KAINANTU
RESOURCES LIMITED

NI 43-101 Technical Report

Kili Teke Cu-Au Project, Papua New Guinea

Prepared by:

Graeme J Fleming

18 November 2022

CERTIFICATE OF QUALIFIED PERSON

I, **Graeme Jon Fleming**, do hereby certify that:

1. I am an independent Consulting Geologist and Professional Geoscientist, business address Jl. Bukit Batu Layar No. 23, Batu Layar, Lombok Barat, NTB, 83111 Indonesia (Tel:+62-370-750 3694) and am the principal of GJF Geological Services based in Lombok, Indonesia.

2. I graduated with a Bachelor of Applied Science (B. App. Sc.) from the NSW Institute of Technology in 1980. I was a registered member of the AUSIMM from 1990 to 2020 and am now a registered member of the Australian Institute of Geoscientists (MAIG, No, 7609).

3. I have worked as a geologist for a total of 27 years since my graduation, primarily as a senior minerals explorationist involved in precious and base metals exploration within young volcanic terrains of the Australasian region. I have participated in and led several successful campaigns from greenfields exploration programs (discovery in 1990 of the Miwah high sulphidation Au-Cu prospect, Aceh), through initial diamond drill programs (1987, Co-O Au deposit, Mindanao) to more advanced and mine development programs (Toka Tindung Gold Project, North Sulawesi, where I recruited and managed from 2010-14 a largely national team instrumental in substantially increasing the published resources). Since 2000, I have, through my Indonesian consulting company, provided geological services for clients including design and implementation of exploration programs, and evaluation and assessment of prospects in Indonesia, Papua New Guinea, Australia, and Africa.

4. I am responsible for all Sections of this Technical Report entitled "NI 43-101 Technical Report-Kili Teke Cu-Au Project, Papua New Guinea". I have visited the Kili Teke Project in EL 2310, Papua New Guinea, on November 17 2022 and reviewed the exploration program, together with interviewing a local representative of the national team involved in the Project history.

5. I am a Qualified Person as defined in National Instrument 43-101 ("the Policy") and a Competent Person as defined under the JORC code (2012).

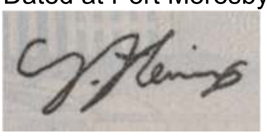
6. I have read the Policy and this report is prepared in compliance with its provisions. I have read the definition of "qualified person" set out in National Instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfil the requirement to be a "qualified person" for the purposes of NI 43-101.

7. That, at the effective date of the technical report, to the best of my knowledge, information and belief, the report contains all scientific and technical information that is required to be disclosed in order to make this report not misleading.

8. I have not had prior involvement with the Property that is the subject of this Technical Report. I have no direct or indirect interest in the Property that is the subject of this report. I do not hold, directly or indirectly, any shares in Kainantu Resources Limited , or any other identity with interests in the Kili Teke Project Property. I am fully independent of the issuer applying all of the tests in section 1.5 of NI 43-101.

9. I do not hold any direct interest in any mineral tenements in Papua New Guinea. I will receive only normal consulting fees for the preparation of this report.

Dated at Port Moresby on November 18, 2022



Graeme Fleming
B. App. Sc. (Geol), MAIG
Qualified Person

Table of Contents

Tables

Figures

1. EXECUTIVE SUMMARY

INTRODUCTION

This report is prepared as an independent review of the Kili Teke Project, by Graeme Fleming, an independent QP, on behalf of Kainantu Resources Limited (KRL). The requirement for the report was triggered by the announcement by KRL of the acquisition of the Kili Teke Project from Harmony Gold (PNG) Exploration Limited (Harmony).

The sources of information are largely the technical reports of Harmony, plus various management interactions with Harmony staff, and others involved in the acquisition process. A site visit undertaken by a Qualified Person on behalf of KRL had been delayed, in part because of security concerns surrounding the recent general election in PNG, but has now been successfully conducted. All information presented has been reviewed and checked for technical quality (in context) by the author of this report, and, in the author's opinion, there is no reason to question the veracity of any of the information.

TENURE

The Kili Teke tenement EL2310 covers an area of approximately 252km^2, and lies approximately 40km west of the Porgera and Mt Kare gold mines. It is located in the Koroba-Kopiago District of the Hela Province of PNG. The EL was granted to Harmony on the 24 May 2014. It has been renewed three times before, and is currently the subject of a Warden's Hearing to approve a further extension of the licence (which is expected to be finalised before the end of 2022). All licence conditions and expenditure commitments for EL2310 have been fulfilled, and the tenement is in good standing.

ACCESS & INFRASTRUCTURE

The Kili Teke tenement area can be accessed by road, via the Highlands Highway which transects the tenement across its southwest corner (Fig. 4-1). The nearest major centre is Mount Hagen, which is a five hour drive to provincial capital, Tari (254 km), and it takes another two hours to reach the village of Auwi (77km), located on the southern boundary of the tenement, 14km due south of the Kili Teke deposit. Access to Kili Teke by helicopter, from Mount Hagen, takes approximately 1 hour 10 minutes.

The climate of the Western Highlands of PNG is temperate all year, and weather is not an impediment to ongoing exploration or future mine development. Kili Teke is located in rugged mountainous terrain, at an elevation of about 1,100m AMSL. The whole tenement is covered with rain forest. Local infrastructure to support a new mine at Kili Teke is favourable. The Hides gas power station, which supplies electricity to the Porgera Gold Mine, is 50km to the south, and the largest sealed airstrip in PNG, at Komo, is 80km to the south. Dirt airstrips are much closer, at Auwi and Tari. The PNG government has also announced funding to extend the sealed road along the Highlands Highway route, which would serve a mine at Kili Teke.

PAST EXPLORATION

The Kili Teke deposit was first discovered by Placer Exploration, in 1995, as an intrusive body with surrounding skarn mineralisation, but they opted not to follow up. Aldridge Minerals were the first company to drill-test Kili Teke. They drilled three short holes at the end of 2011, and two of the three holes intersected weak to moderately developed porphyry and skarn mineralisation. Aldridge abandoned the project due to technical difficulties and logistical challenges.

Harmony began exploration at Kili Teke in June 2014, by completing detailed mapping and ridge and spur soil sampling over the area. Outcrops of stockwork Cu-Au mineralisation, with skarn breccias and classic porphyry alteration assemblages, were identified. A detailed airborne magnetic and radiometric survey was flown in October 2014, to assist with drill targeting, and four targets were defined, including the Central Mineralised Porphyry (CMP), the Transfer Zone Porphyry (TZP), the Ridge Gold Anomaly (RGA), and the Ieru Porphyry (IP). Three separate drilling programmes have been completed since then, on the CMP, each culminating in a Mineral Resource estimate. The TZP and IP targets have been adequately tested and require no further work, but the RGA target remains alive as a target. Three holes have been drilled into the RGA target, but it is possible that the target is largely buried beneath a limestone cap, which is interpreted to have been thrust over the Kili Teke deposit from the north.

In total, Harmony has spent about $20 million on exploration at Kili Teke. No exploration work has been completed by KRL.

GEOLOGY

Kili Teke lies within the northern margin of the Papuan Fold Belt PFB), a terrane of strongly folded and thrusted limestone and clastic sediments. Late Miocene/Pliocene dioritic to monzonitic intrusions occur along a linear trend parallel to the margins of the PFB, and significant mineralised porphyry systems are associated with the intrusions (including the world-class deposits at OK Tedi, Frieda River and Porgera). Prominent NE-trending transfer faults are regarded as a first-order control on porphyry mineralisation.

The local geology of the Kili Teke tenement is derived from regional mapping (at 1:250,000 scale) by the Australian Geological Survey. A host sequence of early to late Cretaceous Ieru Formation clastic sediments, Miocene Darai limestone and Lai Siltstone, have been intruded by multiple phases of intermediate composition dioritic porphyries. Later thrusting has offset the top of the porphyries and emplaced a limestone cap, which obscures the full extent of the underlying intrusives. Various skarn units have developed on the margins of the intrusives, where they are in contact with the host limestone, and numerous hydrothermal breccias occur.

The Kili Teke host intrusion can be subdivided into at least six phases: diorite (ID), microdiorite (IDM), hornblende porphyry (PH), and three different feldspar-hornblende porphyries (PFH1/2/3), which are differentiated by cross-cutting relationships, as well as being geochemically distinct. The early diorite and hornblende porphyry play host to all porphyry vein assemblages but, in contrast, only the first of the later feldspar-hornblende porphyries (PFH1) is mineralised. The latest feldspar-hornblende porphyries (PFH2 and 3) are low grade and barren, respectively.

Magmatic hydrothermal breccias and skarn breccias are both important at Kili Teke, although their geometry and distribution is not well defined, because of the relatively widely spaced drilling. Skarns have developed on the periphery of the main intrusion, but also along internal contacts (between different phases of porphyry) and along structures. Two types of skarn potentially represent prograde and retrograde assemblages.

The structural setting of the Kili Teke Project area is complex at both the regional and prospect scale, and, as such, no fault boundaries (except for the Upper Thrust) have been modelled and incorporated into the Mineral Resource model.

The Kili Teke deposit contains alteration assemblages typical of porphyry Cu-Au systems – an early potassic alteration is overprinted by phyllic and argillic alteration. Mineralisation is mostly disseminated and vein-infill chalcopyrite (the dominant copper sulphide), with some bornite and molybdenite present in the main stockwork zones: the Southern (SSZ) and Northern Stockwork Zones (NSZ). The orientation of the higher grade stockworks is interpreted to dip steeply to the east, but post-mineralisation faulting may complicate this trend – further drilling is required to confirm how.

DRILL-OUT

Apart from the first three holes (drilled by Aldridge Minerals), all drilling at Kili Teke has been under the management of Harmony, who used Titeline Drilling, of Ballarat, Victoria, as the contractor. A heli-portable coretech diamond drill rig was used throughout the programme. The spacing of drill pad locations is typically 200-300m (some were utilised more than once), which resulted in drill intercept spacings of 50-100m, in the upper levels of the deposit, and 100-200m, in the deeper levels. Triple-tube drilling was used to maximise core recovery, which was typically satisfactory (80% of all runs achieved better than 90% recovery, and 65% of all runs achieving 100% recovery).

All drill collars were surveyed and are accurate to ±0.2m, and each hole was surveyed with a Reflex EZ downhole survey tool, at nominal 30m intervals. The core was geologically and geotechnically logged by Harmony geologists and field technicians, using LogChief software, and data was archived on a central server (in Harmony's Brisbane office). All core was photographed, and all intercepts of interest were sampled at 1m intervals.

Samples were prepared (crushed and milled) at the Intertek Laboratory, in Lae, before being shipped to the Townsville laboratory for analysis by the Harmony "hard rock" package (30g fire assay, plus a multi-element suite by ICP-MS or ICP-OES). Standard geochemical QAQC protocols were implemented, which included the submission of blanks, certified reference "standards" and duplicates with each sample batch. QC results were monitored on a weekly and monthly basis and no issues were recorded.

Bulk density measurements were made on samples collected at 30m downhole intervals, but QC issues were identified with some measurements and data used for the Mineral Resource estimation was filtered accordingly.

No independent verification has been made of the Harmony database, to date. However, these data were used by Harmony to generate Mineral Resource estimates, in accordance with the South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves (SAMREC, 2016 Edition) (www.samcode.co.za) – which is recognised and accepted for the purposes of NI 43-101. Further data validation will be undertaken when KRL begin the next phase of work at Kili Teke.

To date, Harmony have completed preliminary metallurgical testwork – on nine samples, only (seven porphyry samples and two of skarn material). Copper and gold receoveries were reported as 95% and 65%, respectively, which is considered reasonable at this stage of the project.

MINERAL RESOURCE ESTIMATION

The geological model and resource domain were built with the implicit modelling tools in Leapfrog Geo and Micromine software. Given the low data density, the implicit modelling approach was considered the best to generate a coherent and unbiased interpretation of the resource domain; very little manual editing was required. Further drilling is required to refine the model.

The geological model depicts the intrusive complex, comprised of two pipe-like zones of stockworking, hosted primarily in the early-mineral phases of Hornblende Porphyry (PH) and Feldspar Hornblende Porphyry (PFH1): the Northern Stockwork Zone (NSZ) and the Southern Stockwork Zone (SSZ). At surface the two stockwork zones are separated by 200-300m, but they are closer at depth where they potentially merge together? No structures were modelled, due to a lack of data, but a Base Of Partial Oxidation (BOPO) surface was generated by lowering the topographic surface vertically by 20m.

Standard data analyses were performed on all raw assay data, including the calculation of global statistics, analysis of element correlations and Cu-Au ratios, top-cut determinations, an assessment of composite intervals, decluster analysis, and assessment of diffusivity and the proportional effect (the latter four were for the maiden resource, only).

Given that the current drilling density is inadequate to resolve the internal boundaries of the various intrusive phases (including the late barren porphyry) and late-stage faulting, which may have offset mineralisation, the Estimation Domain was defined by assays alone – using Micromine's Decompose function, to identify and model separate populations within the data set. The 0.125% Cu shell was the domain used for the 2017 MRE.

The latest Mineral Resource estimate (MRE) for Kili Teke, completed by Harmony in 2017, was conducted using Ordinary Kriging (OK). The calculation of variography was difficult because there is too little data to drive the variograms, and, to counter this, Harmony opted to use *Pairwise Variograms* to model variability. The sample search ellipse dimensions, to create the block model, were based on the variogram models – the first pass was restricted to a maximum of 40 samples, with a maximum of 16 per individual drill hole, which results in block estimates being informed from at least three surrounding drill holes. A kriging neighbourhood analysis (QKNA) was also performed, which confirmed that these the search ranges are the minimum acceptable.

Parent block sizes for the block model were based on one half to one third the average drillhole spacing, which equates to blocks of 60x60x60m, with sub-blocks of 20x20x20m to better resolve the volume estimate at the Estimation Domain boundary. The block model grade interpolation was completed after three passes of the search ellipse. A first pass was based on the drill hole spacing, modelled variogram ranges and the QKNA; the second and third passes are multiples of the first pass, with an increase in the maximum number of samples.

The latest MRE (2017) returns an Inferred Mineral Resource of 237Mt @ 0.34% Cu, 0.24g/t Au and 168ppm Mo, for a total of 802kt of Cu, 1.81Moz of Au and 40kt Mo (at a 0.2% Cu cut-off). The effect of incorporating skarn mineralisation into the resource was tested for the first update only (MRE, 2016).

The effect was to increase the Cu and Au grades by 5% and 4%, respectively, and to increase the respective metal contents by 11% and 10% – this represents a significant upside potential.

Routine validation tests were completed for the 2016 MRE, including a comparison of the global statistics of composite sample grades versus the block model, cross-validation plots of the same, and swath plots for Easting, Northing and elevation slices. Also, an independent estimation was completed for the 2016 MRE, using an Inverse Distance Weighted (IDW) method, which generated comparable block grades. These validation tests were not repeated for the latest estimate (MRE, 2017) but, given the OK estimation methodology was exactly the same, and there was only a minor increase in the declared Inferred Mineral Resource (3%, on an ounce equivalent basis), the latest estimate is considered to be robust.

The drilling data informing the estimate is quite sparse and widely-spaced, so the entire resource defined to date is classified as “Inferred”. Significant infill drilling will be required to upgrade the classification.

CONCEPTUAL MINING STUDIES

Preliminary mining studies, completed to date, indicate that an open pit mine could be a viable proposition. KRL believe that an open pit mine could generate robust economic returns if more high-grade mineralisation can be delineated with the upper reaches of the deposit. The excluded skarn material represents a clear target for future infill drilling.

ENVIRONMENT

There are no environmental impediments to the Kili Teke Project. Baseline water monitoring was conducted (monthly) prior to, during, and post-drilling, which demonstrates that exploration activity has had no impact on the water quality in the area.

COMMUNITY RELATIONS

Harmony completed a social mapping and population census before starting fieldwork in 2014, which revealed that most of the local population had migrated elsewhere, due to lack of services and employment opportunities. Community projects, initiated by Harmony, have included the building of a Community Hall and water tanks, support for local education (including the establishment of the Yambiri Elementary School for >70 students), law and order awareness, and medivacs.

A serious security incident occurred on 6th January 2017, when a drill rig was destroyed on-site. This was prompted by a number of issues that are now well understood. KRL staff have met with leaders of the community, who were unanimous in their support of the project.

CONCLUSIONS

- The Mineral Resource for Kili Teke comprises 237Mt @ 0.34% Cu, 0.24g/t Au and 170ppm Mo (782kt Cu, 1.75Moz Au and 38,kt Mo).
- High-grade skarn mineralisation, developed around the periphery of the host intrusion, represents a significant exploration upside.
- The detailed controls on high-grade mineralisation have not yet been established.
- There is opportunity to upgrade the open-pittable resource by infill drilling
- The RGA target has not been adequately drill-tested and further drilling is justified on this target.
- There are other targets on the tenement that have not been drill-tested.
- The key risks for the Kili Teke Project are:
  - Sovereign – will EL2310 be renewed for a further term?
  - Geological – is there sufficient high-grade mineralisation in the upper reaches of the deposit?
  - Technical – can the controls on mineralisation be determined, to target future drilling?
  - Funding – can KRL raise the funds to pay for infill drilling?

RECOMMENDATIONS

1. KRL must engage with the local community at Kili Teke as soon as possible.
2. Infill drilling should focus on improving the definition of high-grade zones within the upper, open-pittable, parts of the deposit, including the peripheral and internal skarns.
3. The RGA target should be further drill testing.
4. A comprehensive review of all previous exploration work should be completed, to highlight any other targets.

2. INTRODUCTION

This report was prepared on behalf of Kainantu Resources Limited (KRL), an Asia-Pacific-focused gold mining company, listed on the TSX Venture Exchange. It represents an independent review of the Kili Teke Cu-Au Project. The author is an independent consultant geologist, and principal of GJF Geological Services.

2.1. KRL Acquisition of Kili Teke Project

KRL announced the acquisition of the Kili Teke Project from Harmony Gold (PNG) Exploration Limited (Harmony), a wholly-owned subsidiary of the Harmony Gold Mining Company Limited of South Africa, on the following terms (KRL press release, dated 6th April 2022):

- Initial cash consideration of US$1 million, payable in two instalments: US$500,000 on closing, and US$500,000 on receipt of post-closing regulatory approvals (expected in late 2022 or early 2023);
- KRL intends to work towards a Preliminary Economic Assessment ("PEA"), then a Feasibility Study. If KRL views the Project positively at each step, KRL to make further payments to Harmony of US$3 million and US$4 million respectively;
- KRL to pay Harmony a 1.5% net smelter royalty from future mine revenue;
- Potential for Harmony to become a strategic investor in KRL under the Transaction, with Harmony to be issued warrants equal to 9.9% of the issued share capital of KRL on closing (with each warrant exercisable at C$0.28 per share).

This transaction represents a significant acquisition for KRL, which triggers the requirement of an independent Technical Report, prepared to comply with disclosure and reporting requirements set forth in NI 43-101 (2011) Standards of Disclosure for Mineral Projects.

2.2. Sources of Information

Given that the lodgement of this report has been triggered by the acquisition of a new project, the sources of information are largely the technical reports of Harmony, consultants to Harmony, and other third parties involved with the project sale. All relevant sources are listed in Section 19: References.

A formal overview of the Kili Teke Project was presented by members of the Harmony (Harmony) management team, including:

- Mike Humphries – Exploration Executive SE Asia
- Ben Rich – Exploration Manager
- Dylan Jeffries – Project Geologist (target generation)
- Ron Reid – Resource Geologist
- Daniel Ross – Mining Engineer (open pit planner)
- James Watt – Metallurgist
- Greg Job
- Anthony Naguwean

2.3. Site Visit by Qualified Person

A site visit by helicopter from Mt. Hagen to the Kili Teke Project has been conducted by the author on behalf of KRL on 17th November 2022 and confirmed the observations of a previous site visit by KRL personnel, described below. A site visit by a QP had not been possible before the acquisition was announced due to security concerns surrounding the recent general election in Papua New Guinea.

Previously, a site visit was undertaken by three staff members of KRL, as part of the due diligence process, during September 2021. James Topo (KRL Manager, External Relations), Oscar Clark (Project

Director/Geologist) and Sylvester Buku (Senior Geologist) were involved in the visit, but none meet the requirements of a Qualified Person, in terms of NI 43-101. Details of the due diligence site visit are reported under Section 16: Other Relevant Data and Information).

Key notes from the due diligence visit to site were reported by Clarke (2021):

- A concrete helipad is still serviceable, as are several other helicopter landing sites.
- The field camp has been dismantled and all infrastructure removed.
- Only 40% of diamond drill core remains in original core boxes, but the core is weathering (it is unprotected from the elements).
- Drill pads and walking trials are overgrown – but reclaimable. Sumps are backfilled. The original pads took 3-4 weeks to prepare.
- The coordinates of several drill pads and selected drill core reconciled with Harmony data and geological logs.

The author confirmed the above observations during his site visit to Kili Teke on 17th November 2022.

3. RELIANCE ON OTHER EXPERTS

All information presented in this Technical Report is derived from third party reports – all are listed in Section 19: References.

Harmony Gold Exploration (PNG) Ltd (Harmony) is a wholly-owned subsidiary of Harmony Gold Mining Company Ltd, a well-known South African mining company. Harmony is regarded as a successful explorer, with excellent technical credentials. The technical reports, from which information is summarised, conform with one of the international reporting standards: NI 43-101 2011 (Canada), SAMREC 2016 (South Africa) or JORC 2012 (Australia). And all information presented has been reviewed and checked for technical quality (in context) by the author of this report. In the author's opinion, there is no reason to question the validity of any information presented.

The Kili Teke Cu-Au Project includes an Inferred Mineral Resource of 237Mt @ 0.34% Cu (=0.8Mt Cu), 0.24g/t Au (=1.8Moz Au) and 168ppm Mo (=0.04Mt Mo), with an effective date of 30 June 2021, established by Harmony in accordance with the South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves (SAMREC, 2016 Edition) (www.samcode.co.za) – which is recognised and accepted for the purposes of NI 43-101. A suitably appropriate conservative approach was adopted by Harmony in reporting the Inferred Mineral Resource (e.g. excluding the skarn mineralisation – see below). The author has reviewed the Leapfrog model of the Kili Teke deposit.

Nick Franey, principal of NJF Consulting Pty Ltd, and Graeme Duncan, General Manager, Special Projects, KRL assisted with the compilation of this report.

4. PROPERTY DESCRIPTION & LOCATION

4.1. Location

The Kili Teke tenement EL2310 covers an area of approximately 252km^2, and lies approximately 40km west of the Porgera and Mt Kare gold mines. It is located in the Koroba-Kopiago District of the Hela Province of Papua New Guinea. Koroba is the main government station in the area. Other nearby villages include Auwi, Hauwinda and the provincial capital, Tari (Fig. 4.1).

