December 2015	**(2,112)**	**(6,456)**	**(2,303)**	**(23,326)**	**(554)**	**(1,823)**	**(1,035)**	**–**	**(37,609)**
Depreciation charge	(141)	(2,493)	(192)	(3,788)	(185)	(114)	(79)	–	(6,992)
Disposals	–	–	11	4,414	11	417	126	–	4,979
Effect of translation to presentation currency	2	21	3	6	2	(1)	–	–	33
Balance as at 31 December 2016	**(2,251)**	**(8,928)**	**(2,481)**	**(22,694)**	**(726)**	**(1,521)**	**(988)**	**–**	**(39,589)**
Depreciation charge	(141)	(5,826)	(267)	(4,989)	(180)	(96)	(50)	–	(11,549)
Disposals	–	25	12	3,725	–	500	300	–	4,562
Effect of translation to presentation currency	1	21	1	11	–	(1)	(1)	–	32
Balance as at 31 December 2017	**(2,391)**	**(14,708)**	**(2,735)**	**(23,947)**	**(906)**	**(1,118)**	**(739)**	**–**	**(46,544)**
Carrying amount									
At 31 December 2015	**3,408**	**22,038**	**1,599**	**11,987**	**1,104**	**214**	**131**	**2,614**	**43,095**
At 31 December 2016	**3,268**	**27,774**	**2,595**	**8,399**	**961**	**300**	**75**	**2,293**	**45,665**
At 31 December 2017	**3,194**	**23,551**	**2,884**	**23,742**	**780**	**254**	**114**	**5,804**	**60,323**

Out of the total depreciation charge of USD 11,549 thousand for the year ended 31 December 2017 (2016: USD 6,992 thousand, 2015: USD 8,158 thousand) USD 10,956 thousand is charged to cost of sales (2016: USD 5,528 thousand, 2015: USD 6,021 thousand), refer to Note 19, USD 395 thousand is charged to general and administrative expenses (2016: USD 597 thousand, 2015: USD 1,089

thousand), refer to Note 22, USD 7 thousand is charged to distribution costs (2016 and 2015: Nil), refer to Note 21, nil is charged to other operating expenses for the year ended 31 December 2017 (2016: USD 22 thousand, 2015: USD 217 thousand), refer to Note 23 and USD 191 thousand is capitalised on the property, plant and equipment (2016: USD 867 thousand, 2015: USD 1,048 thousand).

8. Intangible Assets

In thousands of US Dollars	Acquired licences
Cost at 1 January 2015	1,407
Accumulated amortisation	(664)
Carrying amount at 1 January 2015	**743**
Additions	159
Disposals	(6)
Amortisation charge	(158)
Effect of translation to presentation currency	(14)
Carrying amount at 31 December 2015	**724**
Cost at 31 December 2015	1,517
Accumulated amortisation	(793)
Carrying amount at 31 December 2015	**724**
Additions	143
Disposals	(232)
Amortisation charge	(157)
Effect of translation to presentation currency	1
Carrying amount at 31 December 2016	**479**
Cost at 31 December 2016	1,275
Accumulated amortisation	(796)
Carrying amount at 31 December 2016	**479**
Additions	135
Disposals	(2)
Amortisation charge	(185)
Carrying amount at 31 December 2017	**427**
Cost at 31 December 2017	1,036
Accumulated amortisation	(609)
Carrying amount at 31 December 2017	**427**

Out of the total amortisation charge of USD 185 thousand for the year ended 31 December 2017 (2016: USD 157 thousand, 2015: USD 158 thousand) USD 59 thousand is charged to cost of sales (2016: USD 67 thousand, 2015: USD 67 thousand), refer to Note 19, USD 126 thousand is charged to general and administrative expenses (2016: USD 90 thousand, 2015: USD 91 thousand), refer to Note 22.

9. Non-current Prepayments

In thousands of US Dollars	2015	2016	2017
Prepayments for goods			
Carrying value at 1 January	**3**	**–**	**3,188**
Additions	1,597	3,711	12,157
Prepayments transferred to construction in progress on receipt of related goods	(1,600)	(498)	(14,395)
Effect of translation to presentation currency	–	(25)	6
Total non-current prepayments at 31 December	**–**	**3,188**	**956**

10. Inventories

In thousands of US Dollars	2015	2016	2017
Consumables and spare parts	8,572	5,032	4,758
Copper and zinc concentrate in stock	3,217	1,632	4,021
Purchased ore stock piles	–	–	568
Ore stock piles extracted	95	162	324
Copper and zinc concentrate in transit	–	3,278	–
Other	156	74	114
Total inventories	**12,040**	**10,178**	**9,785**

Included in consumables and spare parts is the inventory write down provision of USD 7,616 thousand, USD 7,596 thousand and USD 7,599 thousand as at 31 December 2017, 2016 and 2015 respectively.

11. Trade and Other Receivables

In thousands of US Dollars	2015	2016	2017
Trade receivables	1,751	544	4,025
Other financial receivables	499	114	274
Total financial assets within trade and other receivables	**2,250**	**658**	**4,299**
Prepayments to government	800	1,280	2,380
VAT recoverable	5,642	1,735	1,936
Prepayments	644	991	1,833
Other receivables	497	47	33
Less impairment provision	(28)	(40)	(40)
Total trade and other receivables	**9,805**	**4,671**	**10,441**

Trade receivables of USD 4,025 thousand (2016: USD 544 thousand, 2015: USD 1,751 thousand) are denominated in US Dollars.

Analysis by credit quality of trade and other receivables is as follows:

	2015		2016		2017	
In thousands of US Dollars	Trade receivables	Other financial receivables	Trade receivables	Other financial receivables	Trade receivables	Other financial receivables
Neither past due nor impaired – exposure to						
– Large companies	4,025	–	544	–	1,751	–
– Small companies	–	274	–	114	–	499
Total trade and other financial receivables	**4,025**	**274**	**544**	**114**	**1751**	**499**

Movements in prepayments are as follows:

In thousands of US Dollars	Prepayments for goods	Prepayments for services	Other prepayments	Total
Carrying value at 1 January 2015	**145**	**197**	**354**	**696**
Additions	3,207	2,161	371	5,739
Prepayments derecognised on receipt of related goods or services	(3,221)	(2,159)	(394)	(5,774)
Write off of prepayments	(1)	(4)	–	(5)
Effect of translation to presentation currency	(3)	(3)	(6)	(12)
Total prepayments at 31 December 2015	**127**	**192**	**325**	**644**
Additions	3,195	2,371	31	5,597
Prepayments derecognised on receipt of related goods or services	(3,105)	(1,784)	(341)	(5,230)
Write off of prepayments	–	(17)	–	(17)
Effect of translation to presentation currency	(1)	(4)	2	(3)
Total prepayments at 31 December 2016	**216**	**758**	**17**	**991**
Additions	3,433	2,302	4	5,739
Prepayments derecognised on receipt of related goods or services	(2,600)	(2,272)	(21)	(4,893)
Write off of prepayments	–	(1)	–	(1)
Effect of translation to presentation currency	(2)	(1)	–	(3)
Total prepayments at 31 December 2017	**1,047**	**786**	**–**	**1,833**

12. Cash and Cash Equivalents

In thousands of US Dollars	2015	2016	2017
Bank balances payable on demand	3,170	6,990	7,502
Cash on hand	2	1	1
Total cash and cash equivalents	**3,172**	**6,991**	**7,503**

The credit quality of bank balances payable on demand may be summarised based on Fitch's ratings as follows at 31 December:

In thousands of US Dollars	2015	2016	2017
Neither past due nor impaired			
AA–	3,026	34	–
B+	138	6,956	7,502
Unrated	6	–	–
Total bank balances payable on demand at 31 December	**3,170**	**6,990**	**7,502**

13. Share Capital

In thousands of US Dollars	Number of outstanding shares	Ordinary shares	Share premium	Total
At 1 January 2015	**500**	**1,648**	**–**	**1,648**
New shares issued	93,153	195,601	–	195,601
Decrease of nominal value of shares	–	(133,782)	–	(133,782)
At 31 December 2015	**93,653**	**63,467**	**–**	**63,467**
New shares issued	47	31	4,469	4,500
At 31 December 2016	**93,700**	**63,498**	**4,469**	**67,967**
At 31 December 2017	**93,700**	**63,498**	**4,469**	**67,967**

The total authorised and issued number of ordinary shares is 93,700 thousand shares (2016: 93,700 thousand shares, 2015: 93,653 thousand shares, 1 January 2015: 500 thousand shares) with a par value of AMD 312 per share (2016: AMD 312 per share, 2015: AMD 312 per share, 1 January 2015: AMD 1,000 per share). The translation of share capital was performed using the spot rate on the date of share capital replenishment. All issued ordinary shares are fully paid. Each ordinary share carries one vote.

In September 2015, the Company increased its share capital through issuance of 97,741 thousand ordinary shares with a par value of USD 2.1 per share. From the total issued shares 93,153 thousand shares were fully paid by Vatrin Investments Ltd, sole shareholder as at 31 December 2015. The remaining shares were cancelled. The settlement of share capital increase was performed through payment checks, which were used to fully repay the outstanding loan to a related entity - Dundee Precious Metals Cooperatief U.A.

In December 2015, the Company's share capital was decreased by USD 133,782 thousand by means of proportional decrease of the nominal value of the shares.

In April 2016, the Company has issued additional 47 thousand shares for USD 97 each share. The excess over nominal value as of the date of issue (USD 0.651) was recognised as share premium. All the shares were fully paid by Vatrin Investments Ltd.

14. Borrowings

The carrying amounts and fair values of borrowings are as follows:

In thousands of US Dollars	2015	2016	2017
Current borrowings			
Term loans from Polymetal International Plc	–	3,750	10,809
Total borrowings	**–**	**3,750**	**10,809**

Borrowings are denominated in US Dollars. The fair values approximate their carrying values.

Debt Reconciliation

The table below sets out an analysis of debt and the movements in the Company's liabilities from financing activities for 2017. The items of these liabilities are those that are reported as financing in the statement of cash flows.

	Liabilities from financing activities	
In thousands of US Dollars	Borrowings	Total
Net debt at 1 January 2017	**3,750**	**3,750**
Cash flows	6,808	6,808
Interest charge	308	308
Effect of translation to presentation currency	(57)	(57)
Net debt at 31 December 2017	**10,809**	**10,809**

15. Provisions for Asset Retirement Obligations

The Company has a legal obligation to restore a landfill site after its expected closure in 2026.

The Company is expected to incur these costs between 2025 and 2027. Present value of asset retirement obligations was calculated using a discount rate of 12.5% (2016: 13.9%, 2015: 16.9%, 1 January 2015: 13.9%) after applying an inflation rate of 4% (2016: 4%, 2015: 4%, 1 January 2015: 4%). Movements in provisions for asset retirement obligations are as follows:

In thousands of US Dollars	Note	Landfill site restoration
Carrying amount at 1 January 2015		**5,722**
Changes in estimates adjusted against property, plant and equipment	7	(1,599)
Unwinding of the present value discount	24	824
Other		13
Effect of translation to presentation currency		(94)
Carrying amount at 31 December 2015		**4,866**
Additions to property, plant and equipment		49
Changes in estimates adjusted against property, plant and equipment	7	1,563
Unwinding of the present value discount	24	940
Other		11
Effect of translation to presentation currency		(21)
Carrying amount at 31 December 2016		**7,408**
Changes in estimates adjusted against property, plant and equipment	7	897
Unwinding of the present value discount	24	1,103
Effect of translation to presentation currency		(9)
Carrying amount at 31 December 2017		**9,399**

16. Trade and Other Payables

In thousands of US Dollars	2015	2016	2017
Trade payables	12,017	1,520	2,039
Liabilities for purchased property, plant and equipment	49	126	43
Total financial liabilities within trade and other payables	**12,066**	**1,646**	**2,082**
Payables for royalty	–	–	4,297
Accrued employee benefit costs	1,512	1,322	1,607
Taxes other than on income	13	26	121
Other	535	8	53
Total trade and other payables	**14,126**	**3,002**	**8,160**

Trade payables of USD 419 thousand (2016: USD 469 thousand, 2015: USD 10,850 thousand) are denominated in foreign currency, mainly in US Dollars 11% (2016: 90%, 2015: 100%), in Euros 6% (2016: 10%, 2015: Nil) and in Russian Roubles 83% (2016: Nil, 2015: Nil).

17. Other Provisions for Liabilities and Charges

Movements in other provisions for liabilities and charges are as follows:

In thousands of US Dollars	Legal claims	Tax provision	Total
Carrying amount at 1 January 2015	**139**	**445**	**584**
Additional provision	–	8,249	8,249
Utilisation of provision	(47)	–	(47)
Effect of translation to presentation currency	(2)	(107)	(109)
Carrying amount at 31 December 2015	**90**	**8,587**	**8,677**
Additional provision	–	590	590
Effect of translation to presentation currency	–	(7)	(7)
Carrying amount at 31 December 2016	**90**	**9,170**	**9,260**
Additional provision	1,026	–	1,026
Utilisation of provision	–	(5,913)	(5,913)
Effect of translation to presentation currency	–	15	15
Carrying amount at 31 December 2017	**1,116**	**3,272**	**4,388**

Tax provision. The provision relates to tax inspection acts, which were finalised in May 2017 covering fiscal periods 2011-2014 and November 2018 covering fiscal periods 2014-2016. The respective amounts of additional royalty, VAT, fines and penalties were recognised as adjusting subsequent events and were reflected in respective periods when the obligating event had arisen.

Provisions were classified current and non-current based on actual remaining time to maturity till the settlement.

18. Analysis of Revenue by Category

In thousands of US Dollars	2015	2016	2017
Sale of copper concentrate	27,415	29,286	48,990
Sale of zinc concentrate	9,235	9,365	17,018
Other	182	293	14
Total revenue	**36,832**	**38,944**	**66,022**

The Company's sales of copper and zinc concentrate are based on a provisional price and as such, contain an embedded derivative. During 2017 the amount of gain from embedded derivatives included in the lines of sale of concentrate was equal to USD 470 thousand (2016: USD 1,485 thousand loss, 2015: USD 3,508 thousand loss).

19. Cost of Sales

In thousands of US Dollars	Note	2015	2016	2017
Changes in inventories of finished goods and work in progress	10	(412)	(1,760)	159
Depreciation and amortisation		6,088	5,595	11,015
Services		2,110	2,023	7,693
Consumables materials used		7,657	6,919	7,495
Staff costs		5,241	5,107	7,104
Royalty		6,803	3,091	7,084
Spare parts		4,465	4,076	2,992
Energy		2,086	2,288	2,237
Fuel		1,096	897	1,090
Cost of purchased ore		–	–	1,002
Taxes		30	13	18
Environmental fees		14	11	12
Other		274	219	295
Total cost of sales		**35,452**	**28,479**	**48,196**

20. Other Operating Income

In thousands of US Dollars	2015	2016	2017
Foreign exchange gains less losses other than on borrowings	–	77	367
Sublease rental income	–	–	140
Income from waiver of trade payables	10	2	40
Income from canteen	–	–	39
Income from other sales	–	–	7
Reimbursement from insurance companies	–	7	–
Net income from derivative commodity contracts	2,157	–	–
Other	178	9	67
Total other operating income	**2,345**	**95**	**678**

21. Distribution Costs

In thousands of US Dollars	2015	2016	2017
Transportation expenses	1,485	1,393	1,678
Sampling and inspection	88	107	140
Customs clearance	41	61	121
Staff costs	–	12	81
Utilities	–	–	19
Depreciation and amortisation	–	–	7
Marketing expenses	–	1	4
Certification expenses	1	1	–
Other	73	56	136
Total distribution costs	**1,688**	**1,631**	**2,186**

22. General and Administrative Expenses

In thousands of US Dollars	2015	2016	2017
Staff costs	3,104	2,528	1,704
Professional services	2,303	1,132	593
Depreciation and amortisation	1,180	687	521
Utilities	306	315	515
Business trip and representation expenses	244	148	188
Communication expenses	929	535	177
Rent expenses	–	–	156
Repair and maintenance expenses	34	47	133
Expenses on non-refundable taxes	129	1,196	110
Insurance expense	757	495	82
Bank charges	37	30	10
Other	473	557	409
Total general and administrative expenses	**9,496**	**7,670**	**4,598**

23. Other Operating Expenses

In thousands of US Dollars	2015	2016	2017
Social expenses	15	147	1,034
Demolition of old administrative building	–	–	120
Write-off of prepayments	334	93	114
Write-off of inventories	93	167	55
Net loss on disposal of property, plant and equipment and intangible assets	14	507	50
Fines and penalties	2,906	481	9
Foreign exchange losses less gains other than on borrowings	127	–	–
Net loss on disposal of inventories	–	1,591	–
Consumables and spare parts write-down provision	4,106	–	–
Net loss on financial assets	–	832	–
Other	489	204	150
Total other operating expenses	**8,084**	**4,022**	**1,532**

24. Finance Costs

In thousands of US Dollars	2015	2016	2017
Provision for asset retirement obligations: unwinding of the present value discount	824	940	1,103
Interest expense	7,653	64	343
Foreign exchange losses less gains from borrowings	193	51	48
Total finance costs	**8,670**	**1,055**	**1,494**

25. Income Taxes

(a) ***Components of income tax expense***

Income tax expense recorded in profit or loss comprises the following:

In thousands of US Dollars	2015	2016	2017
Current tax	(725)	155	210
Deferred tax	(2,500)	(941)	1,821
Income tax expense/(credit) for the year	**(3,225)**	**(786)**	**2,031**

(b) ***Reconciliation between the tax expense and profit or loss multiplied by applicable tax rate***

The income tax rate applicable to the Company's 2017, 2016 and 2015 income is 20%. Reconciliation between the expected and the actual taxation charge is provided below.

In thousands of US Dollars	2015	2016	2017
Profit/(Loss) before income tax	**(24,212)**	**(3,814)**	**8,730**
Theoretical tax (charge)/credit at statutory rate of 20%:	4,842	763	(1,746)
Tax effect of items which are not deductible or assessable for taxation purposes:			
Changes in expected manner of recovery or settlement resulting from impairment assessment			
Under/Over provided income tax related to prior years	725	(155)	–
– (Non-deductible expenses)/income exempt from taxation, net	(2,342)	178	(285)
Income tax (expense)/credit for the year	**3,225**	**786**	**(2,031)**

(c) ***Deferred taxes analysed by type of temporary difference***

Differences between IFRS and statutory taxation regulations in the Republic of Armenia give rise to temporary differences between the carrying amount of assets and liabilities for financial reporting purposes and their tax bases. The tax effect of the movements in these temporary differences is detailed below and is recorded at the rate of 20% (2016: 20%, 2015: 20%).

The tax effect of the movements in the temporary differences for the year ended 31 December 2017 is:

In thousands of US Dollars	1 January 2017	Charged/(Credited) to profit or loss	Translation difference	31 December 2017
Tax effect of temporary differences				
Property, plant and equipment	(53)	104	–	51
Trade and other receivables	7	(393)	1	(385)
Inventories	1,558	11	–	1,569
Intangible assets	97	–	–	97
Provisions for asset retirement obligations	974	264	(1)	1,237
Provisions for liabilities and charges	19		–	19
Trade and other payables	544	22	–	566
Tax loss carry forwards	1,824	(1,829)	5	–
Net deferred tax asset	**4,970**	**(1,821)**	**5**	**3,154**

The tax effect of the movements in the temporary differences for the year ended 31 December 2016 is:

In thousands of US Dollars	1 January 2016	Charged/(Credited) to profit or loss	Translation difference	31 December 2016
Tax effect of temporary differences				
Property, plant and equipment	353	(409)	3	(53)
Trade and other receivables	(84)	92	(1)	7
Commodity derivative contracts, net	(30)	30	–	–
Inventories	1,507	52	(1)	1,558
Intangible assets	63	34	–	97
Provisions for asset retirement obligations	788	188	(2)	974
Provisions for liabilities and charges	19	–	–	19
Trade and other payables	553	(9)	–	544
Tax loss carry forwards	870	963	(9)	1,824
Net deferred tax asset	**4,039**	**941**	**(10)**	**4,970**

The tax effect of the movements in the temporary differences for the year ended 31 December 2015 is:

In thousands of US Dollars	1 January 2015	Charged/(Credited) to profit or loss	Translation difference	31 December 2015
Tax effect of temporary differences				
Property, plant and equipment	286	73	(6)	353
Trade and other receivables	(43)	(42)	1	(84)
Commodity derivative contracts, net	(569)	535	4	(30)
Inventories	689	840	(22)	1,507
Intangible assets	–	64	(1)	63
Provisions for asset retirement obligations	637	165	(14)	788
Provisions for liabilities and charges	29	(9)	(1)	19
Trade and other payables	570	(7)	(10)	553
Tax loss carry forwards	–	881	(11)	870
Net deferred tax asset	**1,599**	**2,500**	**(60)**	**4,039**

26. Contingencies and Commitments

Legal proceedings. From time to time and in the normal course of business, claims against the Company may be received. On the basis of its own estimates and both internal and external professional advice, management is of the opinion that no material losses will be incurred in respect of claims in excess of provisions that have been made in this financial information.

Tax legislation. Tax and customs legislation of the Republic of Armenia is subject to varying interpretations, and changes, which can occur frequently. Management's interpretation of such legislation as applied to the transactions and activity of the Company may be challenged by the relevant authorities.

The tax authorities of the Republic of Armenia may be taking a more assertive and sophisticated approach in their interpretation of the legislation and tax examinations. Combined with a possible increase in tax collection efforts to respond to budget pressures, the above may lead to an increase in the level and frequency of scrutiny by the tax authorities. In particular, it is possible that transactions and activities that have not been challenged in the past may be challenged. As a result, significant additional taxes, penalties and interest may be assessed.

Fiscal periods remain open to review by the authorities in respect of taxes for three calendar years preceding the year of review.

Capital expenditure commitments. At 31 December 2017 the Company has contractual capital expenditure commitments in respect of property, plant and equipment totalling USD 2.8 million (2016: Nil, 2015: Nil).

27. Commodity Derivative Contracts

During the year ended 31 December 2015, the Company entered into cash settled derivative contracts to swap future contracted monthly average metal prices for fixed metal prices to mitigate a portion of the metal price exposure associated with the time lag between the provisional and final determination of concentrate sales as well as a portion of its by-product metals price exposure. Some of the derivative commodity contracts were subject to master netting agreements.

The table below sets out fair values, at 31 December 2015, of receivables or payables under commodity derivative contracts entered into by the Company. The table reflects gross positions before the netting of any counterparty positions (and payments) and covers the contracts with settlement dates after 31 December 2015. The contracts were short term in nature.

	31 December 2015		
In thousands of US Dollars	Gross assets	Gross liabilities	Net assets
Commodity swap contract asset	5,640	(184)	5,456

28. Financial Risk Management

The risk management function within the Company is carried out in respect of financial risks, operational risks and legal risks. Financial risk comprises market risk (including currency risk, interest rate risk and other price risk), credit risk and liquidity risk. The primary objectives of the financial risk management function are to establish risk limits, and then ensure that exposure to risks stays within these limits.

The operational and legal risk management functions are intended to ensure proper functioning of internal policies and procedures to minimise operational and legal risks.

Credit risk. The Company takes on exposure to credit risk, which is the risk that one party to a financial instrument will cause a financial loss for the other party by failing to discharge an obligation. Exposure to credit risk arises as a result of the Company's sales of products on credit terms and other transactions with counterparties giving rise to financial assets.

The Company's maximum exposure to credit risk by class of assets is as follows:

In thousands of US Dollars	2015	2016	2017
Trade and other receivables (Note 11)			
– Trade receivables	1,751	544	4,025
– Other financial receivables	499	114	274
Cash and cash equivalents (Note 12)			
– Bank balances payable on demand	3,170	6,990	7,502
Commodity derivative contracts (Note 27)			
– Commodity derivative contracts, net	5,456	–	–
Total maximum exposure to credit risk	**10,876**	**7,648**	**11,801**

The Company structures the levels of credit risk it undertakes by placing limits on the amount of risk accepted in relation to counterparties or groups of counterparties. Limits on the level of credit risk are approved regularly by management. Such risks are monitored on a revolving basis and subject to an annual or more frequent review. The Company's management reviews aging analysis of outstanding trade receivables and follows up on past due balances.

Credit risks concentration. The Company is exposed to concentrations of credit risk. At 31 December 2017 the Company had two counterparties (2016: nil, 2015: one) with aggregated trade and other financial receivables balance above USD 500 thousand. This balance amounted to USD 3,618 thousand (2016: nil, 2015: USD 1,007 thousand) or 84% of the gross amount of trade and other financial receivables (2016: nil, 2015: 45%).

Market risk. The Company takes on exposure to market risks. Market risks arise from open positions in: (a) foreign currencies; (b) interest bearing assets and liabilities; and (c) equity products, all of which are exposed to general and specific market movements. Management sets limits on the value of risk that may be accepted, which is monitored on a daily basis. However, the use of this approach does not prevent losses outside of these limits in the event of more significant market movements.

Sensitivities to market risks included below are based on a change in a factor while holding all other factors constant. In practice, this is unlikely to occur and changes in some of the factors may be correlated – for example, changes in interest rate and changes in foreign currency rates.

Currency risk. In respect of currency risk, management sets limits on the level of exposure by currency and in total. The positions are monitored monthly. The table below summarises the Company's exposure to foreign currency exchange rate risk at the end of the reporting period:

	At 31 December 2015			At 31 December 2016			At 31 December 2017		
In thousands of US Dollars	Monetary financial assets	Monetary financial liabilities	Net balance sheet position	Monetary financial assets	Monetary financial liabilities	Net balance sheet position	Monetary financial assets	Monetary financial liabilities	Net balance sheet position
US Dollars	10,576	(11,552)	(976)	3,615	(4,179)	(564)	11,400	(10,880)	520
Euros	12	(36)	(24)	45	(81)	(36)	4	(48)	(44)
Russian Roubles	–	(1)	(1)	36	(2)	34	1	(357)	(356)
Other currencies	–	(109)	(109)	91	(4)	87	6	–	6
Total	**10,558**	**(11,698)**	**(1,110)**	**3,787**	**(4,266)**	**(479)**	**11,411**	**(11,285)**	**126**

The above analysis includes only monetary assets and liabilities. Investments in non-monetary assets are not considered to give rise to any material currency risk.

The following table presents sensitivities of profit and loss to reasonably possible changes in exchange rates applied at the end of the reporting period relative to the functional currency of the Company, with all other variables held constant:

	At 31 December 2015	At 31 December 2016	At 31 December 2017
In thousands of US Dollars	Impact on equity and profit or loss	Impact on equity and profit or loss	Impact on equity and profit or loss
US Dollar strengthening by 5%	(49)	(28)	26
US Dollar weakening by 5%	49	28	(26)
Euro strengthening by 5%	(1)	(2)	(2)
Euro weakening by 5%	1	2	2
Russian Rouble strengthening by 10%	–	3	(36)
Russian Rouble weakening by 10%	–	(3)	36
Other currencies strengthening by 5%	(5)	4	–
Other currencies weakening by 5%	5	(4)	–

The exposure was calculated only for monetary balances denominated in currencies other than the functional currency of the Company.

Interest rate risk. The Company takes on exposure to the effects of fluctuations in the prevailing levels of market interest rates on its financial position and cash flows. The table below summarises the Company's exposure to interest rate risks. The table presents the aggregated amounts of the Company's financial assets and liabilities at carrying amounts, categorised by the earlier of contractual interest reprising or maturity dates.

In thousands of US Dollars	Demand and less than 1 month	From 1 to 6 months	From 6 to 12 months	Total
31 December 2017				
Total interest bearing financial assets	7,502	–	–	7,502
Total interest bearing financial liabilities	–	–	(10,809)	(10,809)
Net interest sensitivity gap at 31 December 2017	**7,502**	**–**	**(10,809)**	**(3,307)**
31 December 2016				
Total interest bearing financial assets	6,990	–	–	6,990
Total interest bearing financial liabilities	–	(3,750)	–	(3,750)
Net interest sensitivity gap at 31 December 2016	**6,990**	**(3,750)**	**–**	**3,240**
31 December 2015				
Total interest bearing financial assets	3,170	–	–	3,170
Net interest sensitivity gap at 31 December 2015	**3,170**	**–**	**–**	**3,170**

The Company does not have formal policies and procedures in place for management of interest rate risks as management considers this risk as insignificant to the Company's business.

The Company monitors interest rates for its financial instruments. The table below summarises effective interest rates at the respective end of the reporting period based on reports reviewed by key management personnel:

	2015			2016			2017		
	AMD	USD	EUR	AMD	USD	EUR	AMD	USD	EUR
Assets									
Bank balances payable on demand	0%-1%	0%-1%	0%-1%	0%-1%	0%-1%	0%-1%	0%-1%	0%-1%	0%-1%
Liabilities									
Borrowings	–	–	–	–	2.8%	–	–	2.8%	–

The sign "–" in the table above means that the Company does not have the respective assets or liabilities in the corresponding currency.

Commodity price risk. The Company is subject to price risk associated with fluctuations in the market prices for metals. The Company sells its products at prices that are effectively determined by reference to the traded prices on the London Metal Exchange and London Bullion Market. The prices of gold, copper, zinc and silver are major factors influencing the Company's business, results of operations and financial condition. During 2015 the Company regularly entered into derivative contracts to reduce the price exposure associated with the time lag between the provisional and final determination of its concentrate sales.

Liquidity risk. Liquidity risk is the risk that an entity will encounter difficulty in meeting obligations associated with financial liabilities. The Company is exposed to daily calls on its available cash resources. Liquidity risk is managed by the management of the Company. Management monitors monthly rolling forecasts of the Company's cash flows. The Company seeks to maintain a stable funding base primarily consisting of borrowing and trade and other payables. The Company's liquidity portfolio comprises cash and cash equivalents (Note 12).

The tables below show liabilities at 31 December 2017, 2016 and 2015 by their remaining contractual maturity. The amounts disclosed in the maturity table are the contractual undiscounted cash flows.

Such undiscounted cash flows differ from the amount included in the statement of financial position because the statement of financial position amount is based on discounted cash flows.

When the amount payable is not fixed, the amount disclosed is determined by reference to the conditions existing at the end of the reporting period. Foreign currency payments are translated using the spot exchange rate at the end of the reporting period.

The maturity analysis of financial liabilities at 31 December 2017 is as follows:

In thousands of US Dollars	Demand and less than 1 month	From 1 to 6 months	From 6 to 12 months	Total
Liabilities				
Borrowings	–	–	11,308	11,308
Trade and other financial payables	2,082	–	–	2,082
Total future payments, including future principal and interest payments	**2,082**	**–**	**11,308**	**13,390**

The maturity analysis of financial liabilities at 31 December 2016 is as follows:

In thousands of US Dollars	Demand and less than 1 month	From 1 to 6 months	From 6 to 12 months	Total
Liabilities				
Borrowings	–	3,795	–	3,795
Trade and other financial payables	1,646	–	–	1,646
Total future payments, including future principal and interest payments	**1,646**	**3,795**	**–**	**5,441**

The maturity analysis of financial liabilities at 31 December 2015 is as follows:

In thousands of US Dollars	Demand and less than 1 month	From 1 to 6 months	From 6 to 12 months	Total
Liabilities				
Trade and other financial payables	12,066	–	–	12,066
Total future payments, including future principal and interest payments	**12,066**	**–**	**–**	**12,066**

29. Management of Capital

The Company's objectives when managing capital are to safeguard the Company's ability to continue as a going concern in order to provide returns for shareholders and benefits for other stakeholders and to maintain an optimal capital structure to reduce the cost of capital. In order to maintain or adjust the capital structure, the Company may adjust the amount of dividends paid to shareholders, return capital to shareholders, issue new shares or sell assets to reduce debt. The amount of capital as of 31 December 2017 was USD 60,359 thousand (31 December 2016: USD 53,697 thousand, 31 December 2015: USD 52,266 thousand).

30. Fair Value of Financial Instruments

Fair value measurements are analysed by level in the fair value hierarchy as follows: (i) level one are measurements at quoted prices (unadjusted) in active markets for identical assets or liabilities; (ii) level two measurements are valuations techniques with all material inputs observable for the asset or liability, either directly (that is, as prices) or indirectly (that is, derived from prices); and (iii) level three measurements are valuations not based on observable market data (that is, unobservable inputs). Management applies judgement in categorising financial instruments using the fair value hierarchy. If a fair value, measurement uses observable inputs that require significant adjustment, that measurement is a level 3 measurement. The significance of a valuation input is assessed against the fair value measurement in its entirety.

Recurring fair value measurements

Recurring fair value measurements are those that the accounting standards require or permit in the statement of financial position at the end of each reporting period:

Financial instruments carried at fair value. Commodity derivative contracts are carried in the statement of financial position at their fair value. As at 31 December 2015 the level of these contracts amounting to USD 5,456 thousand is categorised as level two in the fair value hierarchy.

Financial assets carried at amortised cost. The estimated fair value of fixed interest rate instruments is based on estimated future cash flows expected to be received discounted at current interest rates for new instruments with similar credit risk and remaining maturity. Discount rates used depend on credit risk of the counterparty.

The fair value of trade and other receivables and cash and cash equivalents approximates the carrying values.

Liabilities carried at amortised cost. Fair values of other liabilities were determined using valuation techniques. The estimated fair value of fixed interest rate instruments with stated maturity was estimated based on expected cash flows discounted at current interest rates for new instruments with

similar credit risk and remaining maturity. Refer to Note 14 for the estimated fair values of borrowings. Carrying amounts of trade and other payables approximate fair values.

31. Presentation of Financial Instruments by Measurement Category

For the purposes of measurement, IAS 39, Financial Instruments: Recognition and Measurement, classifies financial assets into the following categories: (a) loans and receivables; (b) available-for-sale financial assets; (c) financial assets held to maturity; and (d) financial assets at fair value through profit or loss ("FVTPL"). Financial assets at fair value through profit or loss have two subcategories: (i) assets designated as such upon initial recognition; and (ii) those classified as held for trading. The following table provides a reconciliation of financial assets with these measurement categories as of 31 December 2017:

In thousands of US Dollars	Total loans and receivables	Financial assets at fair value t hrough profit and loss	Financial liabilities fair value through at profit and loss
ASSETS			
Trade and other receivables (Note 11)			
– Trade receivables	3,725	–	–
– MTM adjustment on provisionally priced sales (included in trade receivables)	–	450	(150)
– Other financial receivables	274	–	–
Cash and cash equivalents (Note 12)			
– Bank balances payable on demand	7,502	–	–
– Cash on hand	1	–	–
TOTAL FINANCIAL ASSETS	**11,502**	**450**	**(150)**

The following table provides a reconciliation of financial assets with the measurement categories as of 31 December 2016:

In thousands of US Dollars	Total loans and receivables	Financial assets at fair value t hrough profit and loss	Financial liabilities fair value through at profit and loss
ASSETS			
Trade and other receivables (Note 11)			
– Trade receivables	2,199	–	–
– MTM adjustment on provisionally priced sales (included in trade receivables)	–	247	(1,902)
– Other financial receivables	114	–	–
Cash and cash equivalents (Note 12)			
– Bank balances payable on demand	6,990	–	–
– Cash on hand	1	–	–
TOTAL FINANCIAL ASSETS	**9,304**	**247**	**(1,902)**

The following table provides a reconciliation of financial assets with the measurement categories as of 31 December 2015:

In thousands of US Dollars	Total loans and receivables	Financial assets at fair value t hrough profit and loss	Financial liabilities fair value through at profit and loss
ASSETS			
Trade and other receivables (Note 11)			
– Trade receivables	2,919	–	–
– MTM adjustment on provisionally priced sales (included in trade receivables)	–	59	(1,227)
– Other financial receivables	499	–	–
Cash and cash equivalents (Note 12)			
– Bank balances payable on demand	3,170	–	–
– Cash on hand	2	–	–
Commodity derivative contracts (Note 27)			
- Commodity derivative contracts	–	5,456	–
TOTAL FINANCIAL ASSETS	**6,590**	**5,515**	**(1,227)**

32. Balances and Transactions with Related Parties

Parties are generally considered to be related if the parties are under common control or if one party has the ability to control the other party or can exercise significant influence or joint control over the other party in making financial and operational decisions. In considering each possible related party relationship, attention is directed to the substance of the relationship, not merely the legal form.

At 31 December 2017, 2016 and 2015 the outstanding balances with related parties were as follows:

	31 December 2015		31 December 2016		31 December 2017	
In thousands of US Dollars	Ultimate parent company	Entities under common control	Ultimate parent company	Entities under common control	Ultimate parent company	Entities under common control
Trade and other receivables	–	139	–	27	–	14
Trade and other payables	40	112	6	–	10,971	318
Borrowings	10,809	–	3,750	–	–	–
Commodity derivative contracts	–	–	–	–	4,499	–

The income and expense items with related parties for the year ended 31 December 2017, 2016 and 2015 were as follows:

	2015		2016		2017	
In thousands of US Dollars	Ultimate parent company	Entities under common control	Ultimate parent company	Entities under common control	Ultimate parent company	Entities under common control
Net income on commodity derivated contracts	2,157	–	418	–	–	–
Information, consulting and other professional services	1,057	483	357	178	–	352
Interest expense	–	7,650	55	–	343	–
Other services	1,333	251	337	53	–	2
Insurance	268	25	111	3	–	–
Gain on disposal of property, plant and equipment	–	–	–	127	–	74
Revenue from services rendered	–	–	–	255	–	29
Gains on disposal of inventory	–	–	–	13	–	59

Key management compensation is presented below:

	2015		2016		2017	
In thousands of US Dollars	Expense	Accrued liability	Expense	Accrued liability	Expense	Accrued liability
Short-term benefits:						
– Salaries	499	36	351	11	107	8
– Short-term bonuses	30	–	58	–	8	–
– Benefits in-kind	–	–	13	–	28	3
Total	**529**	**36**	**422**	**11**	**143**	**11**

33. Events after the Reporting Period

There were no events after the reporting period that may require adjustment of or disclosure in the Company's financial information for the year ended 31 December 2017.

PART B: INTERIM FINANCIAL INFORMATION ON KAPAN

INTERIM STATEMENT OF FINANCIAL POSITION

In thousands of US Dollars	Note	30 June 2018 Unaudited	31 December 2017 Audited
ASSETS			
Non-current			
Property, plant and equipment	4	57,206	60,323
Intangible assets	5	363	427
Deferred income tax asset		3,379	3,154
Non-current prepayments	6	669	956
Deferred VAT receivable		1,108	2,713
Total non-current assets		**62,725**	**67,573**
Current			
Inventories	7	16,516	9,785
Trade and other receivables	8	9,744	10,441
Deferred VAT receivable		1,748	143
Current income tax prepayment		118	–
Cash and cash equivalents	9	3,305	7,503
Total current assets		**31,431**	**27,872**
TOTAL ASSETS		**94,156**	**95,445**
EQUITY			
Share capital	10	63,498	63,498
Equity reserve		9,151	9,151
Share premium	10	4,469	4,469
Accumulated deficit		(15,959)	(16,537)
Currency translation reserve		(1,015)	(1,248)
TOTAL EQUITY		**60,144**	**59,333**
LIABILITIES			
Non-current			
Provisions for asset retirement obligations	12	10,719	9,399
Deferred VAT payable		1,108	2,713
Total non-current liabilities		**11,827**	**12,112**
Current			
Borrowings	11	10,940	10,809
Trade and other payables	13	5,097	8,160
Other provisions for liabilities and charges	14	4,400	4,388
Deferred VAT payable		1,748	143
Current income tax payable		–	500
Total current liabilities		**22,185**	**24,000**
TOTAL LIABILITIES		**34,012**	**36,112**
TOTAL LIABILITIES AND EQUITY		**94,156**	**95,445**

INTERIM STATEMENT OF PROFIT OR LOSS AND OTHER COMPREHENSIVE INCOME

		Six months ended	
		30 June 2018	30 June 2017
In thousands of US Dollars	Note	Unaudited	
Revenue	15	29,700	19,748
Cost of sales	16	(23,727)	(13,818)
Gross profit		**5,973**	**5,930**
Other operating income	17	163	232
Distribution costs	18	(1,228)	(945)
General and administrative expenses	19	(3,086)	(2,002)
Other operating expenses	20	(367)	(558)
Operating profit		**1,455**	**2,657**
Finance income		79	165
Finance costs	21	(711)	(667)
Profit before income tax		**823**	**2,155**
Income tax expense		(245)	(491)
PROFIT FOR THE PERIOD		**578**	**1,664**
Other comprehensive income:			
Items that may be reclassified subsequently to profit or loss:			
Effect of translation to presentation currency		233	402
Other comprehensive income for the period		**233**	**402**
TOTAL COMPREHENSIVE INCOME FOR THE PERIOD		**811**	**2,066**

INTERIM STATEMENT OF CHANGES IN EQUITY

In thousands of US Dollars	Share capital	Equity reserve	Share premium	Accumulated deficit	Currency translation reserve	Total
Balance at 1 January 2018	**63,498**	**9,151**	**4,469**	**(16,357)**	**(1,248)**	**59,333**
Profit for the period	–	–	–	578	–	578
Other comprehensive income for the period	–	–	–	–	233	233
Total comprehensive income for the period	–	–	–	578	233	811
Balance at 30 June 2018 (unaudited)	**63,498**	**9,151**	**4,469**	**(15,959)**	**(1,015)**	**60,144**
Balance at 1 January 2017	**63,498**	**9,151**	**4,469**	**(22,210)**	**(1,211)**	**53,697**
Profit for the period	–	–	–	1,664	–	1,664
Other comprehensive income for the period	–	–	–	–	402	402
Total comprehensive income for the period	–	–	–	1,664	402	2,066
Balance at 30 June 2017 (unaudited)	**63,498**	**9,151**	**4,469**	**(20,546)**	**(809)**	**55,763**

INTERIM STATEMENT OF CASH FLOWS

		Six months ended	
		30 June 2018	30 June 2017
In thousands of US Dollars	Note	Unaudited	
Cash flows from operating activities			
Profit before income tax		823	2,155
Adjustments for:			
Depreciation of property, plant and equipment	16, 18, 19	7,659	4,684
Amortisation of intangible assets	16, 18, 19	92	81
Net loss on disposal of property, plant and equipment and intangible assets	20	5	87
Write-off of inventories	20	–	32
Interest income		(37)	(12)
Revenue from MTM adjustment		(305)	(1,615)
Unwinding of the present value discount on provision for asset retirement obligations	21	565	531
Interest expense	21	145	136
Foreign exchange gains, net	17,21	(42)	(289)
Operating cash flows before working capital changes		**8,905**	**5,790**
Decrease/(Increase) in trade and other receivables		174	(9,185)
Increase in inventories		(6,695)	(4,633)
(Decrease)/Increase in trade and other payables		(3,118)	719
Changes in working capital		**(9,639)**	**(13,099)**
Income taxes paid		(210)	–
Interest paid		(14)	(14)
Interest received		37	14
Net cash used in operating activities		**(921)**	**(7,309)**
Cash flows from investing activities			
Purchase of property, plant and equipment		(3,322)	(10,828)
Purchase of intangible assets		(22)	(134)
Proceeds from sale of property, plant and equipment and intangible assets		39	33
Net cash used in investing activities		**(3,305)**	**(10,929)**
Cash flows from financing activities			
Proceeds from borrowings		–	14,421
Repayment of borrowings		–	(1,503)
Net cash from financing activities		**–**	**12,918**
Effect of exchange rate changes on cash and cash equivalents		28	(75)
Cash and cash equivalents at the beginning of the year	**9**	**7,503**	**6,991**
Cash and cash equivalents at the end of the year	**9**	**3,305**	**1,596**

NOTES TO THE CONDENSED INTERIM FINANCIAL STATEMENTS – 30 JUNE 2018

1. Kapan Mining and Processing Company CJSC and its Operations

This condensed interim financial information has been prepared for the six months ended 30 June 2018 for Kapan Mining and Processing Company CJSC (the "Company").

The Company was incorporated and is domiciled in the Republic of Armenia. The Company is a joint stock company limited by its shares and was set up in accordance with regulations of the Republic of Armenia.

As of 30 June 2018 and 31 December 2017 the Company's immediate parent company was PMTL Holding Ltd and ultimate parent company was Polymetal International Plc.

Principal activity. The Company's principal business activity is the extraction of complex ore and production of copper-gold-silver and zinc concentrates within the Republic of Armenia. The Company's manufacturing facilities are primarily based in Kapan town.

Registered address and place of business. The Company's registered address is #4, Gortsaranain Street, Kapan 3302, Syunik Region, Republic of Armenia.

2. Operating Environment of the Company

The Republic of Armenia displays certain characteristics of an emerging market. The legal, tax and regulatory frameworks continue to develop and are subject to frequent changes and varying interpretations, refer to Note 22. The Armenian economy was growing in 2017, after overcoming the economic recession of 2015 and 2016. The strong economic performance in 2017 suggests a window of opportunity to tackle and accelerate the challenging reforms that will be required for Armenia to unleash a new export-driven growth model that it is both inclusive and sustainable over the medium term.

The economic environment of the Republic of Armenia is significantly influenced by the level of business activity in the Russian Federation and significant cash movements flow from the Russian Federation to the Republic of Armenia. The Russian economy continues to be negatively impacted by ongoing political tension in the region and international sanctions against certain Russian companies and individuals. Firm oil prices, low unemployment and rising wages supported a modest growth of the economy in 2018.

The operating environment has a significant impact on the Company's operations and financial position. Management is taking necessary measures to ensure sustainability of the Company's operations. However, the future effects of the current economic situation are difficult to predict and management's current expectations and estimates could differ from actual results.

3. Summary of Significant Accounting Policies

Basis of preparation. This condensed interim financial information has been prepared in accordance with IAS 34, "*Interim Financial Reporting*". The interim financial information should be read in conjunction with the annual audited financial statements for the year ended 31 December 2017, which have been prepared in accordance with International Financial Reporting Standards ("IFRS"). The principal accounting policies applied in the preparation of this condensed interim financial information are set out below. These policies have been consistently applied to all the periods presented, unless otherwise stated.

These financial statements have been prepared for the purposes of management of PMTL Holding Ltd and Polymetal International Plc, in the context of sale of the Company to Chaarat Gold Holdings Limited.

Use of estimates and judgements. The critical accounting estimates and judgements followed by the Company in the preparation of condensed interim financial statements are consistent with those disclosed in the audited financial statements for the year ended 31 December 2017. Estimates have principally been made in respect of fair values of assets and liabilities, deferred income taxes, asset retirement obligations, impairment of operating assets and gross revenue presentation.

Management reviews these estimates and assumptions on a continuous basis, by reference to past experience and other factors considered as reasonable which form the basis for assessing the book

values of assets and liabilities. Adjustments to accounting estimates and assumptions are recognised in the period in which the estimate is revised if the change affects only that period or in the period of the revision and subsequent periods, if both are affected. Management also makes certain judgements, apart from those involving estimations, in the process of applying the Company's accounting policies. Actual results may differ from such estimates if different assumptions or circumstances apply.

The principal accounting policies and methods of computation followed by the Company are consistent with those disclosed in the audited financial statements for the year ended 31 December 2017, except for the effect of adopted new standard as described below.

IFRS 15 Revenue from Contracts with Customers. In May 2014, the IASB issued IFRS 15 *Revenue from Contracts with Customers* ("IFRS 15"), which covers principles that an entity shall apply to report information to users of financial statements about the nature, amount, timing, and uncertainty of revenue and cash flows arising from a contract with a customer. This standard replaces IAS 18 Revenue, IAS 11 Construction Contracts and related interpretations. IFRS 15 uses a control-based approach to recognise revenue which is a change from the risk and reward approach under the IAS 18. The standard requires entities to apportion revenue earned from contracts to individual performance obligations, on a relative standalone selling price basis.

The Company has adopted IFRS 15 effective 1 January 2018 applying the modified retrospective approach. Under the modified retrospective approach, the Company recognises transition adjustments, if any, in retained earnings on the date of initial application (1 January 2018), without restating the financial statements on a retrospective basis.

The Company's revenue is primarily derived from commodity sales, for which the point of recognition is dependent on the contract sales terms, known as the international commercial terms (Incoterms). As the transfer of risks and rewards generally coincides with the transfer of control at a point in time under incoterms, the timing and amount of revenue recognised by the Company for the sale of commodities is not materially affected.

For the Incoterms Cost, Insurance and Freight (CIF) and Cost and Freight (CFR) the seller must contract for and pay the costs and freight necessary to bring the goods to the named port of destination. Consequently, the freight service on export commodity contracts with CIF/CFR incoterms represents a separate performance obligation as defined under the new standard, and a portion of the revenue earned under these contracts, representing the obligation to perform the freight service, is deferred and recognised over time as this obligation is fulfilled, along with the associated costs. The shipping services do not represent the Company's core activity and are fully outsourced, so these are presented within other operating income and expenses.

The impact of applying the change during the year ended 31 December 2017 would not have been material representing reduction in both revenue and operating costs with no impact on profit.

There is no impact on assets and liabilities at 30 June 2017 and 31 December 2017. Accordingly, there were no transition adjustments recorded at 1 January 2018 and the information presented for 2017 has not been restated.

IFRS 9, Financial Instruments. The standard introduces new requirements for classification and measurement of financial instruments, impairment, and hedge accounting. As the Company does not apply hedge accounting, the main changes relevant to the Company impacted its accounting policies for classification and impairment of financial instruments.

According to IFRS 9, the financial assets are classified in the following measurement categories: those to be measured subsequently at amortised cost, those to be measured at fair value through profit or loss, and those to be measured at fair value through other comprehensive income. The classification depends on the Company's business model for managing the financial assets and the contractual terms of the cash flows. If a hybrid contract contains a host that is a financial asset, the classification requirements apply to the entire hybrid contract.

Financial assets are classified as at amortised cost only if both of the following criteria are met: the asset is held within a business model with the objective of collecting the contractual cash flows, and the contractual terms give rise on specified dates to cash flows that are solely payments of principal and interest on the principal outstanding.

In accordance with IFRS 9, the Company's non-derivative financial liabilities are measured as at amortised cost. Derivatives are classified as at fair value through profit or loss.

In respect of impairment, IFRS 9 replaced the "incurred loss" model used in IAS 39, Financial instruments: Recognition and Measurement, with a new "expected credit loss" ("ECL") model that requires a more timely recognition of expected credit losses. An allowance for expected credit losses shall be recorded for financial assets classified as at amortised cost.

Under IFRS 9, loss allowances are measured on either of the following bases: 12-month ECLs that result from possible default events within the 12 months after the reporting date; and lifetime ECLs that result from all possible default events over the expected life of a financial instrument.

Trade accounts receivable with provisional pricing - Provisionally priced sales fail the contractual cash flow test due to the variability of cash flows associated with the commodity price. As such all trade receivables cannot be accounted for at amortised cost but would be classified as FVTPL and not in the scope of the impairment requirements of IFRS 9. The classification of these receivables does not change on raising of the final invoice and will continue to be out of scope of the impairment requirements of IFRS 9. Fair value of such receivables is calculated depending on contract terms based on forward metal prices for up to six months, applicable as of reporting date.

In accordance with the transition provisions in IFRS 9, the Company applied the new rules retrospectively, except for the items that have already been derecognised at the date of initial application, which is 1 January 2018. The Company also used an exemption in IFRS 9 allowing not to restate prior periods presented as a result of adoption of the new classification and measurement requirements, but rather recognise any differences in the opening retained earnings as at 1 January 2018. The initial application of the standard did not result in any reclassifications of the Company's financial instruments other than described above or any material changes in their measurement, therefore, the opening retained earnings were not restated.

At 30 June 2018 the principal rate of exchange used for translating foreign currency balances was USD 1 = AMD 482.24 (31 December 2017: USD 1 = AMD 484.10). The principal average rate of exchange used for translating income and expenses for the six months ended 30 June 2018 was USD 1 = AMD 482.05 (six months ended 30 June 2017: USD 1 = AMD 484.47).

Income taxes. Income taxes have been provided for in the financial statements in accordance with legislation enacted or substantively enacted by the end of the reporting period. The income tax expense comprises current tax and deferred tax and is recognised in profit or loss for the year except if it is recognised in other comprehensive income or directly in equity because it relates to transactions that are also recognised, in the same or a different period, in other comprehensive income or directly in equity.

Current tax is the amount expected to be paid to, or recovered from, the taxation authorities in respect of taxable profits or losses for the current and prior periods. Taxable profits or losses are based on estimates if financial statements are authorised prior to filing relevant tax returns. Taxes other than on income are recorded within operating expenses.

Deferred income tax is provided using the balance sheet liability method for tax loss carry forwards and temporary differences arising between the tax bases of assets and liabilities and their carrying amounts for financial reporting purposes. In accordance with the initial recognition exemption, deferred taxes are not recorded for temporary differences on initial recognition of an asset or a liability in a transaction other than a business combination if the transaction, when initially recorded, affects neither accounting nor taxable profit.

Deferred tax balances are measured at tax rates enacted or substantively enacted at the end of the reporting period, which are expected to apply to the period when the temporary differences will reverse or the tax loss carry forwards will be utilised. Deferred tax assets for deductible temporary differences and tax loss carry forwards are recorded only to the extent that it is probable that future taxable profit will be available against which the deductions can be utilised.

Uncertain tax positions. The Company's uncertain tax positions are reassessed by management at the end of each reporting period. Liabilities are recorded for income tax positions that are determined by management as more likely than not to result in additional taxes being levied if the positions were to

be challenged by the tax authorities. The company has undergone a tax audit by the Armenian tax authorities for the periods of 2014 to 2017. The initial findings of the tax audit have been accepted by the Company and all findings are recognised as tax provisions in the financial statements. Whilst the tax audit is complete, subject to settlement, it is possible that the tax authorities may identify additional amounts payable as a result of further inspections. The company has not made any provisions for potential payments as a result of the ongoing investigation.

The assessment is based on the interpretation of tax laws that have been enacted or substantively enacted by the end of the reporting period and any known court or other rulings on such issues. Liabilities for penalties, interest and taxes other than on income are recognised based on management's best estimate of the expenditure required to settle the obligations at the end of the reporting period.

4. Property, Plant and Equipment

Movements in the carrying amount of property, plant and equipment for the six months ended 30 June 2018 were as follows:

In thousands of US Dollars	Land and buildings	Mining properties	Structures	Plant and equipment	Fixture and fittings	Motor vehicles	Other	Construction in progress	Total
COST									
Balance at 1 January 2018	**5,585**	**38,259**	**5,619**	**47,689**	**1,686**	**1,372**	**853**	**5,804**	**106,867**
Additions	–	–	–	2,918	–	–	–	739	3,657
Disposals	(108)	–	–	(372)	–	–	–	–	(480)
Changes in estimates of asset retirement obligations	–	253	468	–	–	–	–	–	721
Transfers	32	101	–	(145)	1	59	53	(101)	–
Effect of translation to presentation currency	22	147	22	183	6	5	3	23	411
Balance at 30 June 2018	**5,531**	**38,760**	**6,109**	**50,273**	**1,693**	**1,436**	**909**	**6,465**	**111,176**
DEPRECIATION									
Balance at 1 January 2018	**(2,391)**	**(14,708)**	**(2,735)**	**(23,947)**	**(906)**	**(1,118)**	**(739)**	**–**	**(46,544)**
Depreciation charge	(69)	(4,202)	(153)	(3,109)	(87)	(44)	(21)	–	(7,685)
Disposals	69	–	–	366	–	–	–	–	435
Effect of translation to presentation currency	(9)	(55)	(10)	(92)	(3)	(4)	(3)	–	(176)
Balance at 30 June 2018	**(2,400)**	**(18,965)**	**(2,898)**	**(26,782)**	**(996)**	**(1,166)**	**(763)**	**–**	**(53,970)**
Carrying amount									
At 31 December 2017	**3,194**	**23,551**	**2,884**	**23,742**	**780**	**254**	**114**	**5,804**	**60,323**
At 30 June 2018	**3,131**	**19,795**	**3,211**	**23,491**	**697**	**270**	**146**	**6,465**	**57,206**

Movements in the carrying amount of property, plant and equipment for the six months ended 30 June 2017 were as follows:

In thousands of US Dollars	Land and buildings	Mining properties	Structures	Plant and equipment	Fixture and fittings	Motor vehicles	Other	Construction in progress	Total
COST									
Balance at 1 January 2017	**5,519**	**36,702**	**5,076**	**31,093**	**1,687**	**1,821**	**1,063**	**2,293**	**85,254**
Additions	–	–	–	13,264	–	–	1	2,368	15,633
Disposals	–	–	–	(3,327)	–	(426)	(2)	–	(3,755)
Changes in estimates of asset retirement obligations	–	215	419	–	–	–	–	–	634
Transfers	23	1,711	–	(62)	–	24	89	(1,785)	–
Effect of translation to presentation currency	40	280	39	307	12	10	11	21	720
Balance at 30 June 2017	**5,582**	**38,908**	**5,534**	**41,275**	**1,699**	**1,429**	**1,162**	**2,897**	**98,486**
DEPRECIATION									
Balance at 1 January 2017	**(2,251)**	**(8,928)**	**(2,481)**	**(22,694)**	**(726)**	**(1,521)**	**(988)**	**–**	**(39,589)**
Depreciation charge	(70)	(2,578)	(125)	(1,996)	(91)	(52)	(24)	–	(4,936)
Disposals	–	–	–	3,207	–	426	2	–	3,635
Effect of translation to presentation currency	(17)	(86)	(19)	(155)	(6)	(8)	(7)	–	(298)
Balance at 30 June 2017	**(2,338)**	**(11,592)**	**(2,625)**	**(21,638)**	**(823)**	**(1,155)**	**(1,017)**	**–**	**(41,188)**
Carrying amount									
At 31 December 2016	**3,268**	**27,774**	**2,595**	**8,399**	**961**	**300**	**75**	**2,293**	**45,665**
At 30 June 2017	**3,244**	**27,316**	**2,909**	**19,637**	**876**	**274**	**145**	**2,897**	**57,298**

Out of the total depreciation charge of USD 7,685 thousand for the six months ended 30 June 2018 (for the six months ended 30 June 2017: USD 4,936 thousand) USD 7,492 thousand is charged to cost of sales (for the six months ended 30 June 2017: USD 4,461 thousand), refer to Note 16, USD 166 thousand is charged to general and administrative expenses (for the six months ended 30 June 2017: USD 222 thousand), refer to Note 19, USD 1 thousand is charged to distribution costs (for the six months ended 30 June 2017: USD 1 thousand), refer to Note 18 and USD 26 thousand is capitalised on the property, plant and equipment (for the six months ended 30 June 2017: USD 252 thousand).

5. Intangible Assets

Movements in the carrying amount of intangible assets during the six months ended 30 June 2018 were as follows:

In thousands of US Dollars	Acquired licences
Cost at 1 January 2018	1,036
Accumulated amortisation	(609)
Carrying amount at 1 January 2018	**427**
Additions	22
Amortisation charge	(92)
Effect of translation to presentation currency	6
Carrying amount at 30 June 2018	**363**
Cost at 30 June 2018	1,064
Accumulated amortisation	(701)
Carrying amount at 30 June 2018	**363**

Movements in the carrying amount of intangible assets during the six months ended 30 June 2017 were as follows:

In thousands of US Dollars	Acquired licences
Cost at 1 January 2017	1,275
Accumulated amortisation	(796)
Carrying amount at 1 January 2017	**479**
Additions	134
Amortisation charge	(81)
Effect of translation to presentation currency	4
Carrying amount at 30 June 2017	**536**
Cost at 30 June 2017	1,413
Accumulated amortisation	(877)
Carrying amount at 30 June 2017	**536**

Out of the total amortisation charge of USD 92 thousand for the six months ended 30 June 2018 (for the six months ended 30 June 2017: USD 81 thousand) USD 32 thousand is charged to cost of sales (six months ended 30 June 2017: USD 51 thousand), refer to Note 16, USD 60 thousand is charged to general and administrative expenses (six months ended 30 June 2017: USD 30 thousand), refer to Note 19.

6. Non-current Prepayments

In thousands of US Dollars	Prepayments for goods
Carrying value at 1 January 2018	**956**
Additions	1,648
Prepayments transferred to property, plant and equipment on receipt of related goods	(1,939)
Effect of translation to presentation currency	4
Total non-current prepayments at 30 June 2018	**669**
Carrying value at 1 January 2017	**3,188**
Additions	7,255
Prepayments transferred to property, plant and equipment on receipt of related goods	(8,964)
Effect of translation to presentation currency	16
Total non-current prepayments at 30 June 2017	**1,495**

7. Inventories

In thousands of US Dollars	30 June 2018	31 December 2017
Copper and zinc concentrate in stock	7,089	4,021
Consumables and spare parts	6,858	4,758
Purchased ore stock piles	1,072	568
Copper and zinc concentrate in transit	851	–
Ore stock piles extracted	516	324
Other	130	114
Total inventories	**16,516**	**9,785**

Included in consumables and spare parts is the inventory write down provision of USD 7,645 thousand (31 December 2017: USD 7,616 thousand).

8. Trade and Other Receivables

In thousands of US Dollars	30 June 2018	31 December 2017
Trade receivables	4,355	4,025
Other financial receivables	432	274
Total financial assets within trade and other receivables	**4,787**	**4,299**
VAT recoverable	1,995	1,936
Prepayments	1,580	1,833
Prepayments to government	1,371	2,380
Other receivables	28	33
Less impairment provision	(17)	(40)
Total trade and other receivables	**9,744**	**10,441**

Trade receivables of USD 4,355 thousand (31 December 2017: USD 4,025 thousand) are denominated in US Dollars.

Movements in prepayments are as follows:

In thousands of US Dollars	Prepayments for goods	Prepayments for services	Other prepayments	Total
Carrying value at 1 January 2018	**1,047**	**786**	**–**	**1,833**
Additions	1,423	732	5	2,160
Prepayments derecognised on receipt of related goods or services	(1,812)	(600)	(5)	(2,417)
Write off of prepayments	–	(2)	–	(2)
Translation to presentation currency	3	3	–	6
Total prepayments at 30 June 2018	**661**	**919**	**–**	**1,580**
Carrying value at 1 January 2017	**216**	**758**	**17**	**991**
Additions	875	504	4	1,383
Prepayments derecognised on receipt of related goods or services	(737)	(614)	(12)	(1,363)
Translation to presentation currency	2	4	1	7
Total prepayments at 30 June 2017	**356**	**652**	**10**	**1,018**

9. Cash and Cash Equivalents

In thousands of US Dollars	30 June 2018	31 December 2017
Bank balances payable on demand	3,304	7,502
Cash on hand	1	1
Total cash and cash equivalents	**3,305**	**7,503**

The credit quality of bank balances payable on demand may be summarised based on Fitch's ratings as follows at 30 June 2018 and 31 December 2017:

In thousands of US Dollars	30 June 2018	31 December 2017
Neither past due nor impaired		
B+	3,304	7,502
Total bank balances payable on demand	**3,304**	**7,502**

10. Share Capital

In thousands of US Dollars	Number of outstanding shares in thousands	Ordinary shares	Share premium	Total
At 1 January 2018	**93,700**	**63,498**	**4,469**	**67,967**
At 30 June 2018	**93,700**	**63,498**	**4,469**	**67,967**

In thousands of US Dollars	Number of outstanding shares in thousands	Ordinary shares	Share premium	Total
At 1 January 2017	**93,700**	**63,498**	**4,469**	**67,967**
At 30 June 2017	**93,700**	**63,498**	**4,469**	**67,967**

The total authorised and issued number of ordinary shares is 93,700 thousand shares (31 December 2017: 93,700 thousand shares) with a par value of AMD 312 per share (31 December 2017: AMD 312 per share). All issued ordinary shares are fully paid. Each ordinary share carries one vote.

The translation of share capital was performed using the spot rate on the date of share capital replenishment.

11. Borrowings

The carrying amounts and fair values of borrowings are as follows:

In thousands of US Dollars	30 June 2018	31 December 2017
Current borrowings		
Term loans from Polymetal International Plc	10,940	10,809
Total borrowings	**10,940**	**10,809**

Borrowings are denominated in US Dollars. The fair values of borrowings approximate the carrying values.

Debt Reconciliation

The table below sets out an analysis of debt and the movements in the Company's liabilities from financing activities for the six months ended 30 June 2018 and 30 June 2017. The items of these liabilities are those that are reported as financing in the statement of cash flows.

	Liabilities from financing activities	
In thousands of US Dollars	Borrowings	Total
Debt at 1 January 2018	**10,809**	**10,809**
Interest charge	130	130
Effect of translation to presentation currency	1	1
Debt at 30 June 2018	**10,940**	**10,940**
Debt at 1 January 2017	**3,750**	**3,750**
Cash flows	12,918	12,918
Interest charge	122	122
Effect of translation to presentation currency	(17)	(17)
Debt at 30 June 2017	**16,773**	**16,773**

12. Provisions for Asset Retirement Obligations

The Company has a legal obligation to restore a landfill site after its expected closure in 2026. The Company is expected to incur these costs between 2025 and 2027. Present value of asset retirement obligations was calculated using a discount rate of 11.05% (31 December 2017: 12.5%) after applying

an inflation rate of 4% (31 December 2017: 4%). Movements in provisions for asset retirement obligations are as follows:

In thousands of US Dollars	Note	Landfill site restoration
Carrying amount at 1 January 2018		**9,399**
Changes in estimates adjusted against property, plant and equipment	4	721
Unwinding of the present value discount	21	565
Other		(2)
Effect of translation to presentation currency		36
Carrying amount at 30 June 2018		**10,719**
Carrying amount at 1 January 2017		**7,408**
Changes in estimates adjusted against property, plant and equipment	4	634
Unwinding of the present value discount	21	531
Effect of translation to presentation currency		63
Carrying amount at 30 June 2017		**8,636**

13. Trade and Other Payables

In thousands of US Dollars	30 June 2018	31 December 2017
Trade payables	2,797	2,039
Liabilities for purchased property, plant and equipment	64	43
Total financial liabilities within trade and other payables	**2,861**	**2,082**
Accrued employee benefit costs	1,800	1,607
Taxes other than on income	320	121
Payables for royalty	–	4,297
Other	116	53
Total trade and other payables	**5,097**	**8,160**

Trade payables of USD 560 thousand (31 December 2017: USD 419 thousand) are denominated in foreign currency, mainly in US Dollars 48% (31 December 2017: 11%), nil in Euros (31 December 2017: 6%), in Russian Roubles 23% (31 December 2017: 83%) and in Australian Dollars 29% (31 December 2017: Nil).

14. Other Provisions for Liabilities and Charges

Movements in other provisions for liabilities and charges are as follows:

In thousands of US Dollars	Legal claims	Tax provision	Total
Carrying amount at 1 January 2018	**1,116**	**3,272**	**4,388**
Effect of translation to presentation currency	–	12	12
Carrying amount at 30 June 2018	**1,116**	**3,284**	**4,400**
Carrying amount at 1 January 2017	**90**	**9,170**	**9,260**
Utilisation of provision	–	(5,971)	(5,971)
Effect of translation to presentation currency	–	98	98
Carrying amount at 30 June 2017	**90**	**3,297**	**3,387**

Tax provision. The provision relates to tax inspection acts which were finalised in May 2017 and November 2018. The respective amounts of additional taxes, fines and penalties were recognised as adjusting subsequent events and were reflected in respective periods when the obligating event had arisen.

Provisions were classified current and non-current based on actual remaining time to maturity till the settlement.

15. Analysis of Revenue by Category

	Six months ended	
In thousands of US Dollars	**30 June 2018**	**30 June 2017**
Sale of copper concentrate	20,670	12,216
Sale of zinc concentrate	9,029	7,526
Other	1	6
Total revenue	**29,700**	**19,748**

The Company's sales of copper and zinc concentrate are based on a provisional price and as such, contain an embedded derivative. During the six months ended 30 June 2018 the amount of loss from embedded derivatives included in the lines of sale of concentrate was equal to USD 1,040 thousand (six-months ended 30 June 2017: USD 7 thousand gain).

16. Cost of Sales

		Six months ended	
In thousands of US Dollars	**Note**	**30 June 2018**	**30 June 2017**
Changes in inventories of finished goods and work in progress	7	(4,615)	(4,963)
Depreciation and amortisation		7,524	4,512
Services		5,681	3,514
Consumables used		4,413	3,459
Staff costs		3,750	3,230
Spare parts		2,069	1,243
Royalty		1,992	1,167
Energy		1,446	975
Fuel		706	421
Cost of purchased ore		691	–
Environmental fees		5	6
Taxes		1	15
Other		64	239
Total cost of sales		**23,727**	**13,818**

17. Other Operating Income

	Six months ended	
In thousands of US Dollars	**30 June 2018**	**30 June 2017**
Foreign exchange gains less losses other than on borrowings	71	137
Income from canteen	23	–
Recovery of impairment on trade and other receivables	21	–
Income from other sales	18	4
Sublease rental income	12	60
Mountain rescue services	6	–
Income from waiver of trade payables	–	9
Other	12	22
Total other operating income	**163**	**232**

18. Distribution Costs

	Six months ended	
In thousands of US Dollars	**30 June 2018**	**30 June 2017**
Transportation expenses	968	724
Sampling and inspection	77	47
Staff costs	74	35
Customs clearance	22	59
Utilities	8	–
Depreciation and amortisation	1	1
Marketing expenses	–	2
Other	78	77
Total distribution costs	**1,228**	**945**

19. General and Administrative Expenses

	Six months ended	
In thousands of US Dollars	**30 June 2018**	**30 June 2017**
Staff costs	1,555	806
Utilities	393	238
Professional services	369	146
Depreciation and amortisation	226	252
Repair and maintenance expenses	114	200
Business trip and representation expenses	89	72
Bank charges	83	5
Rent expense	78	68
Communication expenses	58	94
Expenses on non-refundable taxes	36	46
Insurance expense	15	12
Other	70	63
Total general and administrative expenses	**3,086**	**2,002**

20. Other Operating Expenses

	Six months ended	
In thousands of US Dollars	**30 June 2018**	**30 June 2017**
Social expenses	342	374
Net loss on disposal of property, plant and equipment and intangible assets	5	87
Fines and penalties	–	8
Write-off of inventories	–	32
Other	20	57
Total other operating expenses	**367**	**558**

21. Finance Costs

	Six months ended	
In thousands of US Dollars	**30 June 2018**	**30 June 2017**
Provision for asset retirement obligations: unwinding of the present value discount	565	531
Interest expense	145	136
Foreign exchange losses less gains from borrowings	1	–
Total finance costs	**711**	**667**

22. Contingencies and Commitments

Legal proceedings. From time to time and in the normal course of business, claims against the Company may be received. On the basis of its own estimates and both internal and external

professional advice, management is of the opinion that no material losses will be incurred in respect of claims in excess of provisions that have been made in these financial statements.