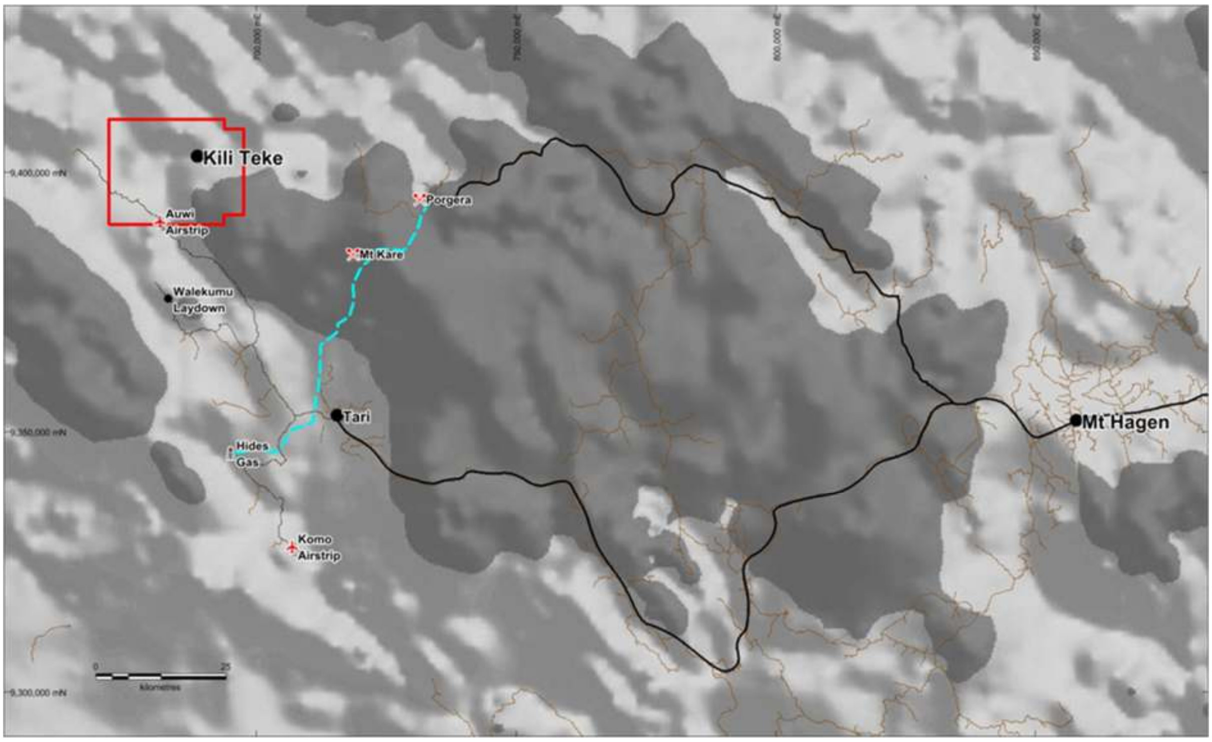


Figure 4-1: Kili Teke location and access.

4.2. Tenure

The Papua New Guinea government issues and administers mining tenements under the Mining Act 1992, through the offices of the Mineral Resources Authority (MRA). Exploration licences are issued for a term not exceeding two years, and are renewable for further two-year terms subject to compliance with expenditure and other conditions.

The Kili Teke deposit is located on exploration licence EL2310, which was granted to Harmony on the 24 May 2014. The tenement covered approximately 512 km^2 but was subject to a 50% reduction in 2016, to 252km^2 (Fig. 4.2). The EL has been renewed three times before, and is currently the subject of a Warden's Hearing to approve a further extension of the licence.

Technically, the licence lapsed on 23 May 2022, but Harmony lodged an application, dated 22nd Febuary 2022, with the MRA for another extension of term. The Warden's Hearing was scheduled for 16 Aug 2022, but this has subsequently been considered too close to the end of the extended General Election and the hearing was postponed. It has been rescheduled for 9 December 2022. After the hearing, the Warden is required to submit a report and technical assessment, within two weeks, to the next meeting of the Mining Advisory Council (MCA), which will make its recommendation to the Minister of Mines for final sign-off. At best, it will take at least five weeks for the renewal to be approved, after the Warden's Hearing (Topo, pers. comm.).

All licence conditions and expenditure commitments for EL2310 have been fulfilled, and the tenement is in good standing. According to the MRA, the tenement is current to Harmony, in acknowledgement of the renewal application underway. Harmony will attend the Warden's Hearing, with KRL granted observer status, prior to completion of the Kili Teke Project acquisition by KRL.

The licence instrument for EL2310 contains a condition conferring on the Papua New Guinea government the right to make a single purchase up to a 30% equitable interest in any mineral discovery under the licence at a price pro-rata to the accumulated exploration expenditure and then to contribute to further exploration and development on a pro-rata basis unless otherwise agreed.

In terms of the acquisition agreement, KRL will also pay Harmony a 1.5% net smelter royalty from any future mine revenue.

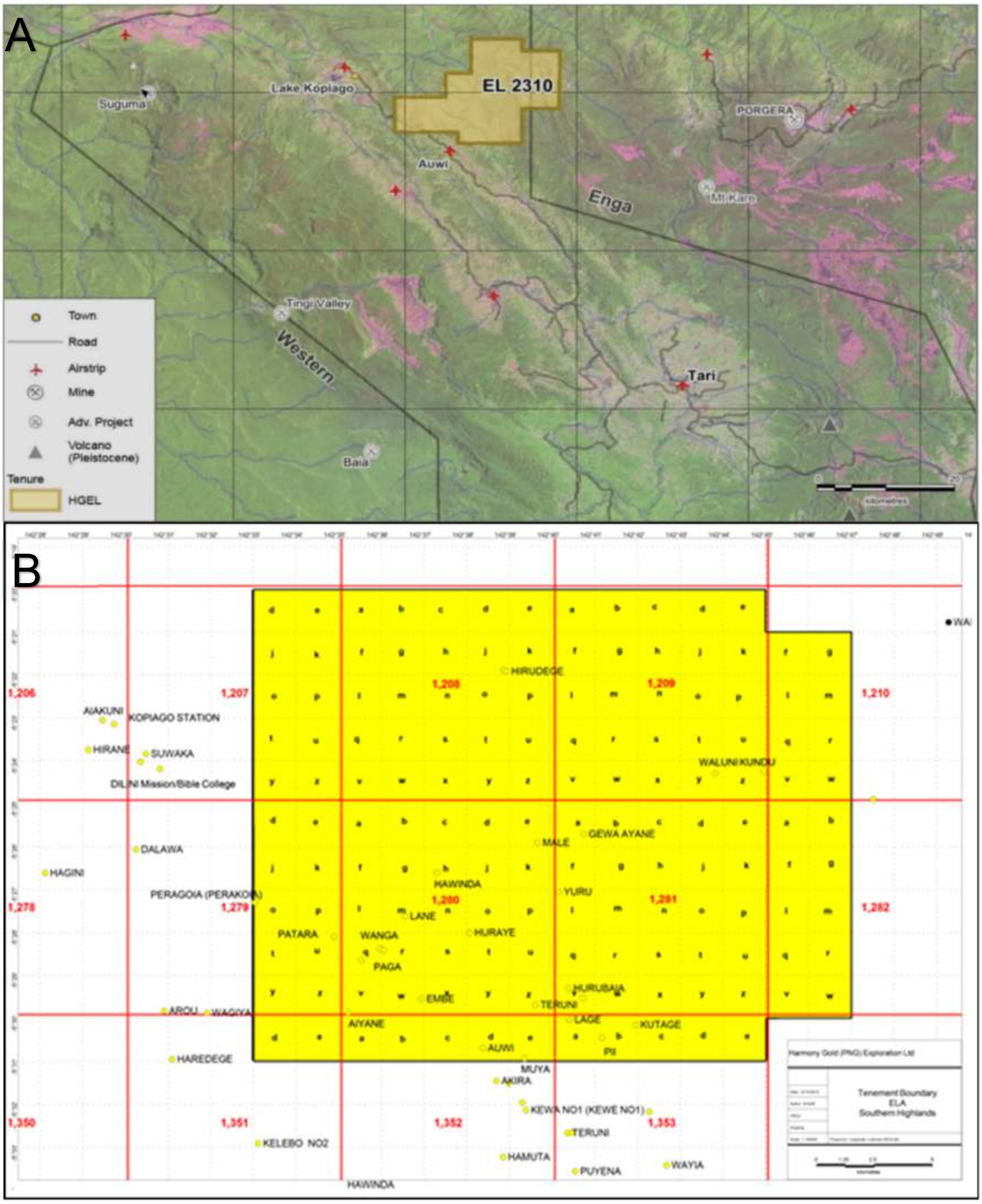


Figure 4-2: (A) Location of the original EL2310; (B) the current EL2310, to show 74 sub-blocks.

5. ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE & PHYSIOGRAPHY

5.1. Accessibility

The Kili Teke tenement area can be accessed by road, via the Highlands Highway which transects the tenement across its southwest corner (Fig. 4-1). The nearest major centre is Mount Hagen, which is a five hour drive to provincial capital, Tari (254 km). It takes another two hours to reach the village of Auwi (77km), which is located on the southern boundary of the tenement, 14km due south of the Kili Teke deposit. It takes locals 2-3 days to get to the Kili Teke site from Auwi, along a walking track – the same trip is a short 10 minute helicopter ride. Access by helicopter, from Mount Hagen, takes approximately 1 hour 10 minutes. Harmony engaged Heli Niugini for all helicopter transfers – they are familiar with the terrane. There are nearby dirt airstrips for fixed wing aircraft at Tari and Auwi.

5.2. Climate

The climate of the Western Highlands of Papua New Guinea is temperate year round (although it is one of the coldest regions in the country), with daily temperatures ranging from 10°C to 25°C For several months of the year it is warm to hot, with temperatures continuously above 25°C (www.worlddata.info) (Fig. 5.1).

Figure 5-1: Average daytime and nighttime temperatures, Western Highlands, PNG.

The average annual rainfall is 3,650mm spread throughout the year, although there are often drier periods from April through to October (Fig. 5-2). There are high-intensity rainfall events of short duration, but there are no large rainfall events such as cyclones or monsoons.

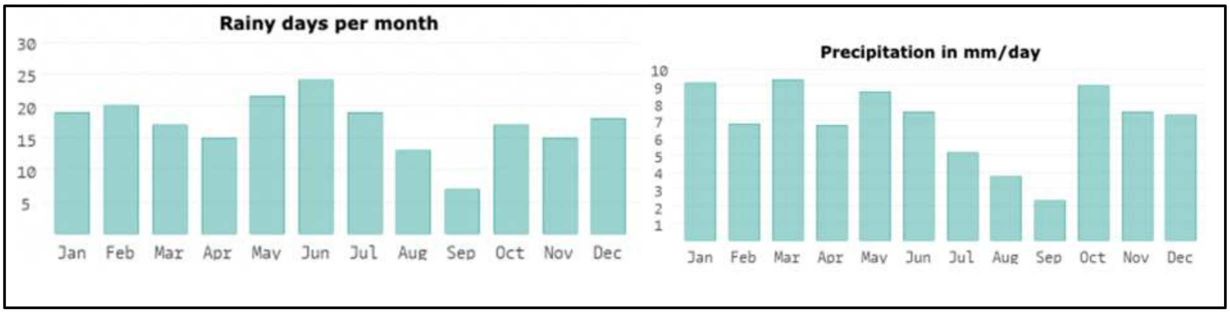


Figure 5-2: Average rainfall, Western Highlands, PNG.

[NB: A rainy day is a day on which there is at least 0.1mm precipitation (=0.1 litre falls per square meter). This can be rain, snow, hail or even dew; it does not have to rain the whole day. June is the wettest month of the year, and September is the driest (only 2.3mm/day)].

5.3. Local Resources & Infrastructure

Local infrastructure to support a new mine at Kili Teke is favourable. The Hides gas power station, which supplies electricity to the Porgera Gold Mine, is 50km south of Kili Teke (Fig. 4-1).

The largest sealed airstrip in PNG, at Komo, is 80km to the south, and there are dirt airstrips much closer, at Auwi and Tari. The government has announced funding to build sealed roads between the local towns of Komo, Tari, Korobo and Mendi, all of which would serve a future mine at Kili Teke.

KRL stakeholders have significant experience operating in the Hela District, where the Project is located. Based on initial discussions, with relevant community groups, KRL is confident it can develop a viable community programme at Kili Teke.

5.4. Physiography

Kili Teke is located in rugged mountainous terrain, on the western side of a ridge. The Logaiyu River, which flows to the west of Kili Teke, is at an elevation of about 1,100m AMSL, with the peak of the ridge, to the southeast, at about 1,650m AMSL. The whole tenement is covered with rain forest (Fig. 5-3).

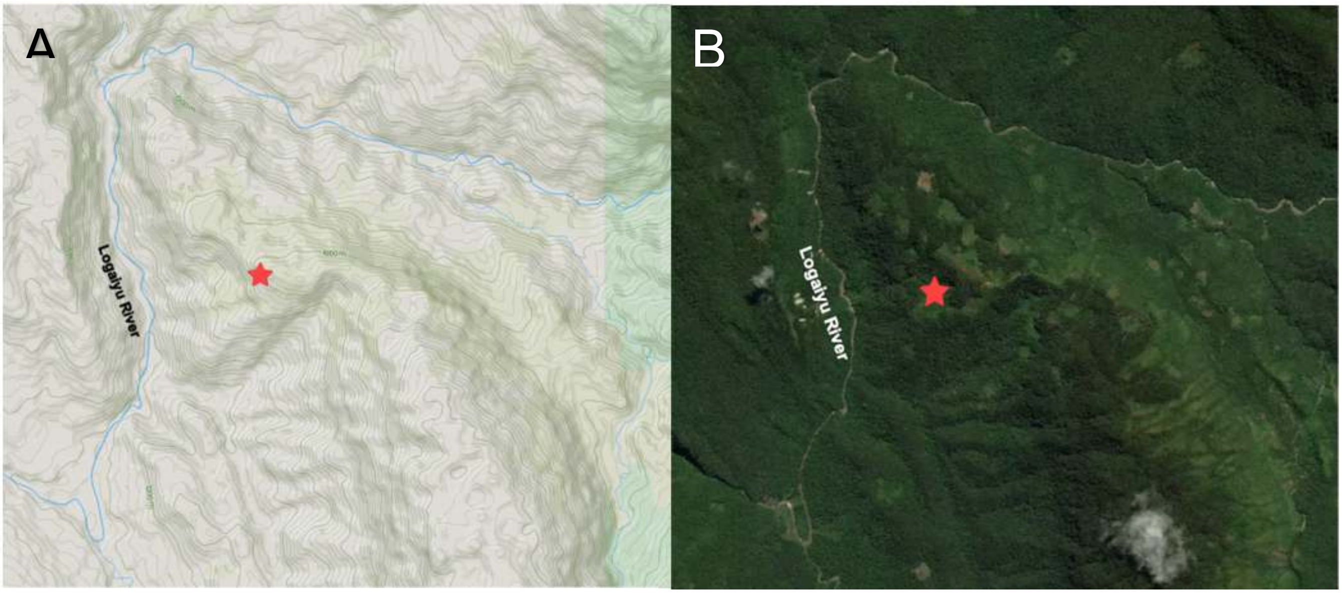


Figure 5-3: Physiography of the Kili Teke area (red star) – A topography, B rainforest cover.

6. HISTORY

6.1. Past Exploration

6.1.1. CRA

CRA completed a program of regional stream sediment sampling during 1987 to 1988 over PA591 Mount York, covering the area west and north of Waluni through to Mount Kare in the east. Exploration in the Waluni area discovered mineralised gold bearing float in the Logaiyu River with assays up to 7.5ppm Au. CRA attributed this material to a conglomerate bed with clasts of this rock derived from a distal source; they relinquished the western 50% of PA591 in 1988 to concentrate on the Mount Kare area.

6.1.2. Magnum Minerals

Magnum Minerals completed work in the Waluni area as part of their exploration program over PA 870 Koroba – Kopiago, during 1988-1989. They identified variably altered volcanics in float material with peak gold results up to 0.1ppm Au. They also identified a low order gold anomaly in panned concentrate and bulk leach samples in the Logaiyu River.

6.1.3. Placer Exploration

Placer Exploration completed reconnaissance geological mapping, stream sediment sampling, rock chip sampling and petrographic analysis during 1995, as part of an exploration program over EL1148 Waluni. They identified an intrusive body with surrounding skarn mineralisation, but deemed the system to contain only low tenor Cu-Au mineralisation, with low potential to host a Porgera-style deposit or a gold-rich copper porphyry system; they relinquished the tenement in 1996.

6.1.4. Aldridge Minerals

Aldridge Minerals explored the Kili Teke area from 2009 to 2012, completing rockchip and soil sampling, followed by an IP geophysical survey in June 2011. Aldridge drilled three holes, for a total of 596.6m, from August 2011 to January 2012. Drill results supported the initial surface works, with two of the three holes intersecting weak to moderately developed porphyry and skarn mineralisation. Reported results were:

- KT003 intercepted 134m grading 0.28% Cu and 0.37g/t Au, from 35m
- KT002 intercepted 137m grading 0.11 g/t Au and 2.82g/t Ag, from surface.

Aldridge initially planned to drill seven holes (for a total of approximately 2000m), but the programme was cut short due to cost overruns, technical drilling issues, difficult terrain and unexpected delays encountered on site.

6.1.5. Harmony

Harmony began exploration at Kili Teke in June 2014, by completing detailed mapping and ridge and spur soil sampling over the area. Outcrops of stockwork Cu-Au mineralisation, with skarn breccias and classic porphyry alteration assemblages, were identified at numerous locations on the western side of the main ridge, and a Cu-Au geochemical anomaly was delineated over a 2km x 1km area. A detailed airborne magnetic and radiometric survey was flown in October 2014, to assist with drill targeting (Fig. 6-1).

Four targets were defined, including the Central Mineralised Porphyry (CMP), the Transfer Zone Porphyry (TZP), the Ridge Gold Anomaly (RGA), and the Ieru Porphyry (IP) (Fig. 6-2). A diamond drill programme of 14 holes (KTDD004 to KTDD017), for 8,713m, was completed at the CMP target, between November 2014 and November 2015, and a maiden Mineral Resource was estimated, based on all available data (17 holes, in total). Details of the Harmony exploration protocols are included in Appendix 1 (JORC Table 1: Kili Teke Project – prepared for MRE, 2016).

Drilling continued at the CMP, with a further 18 holes completed (for 12,760m) between November 2015 and June 2016, and the maiden Mineral Resource was updated (based on 35 drill holes).

22 more holes were drilled (for 14,850m) between June 2016 and January 2017, when the programme was halted. Of the 22, 15 holes (11,168m) were drilled to further test the CMP, and the remaining seven were drilled to test the three peripheral targets: TZP, RGA and IP. A final update to the Mineral Resource estimate was completed in January 2017 (based on 50 drill holes, in total).

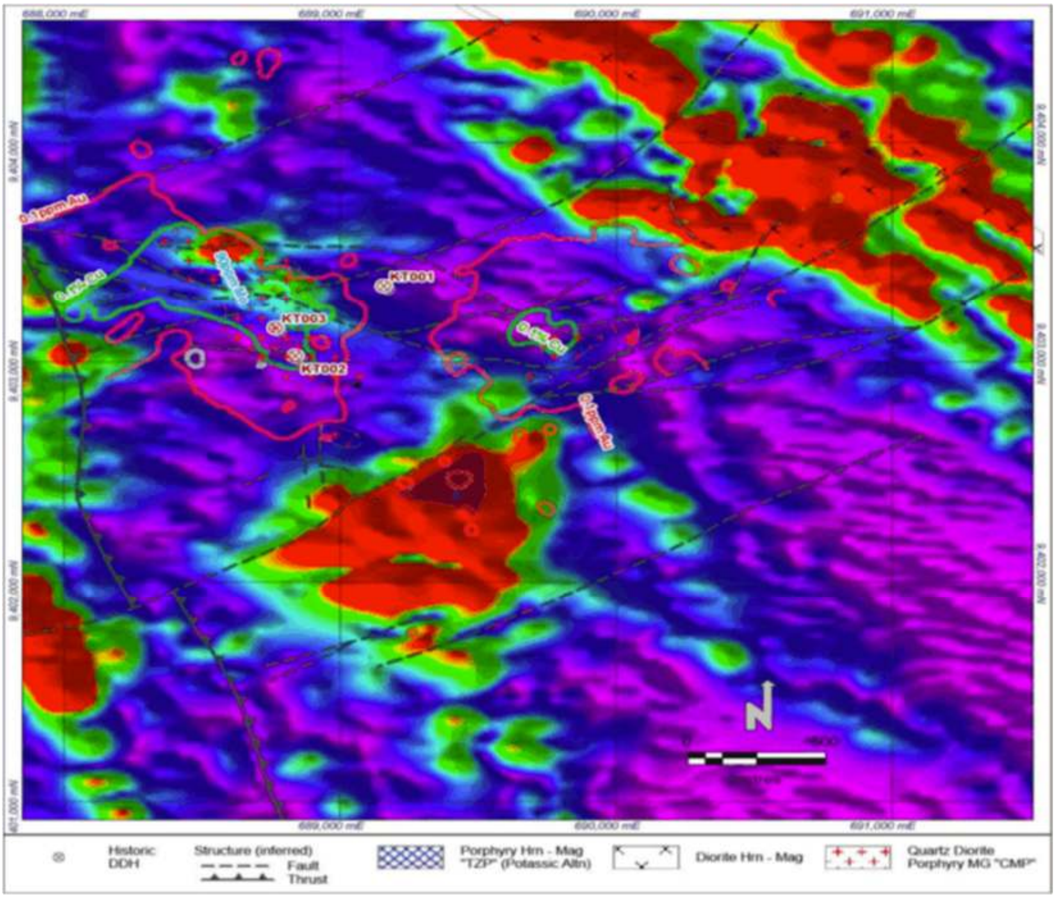


Figure 6-1: Airborne magnetic image, with surface geochemical contours Cu & Au.