Tax legislation. Tax and customs legislation of the Republic of Armenia is subject to varying interpretations, and changes, which can occur frequently. Management's interpretation of such legislation as applied to the transactions and activity of the Company may be challenged by the relevant authorities.

The tax authorities of the Republic of Armenia may be taking a more assertive and sophisticated approach in their interpretation of the legislation and tax examinations. Combined with a possible increase in tax collection efforts to respond to budget pressures, the above may lead to an increase in the level and frequency of scrutiny by the tax authorities. In particular, it is possible that transactions and activities that have not been challenged in the past may be challenged. As a result, significant additional taxes, penalties and interest may be assessed.

Fiscal periods remain open to review by the authorities in respect of taxes for three calendar years preceding the year of review.

Capital expenditure commitments. At 30 June 2018 the Company has contractual capital expenditure commitments in respect of property, plant and equipment totalling USD 1,268 thousand (31 December 2017: USD 2.8 million).

23. Financial Risk Management

The risk management function within the Company is carried out in respect of financial risks, operational risks and legal risks. Financial risk comprises market risk (including currency risk, interest rate risk and other price risk), credit risk and liquidity risk. The primary objectives of the financial risk management function are to establish risk limits, and then ensure that exposure to risks stays within these limits.

The operational and legal risk management functions are intended to ensure proper functioning of internal policies and procedures to minimise operational and legal risks.

Credit risk. The Company takes on exposure to credit risk, which is the risk that one party to a financial instrument will cause a financial loss for the other party by failing to discharge an obligation. Exposure to credit risk arises as a result of the Company's sales of products on credit terms and other transactions with counterparties giving rise to financial assets.

The Company's maximum exposure to credit risk by class of assets is as follows:

In thousands of US Dollars	30 June 2018	30 June 2017
Trade and other receivables (Note 8)		
– Trade receivables at AC	–	4,025
– Trade receivables at FVTPL	4,355	–
– Other financial receivables	432	274
Cash and cash equivalents (Note 9)		
– Bank balances payable on demand	3,304	7,502
Total maximum exposure to credit risk	**8,091**	**11,801**

The Company structures the levels of credit risk it undertakes by placing limits on the amount of risk accepted in relation to counterparties or groups of counterparties. Limits on the level of credit risk are approved regularly by management. Such risks are monitored on a revolving basis and subject to an annual or more frequent review. The Company's management reviews aging analysis of outstanding trade receivables and follows up on past due balances. Management therefore considers it appropriate to provide aging and other information about credit risk as disclosed in Note 8.

Credit risks concentration. The Company is exposed to concentrations of credit risk. At 30 June 2018 the Company had one counterparty (31 December 2017: two) with aggregated trade and other financial receivables balance above USD 500 thousand. This balance amounted to USD 4,067 thousand (31 December 2017: USD 3,618 thousand) or 85% of the gross amount of trade and other financial receivables (31 December 2017: 84%).

Market risk. The Company takes on exposure to market risks. Market risks arise from open positions in: (a) foreign currencies; (b) interest bearing assets and liabilities; and (c) commodity price risk, all of which are exposed to general and specific market movements. Management sets limits on the value of risk that may be accepted, which is monitored on a daily basis. However, the use of this approach does not prevent losses outside of these limits in the event of more significant market movements.

Sensitivities to market risks included below are based on a change in a factor while holding all other factors constant. In practice, this is unlikely to occur and changes in some of the factors may be correlated – for example, changes in interest rate and changes in foreign currency rates.

Currency risk. In respect of currency risk, management sets limits on the level of exposure by currency and in total. The positions are monitored monthly. The table below summarises the Company's exposure to foreign currency exchange rate risk at the end of the reporting period:

	At 30 June 2018			At 31 December 2017		
In thousands of US Dollars	Monetary financial assets	Monetary financial liabilities	Net balance sheet position	Monetary financial assets	Monetary financial liabilities	Net balance sheet position
US Dollars	7,233	(11,265)	(4,032)	11,400	(10,880)	520
Euros	1	(56)	(55)	4	(48)	(44)
Russian Roubles	50	(129)	(79)	1	(357)	(356)
Other currencies	5	(163)	(158)	6	–	6
Total	**7,289**	**(11,613)**	**(4,324)**	**11,411**	**(11,285)**	**126**

The above analysis includes only monetary assets and liabilities. Investments in non-monetary assets are not considered to give rise to any material currency risk.

The following table presents sensitivities of profit and loss to reasonably possible changes in exchange rates applied at the end of the reporting period relative to the functional currency of the Company, with all other variables held constant:

	At 30 June 2018	At 31 December 2017
In thousands of US Dollars	Impact on equity and profit or loss	Impact on equity and profit or loss
US Dollar strengthening by 5%	(202)	26
US Dollar weakening by 5%	202	(26)
Euro strengthening by 5%	(3)	(2)
Euro weakening by 5%	3	2
Russian Rouble strengthening by 10%	(8)	(36)
Russian Rouble weakening by 10%	8	36
Other currencies strengthening by 5%	(8)	–
Other currencies weakening by 5%	8	–

The exposure was calculated only for monetary balances denominated in currencies other than the functional currency of the Company.

Interest rate risk. The Company takes on exposure to the effects of fluctuations in the prevailing levels of market interest rates on its financial position and cash flows. The table below summarises the Company's exposure to interest rate risks. The table presents the aggregated amounts of the Company's financial assets and liabilities at carrying amounts, categorised by the earlier of contractual interest reprising or maturity dates.

In thousands of US Dollars	Demand and less than 1 month	From 1 to 6 months	From 6 to 12 months	Total
30 June 2018				
Total interest bearing financial assets	3,304	–	–	3,304
Total interest bearing financial liabilities	–	(10,940)	–	(10,940)
Net interest sensitivity gap at 30 June 2018	**3,304**	**(10,940)**	**–**	**(7,636)**
31 December 2017				
Total interest bearing financial assets	7,502	–	–	7,502
Total interest bearing financial liabilities	–	–	(10,809)	(10,809)
Net interest sensitivity gap at 31 December 2017	**7,502**	**–**	**(10,809)**	**(3,307)**

The Company does not have formal policies and procedures in place for management of interest rate risks as management considers this risk as insignificant to the Company's business.

The Company monitors interest rates for its financial instruments. The table below summarises effective interest rates at the respective end of the reporting period based on reports reviewed by key management personnel:

	At 30 June 2018			At 31 December 2017		
	AMD	USD	EUR	AMD	USD	EUR
Assets						
Bank balances payable on demand	0%-1%	0%-1%	0%-1%	0%-1%	0%-1%	0%-1%
Liabilities						
Borrowings	–	2.8%	–	–	2.8%	–

The sign "–" in the table above means that the Company does not have the respective assets or liabilities in the corresponding currency.

Commodity price risk. The Company is subject to price risk associated with fluctuations in the market prices for metals. The Company sells its products at prices that are effectively determined by reference to traded prices on the London Metal Exchange and London Bullion Market. The prices of gold, copper, zinc and silver are major factors influencing the Company's business, results of operations and financial condition.

Liquidity risk. Liquidity risk is the risk that an entity will encounter difficulty in meeting obligations associated with financial liabilities. The Company is exposed to daily calls on its available cash resources. Liquidity risk is managed by the management of the Company. Management monitors monthly rolling forecasts of the Company's cash flows. The Company seeks to maintain a stable funding base primarily consisting of borrowing and trade and other payables. The Company's liquidity portfolio comprises cash and cash equivalents (Note 9).

The tables below show liabilities at 30 June 2018 and 31 December 2017 by their remaining contractual maturity. The amounts disclosed in the maturity table are the contractual undiscounted cash flows.

Such undiscounted cash flows differ from the amount included in the statement of financial position because the statement of financial position amount is based on discounted cash flows.

When the amount payable is not fixed, the amount disclosed is determined by reference to the conditions existing at the end of the reporting period. Foreign currency payments are translated using the spot exchange rate at the end of the reporting period.

The maturity analysis of financial liabilities at 30 June 2018 is as follows:

In thousands of US Dollars	Demand and less than 1 month	From 1 to 6 months	From 6 to 12 months	Total
Liabilities				
Borrowings	–	11,308	–	11,308
Trade and other financial payables	2,861	–	–	2,861
Total future payments, including future principal and interest payments	**2,861**	**11,308**	**–**	**14,169**

The maturity analysis of financial liabilities at 31 December 2017 is as follows:

In thousands of US Dollars	Demand and less than 1 month	From 1 to 6 months	From 6 to 12 months	Total
Liabilities				
Borrowings	–	–	11,308	11,308
Trade and other financial payables	2,082	–	–	2,082
Total future payments, including future principal and interest payments	**2,082**	**–**	**11,308**	**13,390**

24. Management of Capital

The Company's objectives when managing capital are to safeguard the Company's ability to continue as a going concern in order to provide returns for shareholders and benefits for other stakeholders and to maintain an optimal capital structure to reduce the cost of capital. In order to maintain or adjust the capital structure, the Company may adjust the amount of dividends paid to shareholders, return capital to shareholders, issue new shares or sell assets to reduce debt. The amount of capital as of 30 June 2018 was USD 61,170 thousand (31 December 2017: USD 60,359 thousand).

25. Fair Value of Financial Instruments

Fair value measurements are analysed by level in the fair value hierarchy as follows: (i) level one are measurements at quoted prices (unadjusted) in active markets for identical assets or liabilities; (ii) level two measurements are valuations techniques with all material inputs observable for the asset or liability, either directly (that is, as prices) or indirectly (that is, derived from prices); and (iii) level three measurements are valuations not based on observable market data (that is, unobservable inputs). Management applies judgement in categorising financial instruments using the fair value hierarchy. If a fair value, measurement uses observable inputs that require significant adjustment, that measurement is a level 3 measurement. The significance of a valuation input is assessed against the fair value measurement in its entirety.

Recurring fair value measurements

Recurring fair value measurements are those that the accounting standards require or permit in the statement of financial position at the end of each reporting period:

Financial instruments carried at fair value. Trade receivables from sale of concentrate are carried in the interim statement of financial position at their fair value. As at 30 June 2018 and 31 December 2017 the level of these balances is categorised as level two in the fair value hierarchy. The fair value of receivables arising from copper, gold and silver concentrate sales contracts that contain provisional pricing mechanisms is determined using the appropriate quoted forward price from the exchange.

Financial assets carried at amortised cost. The estimated fair value of fixed interest rate instruments is based on estimated future cash flows expected to be received discounted at current interest rates for new instruments with similar credit risk and remaining maturity. Discount rates used depend on credit risk of the counterparty.

Liabilities carried at amortised cost. Fair values of other liabilities were determined using valuation techniques. The estimated fair value of fixed interest rate instruments with stated maturity was estimated based on expected cash flows discounted at current interest rates for new instruments with

similar credit risk and remaining maturity. Refer to Note 11 for the estimated fair values of borrowings. Carrying amounts of trade and other payables approximate fair values.

26. Presentation of Financial Instruments by Measurement Category

For the purposes of measurement, IFRS 9 "Financial Instruments" classifies financial assets into the following categories: (a) financial assets at FVTPL; (b) debt instruments at FVOCI; (c) equity instruments at FVOCI; and (c) financial assets at AC. Financial assets at FVTPL have two sub-categories: (i) assets mandatorily measured at FVTPL; and (ii) assets designated as such upon initial recognition or subsequently. In addition, finance lease receivables form a separate category.

For the purposes of measurement at 31 December 2017, IAS 39 "Financial Instruments: Recognition and Measurement", classified financial assets into the following categories: (a) L&R; (b) AFS financial assets; (c) financial assets HTM and (d) financial assets at FVTPL ("FVTPL"). Financial assets at FVTPL had two sub-categories: (i) assets designated as such upon initial recognition, and (ii) those classified as held for trading. In addition, finance lease receivables formed a separate category. All of the Company's financial assets at 31 December 2017 fell in the L&R category. All of the Company's financial liabilities were carried at AC.

The following table provides a reconciliation of financial assets with these measurement categories as of 30 June 2018:

In thousands of US Dollars	FVTPL	AC	Total
ASSETS			
Trade and other receivables (Note 8)			
– Trade receivables	4,355	–	4,355
– Other financial receivables	–	432	432
Cash and cash equivalents (Note 9)			
– Bank balances payable on demand	–	3,304	3,304
– Cash on hand	–	1	1
TOTAL FINANCIAL ASSETS	**4,355**	**3,737**	**8,092**

All of the Company's financial liabilities are carried at amortised cost.

The following table provides a reconciliation of financial assets with measurement categories at 31 December 2017:

In thousands of US Dollars	Total loans and receivables	Financial assets at fair value through profit and loss	Financial liabilities at fair value through profit and loss
ASSETS			
Trade and other receivables (Note 8)			
– Trade receivables	3,725	–	–
– MTM adjustment on provisionally priced sales (included in trade receivables)	–	450	(150)
– Other financial receivables	274	–	–
Cash and cash equivalents (Note 9)			
– Bank balances payable on demand	7,502	–	–
– Cash on hand	1	–	–
TOTAL FINANCIAL ASSETS/(LIABILITIES)	**11,502**	**450**	**(150)**

27. Balances and Transactions with Related Parties

Parties are generally considered to be related if the parties are under common control or if one party has the ability to control the other party or can exercise significant influence or joint control over the other party in making financial and operational decisions. In considering each possible related party relationship, attention is directed to the substance of the relationship, not merely the legal form.

At 30 June 2018 and 31 December 2017 the outstanding balances with related parties were as follows:

	30 June 2018		31 December 2017	
In thousands of US Dollars	Ultimate parent company	Entities under common control	Ultimate parent company	Entities under common control
Trade and other receivables	–	166	–	139
Trade and other payables	54	133	40	112
Borrowings	10,940	–	10,809	–

The income and expense items with related parties for the six months ended 30 June 2018 and 30 June 2017 were as follows:

	Six months ended 30 June 2018		Six months ended 30 June 2017	
In thousands of US Dollars	Ultimate parent company	Entities under common control	Ultimate parent company	Entities under common control
Information, consulting and other professional services	–	460	–	75
Interest expense	145	–	136	–
Gain on disposal of property, plant and equipment	–	–	–	6
Revenue from services rendered	–	16	–	–
Gains on disposal of inventory	–	31	–	13

Key management compensation is presented below:

	Six months ended	
In thousands of US Dollars	30 June 2018	30 June 2017
Short-term benefits:		
– Salaries	145	67
– Short-term bonuses	10	–
– Benefits in-kind	2	12
Total	**157**	**79**

Outstanding balances in respect of the key management compensation as at 30 June 2018 and 31 December 2017 are presented below:

In thousands of US Dollars	30 June 2018	30 June 2017
Short-term benefits:		
– Salaries	16	8
– Benefits in-kind	–	3
Total	**16**	**11**

28. Events after the Reporting Period

On 30 October 2018, Polymetal International Plc announced that it has entered into a legally binding agreement with Chaarat Gold Holdings Limited for the sale of its shareholding in the Company.

PART C: UNAUDITED PRO FORMA STATEMENT OF NET ASSETS OF THE GROUP

The following unaudited pro forma statement of net assets of the Group (the "pro forma financial information") has been prepared to illustrate the effect on the consolidated net assets of the Group as if the acquisition of Kapan had taken place on 30 June 2018.

The pro forma financial information has been prepared for illustrative purposes only and, because of its nature, addresses a hypothetical situation and does not, therefore, represent the Group's actual financial position or results.

The pro forma financial information is based on the consolidated net assets of the Group as at 30 June 2018, set out in the unaudited interim financial information on the Group for the period ended 30 June 2018 incorporated by reference and has been prepared in a manner consistent with the accounting policies adopted by the Company in preparing such information and on the basis set out in the notes set out below.

		Adjustments			
	The Group as at 30 June 2018 (note 1) US$m	Kapan as at 30 June 2018 (note 2) US$m	Acquisition of Kapan (notes 3,4) US$m	Other adjustments (note 5) US$m	Pro forma net assets of the Group US$m
Assets					
Non-current assets					
Property, plant and equipment	4.1	57.2	–	–	61.3
Exploration, evaluation and acquired licences	35.8	0.4	–	–	36.2
Intangible assets	–		(12.8)	–	(12.8)
Deferred income tax assets	–	3.4	–	–	3.4
Non-current prepayments	–	0.7	–	–	0.7
Other receivables	–	–	–	–	–
Deferred VAT receivable	–	1.1	–	–	1.1
	39.9	**62.8**	**(12.8)**	**–**	**89.9**
Current assets					
Inventories	–	16.5	–		16.5
Trade and other receivables	0.7	9.7	–	–	10.4
Deferred VAT receivable	–	1.7	–	–	1.7
Current income tax prepayments	–	0.1	–	–	0.1
Cash and cash equivalents	6.0	3.3	(9.7)	15.5	15.1
	6.7	**31.3**	**(9.7)**	**15.5**	**43.8**
Total assets	**46.6**	**94.1**	**(22.5)**	**15.5**	**133.7**
Liabilities					
Non-current liabilities					
Loans and borrowings	–	–	(40.0)	–	(40.0)
Convertible loan notes	–	–	(10.0)	(18.6)	(28.6)
Provision for asset retirement obligations	–	(10.7)	–	–	(10.7)
Deferred VAT payable	–	(1.1)	–	–	(1.1)
	–	**(11.8)**	**(50.0)**	**(18.6)**	**(80.4)**
Current liabilities					
Trade and other payables	(1.3)	(5.1)	–	–	(6.4)
Loans and borrowings	–	(10.9)	10.9	(10.0)	(10.0)
Convertible loan note	(21.5)	–	–	21.5	–
Deferred VAT payable	–	(1.7)	–	–	(1.7)
Other liabilities	–	(4.4)		–	(4.4)
Current income tax payable	–	–	–	–	–
	(22.8)	**(22.1)**	**10.9**	**11.5**	**(22.5)**
Total liabilities	**(22.8)**	**(33.9)**	**(39.1)**	**(7.1)**	**(102.9)**
Net assets	**23.8**	**60.2**	**(61.6)**	**8.4**	**30.8**

Notes:

1. The net assets of the Group at 30 June 2018 have been extracted without material adjustment from the unaudited interim financial information on the Group for the period then ended which is incorporated by reference in this document.

Adjustments:

2. The net assets of Kapan at 30 June 2018 have been extracted without material adjustment from the unaudited interim financial information on Kapan for the period then ended, set out in Section B of Part V of this document.

3. An adjustment has been made to reflect the estimated intangible assets arising on the acquisition of Kapan

   For the purposes of this pro forma information, no adjustment has been made to the separate assets and liabilities of Kapan to reflect their fair value. The difference between the net assets of Kapan as stated at their book value at 30 June 2018 and the estimated consideration has therefore been presented as a single value in "Intangible assets". The net assets of Kapan will be subject to a fair value restatement as at the effective date of the transaction. Actual intangible assets included in the Group's next published financial statements may therefore be materially different from that included in the pro forma statement of net assets.

	US$m
Net assets of Kapan at 30 June 2018	60.2
Add Kapan borrowings at 30 June 2018	10.9
Less Kapan cash at 30 June 2018	(3.3)
Adjusted net assets	67.8
Purchase price	(55.0)
Negative goodwill arising on acquisition	12.8

4. The consideration of US$55m will been funded through a payment out of existing cash of $5m, a US$40m bank loan and the issue of US$10m of convertible loan notes. In addition, estimated transaction costs of US$1.4m, as disclosed in Part VI of this document, have also been included. Cash has also been adjusted to exclude the Kapan cash as the acquisition is on a debt free/cash free basis making a total adjustment to cash of US$9.7m. The borrowing at 30 June 2018 will be assigned to Chaarat and therefore been adjusted for in the pro forma.

5. Other adjustments are in respect of the various movements in convertible loan notes and other loan transactions entered into by the Company subsequent to 30 June 2018 as follows:

	US$m
Repayment and conversion of existing convertible loan notes	21.6
Repayment of existing convertible loan notes (including re-issue into new loan notes)	(13.1)
Issue of new convertible loan notes (payable after more than one year)	18.6
Issue of new loan payable within one year	10.0
Net new cash	15.5

6. No account has been taken of the financial performance of the Group or of Kapan since 30 June 2018, nor of any other event save as disclosed above.

PART VI

ADDITIONAL INFORMATION

1. THE COMPANY

1.1 The Company was incorporated on 20 July 2007 in the BVI under the BCA as a limited company with registered number 1420336.

1.2 The registered office of Company is at Palm Grove House, PO Box 438, Road Town, Tortola, British Virgin Islands, VG1110.

1.3 Chaarat Gold Holdings Limited is the holding company of the Group. It currently has thirteen 100 per cent. beneficially owned subsidiary companies particulars of which are set out below:

Controlled Entity	Company's Percentage ownership (direct or indirect)	Country of Incorporation
Akshirak Holdings Limited	100%	British Virgin Islands
Akshirak Mining LLC	100%	Kyrgyz Republic
At-Bashi Holdings Limited	100%	British Virgin Islands
At-Bashi Mining LLC	100%	Kyrgyz Republic
Zaav Holdings Limited	100%	British Virgin Islands
Chaarat Zaav CJSC	100%	Kyrgyz Republic
Chon-Tash Holdings Limited	100%	British Virgin Islands
Chon-Tash Mining LLC	100%	Kyrgyz Republic
Goldex Asia Holdings Limited	100%	British Virgin Islands
Goldex Asia LLC	100%	Kyrgyz Republic
Chaarat Gold Services Limited	100%	England & Wales
Chaarat Gold International Limited	100%	Cyprus
Chaarat Malta Limited (in solvent liquidation)	100%	Malta

Following completion of the Kapan Acquisition, the Company will indirectly own 100% of the shares of Kapan, via CGIL.

1.4 The directors of the Group Companies are as follows:

Name	Director(s)
Akshirak Holdings Limited	Alexander Novak
Akshirak Mining LLC	Davron Vakhabov
At-Bashi Holdings Limited	Alexander Novak
At-Bashi Mining LLC	Davron Vakhabov
Chaarat Zaav CJSC	Alexander Novak (chairman), Martin Andersson and Sergei Zhukov
Chon-Tash Holdings Limited	Alexander Novak
Chon-Tash Mining LLC	Davron Vakhabov
Goldex Asia Holdings Limited	Alexander Novak
Goldex Asia LLC	Alexander Novak
Zaav Holdings Limited	Alexander Novak
Chaarat Gold Services Limited	Chris Eger
Chaarat Gold International Limited	Georgios Filippou Militsa Symeou Theodora Kaskani

1.5 The telephone number of the Company at its registered office is +284 542 3572.

1.6 The principal legislation under which the Company operates and under which the Ordinary Shares have been created is the British Virgin Islands Business Companies Act 2004 and the regulations made thereunder.

1.7 The Company has no administrative, management or supervisory bodies other than the Board and the committees constituted and described in paragraph 13 of Part I of this document.

1.8 The auditors of the Company are BDO since 31 December 2012. BDO are a member firm of the Institute of Chartered Accountants in England and Wales.

1.9 The ISIN of the Ordinary Shares is VGG203461055.

2. ORDINARY SHARE CAPITAL, OPTIONS, WARRANTS AND CONVERTIBLE LOAN NOTES

2.1 Pursuant to articles 3.2(iii) and 4.8(a)(iii)(A) of the Articles of the Company, the Board of Directors of the Company is allowed to allot a total of 100 per cent. of the aggregate number of issued Ordinary Shares and rights granted to subscribe for, or to convert securities into, Ordinary Shares in the Company as at 1 January in each year without obtaining shareholder approval and 30 per cent thereof without obtaining shareholder approval to disapply pre-emption rights, ignoring securities whose issue was approved under previous share authorities (the "**Headroom**").

2.2 Between 1 January 2016 and the date of this document, the Company issued Ordinary Shares, Previous Notes and Convertible Loan Notes as follows:

(a) on 27 September 2016, the Company issued 78,840,443 Ordinary Shares pursuant to a placing at a price of 5.25p per share;

(b) on 12 April 2017, the Company issued US$15,000,000 of Previous Notes pursuant to a placing;

(c) on 5 December 2017, the Company issued 400,000 Ordinary Shares pursuant to an exercise of Options at a price of 15 pence per share;

(d) between 20 and 31 December 2017, the Company issued 4,611,940 Ordinary Shares pursuant to a placing at a price of 25 pence per share;

(e) on 6 February 2018, the Company issued 14,529,104 Ordinary Shares pursuant to a placing at a price of 25 pence per share, and US$4,950,000 of Previous Notes pursuant to a placing;

(f) on 27 April 2018, the Company issued 225,000 Ordinary Shares pursuant to an exercise of Options at a price of 15 pence per share;

(g) on 11 September 2018 the Company issued US$17,580,000 Convertible Loan Notes (convertible into 50,091,228 Ordinary Shares assuming conversion in full of all principal and interest to maturity) and converted US$8,150,000 Previous Notes and US$939,369.86 of interest into 22,991,251 Ordinary Shares (after rounding and after cancellation of 1,076,555 Ordinary Shares issued in error). The remaining Previous Notes (and interest thereon) were either reinvested into Convertible Loan Notes or redeemed in cash; and

(h) on 28 November 2018 the Company issued US$1,000,000 Convertible Loan Notes (convertible into 2,804,167 Ordinary Shares assuming conversion in full of all principal and interest to maturity); and

(i) on 14 December 2018 the Company issued 543,888 Ordinary Shares pursuant to the Labro Loan Agreement.

2.3 In addition, the Company has agreed to issue US$ 10,000,000 (or US$5,000,000 if completion takes place after 15 January 2019) of Convertible Loan Notes pursuant to the Kapan Acquisition Agreement, which are convertible into 27,754,284 Ordinary Shares assuming that: (i) US$10,000,000 Convertible Loan Notes are issued on 15 January 2019; (ii) the put option referred to in paragraph 7.20(a)(ix) of this Part VI of this document is not exercised; and (iii) full conversion of all principal and interest to maturity. Please refer to paragraph 7.20 of this Part VI of this document.

2.4 The authorised and issued shares of the Company at the date of this document are as follows:

Authorised Ordinary Shares		**Issued and fully paid Ordinary Shares**	
Amount US$	**Number**	**Amount US$**	**Number**
6,000,000.00	600,000,000	3,951,670.15	395,167,015

2.5 The authorised and issued Ordinary Shares of the Company immediately following Re Admission will be as follows:

Authorised Ordinary Shares*		Issued and fully paid Ordinary Shares*	
Amount US$	**Number**	**Amount US$**	**Number**
6,000,000.00	600,000,000	3,951,670.15	395,167,015

* As from 1 January 2019, the number of Ordinary Shares authorised to be issued as at 1 January 2019 will be 105,833,375 under the annually renewing share authority referred to in paragraph 2.1 of this Part VI of this document and subject to the authorised share capital limit of 600,000,000 Ordinary Shares (assuming no exercise or conversion of Options, Warrants or Convertible Loan Notes or issue of Ordinary Shares or rights to subscribe therefore or to convert Securities into Ordinary Shares prior to 1 January 2019), plus any Options, Warrants or Convertible Loan Notes (including interest thereon) which may be exercised or converted and whose exercise or conversion was approved under previous share authorities (including those referred to in paragraph 2.5 of this Part VI of this document).

\+ Assuming no exercise or conversion of Options, Warrants or Convertible Loan Notes between the date of this document and Re-Admission.

2.6 The authorised and issued Ordinary Shares will rank *pari passu* in all respects including the right to receive all dividends and other distributions declared, made or paid on the Ordinary Shares following Re-Admission.

2.7 The Ordinary Shares are in registered form and, following Re-Admission, the Ordinary Shares may be held in either certificated or uncertificated form.

2.8 In addition to the Ordinary Shares, as at the date of this document the Company has in issue the following securities:

Type of security	Number in issue	Number/amount to be issued	Ordinary Shares arising on exercise or conversion	% of fully diluted share capital[8]
Options[1]	23,704,609	N/A	6,471,673	1.08
Warrants[2]	22,367,521	N/A	22,367,521	3.72
Convertible Loan Notes[3]	US$18,580,000	N/A	52,895,395	8.79
New Options[4]	N/A	59,193,469	59,193,469	9.84
Grant of Ordinary Shares[4]	N/A	19,731,156	19,731,156	3.28
Grant of Ordinary Shares[5]	N/A	17,949,820	17,949,820	2.98
Convertible Loan Notes[6]	N/A	US$10,000,000	27,754,284	4.61
Labro Loan Agreement[7]	N/A	N/A	1,631,644	0.27
Total			**206,363,318**	**34.57**

(1) Please refer to paragraphs 2.9 and 4.2 of this Part VI of this document. Assuming all Options are converted into Ordinary Shares pursuant to the Company's proposals, this would result in 6,471,673 Ordinary Shares in consideration for the cancellation of these options.

(2) Please refer to paragraphs 2.10 and 4.3 of this Part VI of this document.

(3) Please refer to paragraphs 2.2(g) and (h) and 17.19 of this Part VI of this document.

(4) Please refer to paragraph 16 of Part I of this document.

(5) Please refer to paragraph 13.2 of this Part VI of this document.

(6) Please refer to paragraph 2.3 of this Part VI of this document.

(7) Please refer to paragraph 7.26 of this Part VI of this document. Excludes 543,888 Ordinary Shares issued on signing of Labro Loan Agreement and assumes issue of a further 1,631,664 Ordinary Shares based on (a) a single drawdown of the full amount, (b) the same £/US$ exchange rate as applied to calculate the Ordinary Shares issued on signature, (c) no election to pay any drawdown fee in cash and (d) no repayment and reborrowing.

(8) Assumes: (a) all existing Options are converted into Ordinary Shares as per note (1); (b) full exercise of all Warrants as per note (2); (c) full conversion of principal and interest on Convertible Loan Notes as per notes (3) and (6); (d) grant of new Options and Ordinary Shares as per notes (4) and (5); (e) issue of a further 1,631,664 Ordinary Shares under the Labro Loan Agreement as per note (7); and (f) no other issues of Ordinary Shares or rights to subscribe, or convert securities into, Ordinary Shares (including pursuant to the agreement described in paragraph 7.10 of this Part VI of this document), resulting in fully diluted share capital of 601,530,333 Ordinary Shares.

2.9 Each existing Option entitles the holder to subscribe for one Ordinary Share. Excluding the Options issued to Directors, details of which are set out in paragraph 4.2 of this Part VI, the Options have been issued on the following principal terms:

Number of Options	Date of grant	Exercise price per Ordinary Share	Expiry date	Vesting[2]
439,488	22 December 2010	61 pence	21 December 2018	All vested
1,192,621	22 December 2011	27 pence	21 December 2019	All vested
1,872,500	31 December 2012	25 pence	30 December 2020	All vested
200,000	1 January 2014	25 pence	1 January 2022	All vested
12,800,000	12 February 2017	15 pence	12 February 2025	[1]
3,000,000	10 July 2017	16.328 pence	10 July 2025	[1]

Total Options: 19,504,609

Note:

(1) 50% of these Options vest equally over a three-year period beginning one year after the date of grant, with a vesting condition of continued employment by a Group Company. The remaining 50% vest on the achievement of milestones as follows:

20% on completion of the Tulkubash Feasibility Study. This milestone has been satisfied.

20% on the receipt of local permit approvals for the Tulkubash Project. This milestone has been satisfied.

20% on construction finance raise in full for the Tulkubash Project. This milestone has not yet been satisfied.

40% on the first gold pour at the Tulkubash Project. This milestone has not yet been satisfied.

In the event that any of the milestones are not achieved in accordance with the stated timetable, the relevant number of Options will be deferred into the final milestone.

(2) Please refer to paragraph 16 of Part 1 of this document for proposed changes to these arrangements.

2.10 Each Warrant entitles the holder to subscribe for one Ordinary Share. Excluding the Warrants issued to Directors or their related parties, details of which are set out in paragraph 4.3 of this Part VI, the Warrants were issued on 23 December 2014. The terms of the Warrants allowed for an exercise price adjustment should the Company raise funds at a price which represented a discount of more than 10 per cent. to the then prevailing share price.

The Company carried out a placing in September 2016 at a price that represented a discount of more than 10 per cent. to the then prevailing share price. The Company contacted all holders of Warrants to propose that the terms of the Warrants be amended to either: (i) extend the exercise period and allow for net settlement on exercise as summarised below; or (ii) to amend the warrant exercise price, in either case in consideration for the Warrant holder agreeing to waive its price adjustment right in respect of the above-mentioned placing.

The net settlement provision provides that the relevant Warrant holder will not be required to pay the Warrant exercise price (or any other consideration) on exercise of its Warrants, instead, the number of Ordinary Shares to be issued to the Warrant holder shall be calculated as follows:

(a) first, the number of Ordinary Shares shall be multiplied by the fraction which is equal to the fraction represented by: (A) the Current Market Price (being the volume weighted average price of an Ordinary Share for the preceding 10 days) less the Warrant exercise price divided by (B): the Current Market Price; and

(i) second, the resulting number of Ordinary Shares shall be divided by the fraction which is equal to the fraction represented by: (A) the Current Market Price less the par value per Ordinary Share (calculated as the £ equivalent of the US$ par value using the closing spot exchange rate on the last business day preceding the date of the Warrant exercise notice given by the Warrant holder) divided by: (B) the Current Market Price; and

(ii) third, the resulting number of Ordinary Shares shall be rounded up to the nearest whole Ordinary Share.

The Warrant holder shall pay an amount equal to the par value per Ordinary Share (calculated as aforesaid) on the number of Ordinary Shares calculated on the basis set out above (the "**Net Settlement Basis**").

The holders of the outstanding Warrants (other than the Labro Warrants, which are summarised in paragraph 4.3 of this Part VI), chose to extend the exercise period of their Warrants, so each of the Warrants is exercisable at 15 pence per Ordinary Share until 23 December 2019.

2.11 The Convertible Loan Notes have been issued on the terms described in paragraph 7.19(c) of this Part VI.

2.12 Save as disclosed in this document:

(a) no share or loan capital of the Company has been issued or is proposed to be issued;

(b) save for the Options, Warrants and Convertible Loan Notes, details of which are set out or referred to in paragraphs 2.8, 2.9, 2.10, 4.2, 4.3, 7.19(c) and 7.19(d) of this Part VI, there are currently no outstanding convertible securities, exchangeable securities or securities with options issued;

(c) there are no shares in the Company not representing capital;

(d) no Ordinary Shares are currently held in treasury by the Company or held by any other person on its behalf and no Ordinary Shares are currently held by any subsidiary of the Company;

(e) there are no shares in the Company held by or on behalf of the Company itself or by subsidiaries of the Company;

(f) there are no acquisition rights and/or obligations over authorised but unissued share of the Company and the Company has made no undertaking to increase its number of shares;

(g) no person has any preferential or subscription rights for any share capital of the Company; and

(h) no share or loan capital of the Company (save as referred to in paragraph 2.16(b) of this Part VI) or any member of the Chaarat Group is under option or agreed conditionally or unconditionally to be put under option.

2.13 The par value of each Ordinary Share is US$0.01.

2.14 The Company has no issued Ordinary Shares that are not fully paid up.

3. MEMORANDUM AND ARTICLES

3.1 **The Company**

Any and all capitalised words or terms in this paragraph 3 shall have the meaning ascribed to them in the Memorandum and Articles.

(a) ***The Memorandum of Association***

Under the terms of the Memorandum, the Company has the capacity and power to engage in any business or activity that is not prohibited under any law for the time being in force in the BVI, irrespective of corporate benefit. The Memorandum also provides that the Company may by Resolution of Members consolidate and divide, cancel or sub-divide the Shares. The Company may by Special Resolution reduce the number of Shares it is authorised to issue or any capital redemption reserve fund or share premium account or vary rights attaching to the Shares. The Company may only amend its Memorandum or Articles by a Special Resolution. No amendment may be made by the Board.