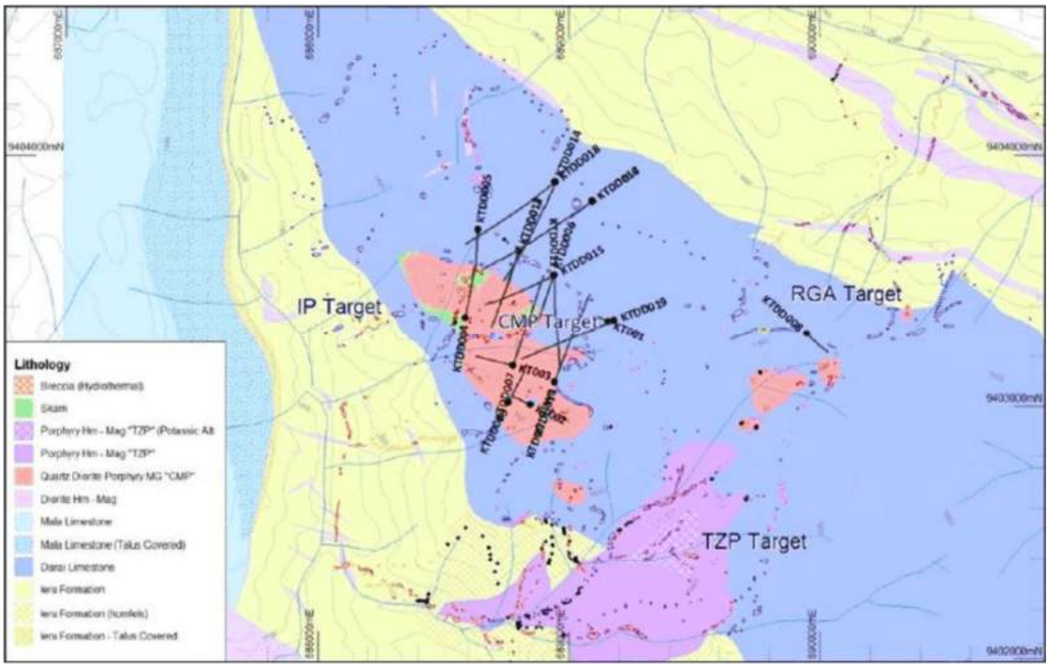


Figure 6-2: Harmony Initial drill targets at Kili Teke.

Harmony considered the drill tests of the TZP and IP targets to be effective, with no further work necessary. The TZP target was tested with two drill holes, and one deflection. KTDD051, drilled towards the SE, to test beneath a pyrite-rich intrusive outcrop, intersected potassic-altered diorite, with some D-veins and sericite-intermediate argillic alteration overprint. This mineralisation was interpreted to be leakage from the nearby CMP, while the alteration overprint is likely due to the nearby TZ structure. KTDD052 & KTDD052 W1, drilled NNW, towards the inferred TZ structure, to test the outward zonation of the TZP potassic alteration, intersected diorite and hornblende breccia before passing into host sediments, and then the TZ structure (with associated phyllic and intermediate argillic alteration).

KTDD040 was drilled into the IP target, but intersected no significant mineralisation. Harmony concluded that the gold anomaly at surface was due to scree from the nearby CMP mineralised outcrop.

The RGA target was first defined as an area of elevated Tl, Sb, As, Bi, Te and Cu-Au-Mo (Fig.6-3) (and selected porphyry proxies, including Ti/Sr and Pb-Zn-Mn) in soils, which was open to the northeast (Kavanamur, 2021). Strong clay alteration and oxidized breccia was mapped in the area and selective rock chips (to 3.5g/t Au) and a short trench (5m@0.37g/t Au & 0.77% Cu) confirmed the target. The target was first tested by an early drill hole (KTDD008), which intersected a sequence of limestone transitioning into marble until 178.5m, before passing into a weak propylitic-silica/pyrite-altered feldspar diorite porphyry, to 208.2m (EOH). Elevated Au was associated with the intrusive, and the final 5.2m of the drill hole was anomalous (0.19g/t Au). Weak Cu and base metal mineralisation (up to 0.7% Zn and 0.2% Pb) was also noted associated with skarn development within limestone or the altered intrusive.

The RGA target area was interpreted as representing the surface expression of either a limestone buffered advanced argillic and/or phyllic alteration lithocap, developed above, or as a plume like shoulder, to a potential "new" porphyry target. It was suggested that the target might extend beneath the limestone cap, northwards, which would effectively screen (cut off) an extended geochemical signature.

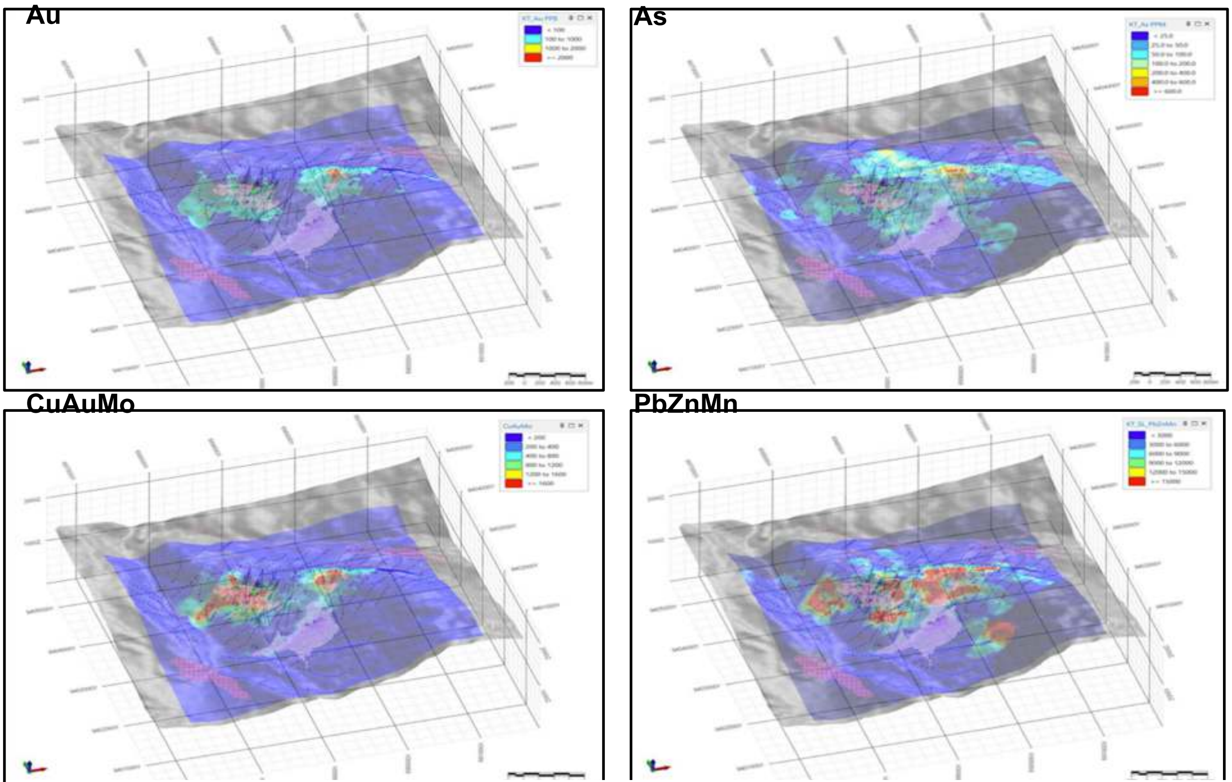


Figure 6-3: Thematic maps of the extended soil sampling grid, across the RGA target – Au, As, CuAuMo, PbZnMn.

Two more holes were drilled to test this target in late 2016 (a fourth hole failed to penetrate the limestone cap). KTDD036 (drilled to the SW) intersected weak- to moderate calc-silicate alteration, narrow patches of massive sulphide skarn and pockets of hydrothermal breccia. Some narrow fingers of altered hornblende-diorite porphyry within a clayey fault zone reported elevated Cu/Au, but no economic intercepts. KTDD055, drilled SSE, to 1,049m (deep!), intersected marble, fingers of diorite and hydrothermal breccia, but no skarn. This test by two holes was considered insufficient for this target.

During the recent COVID-19 pandemic, Harmony extended the soil sampling coverage of the RGA target to the north and east (Fig. 6-3) (Kavanamur, 2021). 189 soil samples and 25 more rock chip samples were collected, and the soil anomaly has now been closed out to the northeast. Further mapping, completed in conjunction with the soil sampling, did not identify evidence of over thrusted limestone in the area. However, the limestone is largely homogenous, with bedding relations poorly preserved, and marbilisation was only noted related to known intrusives. The possibility that late, post-mineral, over-thrusting of the limestone masks the continuation of a blind system cannot be ruled out. The target requires further drill-testing.

In total, Harmony has spent about $20 million on exploration at Kili Teke.

6.2. Previous Mineral Resource Estimates

The maiden Mineral Resource estimate was completed by Harmony in November 2015 (**Error! Reference source not found.**). The Inferred Mineral Resource was reported was based on a 0.2% Cu cut-off, along with sample support criteria and a minimum elevation of 1000mRL. Preliminary mine planning studies indicated that the Kili Teke deposit was amenable to a bulk mining, open pit operation.

Table 6-1: Maiden Resource estimate for the Kili Teke deposit, November 2015.

Resource Category	Mt	Cu %	Au g/t	Mo ppm	Cu (Kt)	Au (MOz)
Measured	-	-	-	-		
Indicated	-	-	-	-		
Inferred	128	0.40	0.29	173	506	1.2
Total	128	0.40	0.29	173	506	1.2

An updated Mineral Resource estimate was completed in June 2016 (Table 6-2), based on similar criteria to the maiden estimate, but his time to a minimum elevation of 780mRl.

Table 6-2: Updated Resource estimate for the Kili Teke deposit, June 2016.

Resource Category	Mt	Cu %	Au g/t	Mo ppm	Cu (Kt)	Au (MOz)
Measured	-	-	-	-		
Indicated	-	-	-	-		
Inferred	222	0.35	0.25	170	781	1.75
Total	222	0.35	0.25	170	781	1.75

A final Mineral Resource estimate was completed in January 2017 – see Section 14 (Mineral Resource Estimate).

6.3. Historical Production

There has been no historical production from the Kili Teke deposit.

7. GEOLOGICAL SETTING & MINERALISATION

7.1. Regional Geology & Structural Setting

The Kili Teke tenement (EL2310) lies within the northern margin of the Papuan Fold Belt, a terrane of strongly folded and thrusted limestone and clastic sediments. This fold belt is bordered to the north by the Legaip Fault zone (which may represent the northern boundary of the Australian tectonic plate) and to the south by the Hegigio Thrust, which separates it from overlying Quaternary sediments of the Australian Fly Platform (Fig. 7.1). The northern part of the fold belt is dominated by thrust faulting, which has produced geological repetition of the sediments as they have been thrust, southwards, against the Muller Anticline.

Late Miocene/Pliocene dioritic to monzonitic intrusions occur along a linear trend parallel to the margins of the Papuan Fold Belt (red in Fig. 7-1). Significant mineralised porphyry systems are associated with the intrusions, including the world-class deposits at OK Tedi, Star Mountains and Frieda River, in the west, and the Porgera and Mt Kare deposits, just east of Kili Teke. Prominent NE-trending transfer faults are regarded as a first-order control on porphyry mineralisation.

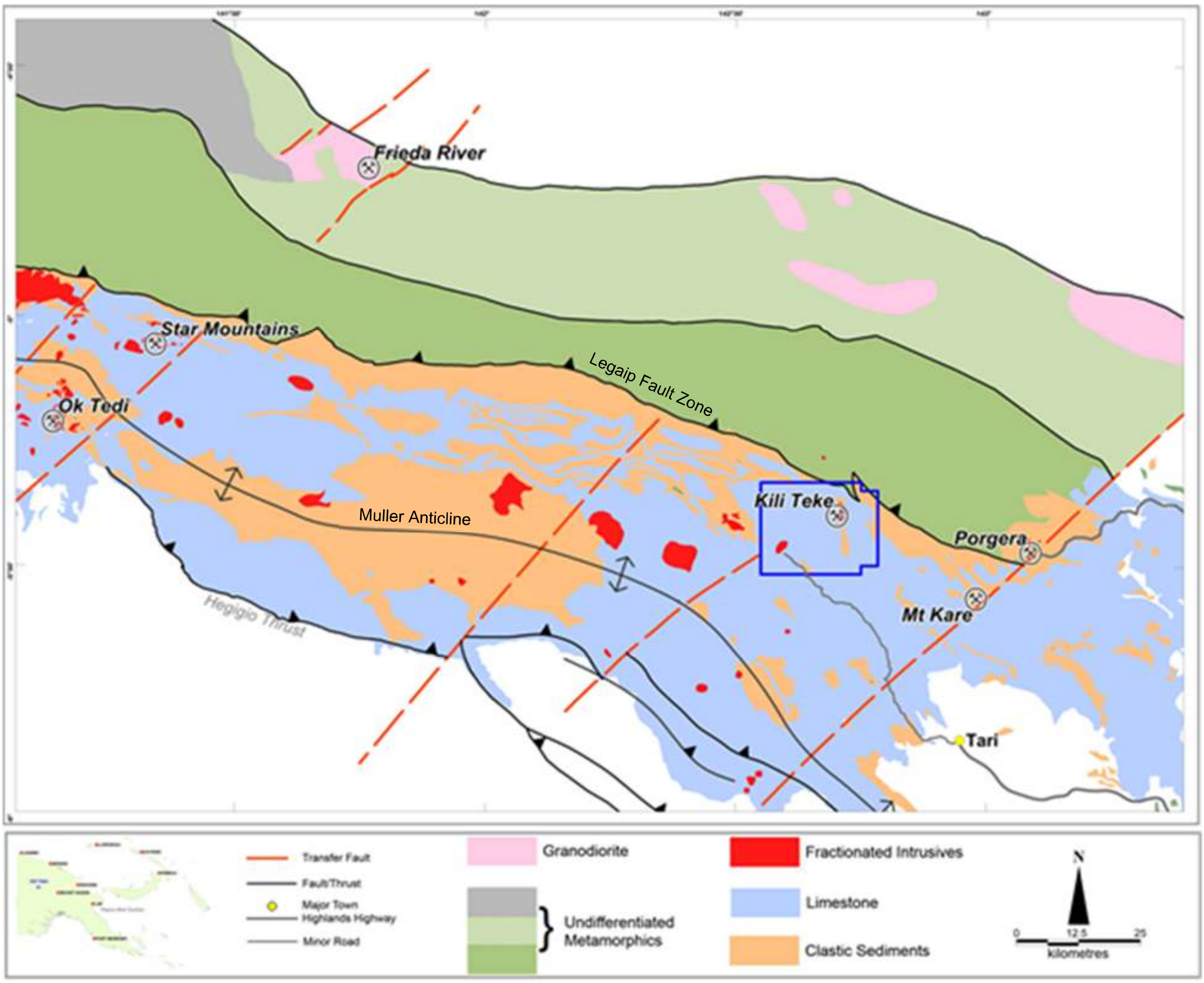


Figure 7-1: Regional geological setting of the Kili Teke prospect.

The Kili Teke tenement is very close to the northern boundary of the Papuan Fold Belt. Extensive tracts of older Jurassic limestone (the Om Formation) are being thrust to the south (over the fold belt). The surface manifestation of these NW-trending, SW-verging, thrusts dominate the regional magnetics of the region (Fig. 7-2). The thrusts have a moderate to shallow dip (to the northeast), as is typical of fold and thrust belt geometries. Note the interpretation of a buried intrusion (?) associated with an ENE-trending structure, on the southeastern extension of the NE-trending Kili Teke transfer fault.

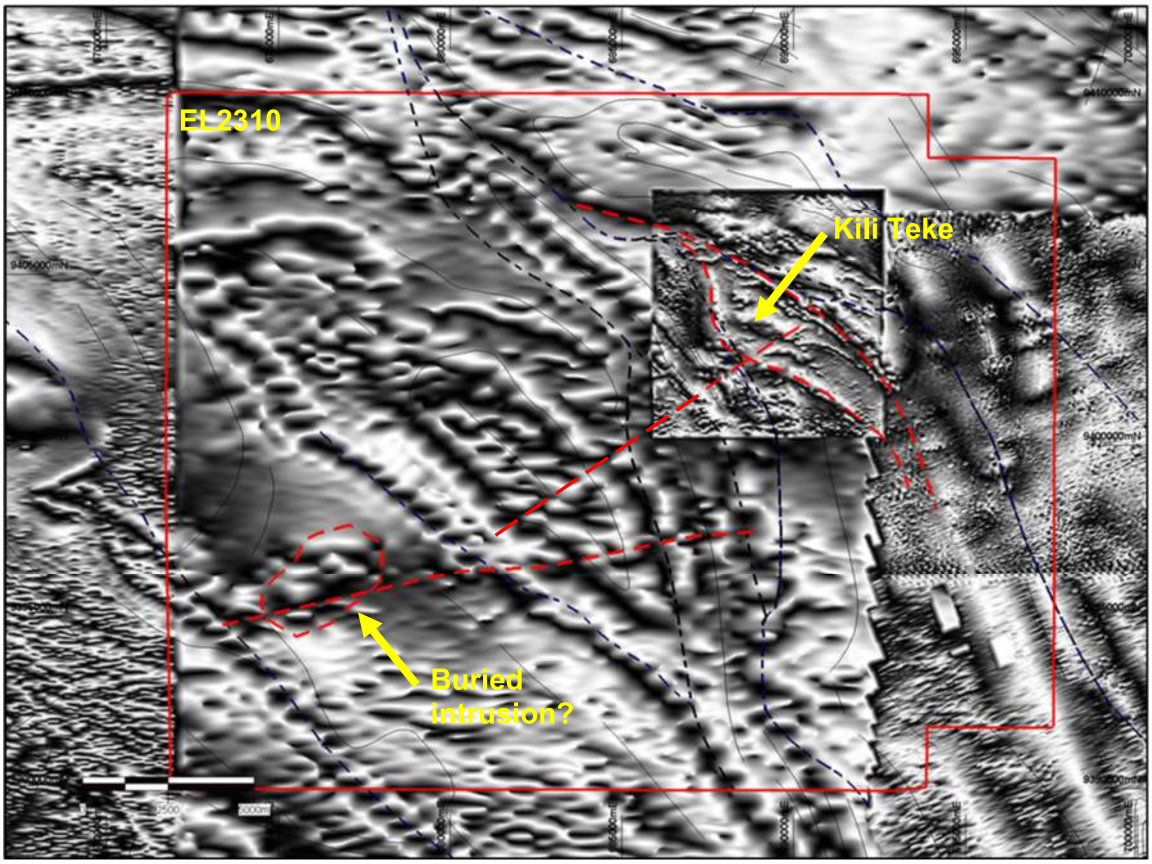


Figure 7-2: Tilt Magnetics from the combined regional and 2014 Helimag survey illustrating the main structural features in the tenement area. Note the location of Kili Teke and a second possible buried intrusion(?).

Age dating results from SHRIMP $^{206}Pb/^{238}U$ analysis of zircons from five samples of selected intrusive phases within the CMP record the age of the Kili Teke intrusives to range from 3.59±0.5Ma to 3.50± 0.04Ma (Table 7-1). This is slightly younger age than nearby deposits, in a similar position within the fold and thrust belt, such as Mt Mula and Bisamu (at Lake Kopiago), which have reported ages of 5Ma and 5.5Ma, respectively. In contrast, the Ok Tedi deposit at the front of the fold and thrust belt has an age of 1.1-2.5Ma (Fig. 7-3).

Table 7-1: Results of SHRIMP 206Pb/238U analysis on selected intrusive phases.

Hole_ID	*Sample_ID*	*From*	*To*	*Lith*	*Comments*	*Age*
KTDD029	S020951	352.7	356	PFH1	Feldspar Hornblende Poprhyry1 with A-B-D veins throughout. Lower contact cut by Feldspar Hornblende Porphyry2 @ 356.2m	3.52 ± 0.05
KTDD029	S020952	356.5	360	PFH2	Feldspar Hornblende Poprhyry2 cuts Feldspar Hornblende Porphyry1 on upper contact and cuts Diorite on lower contact	3.50 ± 0.04
KTDD029	S020953	367.15	370.83	ID	Host Diorite containing A and D veins. Some clay alteration. Upper contact cut by Feldspar Hornblende Poprhyry2, lower contact is breccia zone and Feldspar Hornblende Poprhyry1.	3.59 ± 0.5
KTDD029	S020954	341.7	345.1	IDM	Microdiorite host is mineralised with A-B-D veins and intruded by Feldspar Hornblende Poprhyry1 on lower contact.	3.58 ± 0.4
KTDD029	S020955	439.5	442	PH	Hornblende porphyry with A veins and D vein throughout. Lower contact cut by PFH1 and upper contact cut by PFH1.	3.59 ± 0.07

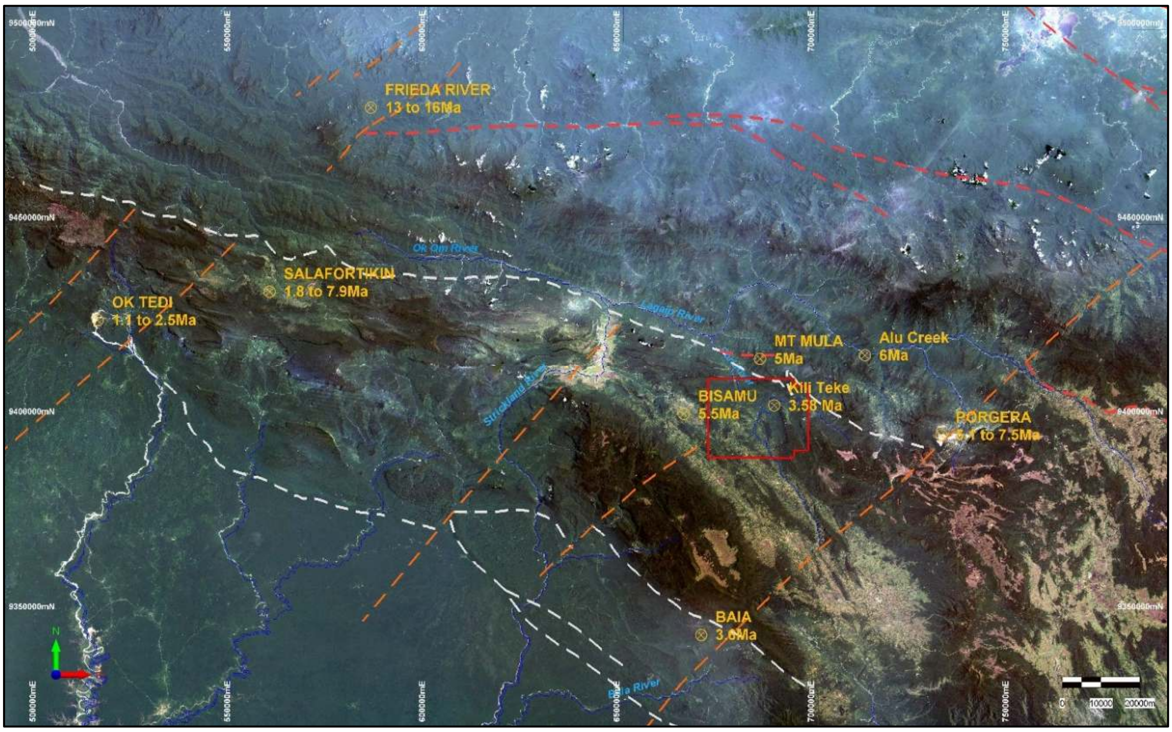


Figure 7-3: Age dates for mineralised systems in surrounding region.

The local geology of the Kili Teke tenement is derived from regional mapping (at 1:250,000 scale) by the Australian Geological Survey (Fig. 7-4). The local stratigraphy is presented in Table 7-2.

Table 7-2: Stratigraphy and host rocks within EL2310.

Unit	Age	Description
Kendupwa Volcanics	Pliocene	Andesitic agglomerate, tuff, and volcanic sandstone, minor marl. Mag High signature.
Orubadi Formation	Late Miocene	Calcareous mudstone and siltstone, minor limestone; part tuffaceous. Magnetite bearing volcaniclastics in upper parts.
Mala Limestone	Middle to Late Miocene	Yellow to brown-grey argillaceous micrite, fine calcarenite, rare calcirudite
Lai Siltstone	Middle Miocene	Grey calcareous siltstone and mudstone; part limestone-shale interbeds; part tuffaceous
Darai Limestone	Early Oligocene to Late Miocene	Cream, buff, grey bioclastic algal limestone; includes calcarenite, micrite, calcirudite; part recrystallized; part massive, part bedded
Ieru Formation	Early to Late Cretaceous	Silty polymict glauconitic blue and green-grey fine sandstone, siltstone, grey mudstone
Om Formation	Middle to Late Jurassic	Black carbonaceous siltstone, mudstone, with pyritic chert nodules and lenses, minor fine quartz sandstone; porphyritic microdiorite dykes; ammonites

The geology comprises a host sequence of early to late Cretaceous Ieru Formation clastic sediments, Miocene Darai limestone and Lai Siltstone, which have been intruded by multiple phases of intermediate composition dioritic porphyries. The Kili Teke intrusives are late Miocene to Pliocene in age. At a regional scale they are essentially blind – although mineralised outcrops do occur on the western side of the main ridge (see below). The cross section in Figure 7-4 illustrates the proximity of the Kili Teke intrusives to a regional NW-trending, and NE-dipping, thrust fault (with a likely offset of 1.5km).

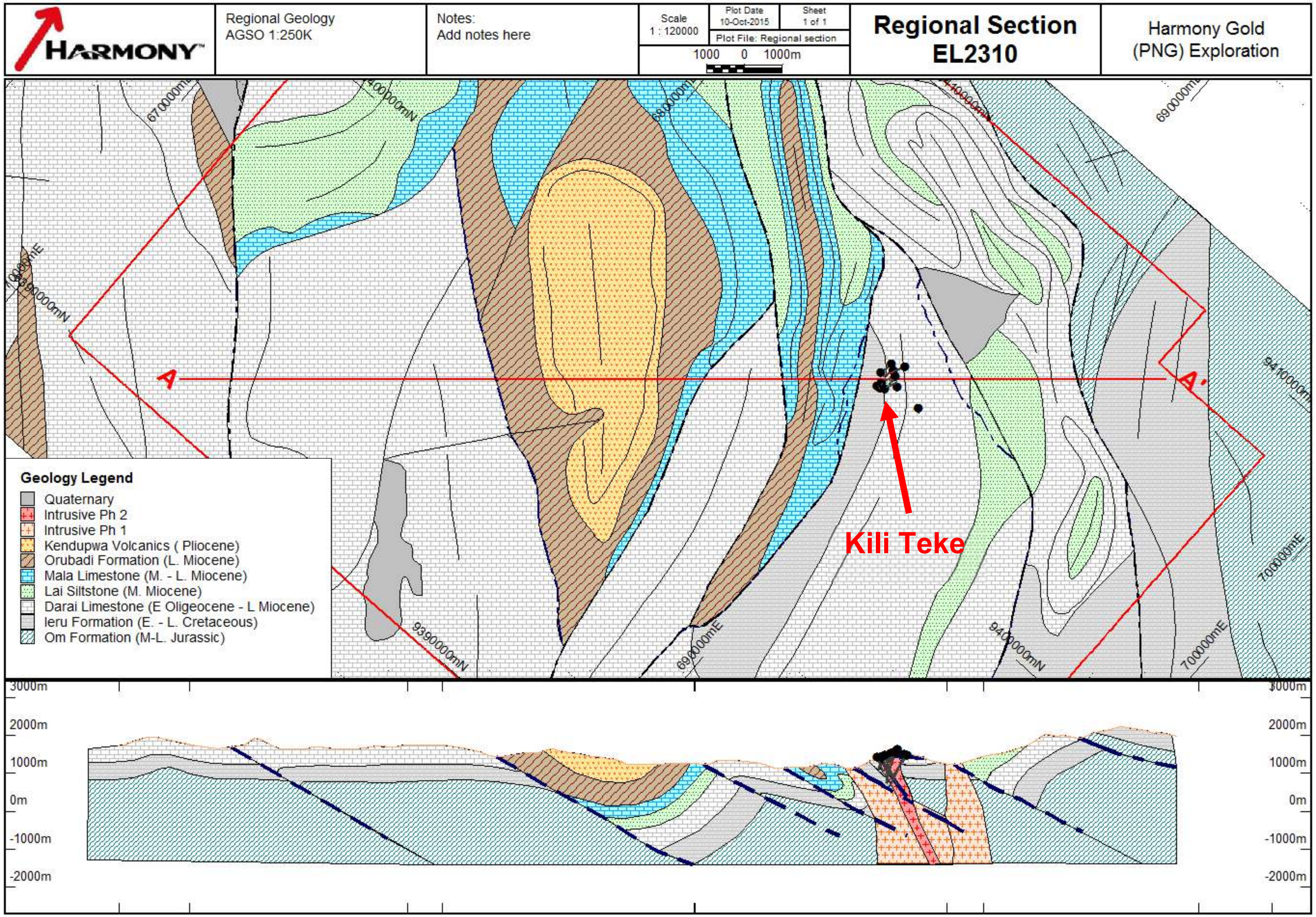


Figure 7-4: Regional northeast geological section through EL2310 and the Kili Teke Prospect.

7.2. Prospect Geology

An outcrop map and interpretation of the geology of the Kili Teke prospect is presented in Figure 7-5, and the interpreted geology is illustrated in a perspective view, looking to the northeast, in Figure 7-6.

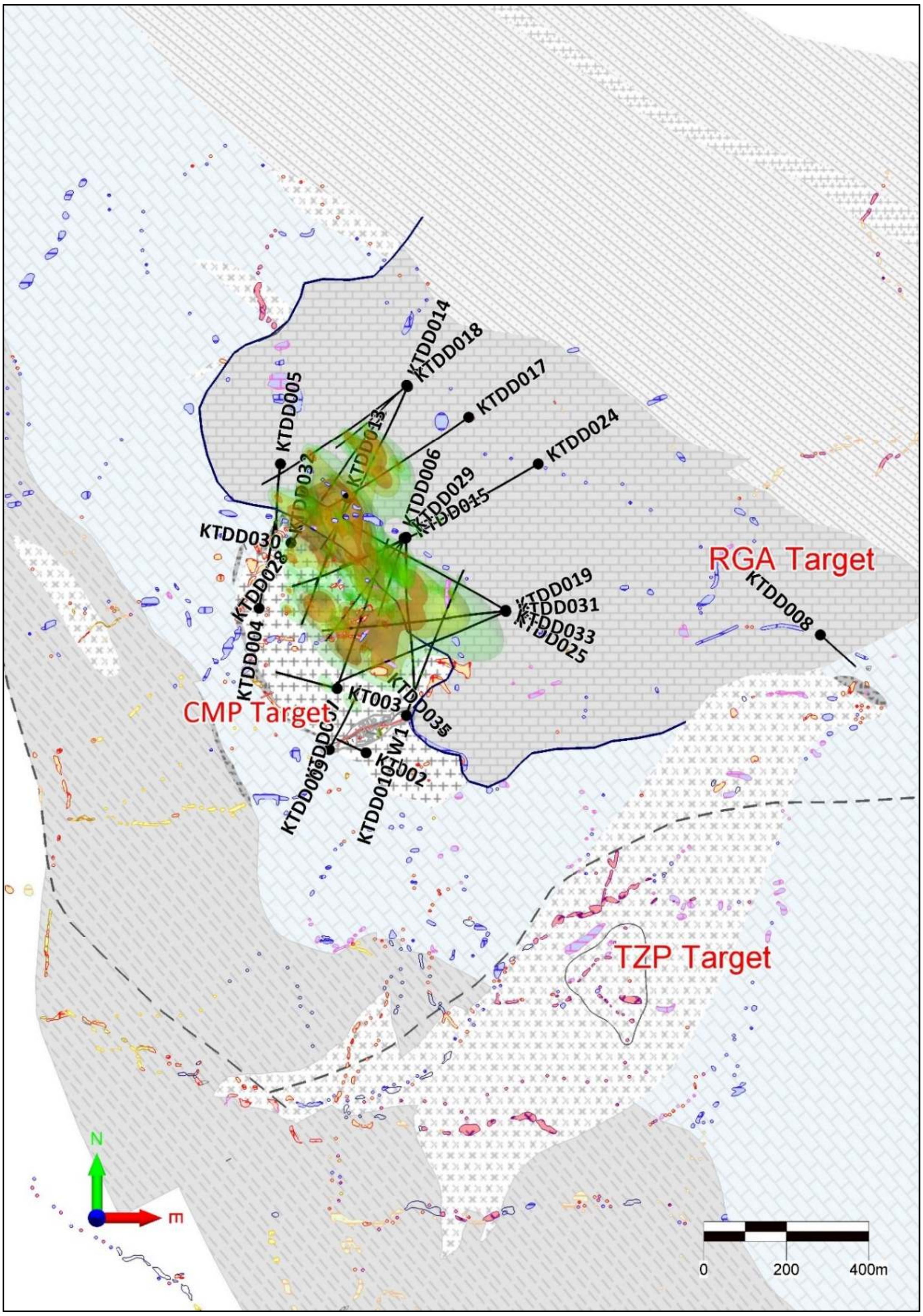


Figure 7-5: Kili Teke prospect geology (with outcrops). The location of the three main targets is shown,

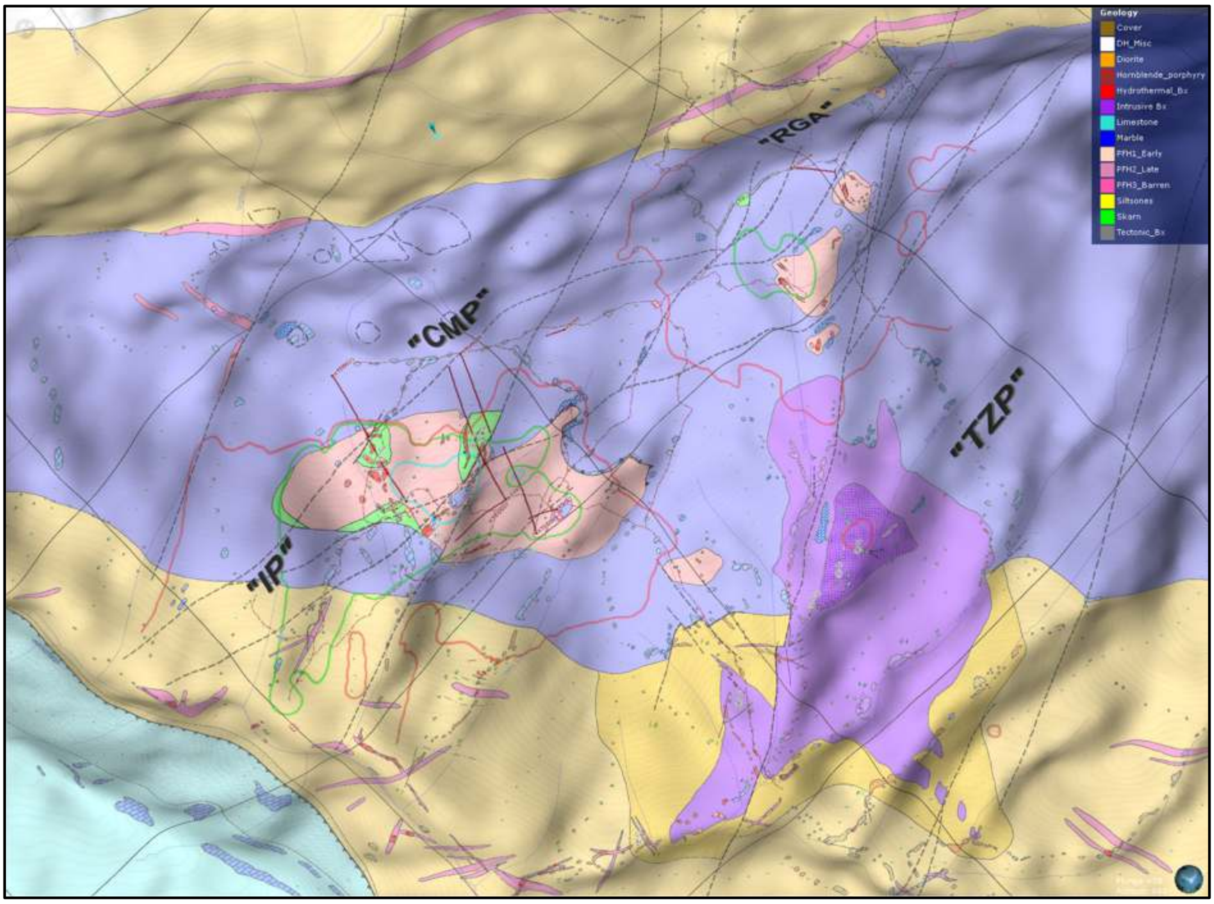


Figure 7-6: Kili Teke prospect geology – perspective view, looking to the northeast.

The mineralised porphyry crops out on the western side of the main ridge, centred on the Yalopi Creek area, and extends under the limestone cap to the east and north (as intersected in drilling). Later thrusting has offset the top of the porphyries and emplaced a limestone cap, which forms the top of the main ridge and obscures the full extent of the underlying intrusives (**Error! Reference source not found.**). Various skarn units have developed on the margins of the intrusive units (Fig. 7-7) where they are in contact with the host limestone and numerous hydrothermal breccias have been intersected in drilling.

Figure 7-7: Mineralised outcrop, Kili Teke.

7.2.1. Wallrocks

Ieru Formation

The Ieru sediments consist of grey to grey-green, weakly glauconitic, non-calcareous siltstone, sandstone and mudstone (Fig. 7-8). This unit is more recessive and forms the lower slopes on the western side of the main ridge and valley floor. Mapped outcrops in drainages typically comprise fine-grained, poorly bedded, siltstone to sandstone, with minor carbonaceous layers. In drilling the fine siltstones of the Ieru Formation have been intersected at depth, as the footwall to the Darai Limestone, comprised of calc-silicate-altered, fine-grained light grey siltstones. In the Kaham Ck area to the west of the TZP target, the siltstone is mapped as being bleached and weak to moderately silicified, suggesting contact metamorphism or hornfelsing around the hornblende porphyry intrusive mapped in the TZP area. Initial mapping has grouped the siltstones on the eastern side of the main ridge as belonging to the Ieru Formation, as per the local geology map (**Error! Reference source not found.**) – this needs further investigation and confirmation. For the Harmony geological model, siltstones on the eastern side of the ridge have been grouped with the younger Lai Siltstone unit, rather than invoking significant thrust faults into the model to explain older Ieru formation overlying the main Darai Limestone unit.

Lai Siltstone

Regionally this unit is described as comprising grey calcareous siltstone and mudstone, part limestone-shale interbeds and part tuffaceous units. At Kili Teke, the lower slopes on the eastern side of the main ridge are mapped as siltstones belonging to the Lai Siltstone unit on the 1:250,000 map (Australian Geological Survey), which conformably overlies the Darai Limestone. Mapping traverses completed by Harmony describe the Lai Siltstone as black/grey siltstone interbedded with green-grey sandstone and minor calcareous layers, along with grey siltstone including local carbonaceous laminae and minor interbedded immature sandstone.

KTDD014-178m | KTDD014-245m | KTDD011-823m

Figure 7-8: Examples of the host rock sequence – Ieru Formation siltstone, Darai Limestone and Marble.

Darai Limestone and Marble

Darai Limestone is grey to cream, bioclastic algal limestone, partly re-crystallised, partly weakly bedded to massive, with fossiliferous intervals in places (Fig. 7-9). The thickness of the Darai Limestone unit in the Kili Teke prospect area is estimated to be in the order of 350 to 400m, based on drill intersections and topographical features. The internal stratigraphy of the Darai Limestone in the prospect area has not been clearly defined, although a potential marker bed of finely-bedded, grey to brown, siltstone can be correlated across some drill holes in the upper parts of the unit on the eastern side of the main ridge.

Figure 7-9: Potential fossiliferous marker unit just above the footwall contact of the Darai Limestone and Ieru Formation.

There is also an interval of fossiliferous limestone, comprising numerous oblong shell fossils ~2-3cm in length, which occurs a few metres above the footwall contact with the Ieru Siltstone (Fig. 7-9). This could represent a useful marker bed to assist in differentiating between conformable or faulted contacts between the Darai Limestone and Ieru Formation.

Marbleisation of the host Darai Limestone is variably developed at the contacts with the porphyry phases (see below). Marble varies from patchy white to cream recrystallization of the limestone host, through to massive white to cream marble with minor calc-silicate veins and alteration (garnet± pyroxene±tremolite). The thickness of marbleisation is variable and has, in places, been offset by later faulting. From drilling, to date, it appears that marbleisation is more extensive in limestone in the hangingwall to the intrusive complex, where it is developed over thicker intervals of 50-100m. In contrast, in the footwall to the intrusive, the marbleisation is typically only developed over 20-50m away from the intrusive contact. The thrust fault at the base of the limestone cap postdates emplacement of the intrusives as there is no marble development above the contact.

7.2.2. Intrusives

The Kili Teke intrusive complex comprises Pliocene age, calc-alkaline intrusive phases, including diorite to variably porphyritic diorite phases. Compositionally the intrusive phases are very similar with petrological descriptions typically being similar variants of micro quartz diorite porphyries. Textural differences and cross-cutting relationships at hand specimen scale have been used to differentiate the intrusive phases. There are multiple phases present in the prospect area, which are grouped into the following units for modelling purposes:

1. Diorite (ID)
2. Microdiorite (IDM)
3. Hornblende Porphyry (PH)
4. Feldspar Hornblende Porphyry 1 (PFH1)
5. Feldspar Hornblende Porphyry 2 (PFH2)
6. Feldspar Hornblende Porphyry 3 (PFH3)

Diorite (ID) and Microdiorite (IDM)

The diorite is a massive igneous rock, which is generally equigranular, with interlocking feldspar and hornblende crystals and little to no groundmass (Fig.7-10). It is porphyritic in places and may also be banded, with alternating zones of equigranular diorite and porphyritic texture. The microdiorite is a minor variant, which may be an earlier phase, because it is typically seen as xenoliths in the main diorite. The diorite typically contains >20% hornblende (but can be just 5% in places), with hornblende crystals up to 3mm in size and predominantly altered to secondary biotite. Close to the host limestone, the diorite is overprinted with a calc-silicate alteration assemblage. The diorite plays host to all porphyry vein assemblages.

KTDD012 – 203.7m

KTDD007 – 373m

KTDD007 – 280.5m

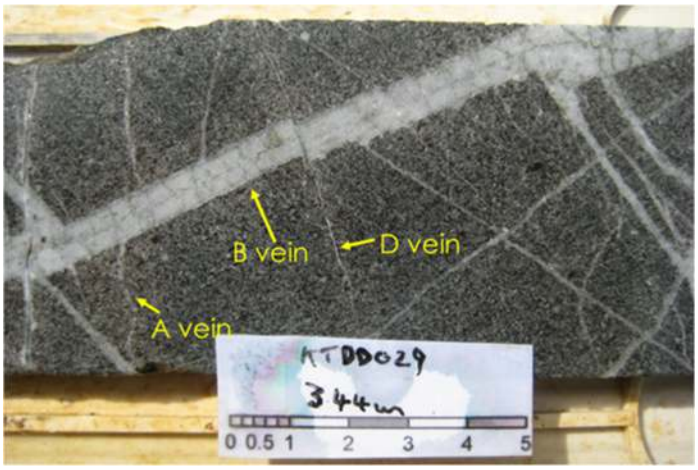


Figure 7-10: Examples of diorite (top) and microdiorite (bottom),

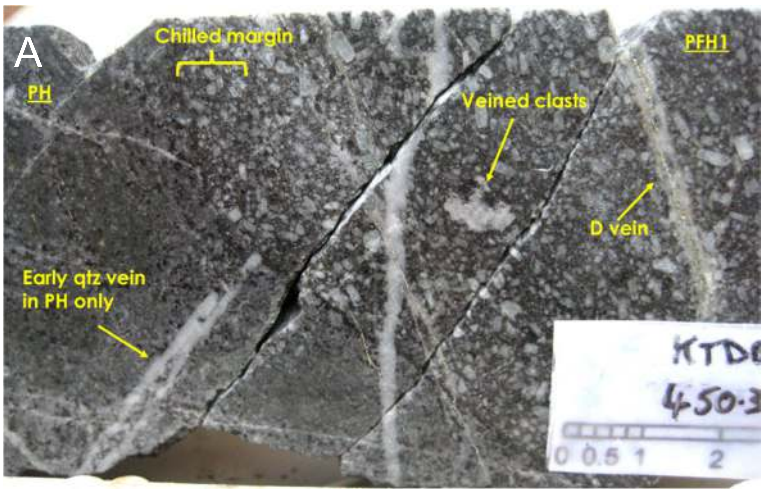
Hornblende Porphyry (PH) and Feldspar Hornblende Porphyries (PFH1,2 & 3)

The Hornblende Porphyry is a massive to flow-aligned porphyritic igneous rock, with 5-10% hornblende phenocrysts (up to 7mm in size) in a fine-grained groundmass (Fig. 7-11). Timing of this phase is interpreted to be slightly later than the diorite and earlier than the Feldspar Hornblende Porphyry phases. It plays host to the following porphyry vein (VP) generations: Early biotite (VPEB), VPA, VPB, VPC & VPD.