(b) ***The Articles of Association***

The rights attaching to the Shares, as set out in the Articles (and certain provisions of BVI law), contain, amongst others, the following provisions:

(i) *General meeting of Shareholders*

The Company is obliged to hold an Annual General Meeting each year, such meeting to be specified as the Annual General Meeting in the notice calling it. Further meetings of shareholders may be called by the Directors at such times and in such manner and places within or outside the BVI as the Directors consider necessary or desirable (such meetings being Extraordinary General Meetings under the Articles). Additionally, upon the written request of shareholders entitled to exercise 10 per cent. or more of the voting rights in respect of the matter for which the meeting is requested, the Directors shall be obliged to convene an Extraordinary General Meeting.

The Director convening a meeting shall give to those shareholders whose names on the date of the notice is given appear as shareholders in the register of members and are entitled to vote at the meeting: (a) in the case of a meeting of shareholders at which it is proposed to pass a Special Resolution, at least 21 clear days' notice; and (b) in the case of a meeting of shareholders at which it is proposed to pass a Resolution of Members, at least 14 days clear notice. The Director may fix as the record date for determining those shareholders that are entitled to vote at the meeting the date notice is given of the meeting, or such other date as may be specified in the notice, being a date not earlier than the date of the notice.

A shareholders' meeting held in contravention of the requirement to give notice is valid if shareholders holding at least 90 per cent, of the total voting rights on all the matters to be considered at the meeting have waived notice of the meeting and, for this purpose, their presence at the meeting shall constitute waiver in relation to all the shares which that shareholder holds.

A shareholder may be represented at a shareholders' meeting by a proxy who may speak and vote on behalf of that shareholder.

A shareholders' meeting is duly constituted if, at the commencement of the meeting, there are present in person or by proxy not less than two persons entitled to vote on the matters to be considered at the meeting. At any separate meeting of any class of shares all the provisions of these Articles as to General Meetings shall mutatis mutandis apply but so that the necessary quorum (other than at an adjourned meeting) shall be not less than two persons personally present and holding or representing, either by proxy or as the duly appointed representative of a corporation which is a shareholder, at least 33.33 per cent. of the capital paid up on the issued shares of the class and, at an adjourned meeting, one shareholder holding shares of the class in question or his proxy, and so that any holder of shares of the class in question present in person or by proxy may demand a poll and shall be entitled on a poll to one vote for every such share held by him. If the Company has two or more classes of shares, a meeting may be quorate for some purposes and not for others. A quorum may comprise a single shareholder or proxy and then such person may pass a resolution of shareholders and a certificate signed by such person accompanied where such person holds a proxy by a copy of the proxy instrument shall constitute a valid resolution of shareholders.

If within two hours from the time appointed for the meeting a quorum is not present, the meeting shall stand adjourned to the fifth next business day in the jurisdiction in which the meeting was to have been held at the same time and place, and if at the adjourned meeting a quorum is not present within one hour from the time appointed for the meeting, the meeting shall be dissolved.

(ii) *Voting rights*

At every meeting of shareholders, the Chairman shall preside as chairman of the meeting. If there is no Chairman or if the Chairman is not present at the meeting, the shareholders present shall choose one of their number to be the chairman. If the shareholders are unable to choose a chairman, then the person representing the greatest number of voting shares present in person or by proxy at the meeting shall

preside as chairman failing which the oldest individual shareholder or representative of a shareholder present shall take the chair.

The chairman decides whether any resolution proposed has been carried or not, and if in doubt, shall cause a poll to be taken of all votes cast upon such resolution. If the chairman fails to take a poll then any shareholder present in person or by proxy who disputes the announcement by the chairman of the result of any vote may demand that a poll be taken. If a poll is taken, the result shall be announced to the meeting and recorded in the minutes of the meeting. In the case of an equality of votes on a poll, the chairman shall not be entitled to a casting vote.

An action that may be taken by the shareholders at a meeting may also be taken by a resolution of shareholders or Special Resolution (as appropriate) consented to in writing, without the need for any prior notice. If any resolution of shareholders or Special Resolution is adopted in writing otherwise than by the unanimous written consent of all shareholders, a copy of such resolution shall forthwith be sent to all shareholders not consenting to such resolution.

Whilst is it not usual for BVI companies to have Special Resolutions, the Articles provide for Special Resolutions in relation to certain issues such as, *inter alia*, the appointment of a liquidator and resultant division of company property upon voluntary liquidation, and the dis-application of pre-emption rights. The Memorandum also provides for certain Special Resolutions as described in paragraphs 3.1(a) and 3.1(b) of this Part VI of this document.

Upon a show of hands every shareholder who (being an individual) is present in person or (being a corporation) is present by a duly authorised representative and in each case is entitled to vote shall have one vote and upon a poll every shareholder present in person or by proxy and entitled to vote shall have one vote for every share, of the relevant class, held by him.

(iii) *Distributions*

The Directors may authorise a distribution and of an amount they think fit if they are satisfied, on reasonable grounds, that, immediately after the distribution, the value of the Company's assets will exceed its liabilities and the Company will be able to pay its debts as and when they fall due. Dividends may be paid in money, or, where authorised by Special Resolution, shares or other property.

Notice in writing of any dividend that may have been declared shall be given to each shareholder in accordance with the notice provisions contained in the Articles and all dividends unclaimed for 3 years after notice shall have been given to a shareholder may be forfeited by Resolution of the Directors for the benefit of the Company.

No dividend shall bear interest as against the Company and no dividend shall be paid on treasury shares.

(iv) *Reserves*

Before recommending any dividend, subject to Regulation 8.1 (Distributions) the Board may set aside out of the profits of the Company (including any premiums received upon the issue of debentures or other securities or rights of the Company) such sums as it thinks proper as a reserve fund or reserve funds which shall at the discretion of the Board be applicable for any purpose for which the profits of the Company may lawfully be applied, and pending such application the Board may employ the sums from time to time so set apart as aforesaid in the business of the Company or invest the same in such securities (other than the shares of the Company or its holding company) as it may select. Subject as aforesaid, the Board may also from time to time carry forward such sums as it may deem expedient in the interests of the Company not to divide.

(v) *Borrowing powers*

The Directors may exercise all the powers of the Company to incur indebtedness, liabilities or obligations and to secure indebtedness, liabilities or obligations whether of the Company or of any third party.

(vi) *Issue of shares and pre-emptive rights*

Regulation 3.1 states that the Directors shall not exercise any power to allot Relevant Securities unless authorised to do so by a Resolution of Members. Regulations 3.4 and 3.5 state that any authority:

- shall state the maximum amount of Relevant Securities that may be allotted under it; and
- shall state the date on which it will expire, which must be not more than 5 years from the date on which the resolution is passed by virtue of which the authority is given; and
- may be renewed or further renewed by a Resolution of Members for a further period not exceeding 5 years. A Resolution of Members which renews an authority to allot Relevant Securities must state (or restate) the maximum amount of Relevant Securities which may be allotted under the authority or, as the case may be, the amount remaining to be allotted under it, and must specify the date on which the renewed authority will expire.

Regulation 5.1 states that where the Directors are authorised to allot shares under Regulation 3, they may be given power by Special Resolution to allot Equity Securities as if the pre-emption rights conferred by Regulations 4.1 to 4.6 and 4.8 did not apply to the allotment.

Regulation 5.2 states that the power under Regulation 5.1 ceases to have effect when the authority is revoked or would (if not renewed) expire, but if the authority is renewed, the power or (as the case may be) the resolution may also be renewed, for a period not longer than that for which the authority is renewed, by a Special Resolution.

Please refer to paragraph 2.1 of this Part VI of this document for annual authorities given to the Board to allot securities and to do so free of pre-emption rights.

(vii) *Transfer of Shares*

Subject to the Memorandum of the Company, certificated shares in the Company may be transferred by a written instrument of transfer signed by the transferor and containing the name and address of the transferee, which shall be sent to the Company for registration.

In the case of uncertificated shares, a shareholder shall be entitled to transfer his shares and other securities in accordance with the Regulations and the practices instituted by the operator of the relevant system, who shall act as agent of the shareholders for the purposes of the transfer of shares or other securities.

Any provision in the Articles of the Company in relation to the shares shall not apply to any uncertificated shares to the extent that they are inconsistent with the holding of any shares in uncertificated form, the transfer of title to any shares by means of a relevant system or any provision of the Regulations.

The transfer of a share is effective when the name of the transferee is entered on a register of members. A register of members may be closed at such times and for such periods as the board of Directors may from time to time determine, not exceeding in whole thirty days in each year, upon notice being given by advertisement in a leading daily newspaper and in such other newspaper (if any) as may be required by the BCA and the practice of the London Stock Exchange.

If the Directors are satisfied that an instrument of transfer relating to shares has been signed but that the instrument has been lost or destroyed, they may resolve: (a) to accept such evidence of the transfer of shares as they consider appropriate; and (b) that the transferee's name should be entered in the relevant register of members notwithstanding the absence of the instrument of transfer.

Subject to the Memorandum, the personal representative of a deceased shareholder may transfer a share even though the personal representative is not a shareholder at the time of the transfer.

Any person becoming entitled to a share in consequence of the death or bankruptcy of a shareholder may, upon such evidence as to title being provided as may from time to time be required by the board of Directors and subject as hereinafter provided either be registered himself as holder of the Share upon giving to the Company notice in writing of his desire to such effect or transfer such Share to some other person. All the limitations, restrictions and provisions of these presents relating to the right to transfer and the registration of transfers of shares shall be applicable to any such notice or transfer as aforesaid as if the death or bankruptcy of the shareholder had not occurred and the notice or transfer were a transfer executed by such shareholder.

(viii) *Return of capital*

On a winding up of the Company, the balance of the assets available for distribution, after deduction of any provision to be made under the BCA and subject to any special rights attaching to any class of shares, shall be applied in repaying to the shareholders the amount paid up or credited as paid up on the issue of such shares. Any surplus assets will belong to the holders of any shares then in issue according to the numbers of shares held by them in proportion to the amount paid up or credited as paid up on the issue of such shares.

(ix) *Variation of rights*

Each share in the Company confers upon the shareholder:

- the right to one vote at a meeting of the shareholders of the Company or on any Resolution of the shareholders;
- the right to an equal share in any dividend paid by the Company; and
- the right to an equal share in the distribution of the surplus assets of the Company on its liquidation.

The Directors may at their discretion by Resolution of Directors, redeem, purchase or otherwise acquire all or any of the shares in the Company, subject to the provisions on redemption of shares and treasury shares in the Articles.

The rights attached to shares as specified above (or any other rights which may otherwise attach to any shares) may only, whether or not the Company is being wound up, be varied by a Special Resolution of the holders of shares of the relevant class.

(x) *Purchase of shares by a company*

The Company may, subject to approval by Special Resolution, purchase, redeem or otherwise acquire and hold its own shares save that the Company may not purchase, redeem or otherwise acquire its own shares without the consent of the shareholder whose shares are to be purchased, redeemed or otherwise acquired unless the Company is permitted by the BCA or any other provision in the Memorandum or Articles to purchase, redeem or otherwise acquire the shares without such consent.

(xi) *Directors*

A Director is not required to hold a Share as a qualification to office

(xii) *Disclosure of Interests*

With the authority of the Directors, the Company may serve on any shareholder, or any other person appearing to be interested in shares held by that shareholder, or to have been so interested at any time during the three years immediately preceding the date on which the notice is issued, a notice requiring disclosure as contemplated by Section 793 of the English Companies Act 2006 in relation to all or any number of the shares which that shareholder holds or to which that other person is entitled or interested.

Failure by the shareholder to give the Company the requisite information within the prescribed period will result in, unless the Board otherwise determines, the imposition of sanctions such as restrictions on, *inter alia*, that shareholder's right to receive notice, attend or vote at shareholder meetings, receive dividends, and registration of the transfer of the shares.

(xiii) *Financial assistance to purchase shares of a company or its holding company*

Financial assistance to purchase shares of a company or its holding company is not prohibited by the BCA. Accordingly, so long as the assistance is for a proper purpose, it will be lawful.

(xiv) *Protection of minorities*

The BCA provides for various remedies to be available to shareholders who alleged that the Company's actions are prejudicial to them, including the right to be able to apply for restraining and compliance orders; derivative actions; personal actions; and representative actions against the Company.

Where a BVI Court considers that it is just and equitable to do so, it may make such order as it thinks fits, including in the case of a shareholder, requiring the Company or any other person to acquire the shareholder's shares; requiring the Company or any other person to pay compensation to the shareholder; regulating the future conduct of the Company's affairs; amending the Memorandum or Articles of the Company; appointing a receiver of the Company; appointing a liquidator of the company under section 159(1) of the Insolvency Act, 2003; directing the rectification of the records of the Company; and setting aside any decision made or action taken by the Company or its Directors in breach of the BCA or the Memorandum or Articles.

A majority of the shareholders must approve a proposed merger of the Company, unless the merger is with a wholly owned subsidiary. Shareholders dissenting from a proposed merger are entitled to require the Company to pay the fair value of their shares, in accordance with the procedures and conditions laid down by the BCA.

The BCA provides that shareholders holding 90 per cent. of the votes of the outstanding shares entitled to vote or the outstanding shares of each class of shares entitled to vote as a class, have a power to require the Company to redeem the shares held by the remaining shares.

Although the BCA does not prescribe procedures for variation of the rights of different classes of shareholders, the rights of such shareholders are governed by common law. The Memorandum permits variation in class rights with the consent of a Special Resolution of the holders of the class of shares affected.

(xv) *Management*

The Company is managed by its Directors, consisting of not less than 2 Directors, with no maximum number, who each have all the powers necessary for managing, and for directing and supervising, the business and affairs of the Company. Each Director shall exercise his powers for a proper purpose and shall not act or agree to the Company acting in a manner that contravenes the Memorandum, the Articles or the BCA. Each Director, in exercising his powers or performing his duties, shall act

honestly and in good faith in what the Director believes to be the best interests of the Company.

Directors are required under the BCA to act honestly and in good faith with a view to the best interests of the company, and to exercise the care, diligence and skill of a reasonably prudent person. As mentioned above, certain actions require prior approval of the shareholders, as a matter of statute. While the Company may provide certain indemnity for its Directors, the BCA precludes the Directors from taking advantage of such indemnities unless they act honestly and in good faith and with a view to the best interests of the Company, and in the case of criminal proceedings, where the Director had no reasonable cause to believe that his conduct was unlawful.

(xvi) *Accounting and auditing requirements*

The board of Directors shall cause to be kept accounting records sufficient to give a true and fair view of the state of the Company's affairs and to show and explain its transactions in accordance with both the BCA and the English Companies Acts. The Company shall also keep all accounting records as would be required by the English Companies Acts to show and explain its transactions were the Company a public limited company incorporated in England and Wales.

The accounting records shall be kept at the registered office or, subject to the BCA, at such other place or places as the Board may think fit and shall always be open to inspection by the officers of the Company. No shareholder (other than an officer of the Company) shall have any right of inspecting any accounting record or book or document of the Company except as conferred by law or authorised by the Board.

Subject to the above, a printed copy of every balance sheet and profit and loss account, together with the report of the Board thereon and including every other document as would be required by the English Companies Acts were the Company a public limited company incorporated in England and Wales to be annexed thereto, which is to be laid before the annual meeting of the shareholders were the Company a public limited company incorporated in England and Wales, together with a copy of the auditors' report, shall be sent to each person entitled thereto at least twenty one days before the date of the meeting in accordance with the requirements of the Companies Act, and copies shall also be sent in appropriate numbers to the Stock Exchange in accordance with its regulations.

The Company need not, if the Board of Directors so decides, send copies of such documents to shareholders, but may instead send them a summary financial statement derived from the Company's balance sheet and profit and loss account and the report of the Board thereon, in such form and containing such information as would be required by the English Companies Acts were the Company a public limited company incorporated in England and Wales provided that copies of the documents referred to above shall be sent to any shareholders who wish to receive them and the Company shall comply with the provisions of the English Companies Acts as to the manner in which it is to ascertain whether a shareholder wishes to receive them, as if the Company were a public limited company incorporated in England and Wales.

Auditors shall be appointed and their duties regulated in accordance with the English Companies Acts as if the Company were a public limited company incorporated in England and Wales.

(xvii) *Inspection of corporate records*

Shareholders of the Company may, pursuant to a written request, inspect certain of the company's books and records (specifically the Memorandum and Articles; the register of directors; the register of members; and minutes and resolutions of shareholders and of the classes of members of which the Shareholder is a member) and make copies or take extracts from the documents and records. However, the Directors have power to refuse or limit the request on the grounds that it would be

contrary to the Company's interests to allow a shareholder to inspect any document or part of a document. A shareholder who has been refused an inspection may apply to BVI Court for an order to permit the inspection.

The only corporate records generally available for inspection by members of the public are those required to be maintained at the BVI Registry of Corporate Affairs, namely the certificate of incorporation and memorandum and articles of association together with any amendments to these documents, and certain other documents which the Company may optionally elect to file.

A BVI incorporated company may elect to maintain a copy of its share register, register of directors and/or file particulars of any relevant charges (as such term is defined in the BCA) created by it from time to time at the Registry of Corporate Affairs, but this is not a mandatory requirement under the BCA.

(xviii) *Winding up*

The Company may by Special Resolution or by a Resolution of the Directors appoint a voluntary liquidator. If the Company is wound up, the liquidator may, with the authority of a Special Resolution, divide among the shareholders in kind the whole or any part of the property of the Company, and may for that purpose set such value as he considers fair upon any property to be so divided, and may determine how the division is to be carried out as between the shareholders or different classes of shareholders.

The liquidator may, with the authority of a Special Resolution, vest the whole or any part of any such property in trustees upon such trusts for the benefit of the contributories as the liquidator thinks fit, but so that no shareholder is compelled to accept any Shares or other securities in respect of which there is any liability.

(xix) *Takeover provisions*

If at any time when the Company is not subject to the City Code or any successor regime governing the conduct of takeovers and mergers in the UK or any other regime governing the same in any other country (any of such being the "**Takeover Regime**"):

- any person acquires interests in Shares which carry 20 per cent. or more of the voting rights of the Company; or
- any person who, together with persons acting in concert with him, holds interests in Shares representing not less than 20 per cent. but not more than 50 per cent. of the voting rights and such person, or any person acting in concert with him, acquires an interest in additional Shares which increase his percentage of the voting rights,

the Board shall be entitled, to require such person (other than the Depositary in its capacity as such) (the "**offeror**") to extend an offer to all the shareholders in the Company.

The offer must be conditional only upon the offeror having received acceptances in respect of Shares which, together with Shares acquired, held or agreed to be acquired before or during the offer, will result in the offeror and any person acting in concert with it holding Shares carrying more than 50 per cent. of the voting rights.

No acquisition of Shares which would give rise to a requirement for any offer under this provision may be made or (unless it is an excepted transfer) registered if it would or might be dependent on the passing of a shareholder resolution of the offeror or upon any other conditions, consents or arrangements.

Offers must be in cash or be accompanied by a cash alternative at not less than the highest price paid by the offeror or any person acting in concert with it for Shares of that class during the offer period and within 12 months prior to its commencement. The cash offer or the cash alternative must remain open after the offer has become or

is declared unconditional as to acceptances for not less than 14 days after the date on which it would otherwise have expired.

No nominee of an offeror or persons acting in concert with it may be appointed as a Director, nor may an offeror and persons acting in concert with it exercise the votes attaching to any Shares held in the Company until the offer document has been posted.

The offer shall be made on terms that would be required by the City Code, save to the extent that the Board otherwise determines. Any matter which under the City Code would fall to be determined by the United Kingdom Panel on Takeovers and Mergers (the "**Panel**") shall be determined by the Board or by such person appointed by the Board to make such determination, in each case with absolute discretion.

If a shareholder fails to extend an offer to the holders of all issued Shares fails to do so or is in default of any other obligation imposed upon shareholders pursuant to this provision, then the Board shall be entitled, to issue a notice (a "**discretion notice**") to such shareholder and any other shareholders acting in concert with such shareholder (together the "**defaulters**") directing certain sanctions, including, *inter alia*, that the defaulters shall not be entitled to vote, or receive a dividend.

If an offer shall be made pursuant to this provision and:

- the offeror (together with persons acting in concert with him) has by virtue of acceptance of the offer acquired or contracted to acquire some (but not all) of the Shares to which the offer relates; and
- those Shares, with or without any other Shares which the offeror (together with persons acting in concert with him) holds or has acquired or contracted to acquire,

would result in the offeror (together with persons acting in concert with him) obtaining or holding an interest in Shares conferring in aggregate 75 per cent. or more of the voting rights then the Offeror shall make an offer (the "**Sell Out Offer**") to all other holders of Shares in respect of all the Shares then in issue and held by them in respect of which the offer has not yet been accepted, at the same price and on the same terms as the offer and be capable of acceptance for a period of not less than 30 days after the date of the Sell Out Offer.

If an offer shall be made pursuant to this provision and:

- the offeror (together with persons acting in concert with him) has by virtue of acceptance of the offer acquired or contracted to acquire some (but not all) of the Shares to which the offer relates; and
- those Shares, with or without any other Shares which the offeror (together with persons acting in concert with him) holds or has acquired or contracted to acquire, would result, or has resulted, in the offeror (together with persons acting in concert with him) obtaining or holding an interest in Shares conferring in aggregate 90 per cent. or more of the voting rights conferred by all the Shares then in issue then:
    - the offeror shall be entitled to give a notice (the "**Squeeze Out Notic**e") to all other holders of Shares in respect of all the Shares then in issue and held by them in respect of which the offer has not yet been accepted, at the same price and on the same terms as the offer and be capable of acceptance for a period of not less than 30 days after the date of the Squeeze Out Notice;
    - any remaining Shareholder shall be entitled at any time thereafter to give the offeror a notice (the "**Sale Notice**") requiring the offeror to purchase its Shares, at the same price and on the same terms as the offer, and the offeror shall be obliged to comply therewith.

Upon delivery of the Squeeze Out Notice each of the recipients ("**Called Shareholders**"): (a) shall be deemed to have accepted the offer in respect of all Shares held by it; and (b) shall become obliged to deliver to the purchaser an executed transfer of such Shares and (if it exists) the certificate(s) in respect of the same. Squeeze Out Notices shall be irrevocable but will lapse if for any reason there is not a sale of the Called Shareholders' Shares within 60 days after the date of service of the Squeeze Out Notice. The Offeror shall be entitled to serve further Squeeze Out Notices following the lapse of any particular Squeeze Out Notice.

Upon any person, following the issue of a Squeeze Out Notice, becoming a shareholder of the Company pursuant to the exercise of a pre-existing option to acquire Shares in the Company, a Squeeze Out Notice shall be deemed to have been served upon the new shareholder on the same terms as the previous Squeeze Out Notice who shall be bound to sell and transfer all such Shares acquired by him to the purchaser or as the purchaser may direct and the provisions of this provision shall apply mutatis mutandis to the new shareholder save that completion of the sale of such Shares shall take place forthwith upon the Squeeze Out Notice being deemed served on the new shareholder.

3.2 **The Group**

Each other member of the Group has adopted constitutional documents which are typical for a wholly, or majority, owned subsidiary in the jurisdiction in which each Group company is incorporated.

4. DIRECTORS' AND OTHER INTERESTS

4.1 As at the date of this document and immediately following Re-Admission, the interests of the Directors and their families (within the meaning set out in the AIM Rules) in the issued share capital of the Company, all of which are beneficial, and the existence of which is known or could, with reasonable diligence, be ascertained by that Director, are as follows:

Director	Number of Shares held directly or indirectly	% of issued share capital	Number of Options held directly or indirectly	Number of Convertible Loan Notes held directly or indirectly (US$)	Number of Ordinary Shares arising on conversion of Convertible Loan Notes[1]	Number of Warrants held directly or indirectly
Martin Andersson via Labro Investments Ltd	132,421,925	33.51	–	1,000,000	2,849,330	21,367,521
Martin Wiwen-Nilsson	9,998,237	2.53	200,000	425,000	1,210,965	–
Gordon Wylie	–	–	–	–	–	–
Robert Benbow	–	–	4,000,000	–	–	–
Artem Volynets	–	–	–	–	–	–
Robert Edwards	–	–	–	–	–	–
Hussein Barma	–	–	–	–	–	–

(1) Assumes full conversion of principal and interest to maturity.

4.2 As at the date of this document, the following Directors held Options to subscribe for Ordinary Shares in the Company:

Option Holder[1]	Number of Options	Date of grant	Option price	Expiry date
Martin Wiwen-Nilsson	200,000[4]	12 February 2017[3]	15 pence	12 February 2025
Robert Benbow	3,500,000[5]	12 February 2017[2]	15 pence	12 February 2025
	500,000[6]	10 July 2017[2]	16.328 pence	10 July 2025

(1) Please refer to paragraph 16 of Part 1 of this document for proposed changes to these arrangements.

(2) 50% of these Options vest equally over a three-year period beginning one year after the date of grant, with a vesting condition of continued employment by a Group Company.

The remaining 50% vest on the achievement of milestones as follows:

- 20% on completion of the Tulkubash Feasibility Study. This milestone has been satisfied.
- 20% on the receipt of local permit approvals for the Tulkubash Project. This milestone has been satisfied.
- 20% on construction finance raise in full for the Tulkubash Project. This milestone has not yet been satisfied.
- 40% on the first gold pour at the Tulkubash Project. This milestone has not yet been satisfied.

In the event that any of the milestones are not achieved in accordance with the stated timetable, the relevant number of Options will be deferred into the final milestone.

(3) See note (2).

(4) 80,000 Options vested as at 16/08/2018

(5) 53,333 Options vested as at 16/08/2018

(6) 933,333 Options vested as at 16/08/2018

(7) 133,333 Options vested as at 16/08/2018.

4.3 As at the date of this document, no Director other than Martin Andersson, via Labro, holds any Warrants. The Warrants issued to Martin Andersson, via Labro (the "**Labro Warrants**") were originally issued by the Company to Fasanara Capital Credit Strategies Fund on 17 December 2014. All rights in respect of the Labro Warrants were novated to Labro in 2015 pursuant to a deed of novation.

The terms of the Labro Warrants allowed for an exercise price adjustment should the Company raise funds at a price which represented a discount of more than 10 per cent. to the then prevailing share price. The Company carried out a placing in September 2016 at a price that represented a discount of more than 10 per cent. to the then prevailing share price.

The Company entered into a deed of amendment to the terms of the Labro Warrants dated 27 September 2016, pursuant to which the parties agreed to: (i) extend the expiry date of the Labro Warrants from 17 December 2014 to 17 December 2019 in exchange for Labro agreeing to waive its right to a price adjustment in the context of the placing referred to above; and (ii) provide for Labro to be able to exercise the Labro Warrants on a Net Settlement Basis.

The Labro Warrants have an exercise price of 15 pence per Ordinary Share.

4.4 The Convertible Loan Notes issued to Directors (directly or indirectly) have the terms set out in paragraphs 7.19(c) and 7.19(d) of this Part VI.

4.5 Chaarat was notified on 27 October 2017 and 7 March 2018 that Labro had purchased a total of 9,880,000 Ordinary Shares from Mada Limited (an entity controlled by Dekel Golan, a former Director of the Company who stepped down from the Board on 1 November 2017). Martin Andersson (the Chairman of Chaarat) is indirectly beneficially interested in the majority of the shares in Labro. Legal and beneficial ownership of the Ordinary Shares transferred immediately, with payment of the consideration to be completed in tranches on or before 1 November 2018, which have been settled. Mada Limited has given a conditional undertaking to Labro not to sell any further Ordinary Shares prior to 28 February 2019 (subject to limited exceptions).

4.6 There is a provision in the Articles which states that the Board has the right (but not obligation) to require any holder of more than 20 per cent. of Chaarat's Ordinary Shares to make a mandatory offer to all Chaarat's shareholders to acquire their Ordinary Shares if they acquire an additional interest in any Ordinary Shares. The Board has previously exercised its discretion to waive the requirement for a mandatory offer when Labro acquired Ordinary Shares in excess of a 20 per cent. holding. The Board has decided to exercise its discretion to waive the requirement for the Concert Party members in respect of this purchase. The Board considered that, as Dekel Golan had indicated he wished to dispose of a proportion of his shareholding, it was in the best interests of Chaarat and its shareholders to remove the potential overhang of shares by allowing Labro to purchase the Ordinary Shares.

4.7 Certain shareholders, who are associated with Martin Andersson, have been considered to form a concert party with Labro (being the Concert Party). As at the date of this document, the Concert Party collectively hold 149,773,966 Shares representing approximately 37.90 per cent. of Chaarat's issued share capital.

As noted above, the Directors have the right (but not obligation) to require any holder of more than 20 per cent. of the Ordinary Shares to make a mandatory offer to all the Company's shareholders to acquire their Ordinary Shares if they acquire an additional interest in any Ordinary Shares. The Directors have previously exercised their discretion to waive the requirement for a mandatory offer when the Concert Party acquired Ordinary Shares in excess of a 20 per cent. holding.

As of the date of this document, if all Labro Warrants and Options held by Martin Wiwen-Nilsson (the "**MWN Options**") were exercised and all Convertible Loan Notes issued to Labro and Martin Wiwen-Nilsson were converted (but no drawdowns were made under the Labro Loan Agreement and no other Warrants or Options were exercised, no other Convertible Loan Notes were converted and no other Ordinary Shares were issued), the Concert Party would hold 175,401,782 Ordinary Shares representing 41.68 per cent. of the resulting enlarged share capital.

4.8 Save as disclosed above, none of the Directors nor any member of their respective immediate families nor any persons connected with the Directors has any interest, whether beneficial or non-beneficial, in any share capital of the Company or Options, or in any other financial product (including a contract for difference or a fixed odds bet) whose value is determined by reference to the price of the Ordinary Shares.

4.9 There are no outstanding loans granted or guarantees provided by the Company to or for the benefit of any of the Directors.

4.10 Save as otherwise disclosed in this document, no Director has any interest, whether direct or indirect, in any transaction which is or was unusual in its nature or conditions or significant to the business of the Company taken as a whole and which was effected by the Company since its incorporation and which remains in any respect outstanding or unperformed.

4.11 Save as disclosed in paragraphs 2.9, 2.10, 4.2, 4.3, 4.5, 4.7, 5.3, 5.4, 7.19, 7.26 (Labro Loan Agreement) and 13.3 of this Part VI, the Nominated Adviser and Broker Agreement, Introduction Agreement, Lock-In Deeds and Labro Relationship Agreement (as described in paragraph 13.1 of Part VI of this document), there are no contracts, existing or proposed, between any Director and the Company.

4.12 In addition to the directorships in the Company or Group Companies as disclosed in paragraph 1.4 of this Part VI, the Directors hold or have held the following directorships or partnerships (unless otherwise stated) within the five years immediately prior to the date of this document:

Name	Current Directorship	Past Directorships
Martin Axel Christer Andersson	Brunswick Property Partners Ltd Central Atlantic Investment Holding LLC	Technosila Holdings Ltd Brunswick Rail Ltd Cabo Delgado Investments Ltd Brunswick Real Estate SARL
Artem Olegovich Volynets	PJSC MMC Norilsk Nickel	None
Martin Wiwen-Nilsson	Brunswick Property Partners Limited (Director)	Brunswick Real Estate S.A.R.L.
Gordon Ferguson Wylie	None	Avocet Mining, Lydian International
Robert (Bob) Duane Benbow	Powderhouse Gulch LLC (Colorado)	None

Name	Current Directorship	Past Directorships
Robert (Rob) William John Edwards	PJSC MMC Norilsk Nickel, Scriptfert New Zealand Limited, Highcross Resources Limited	GB Minerals Limited, Sierra Rutile Limited
Hussein Barma	Atalaya Mining Plc Museum of Modern Art Limited Oxford Islamic Finance Limited Carlton Hill Management (No.70) Company Limited	Antofagasta Services Limited Antofagasta (Chili) and Bolivia Railway Company Limited Antofagasta Copper Limited Antofagasta Gold Limited Antofagasta Holdings Limited Antofagasta Metals Limited Antofagasta Minerals Limited Antofagasta Mining Limited Antofagasta Nickel Limited

4.13 None of the Directors has:

- any unspent convictions in relation to indictable offences;
- had any bankruptcy order made against him or entered into any voluntary arrangements;
- been a director of a company which has been placed in receivership, compulsory liquidation, creditors voluntary liquidation, administration, been subject to a company voluntary arrangement or any composition or arrangement with its creditors generally or any class of its creditors whilst he was a director of that company or within the 12 months after he ceased to be a director of that company;
- been a partner in any partnership which has been placed in compulsory liquidation, administration or been the subject of a partnership voluntary arrangement whilst he was a partner in that partnership or within the 12 months after he ceased to be a partner in that partnership;
- been the owner of any assets or a partner in any partnership which has been placed in receivership whilst he was a partner in that partnership or within 12 months after he ceased to be a partner in that partnership;
- been publicly criticised by any statutory or regulatory body (including recognised professional bodies); or
- been disqualified by a court from acting as a director of any company or from acting in the management or conduct of affairs of a company.

4.14 Save as disclosed in this document, no Director has or has had, any director interest in any:

(a) transaction which is or was unusual in its nature or conditions significant to the business of the Group taken as a whole and which has been effected by the Company or its subsidiary in the current or immediately preceding financial period or was effected during any earlier financial period or was effected during any earlier financial period and remains in any respect outstanding or unperformed;

(b) asset which has been acquired or disposed, or leased to, any member of the Group or which is proposed to be so acquired, disposed of, or leased; or contract or arrangement existing at the date of this document which is significant to the business of the Group.

4.15 The following people have served as directors of the Company during the Company's last financial year:

Name of Director	Date Appointed	Date Resigned
Alexander Novak	7 September 2007	9 July 2017
Dekel Golan	20 October 2007	1 November 2017
Linda Naylor	1 July 2009	15 August 2018
Richard Rae	10 December 2013	13 December 2018

Name of Director	Date Appointed	Date Resigned
Martin Wiwen-Nilsson	1 October 2016	N/A
Gordon Wylie	13 November 2017	N/A
Dorian L. Nicol	13 November 2017	13 December 2018
Martin Andersson	1 October 2016	N/A
Artem Volynets	25 March 2018	N/A
Robert Benbow	3 July 2018	N/A
Robert Edwards	13 September 2018	N/A
Hussein Barma	14 December 2018	N/A

5. DIRECTORS' AND SENIOR MANAGERS' SERVICE/APPOINTMENT AGREEMENTS AND REMUNERATION

5.1 A summary of the terms of appointment for or in respect of each Director and Senior Manager is set out at paragraphs 5.3 and 5.4 below (respectively).