The three types of Feldspar Hornblende Porphyry are differentiated by cross-cutting relationships and chilled margins (Fig. 7-12). They are variably textured, some with intense stockwork veining (Fig. 7-13). PFH1 is characterised by biotite and K-spar alteration (which is magnetite-destructive); it carries the best developed VPA and VPB densities, but also VPD. PFH2 is magnetic when fresh and dominated by VPD, with only minor VPB. This phase destroys grade! PFH3 is similar to PFH2, but is differentiated because it is geochemically distinct and overlies a skarn-altered fault zone. It hosts only minor VPD and is barren of grade. PFH2 and 3 both extend to surface.

KTDD014 – 609m | KTDD013 – 302.5m | KTDD013 – 371.1m

Figure 7-11: Examples of the Hornblende Porphyry.



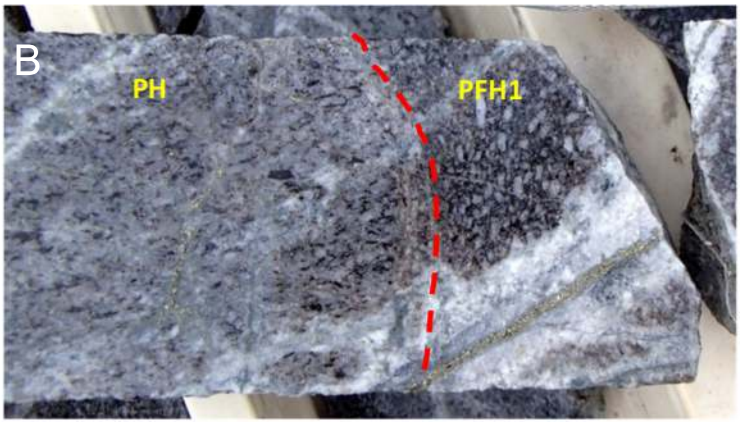
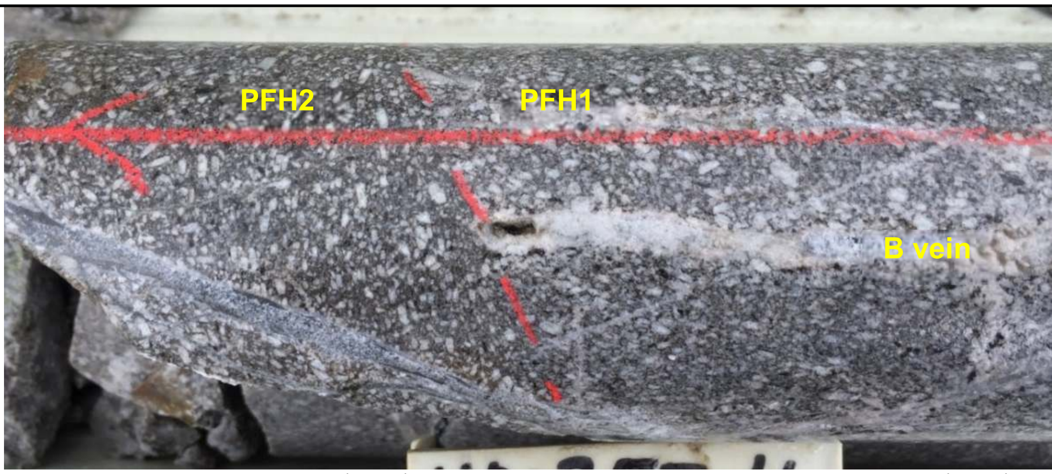
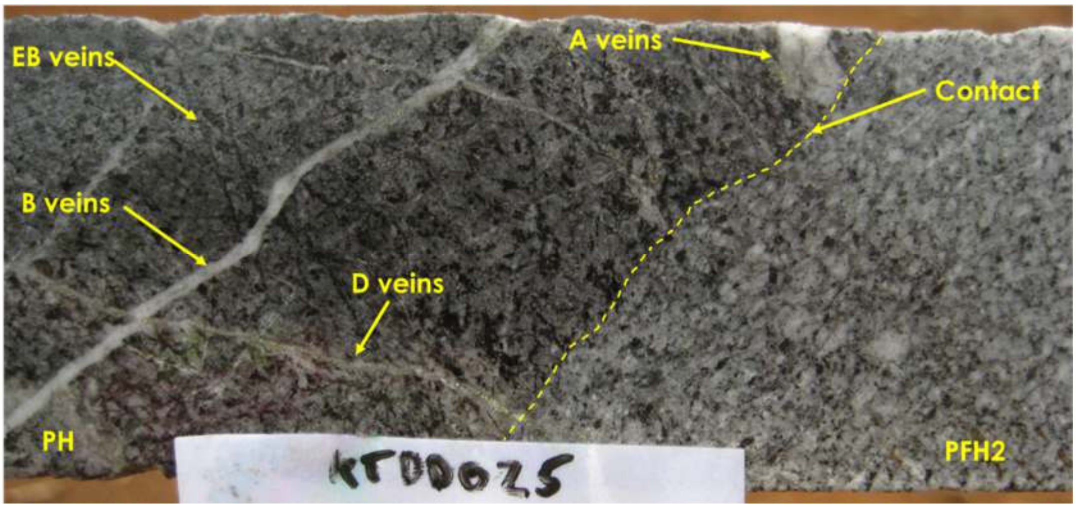


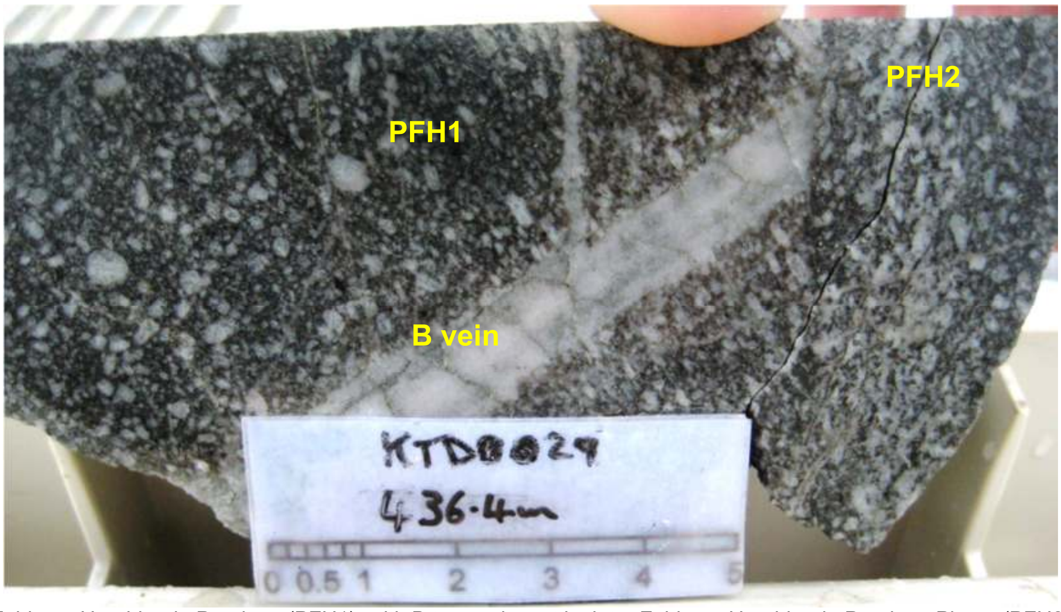
Figure 7-12:



Feldspar Hornblende Porphyry (PFH1) with B veining cut by later intra-mineral porphyry phase (PFH2)



Hornblende porphyry and vein assemblages cut by later Feldspar Hornblende Porphyry (PFH2)



Feldspar Hornblende Porphyry (PFH1), with B type vein, cut by later Feldspar Hornblende Porphyry Phase (PFH2)

Figure 7-13: Examples of Feldspar Hornblende Porphyry, with porphyry veins.

Figure 7-14 illustrates the timing relationships between the various intrusive phases at Kili Teke, as determined by cross-cutting contacts and vein assembalges.

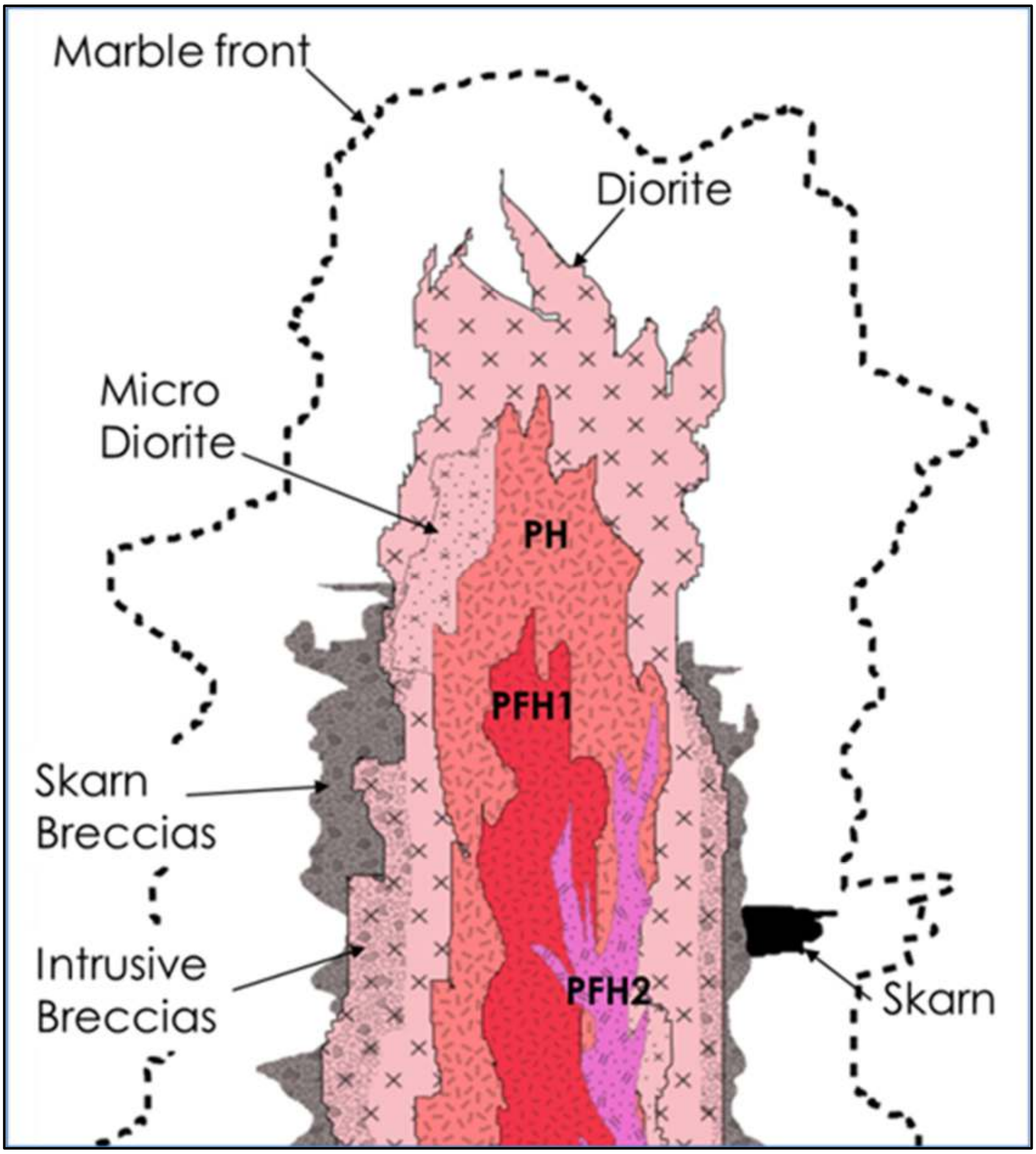


Figure 7-14: Schematic diagram illustrating timing relationships between the different intrusive phases, Kili Teke.

7.2.3. Breccias

Two types of breccia have been recognised at Kili Teke: magmatic hydrothermal breccias and skarn breccias. The orientation and distribution of these breccias is not well defined at this stage due to the relatively widely spaced drilling, but many are mineralised and some appear to be an important component of the deposit.

Magmatic Hydrothermal Breccias

Magmatic Hydrothermal Breccias at Kili Teke are typically comprised of rounded to sub-rounded intrusive clasts in a matrix of biotite±feldspar±magnetite±sulphide cement (Fig. 7-15**Error! Reference source not found.**). Clasts are dominantly intrusive, but minor clasts of altered sediments are also present. Petrology samples from some breccia intervals have been described as xenolithic diorite porphyry, which scavenged wall rock fragments during emplacement and comprised intrusive and sediment clasts within an intrusive matrix of feldspar phenocrysts in a fine-grained groundmass of plagioclase + mafics. Some clasts contain early quartz veining, indicating a slightly later timing for these breccias; they could be associated with the second potassic event identified in the paragenesis. Sulphides are predominantly chalcopyrite and pyrite, and the combination of strong potassic alteration assemblages with chalcopyrite indicate these breccias were active during the mineralisation process – they could represent fluid pathways from the hotter centre of the system?

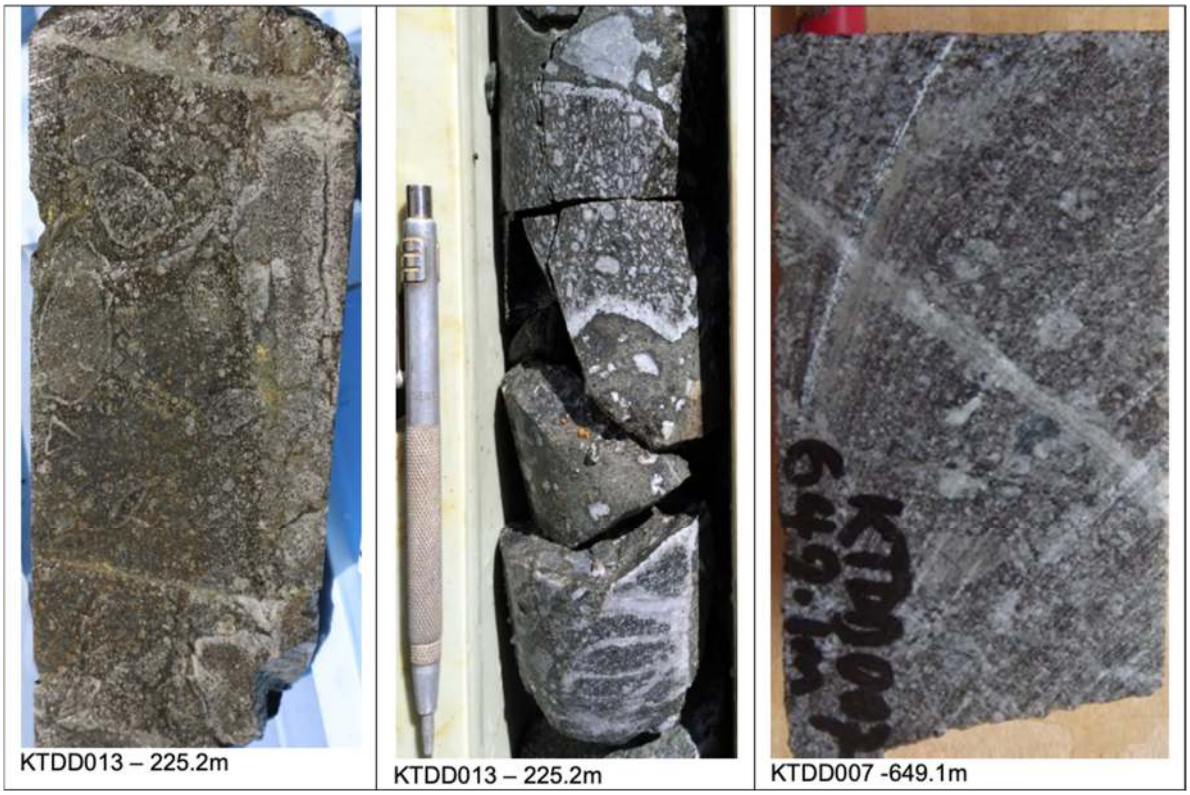


Figure 7-15: Examples of Magmatic Hydrothermal Breccia, Kili Teke.

Skarn Breccias

Numerous hydrothermal breccias comprising calc-silicate skarn mineral assemblages along with sulphide ± magnetite have been intersected in drilling (Fig. 7-16). The skarn zones vary in thickness (up to 30-40m) and orientation, but their overall geometry is interpreted to be a peripheral zone, which pinches and swells, around the outer contact of the intrusive. However, importantly, skarn mineralisation has also been intersected within the CMP; these zones appear to be structurally controlled.

Skarn breccias typically transition from clast-supported at the margins to matrix-supported in the centre. Their matrix is comprised of fine- to coarse-grained calc-silicate minerals (garnet±pyroxene±tremolite), with calcite, sulphides and magnetite. Two types of skarn have been recognised: a dark coloured pyroxene+garnet+magnetite assemblage, and a light coloured epidote+garnet+pyrite assemblage. These are potentially prograde and retrograde skarn assemblages. Further work is required to determine if they might be used as a vector to the hotter (and potentially higher-grade) parts of the mineralised system.

7.2.4. Structure

The structural setting of the Kili Teke Project area, at a regional scale, is complex and this is replicated at the prospect scale (Fig. 7-17). Drilling to date has intersected numerous structural zones ranging from early magmatic hydrothermal breccias through to later clay-altered, broad fracture zones and more discrete brittle fault zones. Orientation of these zones is variable, with both steep and shallow dipping structures appearing to affect both the host sequence and the mineralised intrusives. Due to the complex nature of the faulting compared to the relatively wide-spaced drilling, no fault boundaries, except for the Upper Thrust, have been modelled and incorporated as hard boundaries in the Mineral Resource model.

Upper Thrust

The Upper Thrust is a relatively flat lying, sharp basal contact to the limestone cap forming the top of the main ridge line running through the centre of the prospect area (Fig. 7-17). The thrust comprises strongly broken, angular limestone and intrusive fragments in a crushed rock, with clay matrix, and is typically 0.5-5m thick. The thrust is interpreted to post-date mineralisation as no marbilisation of the limestone occurs across the fault zone where it directly overlies the intrusive phases.

Figure 7-16: Various skarn breccias present at Kili Teke.

Logaiyu Thrust

The Logaiyu Thrust is an Inferred major thrust structure, which trends north-south, parallel to the Logaiyu River, along the western boundary of the prospect area (Fig. 7-17). Regional geology indicates it is a major thrust fault, with sediments of the Cretaceous Ieru Formation thrust over the younger Mala Limestone. It is interpreted to dip moderately to the east and trend below the mineralised system intersected in drilling to date. It is likely to have some control on the mineralised system at depth as surface geochem sampling and mapping shows a sharp boundary to surface anomalism and alteration, with rocks to the west, in the footwall of the fault, exhibiting no evidence of mineralisation.

Yalopi Creek Fault Zone

The Yalopi Creek Fault Zone is an inferred structure, based on topographic features (Fig. 7-17), magnetic lineaments and coincident breccia and skarn zones (intersected in drilling), which appears to separate the Southern and Northern Stockwork zones (SSZ and NSZ, respectively) – although it is not clear whether they are offset (Humphries, pers. comm.). Grade distribution in the NSZ and SSZ indicates that there might be a slightly shallower plunge to mineralisation in the SSZ compared to the NSZ, which suggests some tilting or rotation associated with the Yalopi Ck Fault Zone. However, further drilling is required to confirm this interpretation and determine its impact on the mineralised system.

Kaham Creek Transfer Fault

The Kaham Creek Transfer Fault is a major NE-trending topographical and magnetic lineament, between the CMP and TZP targets. It’s surface expression trends northeast along Kaham Creek (Fig. 7-17) and is interpreted to dip moderately to steeply to the southeast, forming a prominent steep topographical slope between the CMP and TZP targets. It appears to offset the north-south-trending Logaiyu Thrust and could have been active relatively late in the local structural history.

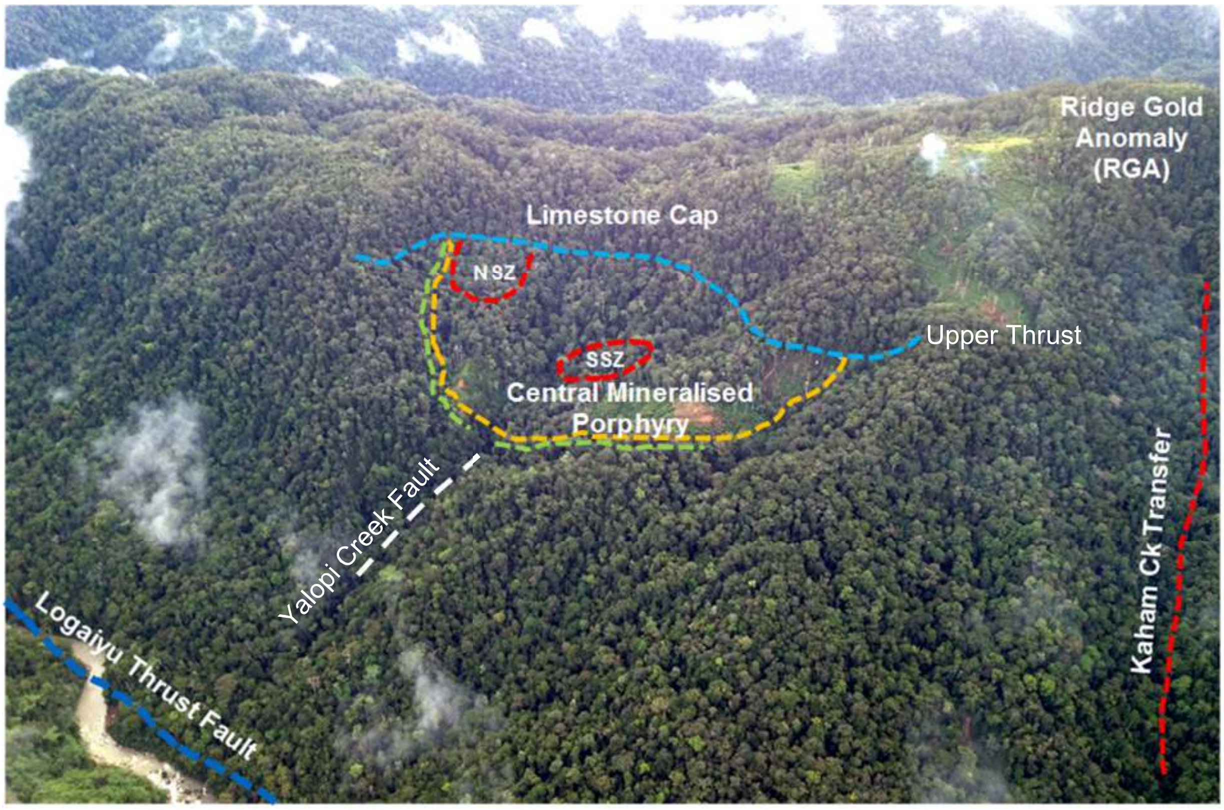


Figure 7-17: Oblique view of the Kili Teke prospect area (looking northeast) to show the location of the CMP (NSX and SSZ) relative to the Upper Thrust, the Logaiyu Thrust, and the Yalopi Creek and Kaham Creek Faults.