5.2 The following table summarises the annual gross remuneration payable to or in respect of each Director and Senior Manager or their related Service Providers:

Director/Senior Manager	Annual gross Remuneration	Commencement of period of office with the Group (with the Company)	Date of Expiration of term of office
Martin Andersson	US$375,000 (accruing from 25 June 2018 but only paid when determined by the Remuneration Committee or 25 June 2019 if earlier)	1 October 2016	Continue until terminated on the expiry of not less than three months' prior notice in writing or such time as the Remuneration Committee request that he enter into a service agreement
Martin Wiwen-Nilsson	£24,000 (accruing from 1 January 2018 but not payable until determined by the Remuneration Committee or 1 January 2019 if earlier) (increasing to £35,000 on 1 January 2019	1 October 2016	Continue until terminated on the expiry of not less than three months' prior notice in writing
Artem Volynets	US$ 500,000	1 June 2018	Continue until terminated by either party giving not less than 12 months' written notice (in the case of the Company this is by making a payment in lieu of notice) or terminable on 2 months' notice by Mr Volynets within 12 months of a change of control with the Company to make a payment in lieu of the balance of the 12 notice period
Gordon Wylie	£25,500 (increasing to £35,000 on 1 January 2019)	13 November 2017	Continue until terminated on the expiry of not less than three months' prior notice in writing

Director/Senior Manager	Annual gross Remuneration	Commencement of period of office with the Group (with the Company)	Date of Expiration of term of office
Robert Benbow	US$345,000	1 January 2017	Continue until terminated by either party giving not less than 60 days' written notice
Robert Edwards	£22,500 (increasing to £35,000 on 1 January 2019)	13 September 2018	Continue until terminated by either party giving not less than 3 months' written notice
Hussein Barma	£25,000 (increasing to £35,000 on 1 January 2019)	With effect from the date of this document	Continue until terminated by either party giving not less than 3 months' written notice
Christopher Eger	US$300,000	1 August 2018	Continue until terminated by either party giving not less than 12 months' written notice (in the case of the Company this is by making a payment in lieu of notice) or terminable on 2 months' notice by Mr Eger within 3 months of a change of control with the Company to make a payment in lieu of the balance of the 12 notice period

5.3 The Group has entered into the agreements described below in relation to the Directors:

(a) **Martin Andersson (Executive Chairman)**

A contract for services between the Company and Martin Andersson dated 20 October 2016 pursuant to which he was appointed as a non-executive Director of the Company, as amended by an addendum (the "**MA Addendum**"). The MA Addendum also confirms that Martin Andersson holds the title of Executive Chairman of the Company with effect from 25 June 2018. Martin Anderson's role is to bring an objectivity and independence of view to the Board discussions and to help the board to provide the Group with effective leadership, as well as ensuring the continuing effectiveness of the management team and the high standards of financial probity and corporate governance. His appointment was deemed to have commenced on 1 October 2016 and initially was to continue for a period of 12 months (until 1 October 2017) unless or until terminated on the expiry of not less than three months' prior notice in writing, however, pursuant to the MA Addendum, the appointment is deemed to have continued until terminated on three months' notice or otherwise as set out in the agreement. In consideration for his services, the Director was entitled to receive basic fees of £22,500 per annum (as amended from £15,000 by Board resolution on 27 February 2018 and additional fees of £7,500 (as amended from £5,000 by Board resolution on 27 February 2018) as chairman of the Company, subject to the deduction of tax and national insurance contributions, if applicable) quarterly in arrears and he shall be entitled to participate in the 2017 Share Option Plan (see paragraph 16 of Part I for future plans). Initially, for the period ending on 31 December 2017 Martin Andersson waived entitlement to these fees. The MA Addendum confirms that Martin Andersson continued to waive his entitlement to basic

and additional fees (which was in effect from the date of the original agreement) until 25 June 2018. From this date he will accrue an annual fee of US$375,000 but this will only become payable when determined by the Remuneration Committee of the Company (or 25 June 2019 if earlier). At such time the Remuneration Committee determines this fee becomes payable and he becomes an employee of the Company he shall enter into a service agreement and his contract for services shall cease. The Company shall reimburse Martin Andersson for all reasonable expenses which he may incur in the proper performance of his duties in accordance with the Company's normal procedures. Martin Andersson shall be fully responsible for and indemnify the Company against any liability, assessment of claims (including reasonable costs and expenses) for (i) any employment claim brought by him against the Company arising out of his appointment; and (ii) any challenge a tax authority as to his employment status and/or any payment which the Company is required to make on his behalf in respect of income tax or social security contributions.

(b) **Artem Volynets (Chief Executive Officer)**

A service agreement between the Company and Artem Volynets dated 12 July 2018 pursuant to which he was appointed as an executive Director with the title chief executive officer. Artem Volynets' role is to be subject always to the directions of the Board and he shall carry out such duties in relation to such Group Companies as the Board may from time to time require. His appointment was deemed to have commenced on 1 June 2018 and shall continue until terminated by either party giving the other not less than 12 months written notice (in the case of the Company this is effected by making a payment in lieu of notice). If during the period of 12 months following a Change of Control (as defined therein) Artem Volynets wishes to resign he will be required to serve a two month notice period and he shall be paid a lump sum payment of twelve months of his total remuneration. In consideration for his services, the Company agreed to pay Artem Volynets an annual salary of US$500,000, payable monthly in arrears (subject to deductions for tax and social security contributions). Such salary shall include any sums receivable as Director's fees in the future and/or any other remuneration from any other Group Company. Artem Volynets shall not (unless in limited exceptions) be interested in any other business other than the Group except with the consent of the Remuneration Committee. It is acknowledged that Artem Volynet's shareholding in ACG Amur Capital Group Limited is approved. The Company shall refund Artem Volynets all reasonable expenses wholly and exclusively incurred by him in the proper performance of the Company or the Group's business. Provided that the share based award scheme that the Company is putting in place (the "**New Share Scheme**") is implemented for the first three years of employment, Artem Volynets will not be eligible for discretionary cash bonus unless the Board decides to make one. Artem will participate in the New Share Scheme as described in paragraph 16 of Part I. In addition, the agreement stated that he shall receive an initial 500,000 award of Restricted Stock Units (as defined therein) and 1,500,000 options (with a strike price of 0.25) after signature of this agreement, which award and terms of vesting will be subject to the New Share Scheme rules or such other scheme put in place to implement this. The arrangements regarding these awards are to be synchronised with the arrangements set out at paragraph 16 of Part I. Artem Volynets shall not, during the period of 12 months after the date of termination of this agreement (i) induce any Skilled Executive (as defined therein) to leave the Group's employment; or (ii) be interested in Competitive Business (as defined therein) with the Group within 50 miles of any place of business of the Group in Kyrgyzstan at which Competitive Business shall have been carried on.

(c) **Gordon Wylie (Non-Executive Director)**

A contract for services between the Company and Gordon Wylie dated 16 November 2017 pursuant to which he was appointed as a non-executive Director of the Company, as amended by an addendum (the "**GW Addendum**"). Gordon Wylie's role is to bring an objectivity and independence of view to the Board discussions and to help the Board to provide the Group with effective leadership, as well as ensuring the continuing effectiveness of the management team and the high standards of financial probity and corporate governance. His appointment was deemed to have commenced on 13 November 2017 and initially was to continue for a period of 12 months unless or until terminated on the expiry of not less than

three months' prior notice in writing, however, pursuant to the GW Addendum the appointment is deemed to have continued until terminated on three months' notice or otherwise as set out in the agreement. In consideration for his services, Gordon Wylie shall be entitled to receive basic fees of £22,500 per annum (as amended from £15,000 by Board resolution on 27 February 2018, subject to the deduction of tax and national insurance contributions, if applicable) quarterly in arrears, and this is confirmed in the GW Addendum. Gordon Wylie is also entitled, as per the Board resolutions of the Company dated 27 February 2018, to £3,000 per annum for being a member of each of the Audit Committee and the Technical Committee. The GW Addendum confirms that from 1 January 2019 he will receive a fee of £35,000 per annum with no additional committee fees. Gordon Wylie shall be entitled to participate in the Company's 2017 Share Option Plan (see paragraph 16 of Part I for future plans). The Company shall reimburse Gordon Wylie for all reasonable expenses which he may incur in the proper performance of his duties in accordance with the Company's normal procedures. Gordon Wylie shall be fully responsible for and indemnify the Company against any liability, assessment of claims (including reasonable costs and expenses) for (i) any employment claim brought by him against the Company arising out of his appointment; and (ii) any challenge a tax authority as to his employment status and/or any payment which the Company is required to make on his behalf in respect of income tax or social security contributions.

(d) **Martin Wiwen-Nilsson (Non-Executive Director)**

A contract for services between the Company and Martin Wiwen-Nilsson dated 20 October 2016 pursuant to which he was appointed as a non-executive Director of the Company, as amended by an addendum (the "MWN Addendum"). Martin Wiwen-Nilsson's role is to bring an objectivity and independence of view to the Board discussions and to help the Board to provide the Group with effective leadership, as well as ensuring the continuing effectiveness of the management team and the high standards of financial probity and corporate governance. The appointment was deemed to have commenced on 1 October 2016 and initially was to continue for a period of 12 months (until 1 October 2017) unless or until terminated on the expiry of not less than three months' prior notice in writing, however, pursuant to the MWN Addendum, the appointment is deemed to have continued until terminated on three months' notice or otherwise as set out in the agreement. In consideration for his services, Martin Wiwen-Nilsson shall be entitled to receive basic fees of £22,500 per annum (as amended from £15,000 by Board resolution on 27 February 2018, subject to the deduction of tax and national insurance contributions, if applicable) quarterly in arrears. Martin Wiwen-Nilsson is also entitled, as per the Board resolutions of the Company dated 27 February 2018, to £1,500 per annum for being a member of the Remuneration Committee. Initially, for the period ending on 31 December 2017 Martin Wiwen-Nilsson waived entitlement to these fees. The MWN Addendum confirms that this waiver ceased on 1 January 2018 and that he has accrued fees from this date however such fee shall only become payable when the Remuneration Committee of the Company determines and in any event no later than 1 January 2019. Martin Wiwen-Nilsson shall be entitled to participate in the Company's 2017 Share Option Plan (see paragraph 16 Part I for future plans). The Company shall reimburse Martin Wiwen-Nilsson for all reasonable expenses which he may incur in the proper performance of his duties in accordance with the Company's normal procedures Martin Wiwen-Nilsson shall be fully responsible for and indemnify the Company against any liability, assessment of claims (including reasonable costs and expenses) for (i) any employment claim brought by him against the Company arising out of his appointment; and (ii) any challenge a tax authority as to his employment status and/or any payment which the Company is required to make on his behalf in respect of income tax or social security contributions.

(e) **Robert Edwards (Non-Executive Director)**

A contract for services between the Company and Robert Edwards dated 5 October 2018 setting out the terms of his appointment as a non-executive Director of the Company. The appointment was deemed to have commenced on 13 September 2018 and shall continue unless or until terminated on the expiry of not less than three months' prior notice in writing

unless one of the grounds for summary termination apply. Robert Edwards' role is to attend Board meetings and bring an objectivity and independence of view to the Board discussions and to help the Board to provide the Group with effective leadership, as well as ensuring the continuing effectiveness of the management team and the high standards of financial probity and corporate governance. In consideration for his services, Robert Edwards is entitled to receive basic fees of £22,500 per annum (subject to deductions for tax and national insurance contributions, if applicable), payable quarterly in arrears. As confirmed by way of a side letter, from 1 January 2019 he will receive a fee of £35,000 per annum with no additional committee fees. Robert Edwards shall be fully reimbursed for all reasonable expenses which he may incur in the proper performance of his duties in accordance with the Company's normal procedures. Robert Edwards shall be fully responsible for and indemnify the Company against any liability and assessment of claims (including reasonable costs and expenses) for: (i) any employment claim brought by him against the Company arising out of his appointment; and (ii) any challenge by HMRC or other tax authority as to his employment status and/or any payment which the Company is required to make on his behalf in respect of income tax or social security contributions. The Company is required to maintain directors and officers insurance for Robert Edwards. Robert Edwards is subject to provisions relating to confidentiality, compliance with all laws, rules and recommendations (including in relation to share dealing) and disclosure of any outside interests where these may give rise to an actual or potential conflicts of interest.

(f) **Robert D Benbow (Chief Operating Officer)**

A service agreement between the Company and Robert D Benbow dated 14 February 2017 pursuant to which he was appointed as chief operating officer. Robert D Benbow's role is to be an officer of the Company and be subject always to the directions of the Board and shall carry out such duties in relation to such Group Companies as the Board may from time to time require. His appointment was deemed to have commenced on 1 February 2017 and shall continue until terminated by either party giving the other not less than 60 days written notice (with the Company having to pay an enhanced payment in lieu of notice and provision of benefits upon termination in certain circumstances). If during the period of six months following a Change of Control (as defined therein) Robert D Benbow resigns he will receive a payment equivalent of 180 days of his total remuneration (subject to deductions for tax and social security contributions). In consideration for his services, the Company agreed to pay an annual salary of US$265,750, payable monthly in arrears (subject to deductions for tax and social security contributions). Such salary shall include any sums receivable as Director's fees in the future and/ or any other remuneration from any other Group Company. On 10 July 2017, Mr. Benbow was appointed Chief Executive Officer and his salary was changed to $345,000 per year. On June 25, 2018, Mr. Benbow reverted to Chief Operating Officer and he was appointed to the Board of Directors on July 4, 2018 as an Executive Director with no change in compensation. The Company is not currently offering a benefits plan including medical insurance to Robert D Benbow. As from 1 September 2018, the Company shall pay an additional sum at the rate of US$36,000 per annum payable monthly in arrears (subject to deductions for tax and social security contributions). The Company intends to enter into a discretionary bonus scheme with Robert D Benbow, and he may be entitled to participate in the Company's 2017 Share Option Plan (see paragraph 16 Part I for future plans). The Company shall refund Robert D Benbow all reasonable expenses wholly and exclusively incurred by him in the proper performance of the Company or the Group's business. Robert D Benbow shall not, during the period of 12 months after the date of termination of this agreement: (i) induce any Skilled Employee (as defined therein) to leave the Group's employment; or (ii) be interested in Competitive Business (as defined therein) with the Group within 50 miles of any place of business of the Group in Kyrgyzstan at which Competitive Business shall have been carried on.

(g) **Hussein Barma (Independent Non-Executive Director)**

A contract for services between the Company and Hussein Barma, setting out the terms of his appointment as a non-executive Director of the Company. The appointment is deemed to

have commenced with effect from the date of this document and shall continue unless or until terminated on the expiry of not less than three months' prior notice in writing unless one of the grounds for summary termination apply. Hussein Barma's role is to attend Board meetings and bring an objectivity and independence of view to the Board discussions and to help the Board to provide the Group with effective leadership, as well as ensuring the continuing effectiveness of the management team and the high standards of financial probity and corporate governance. In consideration for his services, Hussein Barma is entitled to receive basic fees of £22,500 per annum plus an additional £2,500 for chairing a committee (subject to deductions for tax and national insurance contributions, if applicable), payable quarterly in arrears. From 1 January 2019 he will receive a fee of £35,000 per annum with no additional committee fees. Hussein Barma shall be fully reimbursed for all reasonable expenses which he may incur in the proper performance of his duties in accordance with the Company's normal procedures. Hussein Barma shall be fully responsible for and indemnify the Company against any liability and assessment of claims (including reasonable costs and expenses) for: (i) any employment claim brought by him against the Company arising out of his appointment; and (ii) any challenge by HMRC or other tax authority as to his employment status and/or any payment which the Company is required to make on his behalf in respect of income tax or social security contributions. The Company is required to maintain directors and officers insurance for Hussein Barma. Hussein Barma is subject to provisions relating to confidentiality, compliance with all laws, rules and recommendations (including in relation to share dealing) and disclosure of any outside interests where these may give rise to an actual or potential conflicts of interest.

5.4 The Group has entered into the agreement described below in relation to the Senior Manager:

Chris Eger (Chief Financial Officer)

A service agreement between Chaarat Gold Services Limited ("**CGSL**") (the wholly owned English subsidiary of the Company) and Christopher Eger dated on or around 14 August 2018 pursuant to which he was appointed as an executive Director with the title Chief Financial Officer for the Group. Chris Eger's role is to be subject always to the directions of the Board and shall carry out such duties in relation to such Group Companies as the Board may from time to time require. His appointment was deemed to have commenced on 1 August 2018 and shall continue until terminated by either party giving the other not less than 12 months' written notice (in the case of the Company this is effected by making a payment in lieu of notice). If during the period of three months following a Change of Control (as defined therein) Chris Eger wishes to resign he will be required to serve up to a two month notice period and receive a lump sum payment of twelve months of his total remuneration (subject to deductions for tax and social security contributions). In consideration for his services, CGSL agreed to pay an annual salary of US$300,000, payable monthly in arrears (subject to deductions for tax and social security contributions). Such salary shall include any sums receivable as Director's fees in the future and/or any other remuneration from any other Group Company. Chris Eger's contract stated that he shall be entitled to participate in the New Share Scheme (**5% of the initial award**), however the arrangements have been revised under the arrangements set out at paragraph 16 of Part I. CGSL shall refund Chris Eger all reasonable expenses wholly and exclusively incurred by him in the proper performance of CGSL's or the Group's business. Chris Eger shall not, during the period of 12 months after the date of termination of this agreement: (i) induce any Skilled Employee (as defined therein) to leave the Group's employment; or (ii) be interested in Competitive Business (as defined therein) with the Group within 50 miles of any place of business of the Group at which Competitive Business shall have been carried on.

6. SIGNIFICANT SHAREHOLDERS

6.1 Other than the holdings of the Directors and their immediate families and persons connected with them which are set out in paragraph 4.1 of this Part IV of this document, the Directors are not aware of any persons who, at the date of this document and immediately following Re-Admission, directly or indirectly, jointly or severally, hold or will hold, 3 per cent, or more the issued share capital of the Company or exercise or could exercise control over the Company:

	As at the date of this Agreement		Immediately following Re-Admission*	
Shareholder	Number of Ordinary Shares	Approximate % of issued capital	Number of Ordinary Shares	% of issued capital
Martin Andersson via Labro Investments Ltd	132,421,925	33.51	132,421,925	33.51
China Nonferrous Metals Int'l Mining Co. Ltd	22,469,289	5.69	22,469,289	5.69
Sarastro Group Ltd	17,606,228	4.46	17,606,228	4.46
UBS Group AG	14,665,768	3.71	14,665,768	3.71

* Assumes no Ordinary Shares are issued prior to Re-Admission (including following exercise or conversion of Options, Warrants or Convertible Loan Notes)

6.2 To the extent known to the Company based on the above information, and save as stated in paragraphs 4.6, 4.7 and 13.1 of this Part VI of this document, the Company is not directly or indirectly owned or controlled by any person, nor is it aware of any arrangements which may at a subsequent date result in a change in control of the Company.

6.3 None of the major Shareholders set out above has different voting rights from any other Shareholder in respect of any Ordinary Shares held by them.

6.4 The total number of Ordinary Shares:

(a) in Issue: 395,167,015;

(b) not in public hands: 159,149,278 (40.27%);

6.5 Save as disclosed in this document and so far as the Company is aware, there are no arrangements the operation of which may at a subsequent date result in a change of control of the Company.

7. MATERIAL CONTRACTS

This section contains summaries of the principal terms of material contracts (not being contracts entered into in the ordinary course of business) entered into by any member of the Group within the two years immediately preceding the date of this document and any other contracts (not being contracts entered in to the ordinary course of business) entered into by any member of the Group which contain any provision under which any member of the Group has any obligation or entitlement which is material to the Group as at the date of this document, or are material subsisting agreements which relate to, the assets and liabilities of the Group as at the date of this document (and which have not been summarised in Part I or in paragraph 13 of this Part VI of this document):

7.1 **Deed Poll**

The Deed Poll contains provisions to the following effect, which are binding on Depositary Interest holders:

Holders of Depositary Interests warrant that the Ordinary Shares held by the Depositary or the Custodian (on behalf of the Depositary) are transferred or issued free and clear of all liens, charges, encumbrances or third party interests and that such transfers or issues are not in contravention of the Company's constitutional documents or any contractual obligation, law or regulation and the holders of Depositary Interests shall indemnify the Depositary and keep it indemnified from and against any liability which it may suffer by reason of any breach of any such warranty. The Depositary and any Custodian must pass on to Depositary Interest holders and, so far as they are reasonably able, exercise on behalf of Depositary Interest holders all rights and entitlements received or to which they are entitled in respect of the Ordinary Shares which are capable of being passed on or exercised. Rights and entitlements to distributions (cash or otherwise, including bonus issues and distributions arising from capital reorganisations), to information, to make choices and elections and to call for, attend and vote at meetings shall, subject to the Deed Poll, be passed to the Depositary Interest holders in the form in which they are received together with amendments and additional documentation necessary to effect such passing-on, or, as the case may be, exercised in accordance with the Deed Poll.

If the Company makes a distribution in specie to the Custodian of an asset which is not readily divisible among holders of Depositary Interests in their due proportion, the Custodian will use reasonable endeavours to sell the relevant asset within a reasonable time at the best price reasonably obtainable in the market and to distribute the net proceeds of such sale appropriately.

The Depositary will be entitled to cancel Depositary Interests and withdraw the Ordinary Shares in certain circumstances including where a Depositary Interest holder has failed to perform any obligation under the Deed Poll or any other agreement or instrument with respect to the Depositary Interests.

The Deed Poll contains provisions excluding and limiting the Depositary's liability. For example, the Depositary shall not be liable to any Depositary Interest holder or any other person for liabilities in connection with the performance or non-performance of obligations under the Deed Poll or otherwise except as may result from its negligence or wilful default or fraud or that of any person for whom it is vicariously liable, provided that the Depositary shall not be liable for the negligence, wilful default or fraud of any Custodian or agent which is not a member of its group unless it has failed to exercise reasonable care in the appointment and continued use and supervision of such Custodian or agent. Furthermore, except in the case of personal injury or death, the Depositary's liability to a holder of Depositary Interests will be limited to the lesser of:

(a) the value of the Ordinary Shares and other deposited property properly attributable to the Depositary Interests to which the liability relates; and

(b) that proportion of £10,000,000 which corresponds to the portion which the amount the Depositary would otherwise be liable to pay to the Depositary Interest holder bears to the aggregate of the amounts the Depositary would otherwise be liable to pay to all such holders in respect of the same act, omission or event which gave rise to such liability or, if there are no such amounts, £10,000,000.

The Depositary is entitled to charge holders fees and expenses for the provision of its services under the Deed Poll.

Each holder of Depositary Interests is liable for and must indemnify the Depositary and any their agents, officers and employees) against all liabilities arising from or incurred in connection with, or arising from any act related to, the Deed Poll so far as they relate to the property held for the account of, or Depositary Interests held by, that holder, other than those resulting from the wilful default, negligence or fraud of the Depositary, or the Custodian or any agent, if such Custodian or agent is a member of the Depositary's group, or, if not being a member of the same group, the Depositary shall have failed to exercise reasonable care in the appointment and continued use and supervision of such Custodian or agent.

The Depositary may terminate the Deed Poll by giving not less than 30 days' prior notice. During such notice period holders may cancel their Depositary Interests and withdraw their deposited property and, if any Depositary Interests remain outstanding after termination, the Depositary must as soon as reasonably practicable, among other things, deliver the deposited property in respect of the Depositary Interests to the relevant Depositary Interest holders or, at its discretion sell all or part of such deposited property. It shall, as soon as reasonably practicable, deliver the net proceeds of any such sale, after deducting any sums due to the Depositary, together with any other cash held by it under the Deed Poll *pro rata* to holders of Depositary Interests in respect of their Depositary Interests.

The Depositary or the Custodian may require from any holder, or former or prospective holder, information as may be necessary or desirable for the purposes of the Deed Poll including information as to the capacity in which Depositary Interests are owned or held and the identity of any other person with any interest of any kind in such Depositary Interests or the Ordinary Shares and holders are bound to provide such information requested. Furthermore, to the extent that the Company's constitutional documents or an applicable law or regulation in any jurisdiction require disclosure to the Company of, or limitations in relation to, beneficial or other ownership of, or interests of any kind whatsoever, in the Ordinary Shares, the holders of Depositary Interests are to

comply with such provisions, laws and regulations and with the Company's instructions with respect thereto.

It should also be noted that holders of Depositary Interests may not have the opportunity to exercise all of the rights and entitlements available to holders of the Ordinary Shares, including, for example, the ability to vote on a show of hands. In relation to voting, it will be important for holders of Depositary Interests to give prompt instructions to the Depositary or its nominated Custodian, in accordance with any voting arrangements made available to them, to vote the Ordinary Shares on their behalf or, to the extent possible, to take advantage of any arrangements enabling holders of Depositary Interests to vote such Ordinary Shares as a proxy of the Depositary or its nominated Custodian.

A copy of the Deed Poll can be obtained on request in writing to the Depositary or the Company.

7.2 **Depositary Agreement**

On 25 October 2007, the Company and the Depositary entered into an agreement under which the Company appointed the Depository to constitute and issue for time to time, upon the terms of the Deed Poll, the Depository Interests with each such Depository Interest representing a Share. The Depositary agrees that it will comply, and will procure certain other persons comply, with the terms of the Deed Poll and that it and they will perform their obligations in good faith and with all reasonable skill, diligence and care. The Depositary assumes certain specific obligations, including the obligation to arrange for the Depositary Interests to be admitted to CREST as participating securities and to provide copies of and access to the registers of Depositary Interests. The Depositary warrants that it is and, to the extent necessary, any custodian, agent or other parties appointed by it pursuant to the Deed Poll shall be an authorised person under the FSMA and is duly authorised to carry out custodial and other activities under the Deed Poll. The Company agrees to provide such assistance, information and documentation to the Depositary as is reasonably required by the Depositary for the purposes of performing its duties, responsibilities and obligations under the Deed Poll and the Depositary Agreement. In particular, the Company is to supply the Depositary with all documents it sends to its shareholders so that the Depositary can distribute the same to all holders of Depositary Interests. The agreement sets out the procedures to be followed where the Company is to pay or make a dividend or other distribution.

The Depositary is to indemnify the Company against claims made against the Company by any holder of Depositary Interests or any person having any direct or indirect interest in any such Depositary Interests or the underlying securities which arises out of any breach or alleged breach of the terms of the Deed Poll or any trust declared or arising thereunder except if such claim arises as a result of the fraud, negligence or wilful default of the Company. The aggregate liability of the Depositary arising out of the Depositary Agreement is limited to the lesser of £1,000,000 or an amount equal to 10 times the total annual fee payable to the Depositary under the Depositary Agreement.

The Company is to indemnify the Depositary against claims made against the Depositary by any holder of Depositary Interests or any person having any direct or indirect interest in any such Depositary Interests or the underlying securities which arises out of the Depositary's performance of its obligations under the Depositary Agreement or the Deed Poll save in respect of any loss, liability, cost and expense (including legal fees) resulting from the negligence, wilful default or fraud of the Depositary.

The agreement is to remain in force for as long as the Deed Poll remains in force. Both the Company and the Depositary may terminate the agreement on 30 days' notice in the event of material breach by the other party or the occurrence of an event of default and otherwise on 45 days' notice. The Depositary is to ensure that any custodian and any person who maintains the registers of Depositary Interests is a member of its group and may not subcontract or delegate its obligations under the Deed Poll without the Company's consent.

For the provision of its services, the Company will pay the Depository annual fees plus all reasonable out-of-pocket expenses and other related expenses.

7.3 **Registrars Agreement**

On 25 October 2007 the Company and the Registrar entered into an agreement under which the Company appointed the Registrar to maintain the Company's register of members in Guernsey and, where applicable registers of loan stock, debenture and Warrant Holders (the "**Offshore Registers**"), and provide certain other services including maintenance of the Offshore Registers in Guernsey and other usual services. The Registrar agrees to follow all reasonable instructions given by the Company with regard to its duties as Registrar and will provide a registration and transfer office in Guernsey where it will keep the offshore registers and perform the services of a registrar with due diligence, reasonable skill and expertise. The Registrar assumes certain specific obligations, including, for example, to receive and register transfers and all other documents needed to maintain the offshore registers, to prepare and issue new share certificates, as the case may be, and to prepare and dispatch dividend and interest Warrants. The Company agrees to give such assistance to the Registrar as may be reasonably necessary to enable the Registrar to carry out its obligations under the agreement.

The Company's payments to the Depositary (as set out in the Depositary Agreement at paragraph 7.2) above include the fees of the Registrars.

The Company may terminate the agreement on three months' notice to the Registrar, such notice to expire no earlier than the first anniversary of the date of the agreement. The Registrar may terminate the agreement on three months' notice to the Company. Both the Company and the Registrar may terminate the agreement immediately upon giving notice to the other party if the property of the other party being declared en desastre or that other party becoming insolvent or going into liquidation (other than a voluntary liquidation for the purpose of reconstruction or amalgamation upon terms previously approved in writing by the other party) or a receiver being appointed of any of its assets or if some event having equivalent effect occurs, or if the other party has committed a material breach and (if such breach shall be capable of remedy) the other party not making good such breach within thirty days of service upon the party in breach of notice requiring the remedy of such breach or, in the case of the Registrar, being in the opinion of the Directors guilty of fraud, wilful misconduct or gross negligence in the performance of its duties thereunder. The Company may terminate the agreement immediately upon giving notice in the event of the Registrar ceasing to be permitted to act as Registrar of the Company under any applicable law.

The Company is to indemnify the Registrar against all liabilities that may be suffered arising out of or in connection with the performance of its duties as Registrar except such as may be due to fraud, negligence or wilful default of the Registrar or its agents. The aggregate liability of the Registrar is limited to the lesser of a fixed amount or a multiple of the total annual fee payable to the Registrar and excludes liability for indirect or consequential losses or damage, loss of profit, revenue, actual or anticipated saving and goodwill.

7.4 **Nominated Adviser and Broker agreement**

The Company, the Directors of the Company and the Nomad entered into an agreement dated 18 January 2012 (the "**Nomad Agreement**") pursuant to which the Nomad has agreed to act as nominated adviser and broker to the Company in reliance on the warranties, representations and undertakings contained therein. The appointment commenced on 18 January 2012 and was for an initial period of 12 months and thereafter unless and until terminated by either the Company or the Nomad.

The Nomad's duties as a nominated advisor include advising the Company and the Directors on their responsibilities under the AIM Rules and fulfilling the duties of a nominated advisor under the AIM Rules. The Nomad's duties as a broker include routine general advice regarding corporate announcements and on the relevant rules of the London Stock Exchange plc, general corporate broking administration, investor relations services and making a market in the Shares. The Nomad shall provide such other assistance on terms it and the Company may agree in writing from time to time, for which fees and services shall be subject to a separate agreement.

The Company's and Director obligations are to, *inter alia*, comply with all applicable laws and guidelines, take all reasonable steps to preserve any warranties, indemnities, undertakings and rights of benefit between the Company and third parties and notify the Nomad of any board meetings and any documents to be circulated to security holders to review in advance and permit the Nomad

access to sources of information of the Company. The Company undertakes to pay certain indemnities in favour of the Nomad, its affiliates and its and their respective directors, officers, employees and agents for any losses which may arise out of or in connection with the Nomad Agreement.

The Company shall pay to the Nomad a set fee per annum plus VAT and any reasonable expenses. No party may assign or purport to assign the Nomad Agreement, the rights or obligations arising under or out of the Nomad Agreement or the benefit of all or any of the other parties' obligations under the Nomad Agreement without the prior written consent of the other party.

The Company and the Nomad entered into an addendum to the Nomad Agreement on10 December 2018 (the "**Nomad Agreement Addendum**"). Pursuant to the Nomad Agreement Addendum, the Nomad agreed to act as the nominated adviser and joint broker to the Company for the purposes of the reverse takeover and Re-Admission. In consideration of the services to be provided by the Nomad, the Company shall pay a fee plus expenses within 30 days from the publication of this document or if a transaction in respect of the same assets is entered into within 12 months after expiration or termination of the Nomad Agreement Addendum. The engagement of the Nomad under the Nomad Agreement Addendum can be terminated separately to the engagement under the Nomad Agreement and all other terms in the Nomad Agreement apply to the Nomad Agreement Addendum. The appointment is governed by English Law.

7.5 **The Exploration Licence**

Date, Parties and Scope

The Exploration Licence was granted to CZ on 7 October 2013 (the "**Exploration Date of Grant**"), replacing an earlier exploration licence over the Exploration License Area. The terms and conditions of the Exploration Licence are contained in an accompanying licence agreement.

On the Exploration Date of Grant, CZ entered into licence agreement No. 1 with SCIESM. Subsequently, CZ entered into the following licence agreements with SCIESM and licence agreement No.4 with SCIESM:

- licence agreement No.2 dated 29 September 2014;
- licence agreement No.3 dated 21 April 2016; and
- licence agreement No.4 dated 29 July 2016 (the "**Exploration Licence Agreement**")

The Exploration Licence provides CZ with the right to explore for gold molybdenum, copper and tungsten in the Exploration License Area.

Term

The term of the Exploration Licence has been extended four times since the Exploration Date of Grant. The term was last extended on 29 July 2016 to 7 October 2023.

Work Commitments and Programme

The minimum work requirements under the Licence for 2018 and 2019 are as follows:

CZ is under an obligation to carry out works within the scopes and schedule in accordance with certain specified recommendations, and submit annual reports to SCIESM.

Reporting and Related Requirements

Under the terms of the Exploration Licence Agreement, CZ is required to comply with the following reporting requirements:

- implementation of works in accordance with the Corrected Technical Project for exploration for gold, molybdenum, copper and tungsten within the East Chaarat licence area (hereinafter the Technical Project) which has passed the expert valuation for protection of mineral resources, environmental and industrial safety;
- On a quarterly basis inform the licensor on the amount of deductions to the designated reclamation account;

- timely perform technical and biological reclamation of the developed workings in accordance with the Technical Project;
- carry out works in accordance with the Technical project complying with the regulatory legislative requirements on subsoil preservation, environmental and industrial safety;
- make timely payments of taxes for subsoil use and other payments due by subsoil users stipulated by the legislation of the Kyrgyz Republic;
- quarterly inform the licensor on the licence retention fee payments, providing copies of all payment documents;
- all geological information obtained during operations in 2016 to 2022 must be submitted to SCIESM for transfer to the Kyrgyz State Geological Fund;
- a consolidated report containing the results of works conducted (to be prepared in accordance with industry standards) must be submitted to SCIESM in 2023 for transfer to the Kyrgyz State Geological Fund;
- a report confirming CZ's ongoing compliance (or otherwise) of the terms of the licence must be submitted to the SCIESM semi-annually before 15 July each year; and
- a report prepared according to the requirements of the SCIESM and the program for the new year according to "Methodical recommendations on the preparation of annual action mining and exploration plans" must be submitted to SCIESM annually before 31 January in each year.

Relinquishment

Relinquishment is made by the SCIESM upon application of the licensee as described in Part B of Part II of this document.

7.6 **The Mining Licence**

Date, Parties and Scope

The Mining Licence was granted to CZ on 22 January 2014 (the "**Mining Date of Grant**"), over the Chaarat Deposit Area. The terms and conditions of the Mining Licence are contained in an accompanying licence agreement.

Before the Mining Date of Grant, CZ entered into licence agreement No. 1 on 25 June 2012 with SCIESM (the "**Initial Mining Licence Date**"). On the Mining Date of Grant, CZ entered into licence agreement No. 2 with SCIESM. Subsequently, CZ entered into the following licence agreements with SCIESM and licence agreement No.4 with SCIESM:

- licence agreement No.3 dated 6 May 2016; and
- licence agreement No.4 dated 7 September 2017 (the "**Mining Licence Agreement**")

As set out in Part B of Part II of this document, the execution of a new licence agreement terminates the previous licence agreement.

The Mining Licence provides CZ with the right to development of subsurface gold resources in the Chaarat Deposit Area.

Term

The term of the Exploration Licence has been extended four times since the Initial Mining Licence Date. The term was last extended on 7 September 2017 to 25 June 2032.

Work Commitments and Programme

The minimum work requirements under the Licence for 2018 and 2019 are as follows:

CZ is able to continue work on development and detail design and cost estimates of the Tulkubash area, and submit annual reports to SCIESM.

Reporting and Related Requirements

Under the terms of the Mining Licence Agreement, CZ is required to comply with the following reporting requirements:

- a report confirming CZ's ongoing compliance (or otherwise) of the terms of the licence must be submitted to the SCIESM semi-annually before 15 July each year; and
- a report prepared according to the requirements of the SCIESM and the program for the new year according to "Methodical recommendations on the preparation of annual action mining and exploration plans" must be submitted to SCIESM annually before 31 January in each year.
- a report of the established 5-GR form shall be submitted by CZ to SCIESM before 1 March of each year.
- Inform the Licensor quarterly on the amount of deductions to the reclamation account;
- Make timely payments of taxes for subsoil use rights and other payments due by subsoil users specified by the legislation of the Kyrgyz Republic;
- Inform the licensor quarterly on the licence payments made, with attachment of copies of verifying documents;
- Notify the licensor of payment of the license retention fee, which is set for the second stage area – 638.6 hectares, before reaching the full production capacity of the second stage of the Chaarat deposit development, providing copies of the documents confirming payment;
- Any infringement of clauses hereof, in accordance with the legislation, shall result in suspension or termination of the Licence.

Programme of industrial development of the deposit:

- 2019: 1,120 thousand tonnes;
- 2020 onwards: 2,800 thousand tonnes.

Relinquishment

Relinquishment is made by the SCIESM upon application of the licensee as described above in Part B of Part II of this document.

7.7 **Endeavour Engagement Letter**

The Company and Endeavour Financial Limited (Cayman) ("**Endeavour**") entered into an engagement letter, (the "**Endeavour LOE**") dated 10 February 2017, pursuant to which Endeavour agreed to provide financial advisory services to the Company with respect to the financing of the Chaarat Gold Project. The services will be delivered in two phases, firstly the interim/bridge financing and secondly the development phase. In consideration of the services to be provided by Endeavour, the Company shall pay: (1) a monthly fee; (2) certain milestone fees; (3) a success fee; and (4) a drop dead fee should the Company enter into a corporate transaction prior to the termination of the Endeavour LOE and discontinue work on any transaction. The Endeavour LOE terminates on 30 days written notice, within two weeks of the four month anniversary of the Endeavour LOE being signed and also without notice if there is cause. The Company agrees to indemnify Endeavour for losses incurred by the performance of services rendered under the Endeavour LOE. The Endeavour LOE is governed by English law.

7.8 **Jagalmay Agreement**

CZ and Jagalmay Limited Liability Company ("**Jagalmay**") entered into an agreement on 25 April 2017, as amended (the "**Construction Agreement**") pursuant to which Jagalmay agreed, with its own materials, equipment and labour, to perform all services with the necessary effort as set out in the Construction Agreement to construct 16.36km access road to the Chaarat Deposit Area in the Chaktal District, Jalal-Abad Oblast, Kyrgyz Republic. The full consideration for the work is not to exceed a fixed amount inclusive of all expenses, including but not limited to any applicable taxes and fees. Works under this agreement have been completed.

The Construction Agreement is governed by the laws of the Kyrgyz Republic.

7.9 Spektr Agreement

CZ and Industrial Company Spektr Limited Liability Company ("**Spektr**") entered into an agreement on 20 July 2017, as amended (the "**Spektr Construction Agreement**") pursuant to which Spektr agreed, with its own materials, equipment and labour, to perform all services with the necessary effort as set out in the Spektr Construction Agreement to construct a 7km access road to the Chaarat Deposit Area in the Chaktal District, Jalal-Abad Oblast, Kyrgyz Republic. The full consideration for the work is a firm fixed lump sum price inclusive of all expenses, including but not limited to any applicable taxes and fees.

The Spektr Construction Agreement is governed by the laws of the Kyrgyz Republic.

7.10 **CNMIM Subscription Agreement**

The Company entered into a subscription agreement with CNMIM on 10 July 2009 pursuant to which CNMIM subscribed for 22,469,289 Shares. This agreement contains an anti-dilution clause, pursuant to which the Company agrees that, if it intends to issue and Shares for cash in a private or public offering to more than one subscriber, the Company shall give written notice thereof to CNMIM and CNMIM may, within 15 Business Days (as defined therein) of receipt of such notice, give notice to the Company to require that the Company issues such number of Shares to CNMIM, on the same terms as the relevant offering (including price), as is necessary to maintain the percentage shareholding of CNMIM prior to completion of that offering. The agreement is governed by English law.

7.11 **BMO Broker Agreement**

The Company and BMO Capital Markets Limited ("**BMO**") entered into an engagement letter on 18 February 2018 (the "**Corporate Broker Agreement**"). Pursuant to the Corporate Broker Agreement, BMO agreed to act as corporate broker to the Company on an ongoing basis and to provide, if appropriate and requested, certain advice and services. The Corporate Broker Agreement contains indemnities from the Company to BMO as consideration for agreeing to provide its services. Either party may terminate the Corporate Broker Agreement by giving 30 days' notice in writing and on shorter notice in case of material breach or insolvency. The Corporate Broker Agreement is governed by English law.

7.12 **ADSS Engagement Letter**

The Company and ADS Securities ("**ADSS**") entered into a mandate letter on 20 March 2018 (the "**Mandate Letter**") under which ADSS is retained as the Company's financial advisor in connection with raising funding via equity financing or convertible debt for the Company and/or its affiliates (for the purposes of this paragraph 7.12 only, the "**Specific Transaction**"). In consideration for the services provided by ADSS, the Company shall pay a success fee dependent on the aggregate commitment by investors introduced and engaged by ADSS, exclusive of VAT and withholding tax. The Company also agrees to bear all of ADSS's reasonable costs incurred in connection with the Mandate Letter, including, but not limited to, legal fees and out-of-pocket expenses.

The Mandate Letter terminates on the earlier of 12 calendar months from 20 March 2019 or on the expiry of 30 days' written notice given by either party to the other. The Mandate Letter contains indemnities from the Company in favour of ADSS and each of ADSS' affiliates, officers, directors, partners and employees for any losses or claims arising out of or in relation to the Mandate Letter except to the extent that the losses are finally determined to have resulted primarily from the indemnified Person's (as defined therein) fraud, gross negligence, wilful default, or otherwise in a breach of its obligations under the Mandate Letter or where the indemnity is prohibited by law or regulation. The Company's rights and obligations under the Mandate Letter are not transferable. ADSS shall be entitled to transfer all its rights and obligations under the Mandate Letter to an affiliate to which substantially all of ADSS' assets and business are transferred. The Mandate Letter is governed by English law.

7.13 **Lock-In Deed**

The Directors, their related parties and applicable employees have entered into lock-in deeds with the Company and Numis on the terms summarised in paragraph 12 of Part I of this document.

The Lock-In Deeds are governed by English law.

7.14 **Stalker Agreement**

CZ and Stalker Drilling Company Limited Liability Company ("**Stalker**") entered into an agreement on 7 May 2018, as amended (the "**Drilling Agreement**") pursuant to which Stalker agreed, with its own materials, equipment and labour, to perform all services with the necessary effort as set out in the Drilling Agreement. The estimated amount of drilling works is up to 30,000 running metres at the Chaktal District, Jalal-Abad region, Kyrgyz Republic. Stalker agreed to start the work on 25 April 2018 and to complete the work on or before 31 December 2018. The approximate price for the work is not to exceed an agreed amount inclusive of all expenses, including but not limited to any applicable taxes and fees. The parties have the right to revise the contract price if during the term of the Drilling Agreement the official National Bank of Kyrgyz Republic USD to KGS exchange rate fluctuates. The term of the Drilling Agreement shall be considered completed after both parties have met all their obligations thereunder. Each party shall have the right to terminate the Drilling Agreement before their obligations have been completed, upon certain conditions. Stalker shall have no right to assign or delegate any of its rights or obligations under the Drilling Agreement without prior written consent of CZ.

The Drilling Agreement is governed by the laws of the Kyrgyz Republic.

7.15 **Ciftay earthworks mobilisation agreement**

CZ and Çiftay İnşaat Taahhüt ve Ticaret A.Ş ("**Ciftay**") entered into a contract (the "**Ciftay Mobilisation Contract**") dated 11 October 2018 pursuant to which Ciftay agreed to perform the mobilisation of earthworks and mining equipment to the Chatkal District, Jalal-Abad region, Kyrgyz Republic (the "**Ciftay Mobilisation Services**"). Ciftay represented that it possesses the requisite resources and is qualified to perform the Ciftay Mobilisation Services in a competent and timely manner. Regardless of the effective date, Ciftay agreed to start the Ciftay Mobilisation Services on 7 September 2018 and to complete them in accordance with the payments schedule. CZ shall pay to Ciftay an agreed fee (including all expenses but excluding applicable Kyrgyz Republic taxes) for the supply of the Ciftay Services, in accordance with the payments schedule. Either party may terminate the Ciftay Mobilisation Contract on 30 days written notice to the other without penalty provided that CZ shall be responsible for any costs resulting therefrom and shall compensate Ciftay for all services performed up until the date of termination. If a party materially breaches the terms of the Ciftay Mobilisation Contract and cannot remedy it within 30 days or either party becomes insolvent, either party may terminate the Ciftay Mobilisation Contract. CZ can order Ciftay to suspend the Ciftay Mobilisation Contract. The Ciftay Mobilisation Contract shall be considered completed when both parties have met their obligations under it. The Ciftay Contract shall be governed by the laws of England and Wales and the parties submit to the jurisdiction of the courts of England and Wales.

7.16 **Ciftay temporary camp supply agreement**

CZ and Ciftay entered into a contract (the "**Ciftay Supply Contract**") dated 11 October 2018 pursuant to which Ciftay agreed to supply a temporary camp to Tulkubash (the "**Ciftay Supply Services**"). Ciftay represented that it possesses the requisite resources and is qualified to perform the Ciftay Supply Services in a competent and timely manner. Regardless of the effective date, Ciftay agreed to start to supply the Ciftay Supply Services on 25 September 2018 and to complete them on or before 30 November 2018. CZ shall pay to Ciftay an agreed fee (including all expenses but excluding applicable Kyrgyz Republic taxes) (the "**Ciftay Supply Price**") for the supply of the Ciftay Supply Services. The Ciftay Supply Contract shall be governed by the legislation of the Kyrgyz Republic. All disputes in connection with the Ciftay Supply Contract shall be referred to the International Court of Arbitration under the Chamber of Commerce and Industry of the Kyrgyz Republic.

7.17 **Short term loan agreement**

On 13 November 2018, the Company entered into a short term loan agreement with a previous noteholder in the Company. The loan is for the amount of US$10,000,000 in total, of which the Company already held US$4,323,671.23 on account for the lender (as redemption monies for Previous Notes). The loan is for the general corporate purposes of the Company and is guaranteed by the Company's subsidiary Zaav Holdings Limited. The loan is repayable after six months or, at the Company's option, nine months. Interest is fixed at US$650,000 if the loan is repaid or prepaid within six months, and US$975,000 if the loan is repaid or prepaid within nine months. The agreement contains customary undertakings and events of default for a loan of this nature, mirroring those contained in the Convertible Loan Note Instrument and including a cross-default in respect of the Convertible Loan Notes. Default interest is 1% per day, compounding. The agreement is governed by English law and any disputes are subject to the exclusive jurisdiction of the English courts.

7.18 **Pareto Engagement Letter**

The Company and Pareto Securities Ltd, Pareto Securities AB and Pareto Securities AS (together, the "**Pareto Manager**") entered into a mandate agreement (the "**Mandate Agreement**"), dated 10 August 2018, pursuant to which the Pareto Manager agrees to act as broker for the purposes of the Company's intended convertible bond issue (the "**Convertible Bond Issue**"). In consideration of the services to be provided by the Pareto Manager the Company shall pay a subscription fee. The Mandate Agreement terminates upon completion of the Convertible Bond Issue or by writing by either party if there is cause. The Mandate Agreement is governed by English law.

7.19 **Placing of Convertible Loan Notes and Loan Note Security**

(a) ***Placing Letter***

(i) The Company and various holders of the Company's existing 10% secured convertible loan notes, due to mature in 2018 and 2019 (the "**Previous Notes**") entered into placing letters (being the "**Placing Letters**") dated on or around 28 August 2018 in respect of:

(A) the loan note placing (the "**Loan Note Placing**") of up to US$100 million 10% secured convertible loan notes 2021 (the "**Convertible Loan Notes**") at a price of US$1 per Convertible Loan Note (the "**Placing Price**"); and

(B) the redemption of all Previous Notes.

(ii) Pursuant to the Placing Letters:

(A) the holders of the Previous Notes were invited to participate in the Loan Note Placing, on the terms described in the Convertible Loan Note Instrument (see below);

(B) the holders of the Previous Notes were given notice of the Company's intention to redeem the Previous Notes, with the following redemption options provided for:

(1) reinvesting the Previous Notes into the Convertible Loan Notes;

(2) converting the Previous Notes into Shares in the Company;

(3) redemption of the Previous Notes in cash,

(4) or a combination of the above options.

(iii) These agreements are governed by English law.

(b) ***New Investor Placing Letter***

The Company and various new investors entered into placing letters dated between 28 August 2018 and 28 November 2018 in respect of the Loan Note Placing of the Convertible Loan Notes at the Placing Price. These agreements are governed by English law.

(c) ***Convertible Loan Note Instrument***

On 11 September 2018, the Company entered into a convertible loan note instrument constituting the Convertible Loan Notes (the "Convertible Loan Note Instrument") the principal terms of which are as follows:

Amount:	Up to US$100 million, denominated in US Dollars.
Use of Proceeds:	Proceeds will be used to fund: • general corporate purposes of the Company; and • early redemption of the Company's Previous Notes, other than those rolled into Convertible Loan Notes or converted into shares instead.
Minimum Investment:	US$250,000, and thereafter in increments of: (a) US$100,000; or (b) for interest on Previous Notes (as defined below) being reinvested, US$5,000.
Interest:	Accrues at 10% per year and increases to 12% per year for the last 18 months, payable in a single amount on the final repayment date (provided that no conversion of the Convertible Loan Notes into ordinary shares has occurred).
Final Repayment Date:	31 October 2021.
Early Repayment:	The Convertible Loan Notes and accrued interest may be repaid early by the Company upon 10 business days' notice in cash; provided that the minimum accrued interest payable on early repayment shall be equal to 5% of the nominal amount.
Security:	The Company has agreed to grant a charge over 100% of the shares in Zaav Holdings (BVI) which owns 100% of CZ (Kyrgyz Republic) which owns the Chaarat Gold Project (the "Project") (the "Loan Note Security").
Events of Default:	The Convertible Loan Notes contain standard insolvency events of default as well as events of default in case of change of control, delisting, the Company commences payment of dividends, material breach or disposal or abandonment of the Project (in each case except with noteholder consent).
Conversion (ordinary shares):	The Convertible Loan Notes are convertible on a cashless basis at the investor's option in part or full (subject to minimum multiples of US$250,000 and thereafter US$100,000) into ordinary shares of the Company at the Conversion Price (see below) at any time prior to redemption of the Convertible Loan Notes (including after the Company has issued an Early Repayment notice). Conversion rights also apply to accrued interest.
Conversion Price (ordinary shares):	37 pence per ordinary share and, for the purposes of conversion, Convertible Loan Notes shall convert at a fixed exchange rate of £1: US$1.28.
Conversion (mezzanine or senior debt):	If the Company wishes to refinance the Convertible Loan Notes with new mezzanine and/or senior debt prior to the Final Repayment Date (see above) and exercises its Early Repayment option to do so, the

	Company will seek to arrange with the new finance parties that the Convertible Loan Notes may be re-invested at the investor's option in part or full (subject to a minimum multiple of US$250,000 and thereafter US$100,000) into a participation in such replacement financing, provided always that the new finance parties provide all required consents for such re-investment. The re-investment of Convertible Loan Notes in such replacement financing will be on a dollar for dollar basis as to principal, excluding accrued interest.
Transferability:	The Convertible Loan Notes are transferable in accordance with applicable securities laws. The investors shall not be permitted to arrange, create or issue any securities: (i) in relation to the Convertible Loan Notes or linked to the Company's obligations under the Convertible Loan Notes; or (ii) the primary purpose of which is to hedge credit risk in relation to the Convertible Loan Notes, including in each case, without limitation, credit linked notes, fiduciary notes or bonds.
Listing:	The Convertible Loan Notes will not be listed on any exchange. The Company's ordinary shares are listed on AIM and shares issued on Convertible Loan Note conversion will also be AIM listed.
Governing Law	The Convertible Loan Note Instrument is governed by English law.

(d) The Company has to date issued US$18,580,000 of Convertible Loan Notes. Martin Andersson (via Labro Investments Limited) and Martin Wiwen-Nilsson respectively hold US$1,000,000 and US$425,000 of the Convertible Loan Notes.

7.20 **Kapan acquisition documents**

(a) ***Kapan Acquisition Agreement***

(i) The Kapan Acquisition Agreement provides for the purchase by CGIL of Kapan from PMTL. CGIL's obligations are guaranteed by the Company. The consideration of US$55,000,000 payable by CGIL for the entire issued share capital of Kapan is to be settled in cash with the option to pay US$5,000,000 (or, if completion takes place on or before 15 January 2019, US$10,000,000) of the consideration by the way of the issue by the Company of Convertible Notes. The consideration is subject to a net debt and working capital adjustment.

(ii) CGIL agreed to pay a deposit amount equal to US$5,000,000 no later than 10 business days after the execution of the Kapan Acquisition Agreement (the "**Deposit**"). The Deposit was paid on or around 12 November 2018.

(iii) The Kapan Acquisition Agreement provides that PMTL shall pay up to US$500,000 in premiums for an insurance policy in relation to Kapan's tailings storage facility that will cover the two year period after completion of the Kapan Acquisition.

(iv) The Kapan Acquisition Agreement is conditional on certain conditions having been satisfied or waived on or prior to Completion, including the following: (i) Shareholder approval of the Resolution; (ii) SCPEC Approval; and (iii) CGIL and/or the Company obtaining the Kapan Acquisition Financing; (iv) no contract licence or financial agreement that is material to the business of Kapan having been terminated or having its terms materially and adversely changed between the signing date and the completion date without the prior written approval of CGIL; (v) no dividend having been made by Kapan, no material acquisition, disposal or other transaction material to the business of Kapan having been undertaken or agreed to be undertaken by

Kapan between signing of the Kapan Acquisition Agreement and completion of the Kapan Acquisition without the prior written consent of CGIL unless any existing transaction has expired and Kapan has entered into a replacement transaction on terms and conditions no less favourable for Kapan than then current market terms and conditions (other than the Glencore and Trafigura Offtake Agreements which are dealt with separately, see (ix) below); (vi) no breach of any warranty given by PMTL that gives rise or would reasonably be likely to give rise to a material adverse change in the fair market value of Kapan (including any matter properly included in the supplemental disclosure letter); and (vii) no uncured breach by PMTL or CGIL of any of its obligations under the Kapan Acquisition Agreement which is material in the context of the Kapan Acquisition.

(v) The Kapan Acquisition Agreement may terminate automatically if any of the conditions precedent standing to be satisfied on or before 15 February 2019 (the "**Longstop Date**") are not met or waived. Either party may terminate the Kapan Acquisition Agreement if the other party fails, in any material respect, to comply with its obligations at completion of the Kapan Acquisition.

(vi) If the Kapan Acquisition Agreement is terminated on the Longstop Date because CGIL fails to satisfy the conditions for which it is responsible (including the conditions regarding Shareholder approval of the Resolution and the Kapan Acquisition Financing but excluding the condition regarding SCPEC approval) or fails to comply with its reasonable endeavours obligations to obtain the SCPEC approval, PMTL can retain the Deposit and either CGIL pays an additional US$5,000,000 in cash or the Company issues the Convertible Notes to PMTL by way of a total termination fee of US$10,000,000 (inclusive of US$5,000,000 already paid by way of deposit).

(vii) If the Kapan Acquisition Agreement is terminated on the Longstop Date because PMTL fails to satisfy the conditions for which it is responsible, it must repay the Deposit and pay an amount equal to US$5,000,000 in cash to CGIL by way of termination fee.

(viii) If the Kapan Acquisition Agreement terminates for any other reason other than those referred to in (vi) and (vii) above, PMTL must repay the Deposit to CGIL and no further amounts are payable.

(ix) If any Convertible Notes are issued as summarised above, PMTL may require CGIL to purchase those notes at par (including accrued interest) no earlier than 19 months after issue thereof or upon an earlier change of control of the Company.

(x) Under the Kapan Acquisition Agreement, CGIL has a qualified consent right over the renewal or replacement of the Company's two main offtake agreements with Glencore and Trafigura and in any event Kapan is prohibited from entering into any such renewal or replacement on terms and conditions no less favourable for Kapan than then current market terms and conditions. In addition, the Kapan Acquisition Agreement contains pre-completion undertakings whereby PMTL undertakes that the Company shall not take certain actions unless either: (i) it is for the purpose of carrying on day-to-day business consistent with past practice; (ii) is taken with CGIL's prior written consent; or (iii) is required by a legally binding obligation existing prior to the signing date.

(xi) The Kapan Acquisition Agreement provides for certain arrangements regarding the transfer of the royalty agreement between PMTL, Polymetal and Dundee Precious Metals Inc. ("**Dundee**") in relation to Kapan (the "**Dundee Royalty Agreement**"). These arrangements are further described at paragraph (d) below.

(xii) PMTL has given certain warranties to CGIL concerning (amongst other things) its capacity to enter into the Kapan Acquisition Agreement, the ROFR Agreement and other transaction documents, its solvency, its title to the shares of Kapan, Kapan's accounts and events since the accounts date, material contracts to which Kapan is a party, Kapan's indebtedness and financing arrangements, Kapan's title to its assets, real

estate and its material licences, Kapan's employees, Kapan's existing litigations, the condition of Kapan's assets and Kapan's compliance with environmental and health and safety laws. Other than fundamental warranties relating to title to the shares and Kapan's title to its real estate and material licences, the warranties given to CGIL are only in respect of the period PMTL has owned Kapan. A number of the warranties are qualified by PMTL's awareness.

(xiii) CGIL and the Company have given certain warranties to PMTL concerning (amongst other things) their capacity to enter into the Kapan Acquisition Agreement, the ROFR Agreement and other transaction documents and their solvency.

(xiv) PMTL has agreed to indemnify CGIL and its Affiliates against losses (including direct loss of profit but excluding any and all indirect consequential losses) arising out of or in connection with, amongst other things:

(A) the potential invalidation of an increase in share capital in Kapan by means of the issue of in Kapan to Vatrin Investment Ltd in September 2015 and the related repayment of amounts loaned by Dundee Precious Metal Cooperatief U.A. to Kapan in September 2015 (the "Capital Contribution Indemnity");

(B) employment claims by certain previous senior management of Kapan;

(C) the poisoning and other medical complaints of three employees by toxic and other gases present at the Kapan Mine (and any related breach of applicable law and regulations);

(D) the risk that a third party might make a claim requesting a court to hold that a particular licence or permit was invalid because it did not have a compliant environmental impact expertise opinion;

(E) a potentially missing water use permit and an unregistered easement; and

(F) certain potential breaches of Armenian currency laws.

(xv) The Kapan Acquisition Agreement also includes a tax covenant in relation to pre-completion tax issues.

(xvi) The Kapan Acquisition Agreement contains various limitations of liability and the liability of the parties is limited as follows:

(A) the maximum liability of PMTL, CGIL and the Company under the Kapan Acquisition Agreement and other transaction documents is an amount equal to the consideration under the Kapan Acquisition Agreement, except that: (A) in relation to the Capital Contribution Indemnity, PMTL's liability is limited to US$200,000,000; and (B) in relation to the Dundee Royalty Agreement and related arrangements, the liability of PMTL, CGIL and the Company is limited to US$25,000,000;

(B) no warranty claim can be brought against PMTL unless it is for an amount at least equal to US$150,000 and until CGIL has a claim or basket of claims exceeding US$1,000,000; and

(C) there are time limits on claims varying between three and five years from completion of the Kapan Acquisition,

it being noted that none of these financial limitations apply in the case of fraud.

(b) ***ROFR Agreement***

(i) Under the ROFR Agreement, PMTL and Polymetal Netherlands B.V., the minority shareholder of Poly Armenia (the "**Sellers**"), grant the Company: (a) exclusive rights for a period of 6 months from the completion of the Kapan Acquisition to negotiate terms in relation to the acquisition of the Poly Armenia Companies; and (b) a right of first refusal in respect of: (i) the Poly Armenia Companies (the "**Share ROFR**"); and (ii) ore concentrate produced by Lichkvaz (the "**Product ROFR**").

(ii) The Share ROFR will be granted for a period of 12 months beginning on the expiry date of the exclusivity in relation to the Poly Armenia Companies. The Product ROFR will be granted for a period of 18 months from completion of the Acquisition.

(iii) The Sellers are permitted to transfer the Poly Armenia Companies or ore produced by Lichkvaz to another member of their group, provided that such other member of its group agrees to be bound by the terms of the ROFR Agreement.

(iv) The ROFR Agreement is terminated in certain circumstances including if the Company notifies the Sellers of its decision not to proceed with the acquisition of the Poly Armenia Companies.

(c) ***Intra-Group Debt Deed of Novation***

Kapan and PMI entered into a loan agreement on 20 May 2016 pursuant to which PMI agreed to loan Kapan an amount equal to US$4,000,000 in tranches at Kapan's request (the "**Kapan Intra-Group Loan Agreement**"). The Kapan Intra-Group Loan Agreement was amended on 31 May 2016, 21 January 2017 and 3 May 2017 pursuant to three addenda. As at 18 October 2018, the total outstanding amount owned by Kapan to PMI was equal to approximately US$10,300,000 together with accrued interest of US$617,944.62. Under the terms of the Kapan Acquisition Agreement, PMI will transfer all its rights and obligations under the Kapan Intra-Group Loan Agreement to CGIL pursuant to the terms of a deed of novation to be entered into between Kapan, CGIL and PMI at completion of the Kapan Acquisition (the "**Intra-Group Debt Deed of Novation**"). The form of the Intra-Group Debt Deed of Novation is agreed and set out in Schedule 13 of the Kapan Acquisition Agreement. Under the Intra-Group Debt Deed of Novation, PMI novates its rights and obligations under the Kapan Intra-Group Loan Agreement to CGIL and releases Kapan from all obligations owed to it under the Kapan Intra-Group Loan Agreement, CGIL agrees to observe, perform and discharge all liabilities and obligations of PMI under the Kapan Intra-Group Loan Agreement and Kapan consents to the novation of PMI's rights and obligations to CGIL. Both the Kapan Intra-Group Loan Agreement and the Intra-Group Debt Deed of Novation are governed by English law.

(d) ***Arrangements regarding Dundee Royalty Agreement***

Pursuant to the arrangements regarding the Dundee Royalty Agreement, the parties will either: (A) if they agree the fair market value of the obligations under that agreement prior to completion, request Dundee to consent to the transfer of the shares in Kapan and the transfer of the Dundee Royalty Agreement to CGIL, as buyer, and the Company, as guarantor and the related release of PMTL and Polymetal of their obligations thereunder, in which case the agreed fair market value will be deducted from the consideration payable under the Kapan Acquisition Agreement; or (B) if they do not agree such fair market value, request Dundee to consent to the transfer of the shares in Kapan and to PMTL and Polymetal retaining their obligations under the Dundee Royalty Agreement (in which case subject to completion: (i) CGIL shall perform all relevant payment and information obligations under the Dundee Royalty Agreement towards PMTL as if the same applied identically between the parties; (ii) PMTL shall indemnify CGIL in respect of failures by PMTL to comply with the Dundee Royalty Agreement, other than any arising from breach by CGIL to comply with its obligations relating thereto; and (iii) CGIL shall indemnify PMTL for any breaches by it of its obligations in relation thereto); or (C) if they do not agree such fair market value and Dundee does not consent to the request under (B) or such consent is considered unlikely, request Dundee to agree to the transfer of the shares in Kapan and the transfer of the Dundee Royalty Agreement to CGIL, as buyer, and the Company, as guarantor and the related release of PMTL and Polymetal of their obligations thereunder, in which case PMTL shall reimburse CGIL for each royalty payment made by CGIL under the Dundee Royalty Agreement within 5 business days of providing evidence of such payment and related supporting information; or (D) if they do not agree such fair market value and Dundee does not consent to the request under (C) or such consent is considered unlikely, the parties shall use their reasonable endeavours to obtain consent from Dundee as noted in (B)

and if such consent is not obtained and completion occurs, CGIL and PMTL shall have the same obligations as noted at (B)(i), (ii) and (iii) above). In each case (other than as noted in (A)), CGIL is also obliged to provide to PMTL information and access in order to enable them to assess payments due under the Dundee Royalty Agreement. For these purposes, the principal terms of the Dundee Royalty Agreement provide that: (1) PMTL grants Dundee a 2% net smelter return royalty from the sale of product from the Kapan Mine (defined as gross revenues less specified allowable deductions, with comingled product being calculated ratably), payable 30 days after the end of each calendar quarter based on receipts of payment or credits during that quarter, subject to a maximum of US$25 million; (2) the agreement continues in perpetuity or until earlier payment of royalties totalling US$25 million; (3) PMTL has certain obligations to provide information and access to Dundee, (4) if any mining rights are not to be renewed, Dundee has the right to purchase the same for US$1; (5) Dundee may freely assign its rights thereunder; and (6) the governing law is English law with arbitration under LCIA rules.

7.21 **Kapan Offtake Agreements**

(i) On 18 January 2018, Kapan (as the seller) entered into an offtake agreement with Trafigura Pte. Ltd. (as the buyer) for the purchase of 10,000 wet metric tonnes +/–5% in Kapan's option of zinc concentrate. Shipments are to be made throughout 2018 in shipments of 500/750 metric tonnes and the contract price for each shipment of concentrate is based on certain quoted prices for zinc, silver and gold less deductions for treatment charges and the presence of cadmium in the concentrate. This agreement is governed by English law.

(ii) On 17 May 2018, Kapan (as the seller) entered into an offtake agreement with Glencore International AG (as the buyer) for the purchase of 4,800 wet metric tonnes +/–10% in Kapan's option of Kapan copper concentrates. Shipments are to be made from May 2018 to December 2018 in monthly shipments of 600 metric tonnes and 2 lots can be postponed into the first quarter of 2019. The contract price for each shipment is based on certain quoted prices for copper, silver and gold less deductions for treatment and refining charges and penalties for the presence of arsenic, lead and zinc combined or fluorine. This agreement is governed by Swiss law.

7.22 **Other Kapan Material Contracts**

(a) ***Drilling Agreements***

(i) Kapan is party to a drilling agreement with AGRP LLC ("**AGRP**") dated 4 October 2016, which was amended on 11 January 2018 and 15 January 2018. The effective date of this agreement is 1 October 2016. Under this agreement, AGRP is to perform drilling works at the Kapan Mine and the services are to be completed by 31 December 2018. The consideration payable by Kapan is payable in monthly instalments based on the amount of works conducted by AGRP in the previous month. AGRP indemnifies Kapan for any damage resulting from the work conducted by AGRP and any liabilities arising from accidents and breaches of environment law or safety rules by AGRP. Kapan can terminate the agreement with 30 days' notice if the works are not producing positive findings; with 7 days' notice if AGRP is in breach of any applicable rules regulating the work conducted; and with 10 days' notice if AGRP is in breach of the applicable volume and terms of work provisions. The agreement is governed by Armenian law and subject to the jurisdiction of the Armenian courts.

(ii) Kapan is party to a further drilling agreement with AGRP dated 21 February 2017, which was amended on 11 January 2018 and 15 January 2018. The effective date of this agreement is 1 February 2017. Under this agreement, AGRP is to perform drilling works at the Kapan Mine and the services are to be completed by 31 December 2018. The consideration payable by Kapan is payable in monthly instalments based on the amount of works conducted by AGRP in the previous month. AGRP indemnifies Kapan on the same basis as under the first agreement and Kapan can terminate the agreement on the same terms as those set out in the agreement. The agreement is governed by Armenian law and subject to the jurisdiction of the Armenian courts.

(iii) Kapan is party to a drilling agreement with S&A Mining LLC ("**S&A**") dated 20 May 2018 and amended on 25 October 2018. The effective date of this agreement is 10 May 2018. Under this agreement, S&A is to perform underground works at the Kapan Mine (side no. 62 and no. 58) and the services are to be completed by 30 April 2019. The consideration payable by Kapan is payable in instalments and subject to changes based on the works actually performed by S&A during the term of the agreement. Under the agreement, Kapan has a right to terminate at any time and pay only for the works actually performed by S&A prior to the receipt of the relevant termination notice. The agreement is governed by Armenian law and subject to the jurisdiction of the Armenian courts.

7.23 **The Kapan Licence**

Date, Parties and Scope

The Kapan Licence was granted to Kapan on 27 November 2012 (the "**Kapan Mining Date of Grant**"), over the Kapan Licence Area. The Kapan Licence comprises four inseparable components that together evidence Kapan's mining rights:

- a mining permit (no. No. ՇԱԹՎ–29/183);
- a land mass allotment act (no. No. ԼՎ–183);
- a mining contract with the Armenian state (no. No. ՊՎ–183) (the "**Kapan Mining Contract**"); and
- a mining project (approved on 28 August 2010).

The terms and conditions of the Kapan Licence are contained in the Kapan Mining Contract.

The Kapan Licence provides Kapan with the right to extract gold-polymetallic reserves in the Kapan Licence Area.

Term

The Kapan Licence is due to expire on 1 April 2050.

Work Commitments and Programme

Under the terms of the Kapan Licence, Kapan is required to extract 600,000 tons of mineral resources per annum.

Reporting and Related Requirements

Under the terms of the Kapan Licence, Kapan is required to:

- maintain due accounting and recording of the operations and the turnover of the mined ore;
- submit quarterly and annual reports on the development and turnover of ore;
- provide reports on acquired geological data;
- report to the Ministry of Resources on new finds of reserves within 14 days after discovery;
- conduct a revaluation of mineral resources every 5 years; and
- report on existing reserves and already mined minerals.

Relinquishment

The Kapan Licence is not subject to any relinquishment requirements.

7.24 **Kapan Acquisition Financing**

(a) ***Definitive Term Sheet relating to US$20 Million Term Loan Facility***

On 10 December 2018, the Company signed a definitive term sheet (the "**Ameriabank TS**") with Ameriabank CJSC ("**Ameriabank**") in respect of a proposed US$20 million term loan facility (the "**Ameriabank Term Loan**").

The Ameriabank TS states that any transaction that may be entered into between the Company and Ameriabank is subject to approval by Ameriabank's credit and investment committees, as well as state regulatory bodies (if such will be required). The final terms and conditions of the Ameriabank Term Loan are stated as being subject to further discussion and negotiation, and shall be set out in formal transaction documentation ("**Ameriabank Term Loan Agreement**"). The obligations of the Borrower (as defined below) under the Ameriabank Term Loan Agreement will be guaranteed by the Company (the "**Guarantor**").

The main terms of the Ameriabank TS are summarised below:

Purpose & Use of Proceeds: Subject to the final terms of the Ameriabank Term Loan Agreement, Ameriabank agrees to make available to the Borrower the Ameriabank Term Loan to finance the Kapan Acquisition. The Borrower shall be required to apply all amounts borrowed under the Ameriabank Term Loan to finance the Kapan Acquisition.

Borrower/Operator: Kapan.

Buyer: CGIL, as buyer under the Kapan Acquisition.

Drawdown: The Ameriabank Term Loan will be fully drawn on a date to be agreed (the "**Utilization Date**").

Maturity Date: 4 years from the utilization date.