7.2.5. Alteration / Veining

The Kili Teke deposit contains alteration assemblages typical of porphyry Cu-Au systems. An early potassic alteration is overprinted by phyllic and argillic alteration, and skarns are developed at contacts with the limestone host rocks (and along internal structures). Drilling to date has not defined the full extents of the mineralised system, but the initial surface mapping and sampling program identified alteration extending over a 2km x 1km area, much of which remains untested by drilling.

7.2.6. Mineralisation

Mineralisation comprises variably developed, disseminated and vein-infill chalcopyrite (the dominant copper sulphide), with some bornite and molybdenite present in the main stockwork zones (Fig. 7-18). Drilling, to date, has defined two main zones of higher grade mineralisation, centred around KTDD007 and KTDD013, and described as the Southern (SSZ) and Northern Stockwork Zones (NSZ), respectively. Further drilling is required to determine the zonation of sulphide species with confidence.

The orientation of the higher grade stockworking is interpreted to dip steeply to the east, based on the available drill data and initial variogram modelling. Post-mineralisation faulting complicates the trend but further drilling is required to clearly delineate structures that locally offset mineralisation.

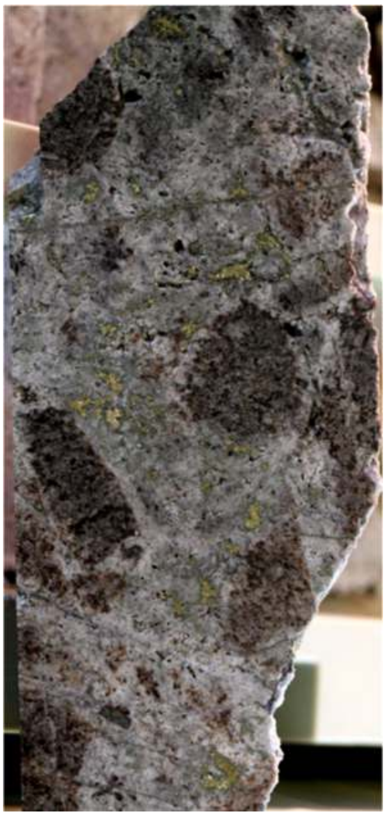
Petrographic investigation of drill core samples identified native gold as an inclusion within a bornite grain, but it is also likely to occur within chalcopyrite because gold and copper show a strong correlation in assays.

Figure 7-19 is a schematic diagram to illustrate the timing relationships between the different mineralised veins.


A: KTDD015-262m


B: KTDD007 – 309m


C: KTDD013 – 373m


D: KTDD013-316.5m


E: KTDD012-303.9m


F: KTDD014-503m

Figure 7-18: Mineralisation styles, including A-D: chalcopyrite, E: bornite and F: molybdenite.

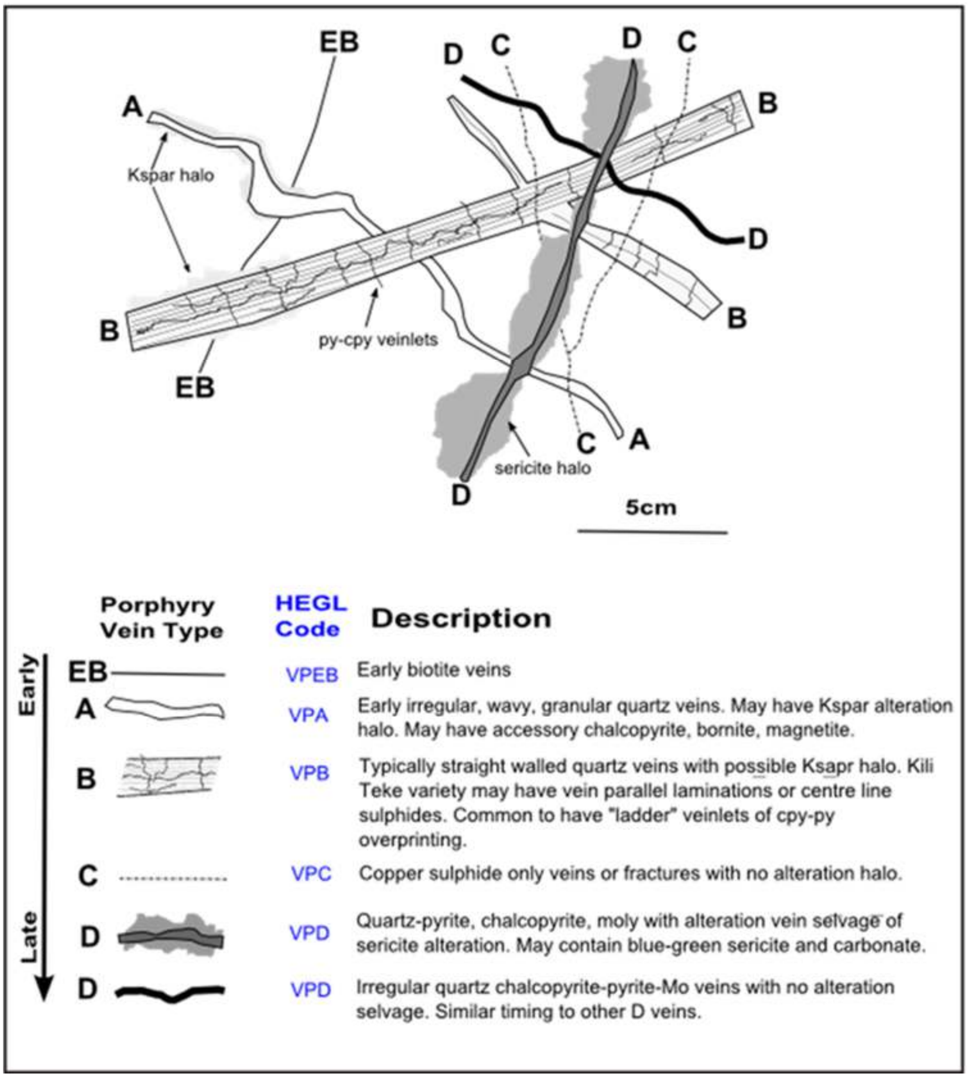


Figure 7-19: Schematic diagram illustrating timing relationships between the different intrusive phases.

7.2.7. The Formation of the Kili Teke Deposit

Based on contact, alteration and vein relationships, as well as mineral paragenesis, the following genetic model is interpreted for the Kili Teke deposit (Fig. 7-20):

1. Intrusion of the diorite and micro-diorite into the host sedimentary sequence.
2. Intrusion of the early-mineral hornblende porphyry (PH) and feldspar hornblende porphyry (PFH1) phases.
3. Pervasive potassic (biotite) alteration of the intrusives during the final stages of crystallisation.
4. Early quartz vein development in favourable parts of the intrusion, during the late stages of crystallisation of the fluid-rich melt.
5. Marbleisation of the limestone host and initial skarn development.
6. Hydrothermal breccia development, with strongly developed potassic (biotite + magnetite + sulphide) infill and alteration.
7. Intrusion of the intra-mineral Feldspar Hornblende Porphyry phases (PFH2 & 3).
8. Further skarn development and brecciation on the periphery of the intrusion and along internal structures.
9. Phyllic alteration, comprised of quartz-sulphide veining, with sericite selvedges.
10. Molybdenum-bearing quartz-carbonate veining/fracture infill.
11. Structurally-controlled argillic (clay) alteration along fractures and major structures.
12. Low angle thrusting of the Darai Limestone (cap), over the deposit.

Alteration Stage	Description	Early	Late
	Intrusion of the diorite (ID) and micro-diorite (IDM) into the host sequence		
	Intrusion of the earl-mineral hornblende porphyry (PH) and Feldspar Hornblende Porphyry (PFH1) phases		
1a	Pervasive potassic alteration of the intrusives during final stages of crystallisation. Pervasive biotite + k feldspar +sulphide		
1b	Early quartz veining development in favourable parts of the intrusive during last stages of crystalisation of the fluid rich melt.		
1c	Marbilisation of the limestone host and initial prograde skarn development. High grade cp+bn+mt skarn in hotter parts of this phase		
2	Hydrothermal breccia development with strongly developed potassic (biotite + magnetite + sulphide) infill and alteration (BRIN). Contains clast of early qtz veining		
	Intrusion of the intra-mineral feldspar porphyry (PFH2 & PFH3) phases.		
3a	Higher temp late cp event - Quartz + K Feld + sulphide (cp>py>mo) with Kf + green> white sericite + sulphide selvedges		
3b	Potential same timing as 4a but represents the lower temp lateral or shallower equivelent. - quartz sulphide (py > cp) veining with sericite(white selvedges)		
3c	Moly > qtz carbonate veining / fracture infill event		
	Faulting???		
4a	Structurally controlled skarn breccia development and brecciation on contacts and structures		
4b	Retrograde calc-silicate alteration. Typically developed around skarn zones. Carbonate + chlorite+ epidote + Sulphide (py> cp>mo). Fine cb fracturing distal with epidote + py increasing		
5a	Advanced Argillic? Banded vuggy silica veins. Rare localised minor stage observed to date.		
5b	Structurely controlled Argillic clay alteration along fractures and major structures. Overprints and destroys earlier alteration stages		
???	Intrusion of more reduced, intermediate compositon, megacrystic hornblende porphyry		
	Low angle thrusting (Limestone cap)		

Figure 7-20: The formation of the Kili Teke deposit.

8. DEPOSIT TYPES

Kili Teke is a classic porphyry Cu-Au deposit, with associated skarn mineralisation, which developed when mineralising fluids interacted with limestone wall rock. There are many excellent descriptions of porphyry Cu-Au deposits (e.g. Sillitoe (2010), but the following cartoons, extracted from Corbett (2009), depict the porphyry model in summary form.

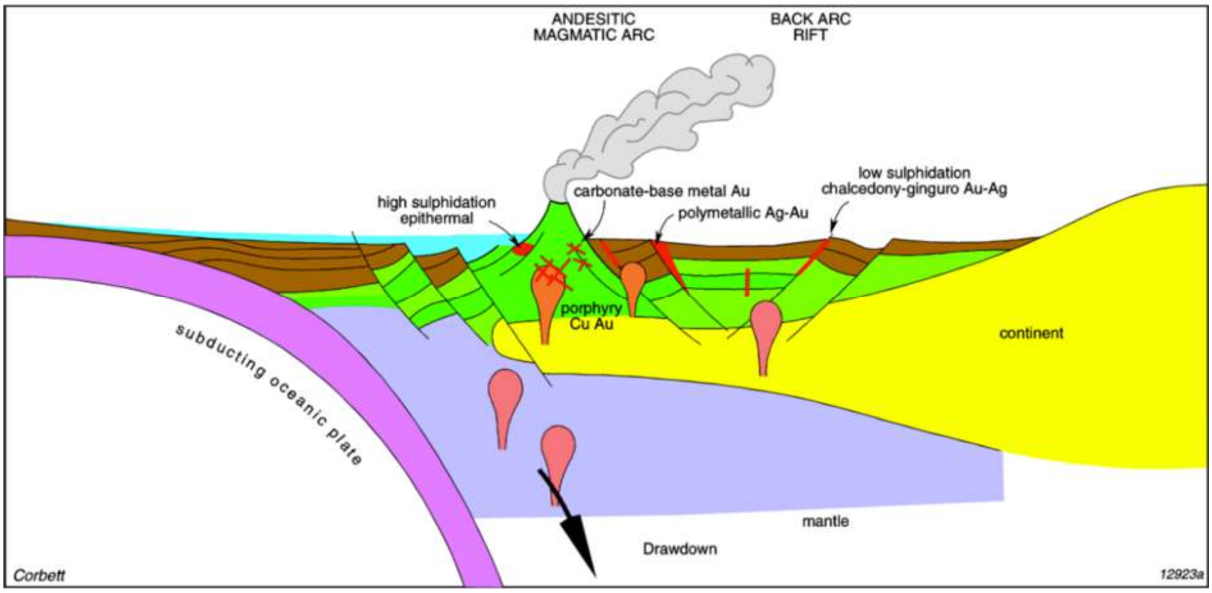


Figure 8-1: Cartoon to illustrate the tectonic setting of porphyry related mineral occurrences.

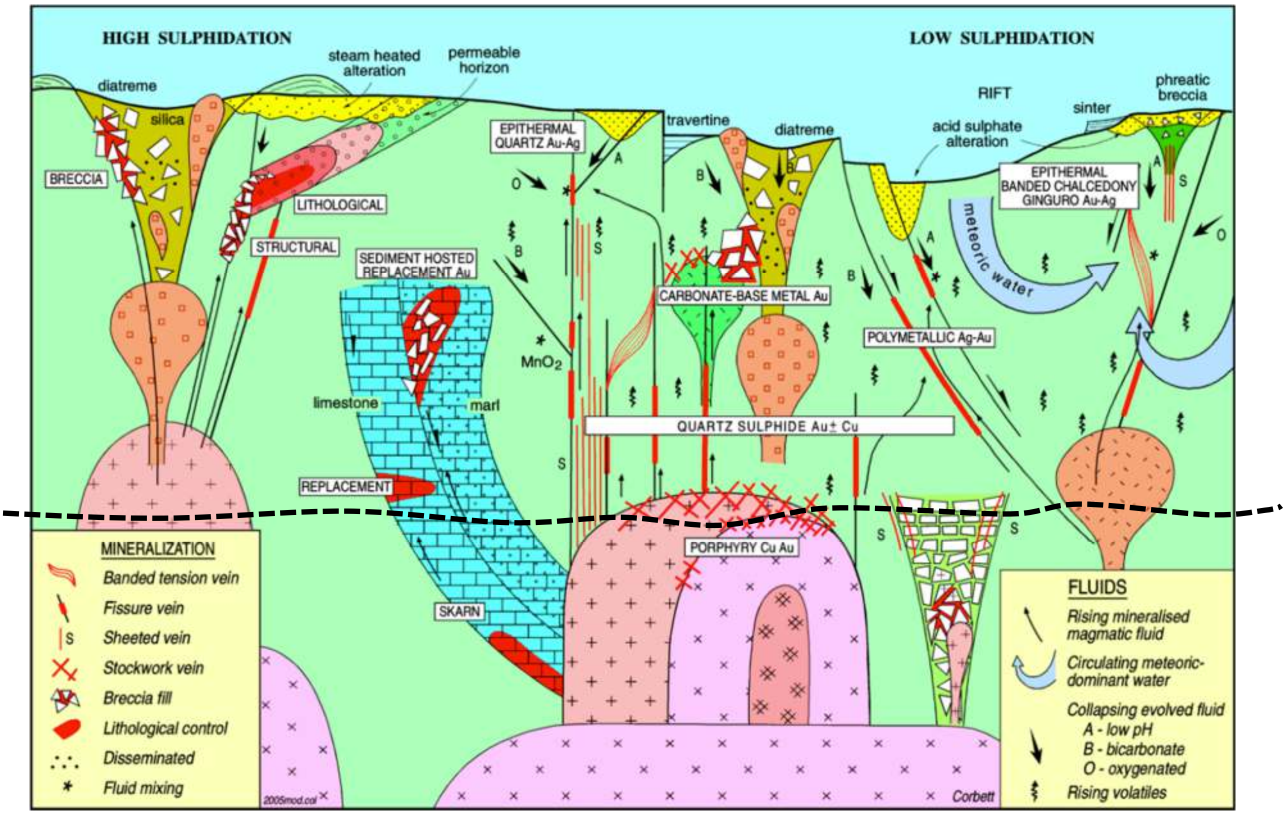


Figure 8-2: Conceptual model to illustrate the different settings and styles of magmatic arc porphyry and epithermal Cu-Au-Mo-Ag mineralisation. Black dash line indicates the approximate level of erosion at Kili Teke.

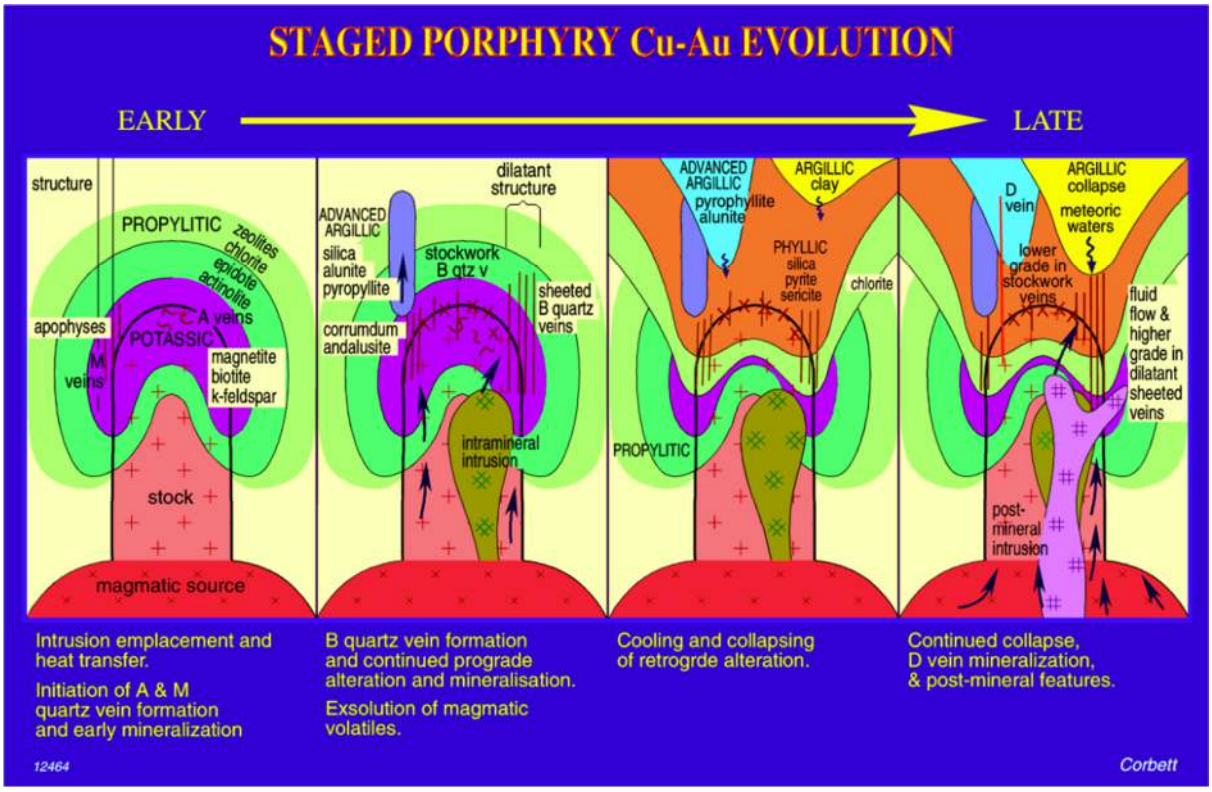


Figure 8-3: Conceptual model to illustrate the stages in the evolution of porphyry Cu-Au intrusions, and associated alteration, vein types and mineralisation.

9. EXPLORATION

No exploration work has been completed by KRL, to date.

10.DRILLING

10.1. Drilling Type and Details

Apart from the first three holes, drilled by Aldridge Minerals (KT001 – KT003), all drilling at Kili Teke has been under the management of Harmony.

Drilling was completed using a heli-portable coretech diamond drill rig utilising PQ3, HQ3 and NQ3 size drilling equipment. Drill holes were commenced in PQ size and subsequently reduced to HQ and NQ as hole depth and ground conditions required. The drill contractor used by Harmony was Titeline Drilling, based out of Ballarat, in Victoria, Australia. A special drill mud was used, which saved on helicopter transport costs – a good tip (Humpries, pers. comm.)

Drill hole orientation was variable due to topographic restrictions on drill pad location, and the evolving geological model (Fig. 10-1). Table 10-1 lists the details of all holes drilled, to date, and cross-sections of most holes are illustrated in Appendix 2. The spacing of drill pad locations is typically 200-300m. A number of pads were utilised numerous times, to test both shallow and deeper targets from the same collar location. This has resulted in a drill spacing within the upper levels of mineralisation of 50-100m, which extends to 100-200m in the lower levels.

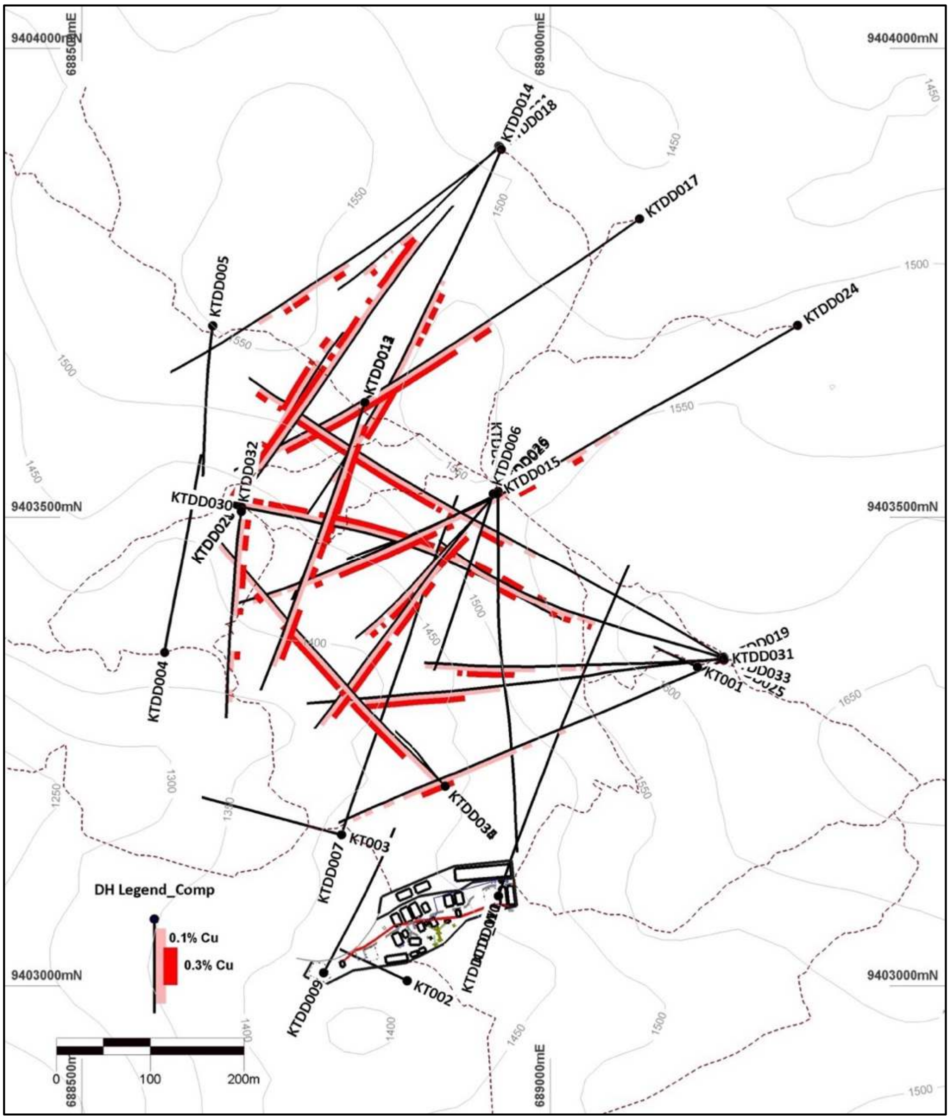


Figure 10-1: Location plan and traces of drill holes (Phase 2, for MRE 2016),

Table 10-1: Drill hole details (MRE 2017), Kili Teke.