Interest Rate: 3-month Libor plus 800 (eight hundred) basis points.

Default interest: 2.00% per annum incremental payable on all outstanding payments (including interest) due but unpaid under the Ameriabank Term Loan Agreement.

Interest: Interest will be paid quarterly in arrears on the same days as the principal repayments and calculated on the basis of a 365-day year consisting of twelve 30-day months, for the actual number of days elapsed. Other provisions relating to interest and standard for a facility of this type will be included in the Ameriabank Term Loan Agreement.

Principal Repayment: There will be a principal repayment holiday for 3 (three) months after the Utilization Date. Thereafter, principal will be repaid in quarterly installments based on a straight-line amortization schedule. The Borrower shall repay the outstanding Ameriabank Term Loan in full on the Maturity Date and in instalments in accordance with a repayment schedule to be set out in the Ameriabank Term Loan Agreement. The Borrower may not reborrow any part of the Ameriabank Term Loan which is repaid.

Hedging Requirement: The Borrower may only enter into hedging agreements with an acceptable hedge counterparty meeting certain requirements.

Hedging in relation to gold, copper and zinc is to be limited to agreed put and/or zero cost collars.

Before the first Utilization Date, the Borrower shall ensure that it has hedge transactions in place with an acceptable hedge counterparty in respect of at least 50% of the Borrower's projected revenues for 12 months after the first Utilization Date. Any hedge should be done so that the price downturn protection is secured at least US$ 1,000 gold equivalent notional price. The Borrower shall ensure that similar hedge arrangements should be executed for another year on a rolling basis for the second anniversary of the Ameriabank Term Loan, and for another 6 (six) months for the third anniversary of the Ameriabank Term Loan, following the second hedge period.

The maximum hedge ratio undertaken by the Borrower pursuant to the hedging shall not exceed 60% of forecast production as of the date of the hedge ratio undertaken.

Cash Sweep: Commencing from the three months ending on 31 December 2018, the Borrower shall, not later than 30 days after the end of each three months period (or, if earlier, the date which is 10 days after the submission of the cash flow statement relating to such period) make a mandatory repayment of the Ameriabank Term Loan then outstanding in a principal amount equal to the cash sweep percentage of the cash flow available for debt service less

debt service for such cash sweep calculation period. For the purposes of this summary, "Cash Sweep Percentage" means: (i) 60% for the period starting on the utilization date to the relevant date following 12 months after the utilization date; (ii) 50% for the period starting on the second anniversary of the utilization date to the relevant date following 24 months after the utilization date; (iii) 35% for period starting on the third anniversary of the utilization date to the relevant date following 36 months after the utilization date; and (iv) 0% thereafter, as long as any portion of the Ameriabank Term Loan's principal remains outstanding.

Financial Covenants: The Ameriabank TS includes the following financial covenants:

(i) the Borrower shall ensure the leverage ratio does not exceed 2.5:1;

(ii) the Borrower shall ensure the maximum financial indebtedness of the Borrower cannot exceed US$ 41,000,000 (save where the same arises as a result of ordinary course short term trade payables);

(iii) the Borrower shall ensure the interest cover shall not be less than 1.2:1;

(iv) reserves of copper/zinc ore will not be, on any date before the fourth anniversary of the Ameriabank Term Loan Agreement (and will not, at any date prior to the termination date be scheduled to be) less than 30% of the reserves as at the date of the Ameriabank TS;

(v) the aggregate amount expended by the Borrower in respect of social spending and donations commencing on the date of the Ameriabank TS shall not exceed the lesser of AMD 150 million or US$ 300,000 each year; and

(vi) from the beginning of 2019 onwards, the Borrower shall use its reasonable endeavors to reduce social spending and donations.

Financial covenants i), ii), iii) and v) are to be tested twice a year starting from 30 June 2019 based on semi-annual financial statements and audited annual financial statements. Financial covenants iv) and vi) are to be tested on an annual basis starting from 31 December 2019. Financial covenant vii) is to be tested on a semi-annual basis.

General Undertakings: Undertakings standard for a facility of this type, including as to:

- material compliance with laws;
- environmental, social and health and safety compliance;
- negative pledge; and
- subordination.

Information Undertakings: Undertakings to provide information which are standard for a facility of this nature, including financial statements for the Borrower and the Buyer, annual budget/financial model and confirmation of compliance with the financial covenants and Cash Sweep calculations.

The Borrower agrees to shall notify Ameriabank of any default (and the steps, if any, being taken to remedy it) promptly upon becoming aware of its occurrence. Promptly upon a request by Ameriabank, the Borrower shall supply to Ameriabank a certificate signed by two of its directors or senior officers on its behalf certifying that no Default is continuing (or if a Default is continuing, specifying the Default and the steps, if any, being taken to remedy it).

Representations, Warranties, Covenants: Standard representations and warranties applicable to the Borrower, its subsidiaries and its affiliates for a facility of this type. In addition to the Financial Covenants summarised above, standard covenants applicable to the Borrower and its subsidiaries for a facility of this type, including a prohibition on any change of control of the Borrower resulting in the Guarantor losing control and a prohibition on actions that make it impractical or impossible to deliver metal under the offtake agreement.

Events of Default: Various events of default which are standard for a facility of this type, which will be subject to appropriate materiality and other qualifications and grace periods.

The Borrower shall have 30 days to remedy any event of default; a list of those events of default which may be remedied will be included in the Ameriabank Term Loan Agreement.

Mandatory Prepayment: Mandatory pre-payment requirements standard for a facility of this type, including proceeds from liquidated damages, termination of material project contracts, asset sales, or insurance proceeds, illegality, change of control, failure to implement capital expenditure plan.

Early Prepayments: The Borrower may repay the outstanding Ameriabank Term Loan in full or partially in a minimum amount of US$3 million at any time by providing not less than 20 business days' notice to Ameriabank with an indication of the date and amount of prepayment and provided the Borrower can evidence that on the proposed date of early prepayment the Borrower will be in compliance with the financial covenants after the prepayment.

Assignment: Ameriabank may assign or transfer all or part of its rights and obligations to another financial institution, subject to the Borrower's prior written consent acting reasonably; provided that the Borrower's consent is not required: (i) if the Borrower is in breach of the Ameriabank Term Loan; or (ii) if the assignment is to a qualified bank (as shall be specified in the Ameriabank Term Loan Agreement). The Borrower may not assign any of its rights or transfer any of its rights or obligations under the Ameriabank Term Loan Agreement without the prior written consent of Ameriabank.

Taxes: All payments to be free and clear of any withholdings tax, stamp duty, or similar tax whatsoever, or shall be grossed up, subject to customary exceptions for a facility of this nature.

Fees: The Borrower shall:

- pay to Ameriabank an arrangement fee in the amount of 2.00% of the Ameriabank Term Loan plus VAT (if applicable), which shall be payable within 10 business days after signing the Ameriabank Term Loan Agreement.
- pay to Ameriabank (for its own account) a security agency fee of US$ 5,750 per quarter as long as the Ameriabank Term Loan is outstanding.
- in connection with any material waiver or amendment requested by it in connection with the Ameriabank Term Loan Agreement or any related documentation, pay a work fee to Ameriabank on the date of (and as a condition to the effectiveness of) the relevant waiver or amendment in an amount equal to a minimum of 0.065% of the then outstanding balance of the Ameriabank Term Loan, but not less than US$ 4,000.

Cost and Expenses: The Borrower agrees to cover certain costs and expenses of Ameriabank, as follows:

- agreed legal fees reasonably incurred by Ameriabank in connection with the negotiation, preparation, printing, execution, syndication and perfection of the Ameriabank TS, the Ameriabank Term Loan Agreement and related transaction documents;
- all costs and expenses (including legal fees) incurred by Ameriabank in connection with enforcement; and
- in the event of a material deviation from the annual actual performance of the Borrower, as compared to that projected in its most recently updated financial model, Ameriabank shall be, subject to certain exceptions, entitled to retain the services of an independent consultant to advise Ameriabank and the Borrower shall indemnify and reimburse Ameriabank in connection with the fees and the reasonable costs and expenses of such independent consultant provided that they do not exceed a specified amount.

Other indemnities: The Ameriabank TS contains currency and other indemnities common for a facility of this type.

Conditions Precedent: The Ameriabank TS contains a number standard conditions precedent for a facility of this type, including:

- full suite of transaction documents, including: (i) Ameriabank Term Loan Agreement; (ii) security document, comprising (subject to local law): (A) real estate mortgage over specific assets of the Borrower; (B) a moveable assets pledge agreement; (C) Borrower share pledge; (D) Buyer share pledge; and (E) Borrower's cash flow pledge agreement; (iii) a fee letter; (iv) all notices required under the security documents referred to above; and (v) a guarantee to be entered into by the Guarantor, Ameriabank and the Buyer.
- complete funding for the Kapan Acquisition being in place (see below at the end of this section "Conditions Precedent").
- execution of the first hedge transaction by the Borrower with an Acceptable Hedge Counterparty in respect of 3000 ounces of gold production for each month of the 2019 financial year at a minimum put strike price of US$1150 per ounce for the period of the next four quarters;
- various legal opinions;
- payment of fees, costs and expenses;
- receipt of the Kapan Mine Action Plan to follow up on the CSA Fatal Flaw Analysis Report;
- confirmation from the Ministry of Energy and Natural Resources that no facts have been revealed by the Ministry that could give rise to grounds for withdrawing the mining rights of Kapan;
- water usage permits, wastewater discharge permits;
- air emission permits;
- valid EIA expertize positive conclusions (including when such conclusions are conditional upon existence of certain circumstances or conduct of certain activities, the proof that such actions where conducted and circumstances occurred);
- valid technical and technological safety expertize positive conclusions on all mining facilities (including tailing dams and pipes and related facilities) as required under applicable law;
- all construction permits for the current construction activities (including land works) underway;
- technical safety declaration signed off by the State Water Committee for the Geghanush tailing dam hydro-technical facility as required under applicable law; and
- all related other permits required for the operation of the Kapan Mine and main activities of Kapan.

The Borrower and the Guarantor warrant to Ameriabank that the purchase price for the Kapan Acquisition is US$55,000,000, funded by US$40,000,000 of acquisition financing to be arranged by Ameriabank on a best effort basis, US$5,000,000 of cash from the Buyer (which was paid to PMTL as a deposit on or around 12 November 2018), and the remaining US$10,000,000 to be settled through PMTL subscribing for US$10,000,000 of Convertible Loan Notes.

The Ameriabank TS notes that the Guarantor and/or the Buyer have provided documentation to Ameriabank evidencing that US$15,000,000 of funding has been fully and irrevocably committed to finance the Kapan Acquisition (comprising the US$5,000,000 deposit paid to PMTL on/around 12 November 2018 and US$10,000,000 of Convertible Loan Notes to be subscribed by PMTL); and

The Ameriabank TS provides that if the consideration for the Kapan Acquisition is adjusted downward from the pre agreed US$55,000,000 purchase price, the Borrower acknowledges

that the same downward adjustment should be applied to the debt funding portion of Kapan Acquisition Financing by proportionally decreasing the Ameriabank Term Loan amount.

Conditions subsequent: The Ameriabank TS contains a number of conditions subsequent, as follows:

- a requirement on the Borrower to provide Ameriabank with an updated mine plan by no later than 1 June 2019, including detailed design, development plan and production schedule.
- various requirements as regards a tailings management facility.
- certain requirements relating to an environmental management program report.
- a requirement on the Borrower to, no later than 1 January 2020, submit a Kapan Mine closure and reclamation plan for the Kapan Mine developed by a qualified consultant acceptable to Ameriabank.
- a requirement that the Borrower shall, on a best effort basis, seek to arrange refinancing of the Ameriabank TS and Kapan Acquisition Financing by local banks by negotiating a prepayment offtake facility with a commodity trader(s) and/or via increasing the Borrower's equity and/or arranging debt financing by a Guarantor.

In addition, by a date which is no later than 15 days before expiry of the first hedge period, the Borrower shall ensure that it has entered into a hedge transaction of the type specified above in the section headed "Hedging Requirement" above with an acceptable hedge counterparty in respect of the notional amount specified in that section. The Borrower is required to ensure that similar hedges should be executed for the 18 months following the end of the first hedge period, being 12 months following the utilization date.

Confidentiality: Standard confidentiality provisions for a facility of this type.

Termination: The Ameriabank TS may be terminated by either party upon at least thirty days' prior written notice to the other party, subject to payment of any fees due.

Either party may terminate the Ameriabank TS without prior written notice to the other party for just cause, which shall include:

- either party's bankruptcy or becoming involved in any fraud or dishonest or serious misconduct in circumstance that would, in the reasonable and duly justified opinion of the other party, make: (i) in the case of Ameriabank, Ameriabank being unsuitable to act on behalf of the Company or the Borrower, in particular as regards any conflict of interest related to the Ameriabank TS or other transactions; and (ii) in the case of the Company or the Borrower make Ameriabank's representation of the Company or the Borrower, in particular as regards any conflict of interest related to the Ameriabank TS or other transactions; and/or
- either party failing to comply with any terms of the Ameriabank TS with such failure not being rectified within an agreed grace period.

Governing Law & Dispute Resolution: The governing law shall be the laws of the Republic of Armenia. Any dispute shall be referred to, and finally resolved by, arbitration under the Arbitration Rules of the London Court of International Arbitration.

(b) ***Letter from Ameriabank regarding a further US$20 million term loan facility***

A letter received by the Company on or around 11 December 2018 from Ameriabank to Kapan and the Company provides that, following agreement being reached as to the main terms of the Ameriabank Term Loan, as set out in paragraph 7.24(a) above the following conditions will be final, binding for both Ameriabank and Kapan and shall not be subject to change:

(i) a US$20 million facility has been committed, with a further US$20 million facility to be raised through a syndication of banks in Armenia under the arrangement by Ameriabank;

(ii) the maturity date of the US$40 million facility shall be the 4th anniversary of the utilization date;

(iii) the interest rate shall be 3 month LIBOR plus 800 basis points;

(iv) interest shall be payable quarterly in arrears;

(v) financial covenants shall be as described in the Ameriabank TS;

(vi) principal shall be repayable quarterly in equal amounts following a repayment holiday of 3 months from the date of utilization; and

(vii) pledges and a corporate guarantee will be provided by the Company.

The letter also confirms that the terms of the Syndicated facility will be identical to those in the Ameriabank TS.

7.25 **Introduction Agreement**

The Company, the Directors and Numis entered into an introduction agreement (the "**Introduction Agreement**"), dated 14 December 2018, pursuant to which Numis has agreed, subject to the terms and conditions set out in the Introduction Agreement, to act as the Company's nominated adviser in connection with Re-Admission. Under the terms of the Introduction Agreement:

a) the Company and the Directors have agreed to give certain warranties and representations in favour of Numis in relation to, *inter alia*, the accuracy of the information contained in this Document, the Company and Kapan and their respective businesses, including details of the Chaarat Gold Project and the Group's financial position;

b) the Company has given certain covenants in favour of Numis in relation to the Kapan Acquisition, including not amending the terms of the Kapan Acquisition Agreement or waiving any of the conditions to the Kapan Acquisition Agreement, in each case without the prior consent of Numis;

c) the Company will indemnify Numis and its officers and employees against all liabilities, demands, losses, claims, costs, charges and expenses which Numis or its officers and employees may suffer or incur as a result of, *inter alia*, any breach of the warranties contained in the Introduction Agreement or any of the statements in this Document being untrue, inaccurate, incomplete or not based on reasonable grounds; and

d) Numis will be able to terminate the Introduction Agreement prior to Admission in certain circumstances, including the occurrence of a material breach of any warranty contained in the Introduction Agreement or a serious adverse change in relevant financial, political, economic and/or market conditions.

7.26 **Labro loan agreement**

On 14 December 2018, the Company entered into a committed revolving term loan facility agreement with Labro for a total amount of US$15,000,000 (or such other aggregate amount as may be agreed between the parties from time to time). The facility is for the general corporate purposes of the Group.

The term of the facility is from the date of the loan agreement until the date that is 19 months after Re-Admission (for the purpose of this paragraph 7.26, the "**Term**").

The facility bears interest at a rate of 10% per annum.

In respect of each loan borrowed pursuant to the facility under the loan agreement, all accrued and outstanding interest, together with the aggregate outstanding principal amount, is payable on the earlier of:

(i) the last business day of the Term;

(ii) the date on which the aggregate outstanding amount of the corresponding loan is fully prepaid or repaid in accordance with the terms of the loan agreement; or

(iii) the termination date, being the earlier of: (A) the business day on or immediately prior to the Term of the facility; and (B) where it has become unlawful in any applicable jurisdiction for Labro to perform its obligations as lender, and where such illegality cannot be remedied, the date falling 10 business days after the date on which Labro notifies the Company of such illegality event (for the purpose of this paragraph 7.26, the "**Termination Date**").

The Company shall repay to Labro in full the aggregate outstanding principal amount of all loans borrowed under the facility, together with all accrued and outstanding interest and all other amounts due, on the Termination Date.

The aggregate outstanding principal amount of all loans borrowed under the facility shall be:

(i) immediately prepaid in whole by the Company to Labro upon the occurance of an event of default or an illegality event as summarised above (save, in the case of an illegality event, where Labro determines that such event does not require the prepayment of the entire facility and all loans provided thereunder, in which case only a relevant proportion shall be prepaid and cancelled); and

(ii) immediately prepaid (either in whole or in part, as the case may be) by the Company to Labro in an amount equal to the aggregate principal amount of all loan facilities, debt instruments, credit agreements, notes or similar instruments or any other financial accommodation made available to the Company after the date of the loan agreement from any person other than the Labro.

The Available Facility shall be automatically and permanently reduced to zero on the Termination Date.

The Company has agreed to pay to Labro a commitment fee, which shall be settled through the issue of Ordinary Shares (for the purpose of this paragraph 7.26, the "**Commitment Fee**"). The Commitment Fee shall be due and payable in advance on each of the following dates (for the purpose of this paragraph 7.26, each such date being a "**Commitment Fee Payment Date**"), provided that the final Commitment Fee Payment Date shall occur on the Termination Date, and shall:

(i) be equal to 1.5% of the facility made available under the loan agreement and be payable on the date thereof (resulting in 543,888 Ordinary Shares); and

(ii) be equal to 1.5% of the facility made available under the loan agreement and be payable on the first drawdown date,

or such other percentage of the facility made available under the loan agreement as may be agreed in writing between the Company and Labro from time to time. The Commitment Fee set out in (i) above is payable on the date of the loan agreement irrespective of whether any amount is drawn down. The Commitment Fee set out in (ii) above is payable on the first drawdown date irrespective of the amount of the loan borrowed on such date.

The Ordinary Shares to be issued to Labro in respect of the Commitment Fee on the Commitment Fee Payment Date shall be calculated (unless otherwise agreed in writing between the Company and Labro from time to time) by converting the facility made available under the loan agreement into pounds sterling at the exchange rate published by the Financial Times on the date falling no earlier than three business days prior to the immediately upcoming Commitment Fee Payment Date, and dividing that number by a price of 33 pence per Ordinary Share.

The Company also agrees to pay a drawdown fee to Labro on each drawdown date, in an amount equal to 3% of the amount of each loan borrowed under the facility, and the Company may elect to pay the same in cash or settle such amount through the issue of Ordinary Shares (in which case, the number of Ordinary Shares to be issued shall be calculated in the same way used to calculate the number of Ordinary Shares issued to settle any Commitment Fee.

The loan agreement contains customary undertakings and events of default for a loan of this nature.

The agreement is governed by English law and any disputes are subject to the exclusive jurisdiction of the English courts.

8. EMPLOYEES

8.1 Chaarat has the following direct employees as at the date of this Re-Admission Document:

Name of employee	Principal place of employment
Artem Volynets	The UK and Company Countries of Operation
Robert Benbow	Colorado, USA
Dorian L. (Dusty) Nicol)	California, USA
Peter Carter	Bishkek, Kyrgyz Republic
Frank Fenne	Colorado, USA

As at the date of this document, CZ had 106 employees in total.

Of the 106 employees, 90 employees are permanent: 89 staff paid in US$, 1 employee paid in KGS and the remaining 16 employees are seasonal staff paid in KGS.

70 of the employees are based at Bishkek, the Kyrgyz Republic, 9 in Kanysh-Kiya regional office, the Kyrgyz Republic, 13 Security staff in Chatkal region, the Kyrgyz Republic and the remaining 14 work at the Company's Chaarat Gold Project site in the Kyrgyz Republic.

Notice periods for all the employees are either 3 or 14 days. All 16 seasonal staff paid in KGS have a notice period of 3 days. 90 permanent staff have a notice period of 14 days.

Chaarat Gold Services Limited (the English Subsidiary) directly employs Chris Eger on the terms summarised in paragraph 5.4(a) Part VI of this document. Chris' principal place of employment is London, UK.

The Company has confirmed that, save as stated above, no other member of the Group has any employees as at the date of this document. The Company does not anticipate any material changes in the number or composition of employees of the Group between the date of this document and Admission, save for certain reductions in seasonal staff due to the winter season.

8.2 As from completion of the Kapan Acquisition, the Group's employees will also include Kapan employees. Kapan had 933 employees as at the date to which the Kapan CPR was prepared as set out in Table 21 of the Kapan CPR.

9. CONTRACTORS/CONSULTANTS

The Group is party to the consultancy agreements summarised at paragraph 19.6 of this Part VI (excluding professional advisers otherwise disclosed in this document and trade suppliers).

10. SHARE OPTION SCHEMES

The Company has in place the following share option schemes:

10.1 **Share Option Plan dated 23 November 2007 as amended and restated on 1 July 2009**

The Company adopted an unapproved share option plan on 23 November 2007 (for the purposes of this paragraph only, the "**Adoption Date**") and amended and restated its terms on 1 July 2009 (the "**Share Option Plan**").

Grant of Options

Pursuant to the Share Option Plan the Board may, in its absolute discretion, grant or procure the grant of an Option to an eligible person at the time and over the number of Ordinary Shares determined by the Board. An eligible person means: (i) an employee or officer of the Company, a subsidiary of the Company and any other entity nominated by the Board as a participating company; and (ii) any other person the Board may in its absolute discretion decide (an "**Eligible Person**").

The Options may only be granted within a grant period. For the purposes of the Share Option Plan, a "**Grant Period**" shall be any period of 56 days commencing on the dealing day (for the purposes of this paragraph being a date on which the LSE is open for business, a "**Dealing Day**") following any of: (a) the Adoption Date; (b) the Second Adoption Date, as defined in this paragraph; (c) 1 January in each year; (d) an Acquisition Date, as defined in this paragraph; (e) an Asset Disposal

Date, as defined in this paragraph; (f) an "**Announcement Date**", being any date preceding the Second Adoption Date on which the Company made an announcement of financial results or issued any prospectus, listing particulars or other document containing equivalent information relating to the Shares; (g) in respect of a grant to a particular Eligible Person, the date on which such Eligible Person commences employment or first holds office with a Group Company (an "**Employee/Officer Appointment Date**"); or (h) the date on which the Directors resolve that exceptional circumstances have arisen which justify the grant of an Option (an "**Exceptional Circumstances Date**").

Options may not be granted, in any event, later than the tenth anniversary of 1 July 2009 (the "**Second Adoption Date**") (and therefore not later than 1 July 2019).

The number of Ordinary Shares subject to an Option granted to an Eligible Person shall be calculated as follows:

- in the case of a grant made during the Grant Period following the Adoption Date or an Announcement Date, the number stated on the relevant Option certificate;
- in the case of a grant made during the Grant Period following:
  - o the Second Adoption Date, the number calculated on the basis of **A = ((B/C) x D) /2**; and
  - o 1 January in each year, the number calculated on the basis of **A = (B/E) x D**,

  in each case, where:
  - **A** is the number of Ordinary Shares subject to the Option;
  - **B** is the gross annual salary of that Eligible Person on the applicable date of grant;
  - **C** is 0.25 pence;
  - **D** is the percentage between 100% and 50% to be applied to each Eligible Person depending on their service grade within the Group, provided that the decision as to the service grade into which any particular Eligible Person falls and the percentage to be applied to that service grade shall be at the absolute discretion of the Directors; and
  - **E** is the average middle market quotation (as derived from the Daily Official List of the LSE) of an Ordinary Share measured over the period of the fifteen Dealing Days immediately preceding the applicable date of grant;
- in the case of a grant made during the Grant Period following an Acquisition Date or an Asset Disposal Date, the number as may be determined by the Directors in accordance with the rules of the Share Option Plan (see further below); and
- in the case of a grant made during the Grant Period following an Employee/Officer Appointment Date or an Exceptional Circumstances Date, the number decided by the Directors in their sole discretion.

No Transfer of Options

An Option may be exercised by the personal representatives of a deceased Option holder in certain circumstances, however, aside from this, no Option may be transferred, assigned or charged unless approved by the Company in writing.

Limitations on Grant of Options

If and so long as the Ordinary Shares are admitted to AIM, the maximum number of Ordinary Shares which may be allocated for subscription under the Share Option Plan, taken together with any other employee or director share option arrangements, shall not exceed 15 per cent. of the Company's issued ordinary share capital for the time being (excluding any Ordinary Shares already in issue when placed under option and any Ordinary Shares comprised in any option which has lapsed, and any Ordinary Shares which are issued pursuant to the grant of Options shall be taken into account once only on the date they are placed under option).

Exercise of Options

Unless otherwise stated in the Share Option Plan, an Option may not be exercised later than the day before the eighth anniversary of the date of its grant or any earlier date that may have been stipulated at the date of its grant and specified in the relevant Option certificate or determined by the Board.

Except: (a) as otherwise stated at the date of grant of an Option and specified in the relevant Option certificate; or (b) as determined by the Directors; or (c) for exercise by a deceased Option holder's personal representative; or (d) for exercise by an Option holder after that Option holder has ceased to be an employee or officer of a Group Company, which is permitted in certain circumstance, an Option holder may only exercise an Option while he or she is an employee or officer of a Group Company

Takeover Offer

If any person obtains control (which shall have the meaning given to it in section 840 Income and Corporation Taxes Act 1988) of the Company as a result of making: (a) an offer to acquire the whole of the issued share capital of the Company (such offer being conditional on the offer resulting in the person making the offer obtaining control of the Company) or (b) to acquire all the shares in the Company which are of the same class as the Shares (an "**Offer**"), certain takeover provisions will apply.

If the Option price in respect of a subsisting Option on the date on which the person making the Offer (the "**Offeror**") obtains control of the Company (or, if later, on the date on which any condition subject to which the Offer is made is met) (the "**Acquisition Date**") is:

- less than the price to be paid for each Share by the Offeror, then:
    - the Company shall serve notice on each Option holder no less than 7 days before the Acquisition Date that: (i) if applicable, that Option holder is deemed granted additional Options; (ii) all subsisting Options shall be deemed to be exercised in full immediately prior to the Acquisition Date; and (iii) the Ordinary Shares granted pursuant to that exercise form part of the Ordinary Shares acquired by the Offeror on the Acquisition Date;
    - the Company shall provide value to the Option holder equal to the total amount payable by the Offeror for the Ordinary Shares granted on exercise of that subsisting Option, less the total amount that would have been payable by that Option holder on the exercise of that subsisting Option; and
    - the Option holder shall appoint the Company as its attorney for the purpose of selling the Shares granted pursuant to the deemed exercise of that subsisting Option, and for receipt of the sale proceeds;
- greater than the price to be paid for each Ordinary Shares by the person obtaining control of the Company, that subsisting Option shall lapse on the Acquisition Date.

If any member of the Group disposes of all or a substantial part of the assets of the Group (an "**Asset Disposal**") then:

- the Company shall serve notice on each Option holder on the date on which the Asset Disposal occurs (the "**Asset Disposal Date**") that:
    - o if applicable, that Option holder is granted a further Option; and
    - o each Option holder shall have the immediate right to exercise that subsisting Option in whole or part at any time;
- the Company shall not declare or make any dividend or other distribution of the Company or take any steps to start a voluntary winding up of the Company earlier than 60 days from the Assets Disposal Date.

If any Offer is made and an Acquisition Date occurs as a result of that Offer, or an Asset Disposal occurs, then the Company shall grant to each Option holder on the (as applicable) Acquisition Date or Asset Disposal Date, an additional Option to subscribe for such number of Ordinary Shares as is equal to the number of Ordinary Shares subject to the latest subsisting Option previously granted to that Option holder, however, the Company shall have no obligation to grant additional Options if, on the applicable Acquisition Date or Asset Disposal Date, the Board determines that due to the occurrence of unforeseen, special circumstances the grant of additional Options would be detrimental to the Company.

The Share Option Plan shall terminate on the 10th anniversary of the Second Adoption Date (being 1 July 2019) or at any earlier time by the passing of a resolution by the Board.

The Share Option Plan is governed by English law.

10.2 **Share Option Plan dated 12 February 2017**

The Company has adopted rules of the unapproved share option plan of the Company, established by resolution of the board of directors of the Company on 12 February 2017 (the "**2017 Share Option Plan**").

Grant of Options

Pursuant to the 2017 Share Option Plan, the Company may grant any of the following:

- an Option to acquire Ordinary Shares of which the exercise price is not less than the market value of an Ordinary Share on the date of its grant (a "**Market Value Option**"), with the market value (the "**Market Value**") being the average of the middle market quotations for an Ordinary Share for the three immediately preceding days on which the LSE is open for business (for the purpose of this paragraph, "**Dealing Day**") (but excluding any Dealing Days that fall in a Closed Period, as the same is defined in MAR);
- an Option to acquire Ordinary Shares for no payment; and
- an Option to acquire Ordinary Shares for payment of an exercise price equal to the nominal value of such Ordinary Shares,

(each an "**Award**"), to any employee (including a Director) of a Group Company and any other person the Board may in its absolute discretion decide, during: (a) the period of 42 days after 12 February 2017, being the date of the approval of the 2017 Share Option Plan by the Board (for the purposes of this paragraph, the "**Adoption Date**"); (b) any period of 42 days immediately following the end of a Closed Period (as defined in MAR); and (c) any other period in which the Board has decided to grant an Award due to exceptional circumstances which justify such a decision.

The Company may not grant Awards during a Closed Period (as defined in MAR), or after the 10th anniversary of the Adoption Date (being 12 February 2027).

The Board shall decide how many Ordinary Shares under option (if any) are subject to one or more vesting periods (periods for which an Option or part of it must be held before it can be exercised, each a "**Vesting Period**") and how many of the Shares under option (if any) are subject to performance conditions specified by the Board and periods over which performance is measured or periods applicable to any part of the Option.

The Company may not grant an Award if that grant would result in the total number of Dilutive Shares exceeding 10% of the issued share capital of the Company. For the purpose of this paragraph "**Dilutive Shares**" means, on any date, all Shares which:

- have, during the prior ten year period, been issued, or transferred out of treasury, on the exercise of, or in satisfaction of any option or any other right or award under which Shares may be acquired or received, granted under any share option plan of the Company (including the 2017 Share Option Plan) (an "**Existing Award**"); or
- remain capable of issue, or transfer out of treasury, under any Existing Award,

other than, in either case, under an Existing Award which was granted prior to the date on which the 2017 Share Option Plan was established.

Exercise of Options

The date on which the Option is exercised may not be earlier than either:

- the "Performance Measurement Date" (where a performance condition applies) – the Performance Measurement Date means the date on which the Board determines that any performance condition on the exercise of the Award has been satisfied, unless an earlier event occurs to cause the Award to lapse or become exercisable. This date may not be: (i) earlier than the first day after the end of the performance period; or (ii) later than the tenth anniversary of the date of grant of the Award; or
- the first Dealing Day following the end of the Vesting Period (where a Vesting Period applies),

("**Rule** 5").

However, if that date falls in a Closed Period, the earliest exercise date will be the first Dealing Day following the end of that Closed Period.

A holder of an Award may not exercise an Option before the earliest of the time when it becomes exercisable under:

- Rule 5 (see above);
- on the termination of employment of the holder of the Award; and
- if any person obtains control of the Company (see below).

The Options will lapse in certain circumstances, including where an Award holder seeks to transfer, assign or create any charge or other security interest over an Award or any rights arising under it (all of which are prohibited under the terms of the 2017 Share Option Plan), on the first anniversary of an Award holder's death, six months after the termination of an Award holder's employment, other than by reason of death, where relevant performance criteria are, in the opinion of the Board, incapable of being met in whole or in part and in certain insolvency/bankruptcy circumstances.

The 2017 Share Option Plan includes certain provisions dealing with the termination of an Award holder's employment, including a provision that the personal representatives of a deceased Award Holder may, during the period ending 12 months after the death, exercise the any outstanding and exercisable Options and that an Award Holder who ceases to be an employee may, during the period ending 6 months after the date of termination, exercise any outstanding and exercisable Options.

Takeovers and Liquidation

If any person obtains control (as defined in section 719 of Income Tax (Earnings and Pensions) Act 2003) of the Company as a result of making an Offer, then if the exercise price in respect of a subsisting Option on the date on which the Offeror obtains control of the Company (or, if later, on the Acquisition Date is:

- less than the price to be paid for each Ordinary Share by the Offeror, then:
    - the Company shall serve notice on the holder of the Awards of each subsisting Option no less than 7 days before the Acquisition Date that: (i) if applicable, that Option holder is deemed granted additional Options; (ii) all subsisting Options shall be deemed to be exercised in full immediately prior to the Acquisition Date; and (iii) the Ordinary Shares granted pursuant to that exercise form part of the Shares acquired by that person on the Acquisition Date;
    - the Company shall provide value to the holder of the Award of each subsisting Option equal to the total amount payable by the Offeror for the Ordinary Shares granted on exercise of that subsisting Option, less the total amount that would have been payable by that Award Holder on the exercise of that subsisting Option; and

- the holder of the Award of each subsisting Option shall appoint the Company as its attorney for the purpose of selling the Ordinary Shares granted pursuant to the deemed exercise of that subsisting Option, and for receipt of the sale proceeds;

- greater than the price to be paid for each Ordinary Share by the person obtaining control of the Company, that subsisting Option shall lapse on the Acquisition Date.

If any member of the Group carries out an Asset Disposal, then:

- the Company shall serve notice on the holder of the Award of each subsisting Option on the Asset Disposal Date that:

  - if applicable, that holder of the Award is granted a further Option; and

  - each holder of an Award of a subsisting Option shall have the immediate right to exercise that subsisting Option in whole or part at any time;

  - the Company shall not declare or make any dividend or other distribution of the Company or take any steps to start a voluntary winding up of the Company earlier than 60 days from the Assets Disposal Date.

If any Offer is made and an Acquisition Date occurs as a result of that Offer, or an Asset Disposal occurs, then the Company shall grant to each holder of an Award of a subsisting Option on the Acquisition Date or Asset Disposal Date, (as applicable), an additional Option to subscribe for such number of Ordinary Shares as is equal to the number of Ordinary Shares subject to the latest subsisting Option previously granted to that Option holder, however, the Company shall have no obligation to grant additional Options if on the applicable Acquisition Date or Asset Disposal Date the Board determines that due to the occurrence of unforeseen, special circumstances the grant of additional Options would be detrimental to the Company.

The 2017 Share Option Plan is governed by English law.

11. EXECUTIVE COMPENSATION STRATEGY / STRUCTURE

As noted in paragraph 16 of Part I of this document, the Company is proposing to implement a new incentive scheme as set out in that paragraph.

12. LITIGATION

Save as set out below, no member of the Group is, or has been, involved in any governmental, legal or arbitration proceedings which may have or have had in the 12 months preceding the date of this document a significant effect on the Company's financial position or profitability or the financial position or profitability of the Group as a whole and, so far as the Directors are aware, there are no such proceedings pending or threatened against the Company or any member of the Group.