Hole_ID	East (PNG94)	North (PNG94)	RL	Azimuth	Dip	Depth
KT001	689157.102	9403339.808	1616	295	-55	90
KT002	688847.006	9403005.611	1423	295	-55	138
KT003	688781.377	9403187.609	1404	285	-65	365.6
KTDD004	688588.088	9403355.238	1359.855	10	-55	394.7
KTDD005	688639.548	9403704.292	1526.629	190	-65	401.8
KTDD006	688939.033	9403525.105	1527.348	200	-60	430.8
KTDD007	688776.941	9403160.856	1399.64	15	-55	700.1
KTDD008	689946.696	9403290.969	1671.824	130	-55	208.2
KTDD009	688757.944	9403013.785	1416.736	29.5	-65	421.5
KTDD010	688944.631	9403095.977	1451.479	20	-65	318
KTDD010_W1	688944.631	9403095.977	1451.479	20	-65	872.9
KTDD011	688944	9403526	1537	180	-60	826.7
KTDD012	688802.19	9403622.439	1519.826	200	-55	594.4
KTDD013	688802.19	9403622.439	1519.826	200	-75	834.8
KTDD014	688947.46	9403892.678	1464.898	204	-60	959.9
KTDD015	688943.184	9403524.962	1527.424	240	-65	719
KTDD016	689093.539	9403818.016	1454.061	235	-50	170.2
KTDD017	689094.5	9403818.8	1454.061	235	-50	900
KTDD018	688946.29	9403894.94	1464.81	230	-50	686.4
KTDD019	689185.44	9403347.46	1612.19	245	-55	818.2
KTDD020	688945	9403896.07	1464.77	235	-70	355
KTDD021	688944.99	9403896.06	1464.8	226	-70	763.1
KTDD022	689185.25	9403348.79	1612.08	263	-55	796.9
KTDD023	689263.92	9403704.41	1484.62	236	-50	245.6
KTDD024	689263.85	9403704.73	1484.47	235	-50	983.1
KTDD025	689184.92	9403350.25	1612.07	300	-50	950.4
KTDD026	688944.25	9403527.32	1527.31	222	-52	540.8
KTDD027	688665.23	9403513.38	1411.34	37	-50	680.4
KTDD028	688665.23	9403513.38	1411.34	37	-70	701.7
KTDD029	688944.25	9403527.32	1527.31	224	-70	743.4
KTDD030	688670.31	9403510.58	1411.39	99	-70	1059.4
KTDD031	689184.65	9403348.07	1612.2	265	-70	963.6
KTDD032	688670.07	9403506.25	1411.44	190	-50	371.2
KTDD033	689184.37	9403349.2	1612.16	286	-70	1106.4
KTDD034	688887.83	9403212.65	1421.53	315	-50	595.4
KTDD035	688887.83	9403212.65	1421.53	315	-78	398.9
KTDD036	689945.53	9403291.28	1671.79	878.5	-60	235.0
KTDD037	688891.53	9403211.30	1422.39	507.7	-65	185.0
KTDD038	688880.00	9403205.00	1424.00	405.6	-50	245.0
KTDD039	689097.90	9403810.70	1455.00	884.7	-72	235.0
KTDD040	688204.00	9403439.00	1190.00	409.2	-65	185.0
KTDD041	688665.20	9403513.00	1411.30	335.1	-55	250.0
KTDD042	689097.90	9403811.00	1455.00	1104.3	-55	290.0
KTDD043	688665.20	9403513.00	1411.30	332.4	-50	340.0
KTDD044	688665.20	9403513.00	1411.30	441.5	-75	260.0
KTDD045	688664.00	9403517.00	1408.50	938.4	-55	305.0
KTDD046	688802.20	9403622.00	1519.80	726.5	-78	302.0
KTDD047	689236.00	9402970.00	1536.00	815.5	-78	302.0
KTDD048	688802.20	9403622.40	1519.80	485.2	-60	115.0
KTDD048_W1	688802.20	9403622.40	1519.80	655.8	-60	335.0
KTDD049	689236.00	9402970.00	1536.00	911.6	-69	165.0
KTDD050	689476.00	9403572.00	1567.00	1533.7	-68	218.0
KTDD051	689396.10	9402437.00	1299.00	423.8	-64	165.0
KTDD052	689396.10	9402436.60	1299.00	197.9	-60	235.0
KTDD052_W1	689396.10	9402436.60	1299.00	375.7	-65	185.0
KTDD053	689799.00	9403548.00	1546.50	347.8	-50	245.0
KTDD054	689476.00	9403572.00	1567.00	1089.6	-72	235.0
KTDD055	689806.00	9403553.00	1545.00	1049.8	-65	185.0

Drill core recovery was measured for each run by comparing the actual measured core to the drilled depth recorded on core blocks at the end of each run. Triple-tube drilling was used to maximise core recovery, which was typically satisfactory, with 80% of all runs achieving better than 90% recovery, and 65% of all runs achieving 100% recovery (Fig. 10-2). Intervals of core loss are typically associated with fracture controlled clay alteration within the intrusive units, and also with fractures and broken zones within the marble and limestone units. There is no correlation between and grade and recovery (Fig.10-3).

Processing of the drill core was completed as follows:

1. At the rig site the core was removed from the splits and placed into core trays, with a core block stating the hole depth, run length and any core loss placed at the end of the run.
2. The core trays were loaded into purpose-built core cages and slung by helicopter from the rig site back to base camp.
3. The core trays were laid out in sequence on core racks at the core shed for processing.
4. The core was measured and metre intervals were marked on the core.
5. The trays were labelled with the start and end depths.
6. Basic geotech logging was completed, with core recovery and RQD measurements for each run logged.
7. Geological logging was completed.
8. Samples were selected for bulk density measurement.
9. Each core tray was photographed.
10. The sample run sheet was completed by the geologist and the core was wrapped in masking tape, if necessary.
11. The core was cut using a core saw (quarter core for PQ and half-core for HQ and NQ).
12. Sampling of the core was completed as per the relevant run sheet, into pre-numbered calico sample bags.
13. The calico sample bags were packaged into larger polyweave bags of approximately 20kg weight prior to dispatch from the site.
14. Core trays with the remaining core were stacked in sequence in the undercover core storage areas.

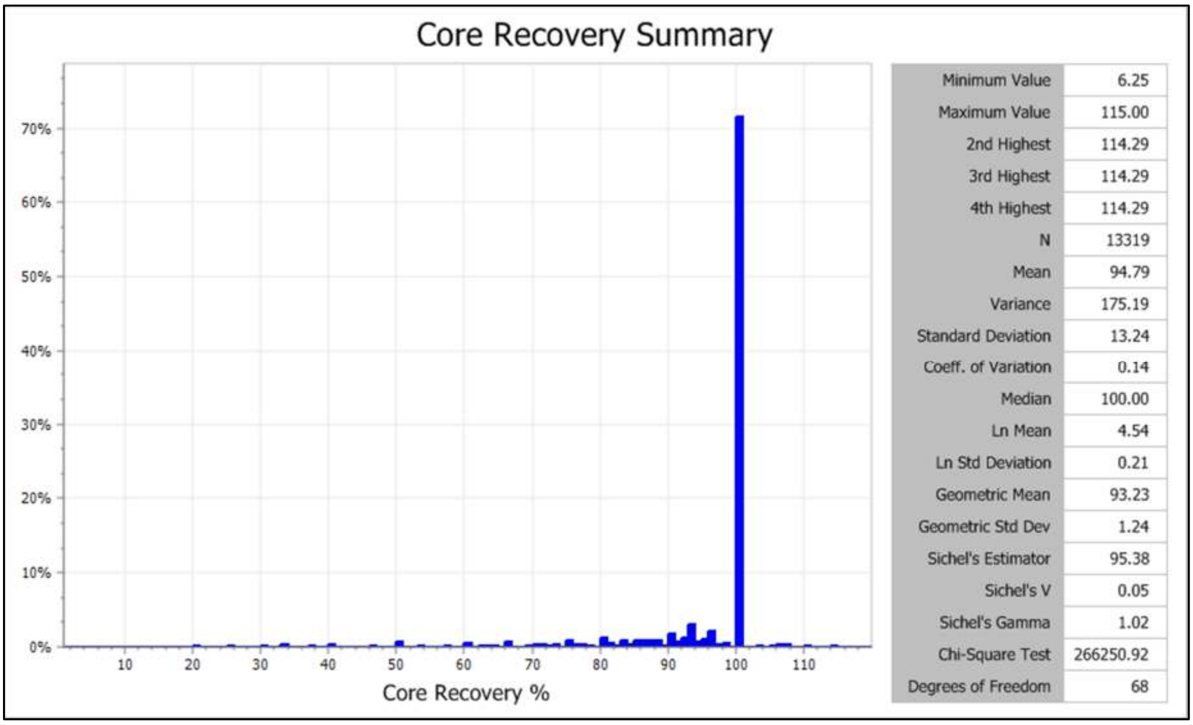


Figure 10-2: Core recovery, Kili Teke.

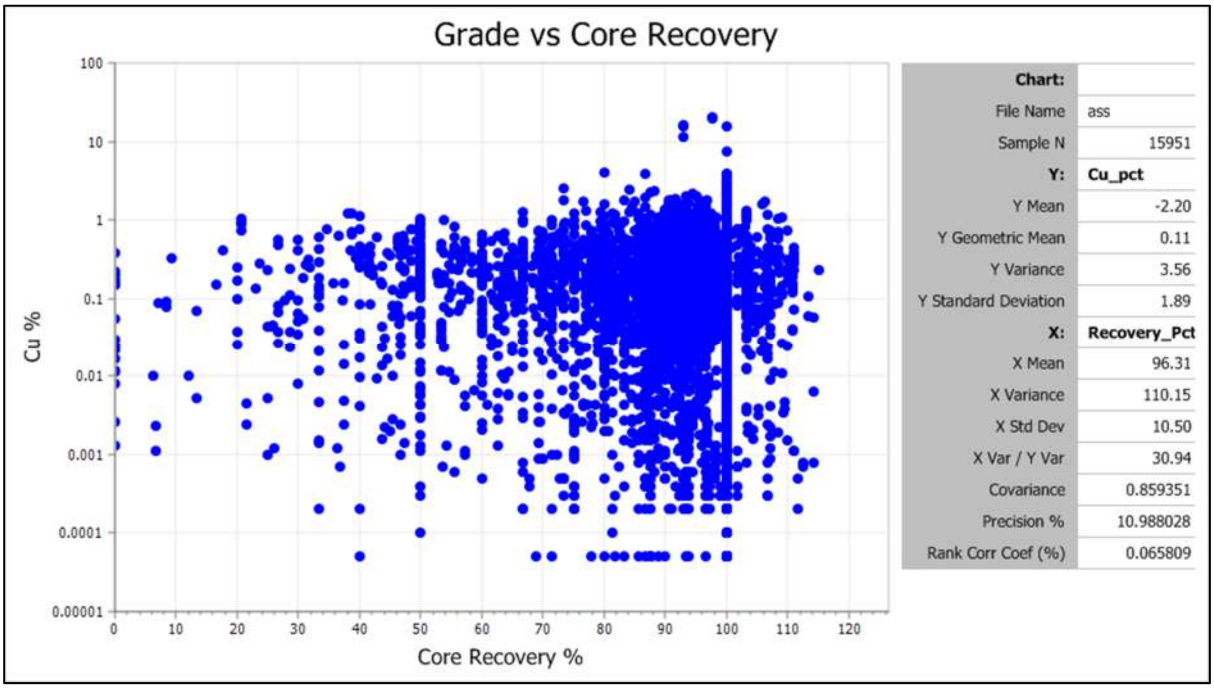


Figure 10-3: Core recovery vs copper grade, Kili Teke.

10.2. Collar and Downhole Surveys

Drill hole collars for holes KTDD004 to KTDD055 were surveyed using a Leica TCRA1203 R100 Total Station, from control points established by contract licenced surveyors, Land Surveys (using static GPS survey observations by dual frequency GPS receivers). The collar pickups are believed to be accurate to ±0.2m. The collar locations for the historical Aldridge Minerals drill holes (KT001 to KT003) were surveyed using a handheld GPS and are accurate to ±5m (these were not surveyed by Land Surveys).

Downhole surveys were made with a Reflex EZ downhole survey tool, at nominal 30m intervals whenever possible (depending on ground conditions). A multi-shot survey at 6m intervals was completed at the end of each hole, when casing was retrieved and ground conditions allowed. Downhole surveys were loaded into the Harmony SQL database, assessed for magnetic interference and assigned a priority for inclusion in the exported downhole survey results.

10.3. Geological Logging

All core is geologically and geotechnically logged by Harmony geologists and field technicians and entered into the LogChief logging system prior to synchronising to the main SQL database. LogChief contains a number of validation checks the through which the entered data must comply and further validation is completed once the logging is loaded to the main database. All core is digitally photographed onsite prior to cutting and sampling, with the core photos stored on the onsite server.

Harmony has noted the need to improve consistency in the logging of drill core, to enable the accurate definition of geological domains in future Mineral Resource estimates, and to help elucidate the controls on mineralisation.

11.SAMPLE PREPARATION, ANALYSIS & SECURITY

11.1. Sampling

The majority of the drilling was sampled at 1m intervals (Fig. 11-1). The interval was increased to 2m for a short period, during the sampling of KTDD011, KTDD012 and the first 270m of KTDD013, when looking at options to reduce sample costs, but it was decided to revert to 1m intervals. All lithologies were sampled in the initial few holes, but the barren hangingwall limestone was not sampled throughout the programme; rather, sampling began 10m above the Basal Thrust (to the Limestone), immediately above the mineralised intrusives, or wherever marble and skarn development was logged close to intrusive contacts. Core was continuously sampled along metre intervals and not split on lithological or alteration contacts/boundaries.

The core was split using a core saw with quarter core samples taken in the PQ section and half core samples taken in the HQ and NQ sections. For intervals of very broken core, samples were collected by taking approximately half the core over the relevant sample interval. The remaining core was stored onsite. The core samples for assay were bagged in labelled calico sample bags, which were transported to the laboratory in large polyweave bags. Samples were dispatched by helicopter to the Harmony Mt Hagen office or to the Harmony truck at the Walekumu Laydown, for onward transport to the Mt Hagen office via road. Samples were transported from Mt Hagen to the Intertek Laboratory in Lae by commercial freight, Mapai Transport.

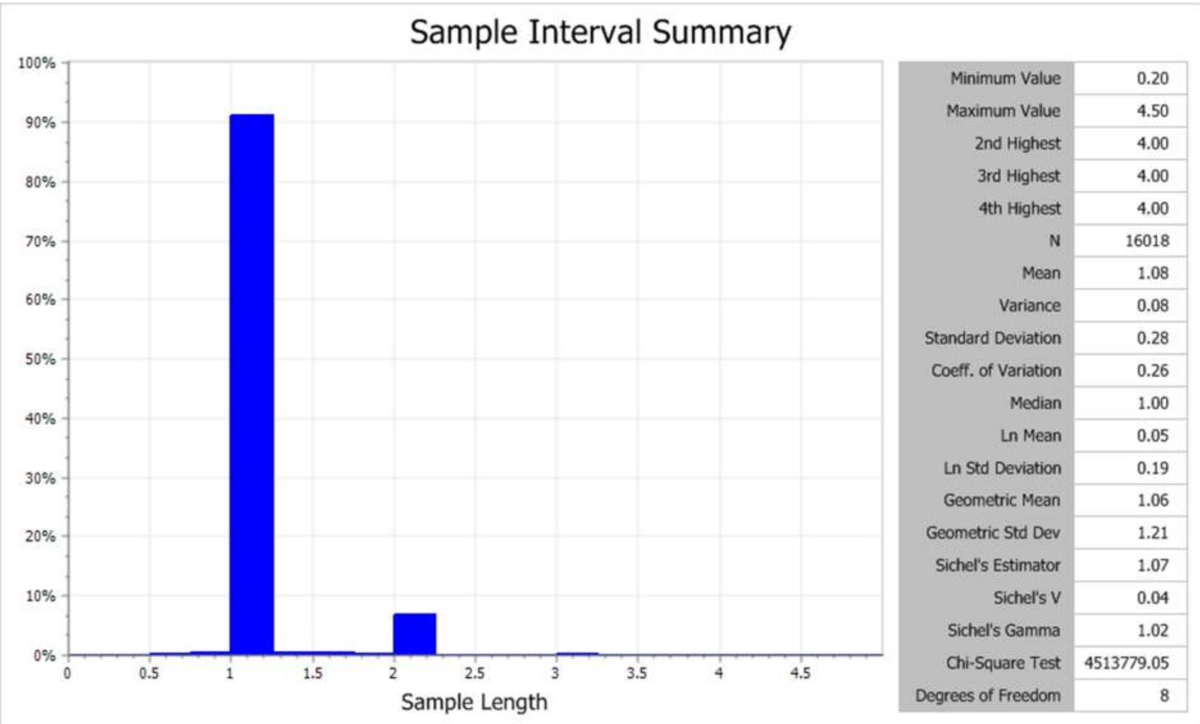


Figure 11-1: Summary of sample interval lengths.

To maintain sample quality during cutting, any broken or fractured core was wrapped with masking tape to prevent it from breaking up during cutting. When core orientation had been successful, the core was cut along the orientation line at the bottom of hole, to reduce the possibility of sample bias.

Sample numbers and their associated drill hole intervals are recorded by the responsible geologist and given to the core yard technician for cutting and sampling. A sample despatch sheet documenting the sample numbers and required assay work is sent along with the batch to the laboratory.

Drill core from two of the three historical drillholes completed by Aldridge Minerals had been stored at a laydown facility at Koroba. No assay data for these holes had been submitted to the MRA so Harmony geologists completed a program of logging and re-sampling of both drill holes, KT002 and KT003. Quarter core samples were taken along both the PQ, HQ and NQ sections of these two holes. Samples were dispatched to Intertek laboratory in Lae.

11.2. Sample Preparation

All samples were prepared at the Intertek Laboratory, in Lae: ITS (PNG) Ltd, according to the following procedure (Fig. 11-2):

- Weighed wet.
- Dried, at 105°C, until dry (if samples were to be analysed for Hg they would be dried at 60°C).
- Weighed dry.
- Crushed in a Boyd/RSD crusher to <2mm.
- Pulverised to 75µm (with minimum 95% passing).
- 250g pulp split from the bulk sample and sent to Intertek Laboratory, Townsville.
- A second 250g split is taken every 15 samples – for duplicate analysis.
- Bulk residue stored at Intertek, Lae, for three months and then disposed of, unless specified otherwise by Harmony.

11.3. Analyses

All Harmony rock chip and core samples were analysed at the Intertek Laboratory in Townsville, Australia, by the Harmony "hard rock" package (Table 11-1). Samples from the two historical Aldridge drill holes (KT002 and KT003) were fire assayed at the Intertek Laboratory in Lae (FA50 Au) and forwarded to the Intertek Laboratory in Jakarta, Indonesia, for base metals analysis.

11.4. QA/QC

The following geochemical quality assurance /quality control (QA/QC) measures were routinely employed by Harmony to monitor the quality of all data used for Mineral Resource estimation:

- At each interval of 20 samples a pulp Certified Reference Material (CRM) or Gravel Blank was included as a sample in every batch submitted for analysis.
- The project Senior Geologist was responsible for selecting appropriate CRMs (based on the elements of interest and their expected grade).
- A photograph of the relevant CRM and its Sample ID was recorded to minimise uncertainty re sample mix-ups.
- If the sample batch was less than 40 samples, a minimum of one CRM pulp was inserted.
- Laboratory QA/QC procedures included pulp duplicates, analytical blanks, CRMs and pulp particle size distribution tests.

Sample pulps were stored for a nominal 3-month period at the Intertek Laboratory in Lae, unless otherwise requested by Harmony.

QC issues were addressed on a batch by batch basis, when data were loaded into the database. In addition, QC reports were generated directly from the database and reviewed weekly and monthly.