The Group

12.1 **Licence Fee Recalculation Dispute – First Round (Prospecting Works vs Exploration Works)**

On 10 December 2002 CZ was issued licence no. 2626 AR for the performance of exploration works in the Chaarat Licence Area. CZ performed prospecting works and not exploration works under licence no. 2626 AR. On 18 September 2013, as the prospecting works had been completed, licence no.2626 AR was annulled and, on 7 October 2013, a new licence no. 3319 AR was issued to CZ for the performance of exploration works. Under the then effective Kyrgyz regulation, there was no clear distinction between prospecting works and exploration works, and it did not provide for the recalculation of retention fees to account for a different type of works having been performed under a licence. However, on 6 November 2015, the regulation was amended to provide for such recalculation of retention fees. Therefore, the State Agency of Geology under the Government of the Kyrgyz Republic (currently the SCIESM) recalculated the licence retention fees in relation to licence no. 2626 AR in the amount of KGS 46,340,060.80 (approximately USD 673,548). On 13 May 2016, CZ filed a claim against SCIESM with the Bishkek Inter-District Court to challenge the legality of the SCIESM's recalculation of licence retention fees. The Bishkek Inter-District Court supported CZ's claim. On 23 November 2016, the SCIESM appealed to the Bishkek City Court and on 23 November 2016 the Bishkek City Court upheld the decision of the Bishkek

Inter-District Court. The SCIESM appealed to the Supreme Court of the Kyrgyz Republic (and, in addition, the Prosecution Office of Bishkek filed an appeal against the ruling of the Bishkek City Court). The Supreme Court decided that CZ had performed prospecting works until 21 May 2010 and exploration works thereafter. On 25 April 2017 the Supreme Court cancelled the decisions of the Bishkek Inter-District Court and the Bishkek City Court and dismissed the claims.

12.2 **Licence Fee Recalculation Dispute – Second Round (Determining the Amount of the Fee)**

On 14 June 2017 the SCIESM sent a letter to CZ demanding payment of KGS 42,445,249.81 for the period starting from 10 December 2002, the date of the initial issuance of licence no. 2626 AR. CZ asked the SCIESM to recalculate the licence fee but the SCIESM refused. CZ filed a claim against the SCIESM with the Bishkek Inter-District Court stating that that the licence retention fees at the rate applicable to exploration works must be accrued starting from 21 May 2010, the date when CZ started performing exploration works under licence no. 2626 AR. On 8 September 2017 the Bishkek Inter-District Court ruled in favour of CZ. The SCIESM filed an appeal against CZ at the Bishkek City Court and on 30 November 2017 it upheld the decision of the Bishkek Inter-District Court. The SCIESM filed an appeal against CZ at the Supreme Court which upheld the decisions of the Bishkek Inter-District Court and the Bishkek City Court. On 17 April 2018, CZ sent a letter to the SCIESM stating that the total recalculated licence fee under licence no. 2626 AR for 2012-2013 amounted to KGS 5,189,064.39, of which CZ had already paid KGS 4,400,563 and the remaining amount payable was KGS 788,501.39 by CZ. CZ paid this KGS 788,501.39 to the SCIESM on April 19, 2018.

12.3 **Land Tax Dispute**

On 14 June 2013, CZ entered into a lease agreement with Kanysh-Kiya Ayil Aymak of the Chatkal District of Jalal-Abad oblast of the Kyrgyz Republic ("**KKAA**") for the lease of land located in Kanysh-Kiya Ayil Aymak (the "**Land Plot**") for a lease period from 13 June 2013 until 13 June 2018 (the "**Lease Agreement**"). The lease payment was calculated at the commercial use coefficient of 0.3 established by the tax code of the Kyrgyz Republic for land plots used for buildings and facilities of mining enterprises. On 3 April 2018, CZ received a letter from the Ministry of Economy of the Kyrgyz Republic stating that the commercial use coefficient shall be 0.005, which is applicable for land plots used for prospecting and exploration works. Since CZ's main type of activity is related to engineering surveying and the provision of technical consultations in those areas, CZ signed a supplementary agreement to the Lease Agreement (the "**Supplementary Agreement**") in which the lease payments were recalculated at a coefficient of 0.005. In March 2017, the KKAA administration filed a complaint against CZ with the Inter-district Court of the Jalal-Abad Region claiming invalidation of the Supplementary Agreement, and recovery of KGS 8,827,024 (approximately USD 128,000) of the land tax for the period from 2014 until 2016 calculated according to the coefficient rate of 0.3. The Inter-district Court of the Jalal-Abad Region dismissed the claim of the KKAA administration on lack of jurisdiction grounds. KKAA administration has not filed any claim with the court of relevant jurisdiction, but rather signed a new lease agreement with CZ on 13 June 2018, pursuant to which the term of the Lease Agreement is extended from 13 June 2018 until 13 June 2021, and CZ has the right to terminate the Lease Agreement unilaterally without any liability. On 18 September 2017, the State Service on Fighting against Economic Crimes of the Kyrgyz Republic initiated a criminal case based on facts of the evasion of taxes and social security payments by officials of economic entities and received a court order on seizure of documents from CZ relating to the rent payments and explanations on the issue of using the lower coefficient of 0.005 instead of 0.3. However, the investigation was suspended on November 17, 2018 due to insufficient evidence for bringing criminal charges since no defendant could be identified.

Kapan

As from completion of the Kapan Acquisition, the Group will own Kapan which is party to the following governmental, legal or arbitration proceedings.

12.4 **Claims by Former Kapan Management Team**

The former CEO, CFO and former Head of Mining each submitted claims against Kapan in 2016 regarding the termination of their employment, demanding to invalidate the termination of their employment contracts, to reinstate them in former positions and to charge the salary and average

salary for the whole period of forced idleness. The combined value of these claims is approximately US$1,026,212. The court of first instance has yet to issue its ruling.

12.5 **Poisoning of Three Kapan Employees**

On 3 March 2018 three Kapan employees were poisoned by toxic gases present in the Kapan Mine. All three employees were hospitalized and one employee died as a result of his exposure to the toxic gases. A report by the health and labour authorities in Armenia found that Kapan had breached certain health and safety regulations. This incident gives rise to potential penalties for breach of health and safety regulations by Kapan, potential criminal liability for the responsible officers of Kapan, possible civil claims by the estate of the deceased employee and the possible suspension of mining activity by the relevant Armenian government authority until any failure of the ventilation system in the Kapan Mine is addressed so as to ensure compliance with applicable law and regulations.

The Kapan Acquisition Agreement contains indemnities in relation to the issues referred to at paragraph 12.4 and 12.5 above which is capped at the consideration for the Acquisition and has a time limit of 3 years from completion. For further details, see paragraph 7.20 of this Part VI of this document.

13. RELATED PARTY TRANSACTIONS

In addition to the agreements summarised in paragraphs 2.9, 2.10, 4.2, 4.3, 4.5, 4.7, 5.4, 7.19, 7.27 and 9 of this Part VI of this document and any related party transactions disclosed in the Company's historical financial information incorporated by reference in this document, the Company has entered into the following related party transactions:

13.1 **Labro Relationship Agreement**

On 27 September 2016, the Company entered into a relationship agreement with Labro (the "**Labro Relationship Agreement**") in order to manage the relationship between them to ensure, amongst other things: (A) the Company would at all times be capable of carrying on the business of the Company independently of Labro and its associates (as defined in the listing rules made by the Financial Conduct Authority); and (B) that all transactions and arrangements between the Company, Labro and its associates would be at arm's length and on normal commercial terms.

The agreement provides, *inter alia*, that for so long as Labro and its associates in aggregate beneficially own or are interested in 20 per cent. or more of the issued share capital of the Company:

(a) Labro shall, and shall procure (to the extent that it is able) that its associates and nominee director shall permit the Company to carry on its business independently of Labro and its associates and the Concert Party including so that:

(i) a majority of the revenue generated by the Company's business is not attributable to business conducted directly or indirectly with Labro, its associates or any member of the Concert Party;

(ii) Labro, its associates and the Concert Party are not able to influence the operations of the Company outside of its legal governance structure; and

(iii) save with the requisite approval of the Company's shareholders in accordance with the AIM Rules and/or applicable company law, Labro, its associates and the Concert Party do not hold or acquire a material shareholding in one or more significant subsidiaries of the Company;

(b) Labro undertakes to the Company that it shall not, and shall procure (to the extent that it is able) that its associates and the Concert Party shall not, exercise any rights which any of them may have from time to time as shareholders in the Company to:

(i) enter into any transactions and/or relationships between any Group Company and Labro, its associates and any member of the Concert Party other than at arm's length

and on a normal commercial terms and in accordance with the related party transaction rules set out in the AIM Rules and/or under applicable company law; and

(ii) propose any resolution or take any action which is intended to circumvent the proper application of the AIM Rules;

(c) Labro will have the right to nominate a director of the Company (and to remove its nominee from office and replace such nominee with another director appointed by it); and

(d) The Labro nominee director is, to the extent permitted by law and subject to that director complying with his/her fiduciary duties, entitled to disclose any information received in his/her capacity as a director of the Company to Labro or any of its associates.

(e) Neither party may assign its rights under the Labro Relationship agreement.

(f) The Labro Relationship Agreement will automatically terminate and cease to have any effect on the earlier of:

(i) Labro and its associates in aggregate ceasing to beneficially own or be interested in at least 20 per cent. of the issued share capital of the Company carrying voting rights; or

(ii) the Shares ceasing to be admitted to trading on AIM.

(g) The Labro Relationship Agreement is governed by English law and the parties irrevocably submits to the jurisdiction of the English courts.

13.2 **M&A Pipeline**

Artem Volynets and Dmitry Yudin benefit from a contingent incentive fee in relation to one potential and future M&A transaction, subject to such closing prior to 30 July 2020, after which this contingent incentive fee will expire for nil consideration. Should such transaction close by 30 July 2020, Artem Volynets and Dmitry Yudin will be awarded 12,564,874 Ordinary Shares and 5,384,946 Ordinary Shares respectively, in each case subject to a clawback for 12 months following completion, in case they cease to be employed by the Group within that period. Artem Volynets would not be a participating board member, or carry a vote, on this future and potential M&A transaction.

13.3 The Directors are anticipated to receive the following remuneration from the Company during 2018 financial year:

Director	Salary (US$)	Fees (US$)	Termination Payments (US$)	Share based Payments (US$)
Alexander Novak[(1)]	299 568	–	–	N/A
Linda Naylor[(1)]	150 219	–	162 814	–
Richard Rae[(1)]	–	32 312	–	N/A
Martin Wiwen-Nilsson	–	–	–	N/A
Gordon Wylie	–	32 107	–	N/A
Dorian L. Nicol[(1)]	–	270 306	–	N/A
Martin Andersson	–	–	–	N/A
Artem Volynets[(2)]	335 417	N/A	N/A	N/A
Robert Benbow[(2)]	375 000	N/A	N/A	N/A
Robert Edwards[(2)]	N/A	N/A	N/A	N/A
Hussein Barma[(2)]	N/A	N/A	N/A	N/A

Notes:

(1) Former directors. Alexander Novak's services are provided through Vetan Investments Limited.

(2) Artem Volynets was appointed as a Director on 26 March 2018, Robert Benbow was appointed as a Director on 4 July 2018, Robert Edwards was appointed as a Director on 13 September 2018 and Hussein Barma was appointed as a Director on 14 December 2018.

14. INVESTMENTS

Other than its investments in relation to its subsidiary companies and the Licences as shown in Part V of this document, as well as in relation to the Kapan Acquisition, the Company has made no principal investments during the period covered by the historical financial information which is incorporated by

reference in this document and does not have any investments in progress and has not made any firm commitment in respect of future investments, including in relation to the Group.

15. TAXATION

15.1 Summary of UK Taxation

*The following statements are intended to apply only as a general guide to certain UK tax considerations in relation to the Ordinary Shares. They are based on current UK tax law and the current published practice of HM Revenue and Customs ("**HMRC**") (which may not be binding on HMRC), both of which are subject to change at any time, possibly with retrospective effect.*

They relate only to certain limited aspects of the UK tax treatment of, and are intended to apply only to Shareholders who are resident and, in the case of individuals, domiciled or deemed domiciled, solely in the United Kingdom for UK tax purposes (except where the position of non-UK resident or non-UK domiciled Shareholders is referred to expressly) and do not apply to Shareholders to whom split-year treatment applies. They apply only to Shareholders who hold the Ordinary Shares as investments (other than through an individual savings account or a self-invested personal pension) and who are the absolute beneficial owners of both the Ordinary Shares and any dividends paid on them. The statements may not apply to certain classes of shareholder such as (but not limited to) trustees, persons acquiring Ordinary Shares in connection with an office or employment, persons holding their shares through trust arrangements, dealers in securities, banks, insurance companies and collective investment schemes.

Prospective holders of Ordinary Shares who may be subject to tax in a jurisdiction other than the United Kingdom or who may be unsure as to their UK tax position should seek their own professional advice.

(a) ***Dividends***

Withholding tax

The Company should not be required to deduct or withhold amounts on account of UK tax at source from dividend payments it makes, irrespective of the residence or particular circumstances of the Shareholder receiving such dividend payment.

Individuals

A nil rate of income tax will apply for the first £2,000 of dividend income received by individual Shareholders in a tax year (the "**Nil Rate Band**").

The rate of tax applicable to dividend income in excess of the Nil Rate Band will depend on the wider tax position of the Shareholder. Broadly speaking, after taking into account the amount (if any) of a Shareholder's personal allowance, and any other allowances, exemptions and reliefs, the Shareholder's taxable income up to the basic rate limit will fall within the basic rate band; taxable income between the basic rate limit and the higher rate limit will fall within the higher rate band; and taxable income above the higher rate limit will fall within the additional rate band. For the tax year running 6 April 2018 to 5 April 2019 the basic rate limit is £34,500 and the higher rate limit is £150,000 (although, these limits can be increased in certain circumstances).

The rates of income tax on dividends received above the Nil Rate Band are: (a) 7.5 per cent. for dividends in the basic rate band; (b) 32.5 per cent. for dividends in the higher rate band; and (c) 38.1 per cent. for dividends in the additional rate band.

In determining the tax band in which any dividend income over the Nil Rate Banks falls, dividend income is treated as the top slice of a Shareholder's income and dividend income within the Nil Rate Band is still taken into account.

Because dividend income (including income within the Nil Rate Band) is taken into account in assessing whether a Shareholder's overall income is above the higher or additional rate limits, the receipt of such income may also affect the amount of personal allowances to which the Shareholder is entitled.

Companies

Shareholders within the charge to UK corporation tax that are "small companies" for the purposes of Chapter 2 of Part 9A of the Corporation Tax Act 2009 should be subject to UK corporation tax on any dividend received from the Company.

Shareholders within the charge to UK corporation tax that are not "small companies" for this purpose will not be subject to UK corporation tax on any dividend received from the Company so long as the dividend falls within an exempt class and certain conditions are met. For example: (i) dividends paid on shares that are not redeemable and do not carry any present or future preferential rights to dividends or to the Company's assets on its winding up; and (ii) dividends paid to a person holding less than a 10 per cent. interest in the Company, should generally fall within an exempt class. However, the exemptions mentioned above are not comprehensive and are subject to anti-avoidance rules.

If the conditions for exemption are not met or cease to be satisfied, or such a Shareholder elects for an otherwise exempt dividend to be taxable, the Shareholder will be subject to UK corporation tax on dividends received from the Company, at the rate of corporation tax applicable to that Shareholder (the main rate of corporation tax is currently 19 per cent.).

Non-UK Resident Shareholders

Shareholders who are not resident in the UK will not generally be subject to UK income or corporation tax on dividends unless they are carrying on a trade, profession or vocation in the UK through a branch or agency (or, in the case of a corporate shareholder, a permanent establishment) in connection with which the Ordinary Shares are used, held or acquired. A shareholder resident outside the UK may be subject to non-UK tax on dividend income under local law. Shareholders who are not resident for tax purposes in the UK should obtain their own tax advice concerning tax liabilities on dividends received from the Company.

(b) ***Capital gains***

A disposal or deemed disposal of Ordinary Shares by a Shareholder who is resident in the United Kingdom for tax purposes may, depending on the Shareholder's circumstances and subject to any available exemptions and reliefs, give rise to a chargeable gain or an allowable loss for the purposes of UK taxation of chargeable gains.

Individuals

For individual Shareholders, the principal factors that will determine the UK capital gains tax position on a disposal or deemed disposal of Ordinary Shares are the extent to which the Shareholder realises any other capital gains in the UK tax year in which the disposal is made, the extent to which the Shareholder has incurred "capital losses" in that or earlier UK tax years, the income tax band into which the Shareholder falls, and the level of the annual allowance of tax-free gains in that UK tax year (the "**Annual Exemption**"). The Annual Exemption for the tax year running 6 April 2018 to 5 April 2019 is £11,700.

The applicable rate for an individual Shareholder who is subject to income tax at a rate or rates not exceeding the basic rate and makes a capital gain on the disposal (or deemed disposal) of Ordinary Shares which (after taking advantage of the Annual Exemption and deducting any available capital losses) is liable to UK capital gains tax is 10 per cent. Where an individual Shareholder is subject to income tax at either the higher or the additional rate, or to the extent that any gain on the disposal (or deemed disposal) takes the individual Shareholder's aggregate income and gains over the basic rate limit, the applicable rate will be 20 per cent.

A Shareholder who ceases to be resident in the UK for tax purposes and then reacquires UK tax residence before five complete tax years have elapsed and who disposes of Ordinary Shares during that period of non-residence may also be liable on their return to the UK to tax on any capital gain realised, subject to any available exemptions or reliefs.

Companies

For a Shareholder that is a UK resident company or a UK permanent establishment of a non UK resident company, any gain on a disposal or deemed disposal of Ordinary Shares should be included in the company's total taxable profits, which are subject to UK corporation tax at a rate of 19 per cent. (17 per cent. from 1 April 2020). There are a number of reliefs, within UK tax legislation, which may apply to defer, exempt or offset any gain. Depending on the circumstances, such disposal may, alternatively, give rise to an allowable loss for the purposes of UK corporation tax. Shareholders should seek independent advice with respect to their tax position.

(c) ***Stamp duty and stamp duty reserve tax ("SDRT")***

The following statements are written on the basis that: (i) the Company is a body corporate not incorporated in the UK; (ii) the Ordinary Shares are not registered in a register kept in the UK by or on behalf of the Company; and (iii) the Ordinary Shares are not paired with shares issued by a body corporate incorporated in the UK. They are intended as a general guide to the current UK stamp duty and SDRT position, and apply regardless of whether or not a holder of Ordinary Shares is resident in the UK. It should be noted that certain categories of person, including market makers, brokers, dealers, and other specified market intermediaries, are entitled to exemption from stamp duty and SDRT in respect of purchases of securities in specified circumstances.

In practice, no UK stamp duty should need to be paid on an instrument transferring the Ordinary Shares, provided that such instrument is not executed in the UK and the instrument does not relate to any property situate, or to any matter or thing done or to be done, in the UK.

No SDRT will be payable in respect of any agreement to transfer the Ordinary Shares.

15.2 **Summary of BVI Taxation**

The Company is not subject to any income, withholding or capital gains taxes in the British Virgin Islands. No capital or stamp duties are levied in the British Virgin Islands on the issue, transfer or redemption of shares.

Shareholders who are not tax resident in the British Virgin Islands will not be subject to any income, withholding or capital gains taxes in the British Virgin Islands, with respect to the shares of the Company owned by them and dividends received on such shares, nor will they be subject to any estate or inheritance taxes in the British Virgin Islands.

It is the responsibility of all persons to satisfy themselves of the particular taxation treatment that applies to them by consulting their own professional tax advisers. Taxation consequences will depend upon particular circumstances.

16. TAKEOVERS AND MERGERS

As a BVI incorporated company, the Company is not directly subject to any restrictions on takeover offers such as those which exist in the UK pursuant to the City Code. However, the Articles contain certain provisions which are based on the principles of the City Code; please see further "Takeover Provisions" at paragraph 3.1(b)(xix) of this Part VI of this document.

In addition to these provisions in the Articles, the BCA also provides for a statutory procedure which applies to the mergers or consolidations of BVI incorporated companies with other BVI companies or non-BVI incorporated companies, which requires shareholder approval (however a BVI incorporated company may merge with its parent company provided that the parent company owns at least 90 per cent. of the outstanding shares, without shareholder approval).

In the case of a statutory merger between a BVI incorporated company and non-BVI incorporated company, the BCA requires the merger to be lawful under the laws of the jurisdiction in which the non-BVI incorporated company is incorporated.

Shareholders dissenting from a statutory merger are entitled to payment of the fair value of their shares, unless the company is the surviving company and the shareholder continues to hold a similar interest in the surviving company.

Under the BCA, following a statutory merger, one of the companies is subsumed into the other (the surviving company) or both are subsumed into a third company (a consolidation). In either case, with effect from the effective date of the merger, the surviving company assumes all of the assets and liabilities of the other entity(ies) by operation of law and the other entities cease to exist.

Following completion of a takeover or a statutory merger, shareholders holding 90 per cent. of the outstanding shares may direct the company to redeem the remaining 10 per cent. of shares. There is no time limit during which this minority shareholder squeeze out must be implemented, such that it can be implemented at any time.

17. CREST AND DEPOSITARY INTERESTS

The Ordinary Shares are in registered and certificated form. However, Ordinary Shares may be delivered, held and settled in CREST by means of the creation of dematerialised Depositary Interests. Pursuant to a method proposed by Euroclear under which transactions in international securities may be settled through the CREST system, the Depositary issues dematerialised Depositary Interests representing entitlements to Ordinary Shares. The Depositary Interests are independent securities constituted under English law which may be held and transferred through the CREST system.

Pursuant to the Depositary Agreement, the Company has appointed the Depositary to provide the Depositary Interest arrangements.

The Depositary Interests have been created pursuant to and issued on the terms of the Deed Poll executed by the Depositary in favour of the holders of the Depositary Interests from time to time. Holders of Depositary Interests should note that they have no rights in respect of the underlying Ordinary Shares or the Depositary Interests against Euroclear or its subsidiaries.

Each Depositary Interest is treated as one Ordinary Share for the purposes of determining, for example, eligibility for any dividends. The Depositary will pass on to holders of Depositary Interests any stock or cash benefits received by it as holder of Ordinary Shares on trust for such Depositary Interest holder. Depositary Interest holders will also be able to receive notices of Shareholder meetings and other notices issued by the Company to its Shareholders.

The Depositary Interests have the same security code (ISIN) as the underlying Ordinary Shares and do not require a separate listing on AIM.

18. WORKING CAPITAL

It is the opinion of the Directors, having made due and careful enquiry, that, taking account of the net proceeds of the Kapan Acquisition Financing and the Company's ability to draw down funds under the Labro Loan Agreement, the working capital available to the Company and its group will be sufficient for its present requirements, that is for at least twelve months from the date of Re-Admission.

19. GENERAL

19.1 The financial year of the Company will end on 31 December in each year.

19.2 There are no specific dates on which entitlement to dividends or interest thereon on Ordinary Shares arises and there are no arrangements in force for the waiver of future dividends.

19.3 The total costs and expenses (including professional fees, printing and advertising and the amounts payable pursuant to the Introduction Agreement) payable by the Company in relation to the Kapan Acquisition and the application for Re-Admission are estimated to amount to approximately US$1.4 million (inclusive of irrecoverable VAT) and are payable by the Company.

19.4 The registrar of the Company is Link Market Services (Guernsey) Limited and will, in relation to the Ordinary Shares in certificated form, be responsible for keeping the Company's share records.

19.5 Except as disclosed in this document, and as far as the Directors are aware, there are no environmental issues that may affect the Company's utilisation of its tangible fixed assets.

19.6 Each of the following persons being consultants and contractors to the Group has received those fees detailed below from the Company within the 12 months prior to the date of this document:

(a) Name: KPMG LLP: US$130,000;

(b) Name: KPMG CJSC: US$70,000; and

(b) Name: ACG Eurasia LLC: US$293,517.

19.7 Save as aforesaid and save as disclosed in this document, no person (excluding professional advisers otherwise disclosed in this document and trade suppliers), has:

(a) received, directly or indirectly, from the Company within 12 months preceding the date of this document; or

(b) entered into contractual arrangements (not otherwise disclosed in this document) to receive, directly or indirectly, from the Company on or after Re-Admission any of the following:

- fees totalling £10,000 or more; or
- securities in the Company with a value of £10,000 or more; or
- any other benefit with a value of £10,000 or more at the date of Re-Admission.

19.8 Payments in aggregate of US$14,070.50 in relation to land tax and US$59,511.80 in relation to license retention have been made by or on behalf of the Group to governmental, regulatory authorities or similar bodies with respect to the acquisition of, or maintenance of, its assets in 2018.

19.9 Payments in aggregate of AMD 41,662,527 have been made by or on behalf of Kapan to governmental, regulatory authorities or similar bodies with respect to the acquisition of, or maintenance of, its assets in 2018.

19.10 The Directors will comply with Rule 21 of the AIM Rules and Article 19 of the MAR relating to Directors' and applicable employees' dealings in Ordinary Shares and to this end, the Company has adopted an appropriate share dealing code.

19.11 Save as disclosed in this document, the Company does not hold a proportion of the capital of any undertaking likely to have a significant effect on the assessment of the Company's assets and liabilities, financial position or profits and losses.

19.12 Save as disclosed in this document, there are no patents or licences, industrial, commercial or financial contracts or new manufacturing processes which are material to the Company's business or profitability.

19.13 Save as disclosed in this document, the Directors are unaware of:

(a) any significant trends in production, sales and inventory and costs and selling prices since the date to which the historical financial information set out in Part V of this document was prepared to the date of this document;

(b) any trends, uncertainties, demands, commitments or events that are reasonably likely to have a material effect on the Group's prospects for at least the current financial year; or

(c) any exceptional factors which have influenced the Company's activities.

19.14 The Company has made statements regarding its competitive position on the basis of its knowledge of the mining industry in the regions in which it operates.

19.15 Where information has been sourced from a third party, including the CPRs in Part IV of this document and the Accountant's Reports in Part V of this document, this information has been accurately reproduced. So far as the Company and the Directors are aware and are able to ascertain from information provided by that third party, no facts have been omitted which would render the reproduced information inaccurate or misleading.

19.16 Save as otherwise disclosed in this document, there have been no significant authorised or contracted capital commitments of the Group at the date of publication of this document.

19.17 Save as disclosed in this document, no environmental issues have arisen in the past 12 months which would have had a significant effect on the Company's financial position or profitability. Save as disclosed in this document, the Company is not aware of any material environmental issues or risks affecting the utilisation of the Group's tangible fixed assets or its operations.

19.18 No public takeover bid has been made in relation to the Company during the last financial year or the current financial year.

19.19 Other than the current application for Re-Admission, the Ordinary Shares, Options, Warrants and Convertible Loan Notes have not been admitted to dealings on any recognised investment exchange nor has any application for such Re-Admission been made nor are there intended to be any other arrangements for dealings in the Ordinary Shares, Options, Warrants or Convertible Loan Notes.

19.20 Certain figures included in this document have been subject to rounding adjustments.

19.21 BDO has given and not withdrawn its written consent to the inclusion in this document of its report in Part V of this document in the form and context in which it appears. BDO has no material interests in the Company.

19.22 Tetra Tech has given and not withdrawn its written consent to the issue of this document with the inclusion of the Chaarat CPR in Part A of Part IV of this document and references to the Chaarat CPR and name in the form and context in which they appear. Furthermore, it has advised that, as informed by the Company, it has not become aware, since the date of the Chaarat CPR, of any matter affecting the validity of the Chaarat CPR at such date. Tetra Tech has no material interests in the Company

19.23 CSA has given and not withdrawn its written consent to the issue of this document with the inclusion of the Kapan CPR in Part B of Part IV of this document and references to the Kapan CPR and name in the form and context in which they appear. Furthermore, it has advised that, as informed by the Company, it has not become aware, since the date of the Kapan CPR, of any matter affecting the validity of the Kapan CPR at such date. CSA has no material interests in the Company.

19.24 Numis has given and not withdrawn its written consent to the issue of this document with the inclusion of its name and references to its name in the form and context in which it appears.

19.25 Save as set out in this document, the Directors are not aware of any exceptional factors that have influenced the Company's activities.

19.26 Save as disclosed in this document, no commission is payable by the Company to any person in consideration of his agreeing to subscribe for securities to which this document relates or of his procuring or agreeing to procure subscriptions for such securities.

19.27 No paying agent has been appointed by the Company.

19.28 Save as disclosed in this document, no payment (including commissions) or other benefit has been or is to be paid or given to any promoter of the Company.

19.29 Save as disclosed in this document, there has been no significant change in the financial or trading position of the Company which has occurred since the date of the latest historical financial information on the Company set out or incorporated by reference in this document.

19.30 Save as disclosed in this document, there has been no significant change in the financial or trading position of Kapan which has occurred since the date of the latest historical financial information on Kapan set out in this document.

20. AVAILABILITY OF RE-ADMISSION DOCUMENT

Copies of this document are available free of charge at the Company's registered office and at the offices of Watson Farley & Williams LLP, during normal business hours on any weekday (Saturdays and public holidays excepted) and shall remain available for at least one month after Re-Admission.

14 December 2018

PART VII

NOTICE OF GENERAL MEETING

CHAARAT GOLD HOLDINGS LIMITED

(incorporated in the British Virgin Islands with registered number 1420336)

(the "**Company**")

NOTICE IS HEREBY GIVEN that a General Meeting of the Company will be held at the offices of Watson Farley and Williams LLP, 15 Appold Street, London, EC2A 2HB at 11a.m. on 31 December 2018 for the purpose and of considering and, if thought fit, passing the following resolution as an Ordinary Resolution.

You will not receive a form of proxy or form of direction for the General Meeting in the post. Instead, Shareholders will receive instructions to enable you to vote electronically and how to register to do so, and Depositary Interests holders will be able to vote in CREST. You will still be able to vote in person at the General Meeting, and may request a hard copy proxy form directly from the registrars, Link Asset Services, 34 Beckenham Road, Beckenham, Kent, BR3 4TU (telephone number: UK – 0871 664 0300 or from overseas +44 (0)371 664 0300). – Calls outside the United Kingdom will be charged at the applicable international rate. The Registrars are open between 09:00 – 17:30, Monday to Friday excluding public holidays in England and Wales.

ORDINARY RESOLUTION

1. **THAT** the proposed acquisition by Chaarat Gold International Limited ("**CGIL**"), a wholly owned subsidiary of the Company, of the entire issued share capital of Kapan Mining and Processing Company CJSC from PMTL Holding Ltd (the "**Kapan Acquisition**") on the terms, including as to the financing thereof, summarised in the Re-Admission document issued by the Company dated 14 December 2018 (the "**Re-Admission Document**") of which this notice forms part be and is hereby approved and that the Directors of the Company, or a duly constituted committee of the Directors, be and are hereby authorised to waive, amend, vary or extend any of the terms and conditions of the Kapan Acquisition or the agreement for the Kapan Acquisition or any related agreements, including as to the financing thereof, and do all such things that they may consider necessary or desirable in connection with the Kapan Acquisition, including as to the financing thereof.

By Order of the Board
Martin Andersson
Chairman

Dated: 14 December 2018

Registered Office:
Palm Grove House, PO Box 438, Road Town, Tortola, British Virgin Islands, VG1110

Notes for Shareholders

1. Pursuant to Regulation 41 of the Uncertificated Securities Regulations 2001 (as amended), only those members registered in the register of members of the Company 48 hours before the General Meeting (i.e. by close of business on 29 December 2018) (or if the Meeting is adjourned, in the register of members of the Company 48 hours before the date and time of the adjourned meeting) (the "**Meeting**") shall be entitled to attend or vote at the Meeting in respect of the number of shares registered in their respective names at that time. Changes to entries on the register of members after that time will be disregarded in determining the rights of any person to attend or vote at the Meeting.

2. Registered members of the Company may vote at the Meeting (whether by show of hands or poll) in person or by proxy or corporate representative. A member may appoint one or more persons as his proxy to attend and vote at the Meeting on his behalf. A proxy need not be a member. Where more than one proxy is appointed the instrument of proxy must specify the number of shares each proxy is entitled to vote.

3. The appointment of a proxy will not affect the right of a member to attend and vote in person at the Meeting or adjourned meeting. A member that is a corporation may appoint a representative to attend and vote on its behalf at the Meeting by delivering evidence of such appointment to the Company's registrar no later than 48 hours before the time fixed for the Meeting (i.e. by 11a.m. on 29 December 2018) or any adjourned meeting.

4. In order to be valid, the proxy appointment (together with any power of attorney or other authority (if any) under which it is signed, or a notarially certified copy of that authority) must be returned by one of the following methods, in each case so as to arrive no later than 11a.m. on 29 December 2018 or, in the case of an adjourned meeting, not less than 48 hours before the time appointed for holding such adjourned meeting (ignoring for these purposes non-working days) or (in the case of a poll taken otherwise than at or on the same day as the Meeting or adjourned meeting) for the taking of the poll at which it is to be used:

   a. in hard copy form by post, by courier or by hand to the company's registrars, Link Asset Services at 34 Beckenham Road, Beckenham, Kent, BR3 4TU;

   b. via www.signalshares.com by logging on and selecting the 'Proxy Voting' link. If you have not previously registered for electronic communications, you will first be asked to register as a new user, for which you will require your investor code (IVC), (which can be found on your share certificate), family name and postcode (if resident in the UK).

Notes for Depositary Interest Holders:

1. You will not receive a form of direction for the Annual General Meeting in the post. Depositary Interests may be voted through the CREST Proxy Voting Service in accordance with the procedures set out in the CREST manual.

   In the case of Depositary Interest Holders, a form of direction may be requested and completed in order to instruct Link Market Services Trustees Limited, the Depositary, to vote on the holder's behalf at the Meeting by proxy or, if the Meeting is adjourned, at the adjourned meeting. Requests for a hard copy should be sent to Link Asset Services at 34 Beckenham Road, Beckenham, Kent, BR3 4TU (Telephone number: UK – 0871 664 0300 or from overseas +44 (0)371 664 0300). – Calls outside the United Kingdom will be charged at the applicable international rate. The Registrars are open between 09:00 – 17:30, Monday to Friday excluding public holidays in England and Wales.

2. To be effective, a valid form of direction (and any power of attorney or other authority under which it is signed) must be received electronically or delivered to Link Asset Services at 34 Beckenham Road, Beckenham, Kent, BR3 4TU by no later 11 a.m. on 28 December 2018) or 72 hours before any adjourned Meeting. You must be registered as holder of the Depositary Interests as at close of business on 28 December 2018 for your form of direction to be valid.

3. The Depositary will appoint the Chairman of the meeting as its proxy to cast your votes.

4. Depositary Interest holders wishing to attend the meeting should contact the Depositary at Link Market Services Trustees Limited, The Registry, 34 Beckenham Road, Beckenham, Kent, BR3 4TU or by email by using CAGtrustees@linkgroup.co.uk by no later than 11a.m. on 28 December 2018.

General Notes:

1. The Chairman may also vote or abstain from voting as he or she thinks fit on any other business (including amendments to resolutions) which may properly come before the meeting.

2. The 'Vote Withheld' option is provided to enable you to abstain from voting on the resolutions. – However, it should be noted that a 'Vote Withheld' is not a vote in law and will not be counted in the calculation of the proportion of the votes 'For' and 'Against' a resolution.

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