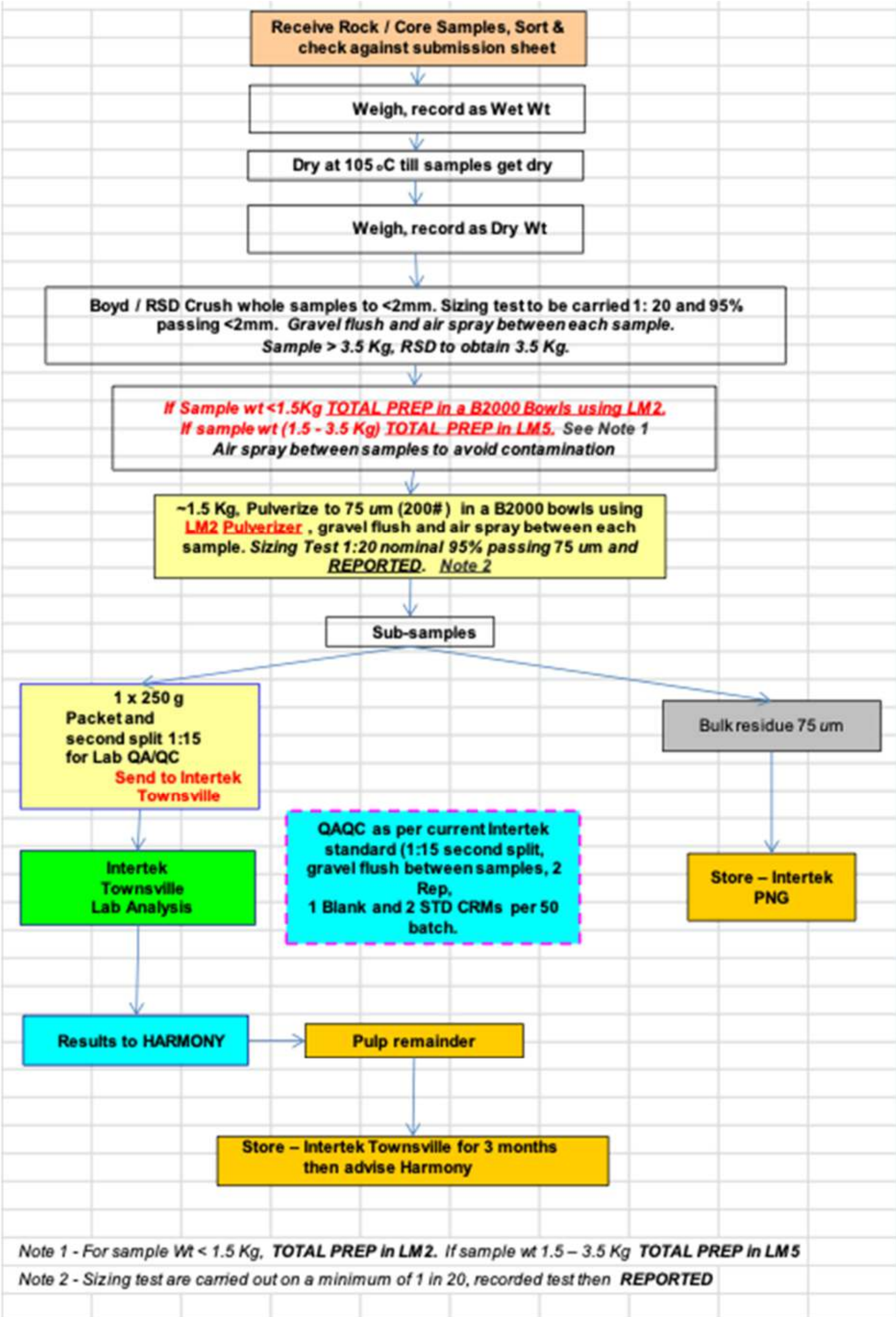


Figure 11-2: Harmony sample preparation procedure, Kili Teke.

Table 11-1: Harmony "Hard Rock" analytical package.

Element	MethodCode	Detection ppm	Digest	Analysis
Au	FA30	0.01	30gFA	AAS
Ag	4A/OM10	0.1	4 Acid	ICP-MS
Al	4A/OM10	50	4 Acid	ICP-OES
As	4A/OM10	1	4 Acid	ICP-MS
Ba	4A/OM10	1	4 Acid	ICP-MS
Be	4A/OM10	0.5	4 Acid	ICP-MS
Bi	4A/OM10	0.05	4 Acid	ICP-MS
Ca	4A/OM10	50	4 Acid	ICP-OES
Cd	4A/OM10	0.05	4 Acid	ICP-MS
Co	4A/OM10	0.1	4 Acid	ICP-MS
Cr	4A/OM10	5	4 Acid	ICP-OES
Cs	4A/OM10	0.1	4 Acid	ICP-MS
Cu	4A/OM10	1	4 Acid	ICP-OES
Fe	4A/OM10	100	4 Acid	ICP-OES
Ga	4A/OM10	0.1	4 Acid	ICP-MS
Ge	4A/OM10	0.1	4 Acid	ICP-MS
Hf	4A/OM10	0.1	4 Acid	ICP-MS
In	4A/OM10	0.05	4 Acid	ICP-MS
K	4A/OM10	20	4 Acid	ICP-OES
Li	4A/OM10	0.1	4 Acid	ICP-MS
Mg	4A/OM10	20	4 Acid	ICP-OES
Mn	4A/OM10	1	4 Acid	ICP-OES
Mo	4A/OM10	0.1	4 Acid	ICP-MS
Na	4A/OM10	20	4 Acid	ICP-OES
Nb	4A/OM10	0.1	4 Acid	ICP-MS
Ni	4A/OM10	1	4 Acid	ICP-OES
P	4A/OM10	50	4 Acid	ICP-OES
Pb	4A/OM10	1	4 Acid	ICP-MS
Rb	4A/OM10	0.1	4 Acid	ICP-MS
Re	4A/OM10	0.05	4 Acid	ICP-MS
S	4A/OM10	50	4 Acid	ICP-OES
Sb	4A/OM10	0.1	4 Acid	ICP-MS
Sc	4A/OM10	1	4 Acid	ICP-OES
Se	4A/OM10	1	4 Acid	ICP-MS
Sn	4A/OM10	0.1	4 Acid	ICP-MS
Sr	4A/OM10	0.5	4 Acid	ICP-MS
Ta	4A/OM10	0.05	4 Acid	ICP-MS
Te	4A/OM10	0.1	4 Acid	ICP-MS
Th	4A/OM10	0.05	4 Acid	ICP-MS
Ti	4A/OM10	5	4 Acid	ICP-OES
Tl	4A/OM10	0.02	4 Acid	ICP-MS
U	4A/OM10	0.05	4 Acid	ICP-MS
V	4A/OM10	1	4 Acid	ICP-OES
W	4A/OM10	0.1	4 Acid	ICP-MS
Y	4A/OM10	0.1	4 Acid	ICP-MS
Zn	4A/OM10	1	4 Acid	ICP-OES
Zr	4A/OM10	0.5	4 Acid	ICP-MS

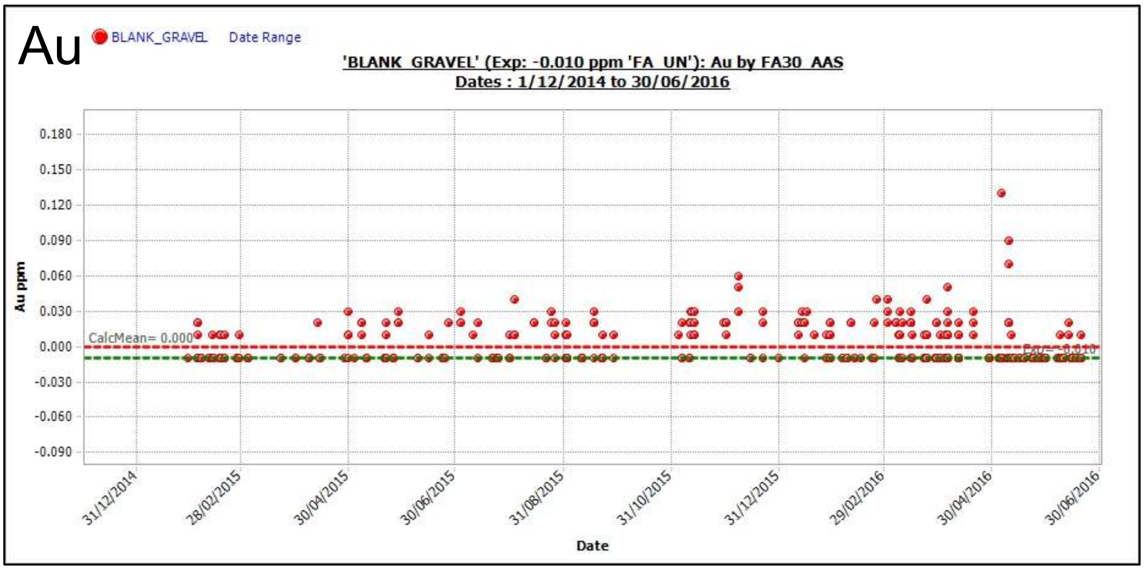
All samples analysed for Au by 30g fire assay (with AAS finish) and other elements, using an 4 acid digest and ICP or OES finish.

11.4.1. Blanks

Blank material, purchased from Intertek in Lae, was comprised of river sands collected from a local source. This was was not ideal because the material was not a homogenous rock type. Harmony were investigating alternative sources of blank material.

QC results of blanks are illustrated in Figure 11-3. Most blanks reported <0.034ppm (34ppb) Au; only ten exceeded this threshold. Three blanks reported from 0.07-0.13ppm (70-130ppb) Au in two batches processed in early May 2016. A review of these batches did not identify any consistent issues with other control standards or internal laboratory QC data, and base metal results were in line with expected values. It was concluded that minor contamination may have been occurred during sample preparation or fire assay, but this was not considered to be significant.

Copper results for the blanks reported a mean result of 93.6ppm Cu, which, although not barren, was considered to be low enough for use as a blank control. This grade is well below the natural cut-off between non-mineralised and mineralised samples, and would easily have highlighted any contamination issues (including any long-term trends).



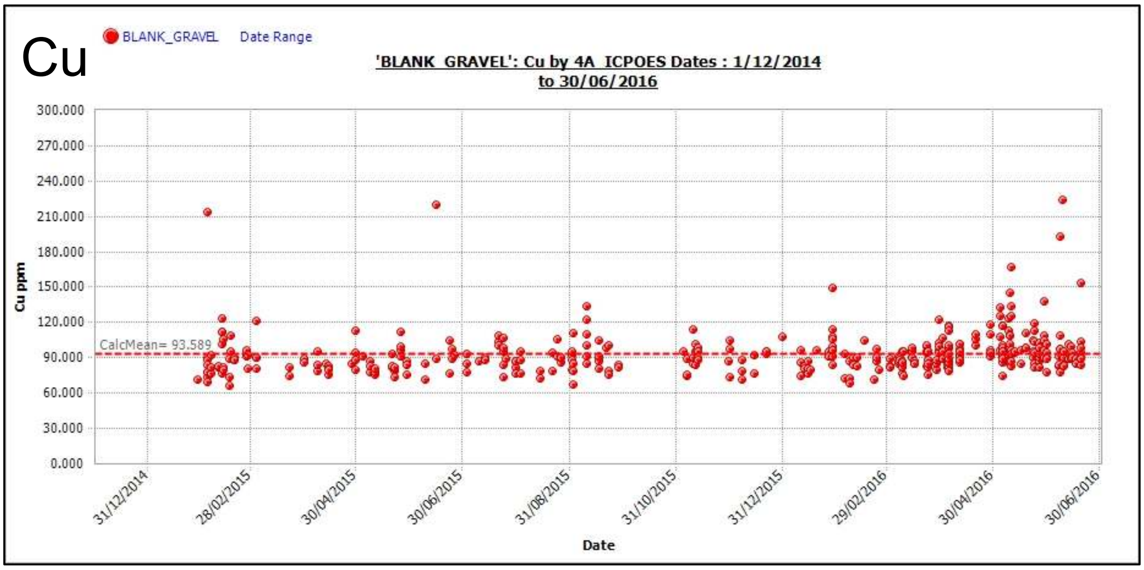


Figure 11-3: QC results for 399 river sand blanks used at Kili Teke – Au and Cu.

11.4.2. Standards/Certified Reference Materials (CRMs)

Three certified standards were used for were used as QC control on accuaracy for Au, Cu and Mo. These standards were sourced from the Morobe Exploration Joint Venture (MEJV), a JV between Harmony and Newcrest Mining Company, focused on exploration in the Morobe Province of PNG. The standards were made from mineralised porphyry material from the Wafi-Golpu Project, over a number of grade ranges, and certified by OREAS, via analysis at 10 commercial laboratories. Three control standards were used at Kili Teke:

1. WG_VLG_01 (Very Low Grade)
2. WG_LG_02 (Low Grade)
3. WG_MG_01 (Medium Grade)

Results of the three control standards for copper, gold and molybdenum are illustrated in **Error! Reference source not found.**11-4. Mean results for both gold and copper for the three standards agree with the expected results indicating there is no material bias present in the assay data for these elements. Molybdenum results show a positive bias of 1-2% for the calculated mean vs the expected mean for all three control standards, however this will not have a material impact on the estimate at this stage.

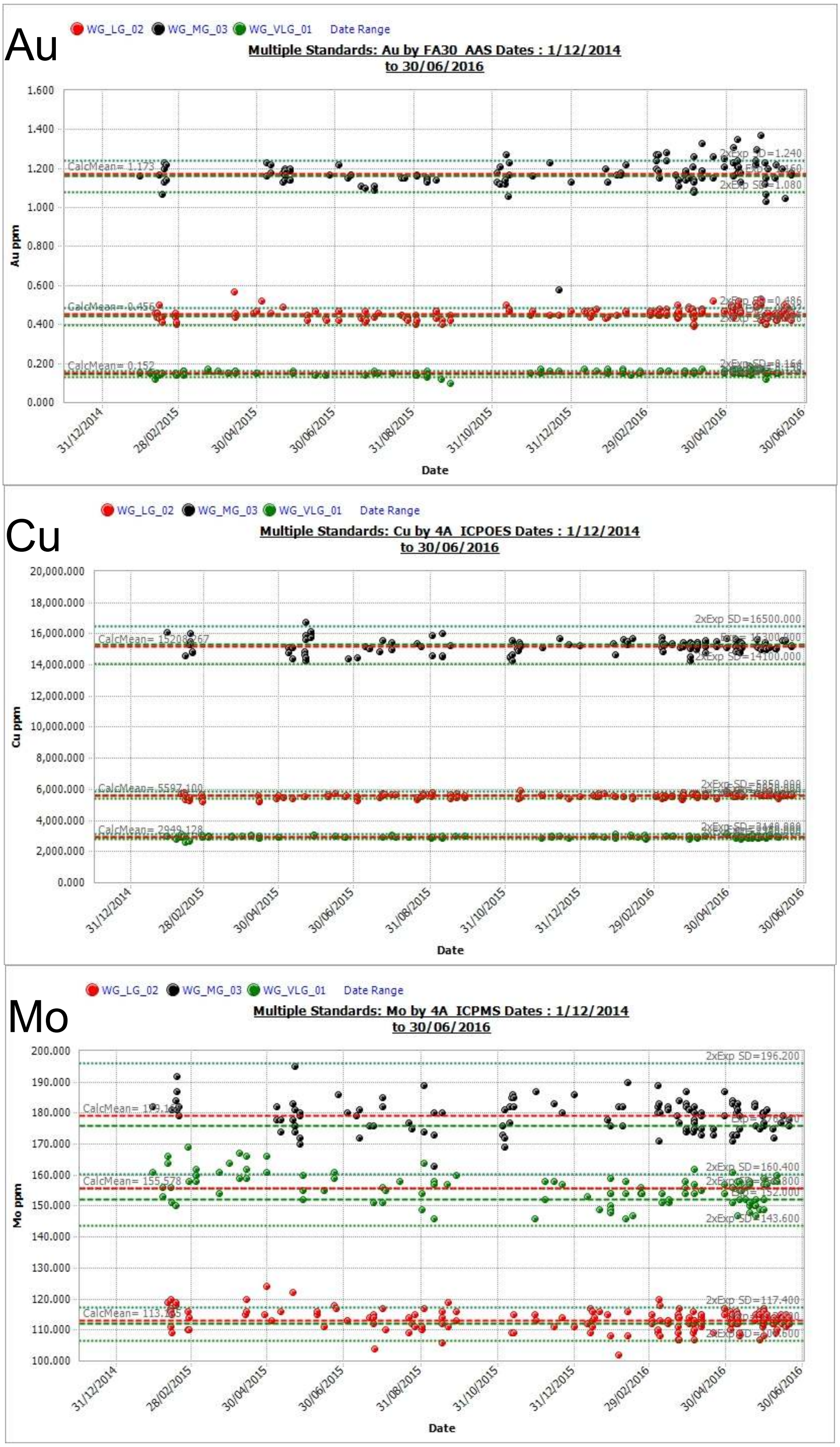


Figure 11-4: QC results for three Control Standards used at Kili Teke: Au, Cu and Mo.

11.4.3. Repeat Analyses

A review of laboratory repeat analyses (Fig. 11-5) illustrates there are only a few minor outliers; no systematic bias is present between the original and internal laboratory repeats.

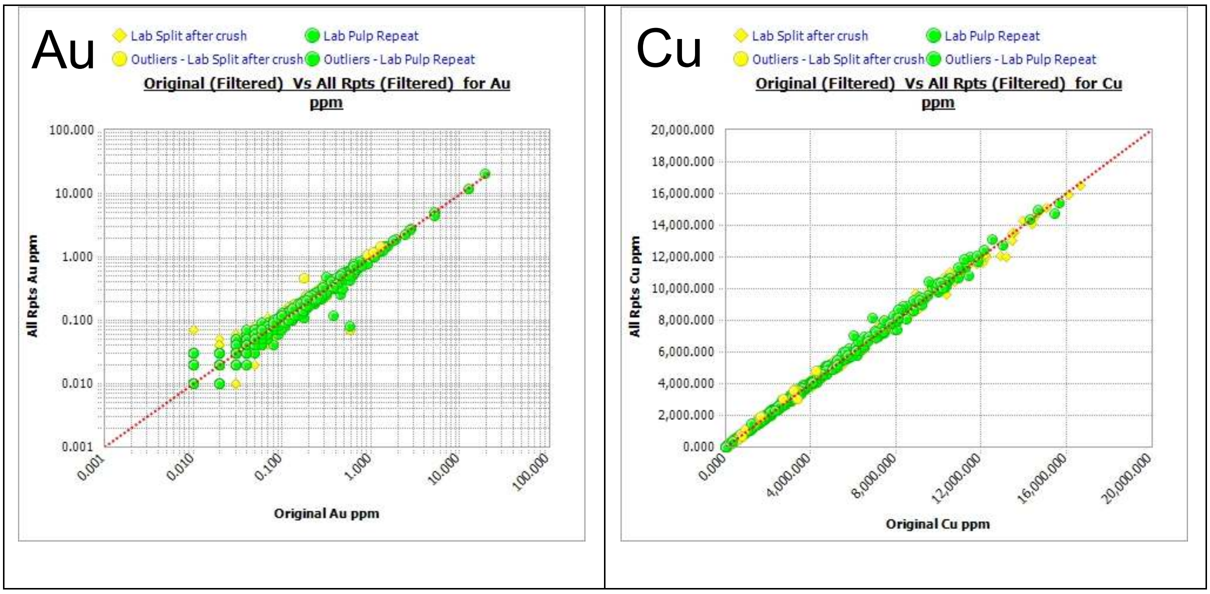


Figure 11-5: Laboratory repeat analyses, Kili Teke: Au and Cu.

The QAQC results of the blank and control standards submitted to date illustrate there is no material bias or trend in the assay results for copper, gold and molybdenum. The main QAQC issue identified is the occurrence of sample mixups in the fire assay stage at the Intertek Lae laboratory and to a lesser extent in the sample preparation process. This is being managed by continued review and communication with the laboratory upon receipt of each batch, with anomalous samples investigated and a number of batches and partial batches re-assayed to confirm results.

11.5. Bulk Density

The first samples used to measure bulk densities were only air dried, before oven drying facilities were installed, but since that time all samples have been oven-dried. Samples were collected at 30m intervals down hole. Initially, the method used was to measure the weight of displaced water when a sample was submerged, but the method was changed to measuring the weight of the sample submerged in water and utilising the formula below:

$$\text{Bulk Density} = \frac{M_{dry}}{M_{sat} - M_{sat\ in\ water}}$$

Calibration issues with the scales used were identified, during the programme, and a review of the data and repeat measurements are required for some recent data. As a result, only bulk density determinations from drill core up to hole KTDD030 were included in calculation of the average bulk densities (Fig. 11-6). Bulk density values for intrusives and limestone were 2.51 and 2.67, respectively. A default density of 2.6 was assigned to all remaining blocks. Further work is required to determine the variations in bulk density between fresh and altered rock. But, overall, the average bulk densities used for the Mineral Resource estimate are in line with expected values for the relevant rock types.

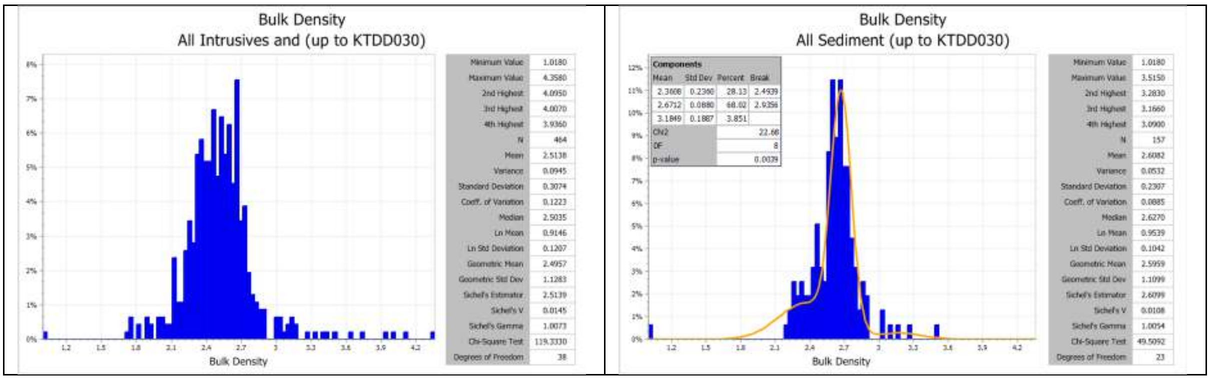


Figure 11-6: Bulk density data for drill core samples up to and including KTDD030.

12.DATA VERIFICATION

12.1. Data Management

The Kili Teke drill hole database was stored in the main Harmony SQL database, located on a server in their Brisbane Office. The database is managed by a dedicated Database Administrator. Daily, weekly and quarterly QC reports were auto-generated from the database and emailed to the relevant personnel for analysis and review – and action, if required.

Drill hole logging was completed on site using laptops and Maxwell's LogChief software, which was synchronised each evening to the main database in Brisbane.

Assay files were reported by the laboratory in digital and hardcopy format, and imported into the database using standard import templates by the Database Administrator.

All drill data were extracted from the main Harmony SQL database tables through a series of standard export templates in Datashed, to generate the following csv files for import into Micromine (for visualisation and modelling):

1. Coll.csv
2. Surveys.csv
3. Ass.csv
4. Lith.csv
5. Alt.csv
6. SG.csv
7. dh_Corerec.csv
8. dh_structureZones
9. dh_StructurePoint
10. magsus.csv

In addition to the data validation functions built into the LogChief logging software and the Datashed database, manual validation checks were run using Micromine's drillhole database validation runs. Drill traces were visually checked on screen (in 3D) and any anomalies corrected, as required.

12.2. Data Validation

No independent verification has been made of any of any data exported from the Harmony database.

However, the data have been used by Harmony to generate Mineral Resource estimates, in accordance with the South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves (SAMREC, 2016 Edition) (www.samcode.co.za) – which is recognised and accepted for the purposes of NI 43-101.

Further data validation will be undertaken when KRL begin the next phase of work at Kili Teke.

13.MINERAL PROCESSING & METALLURGY

Preliminary metallurgical testwork was completed at ALS Metallurgy (ALS), in October to November 2015. Seven samples of porphyry and two of skarn material were tested. The testwork comprised of rougher flotation testwork, utilising a typical reagaent suite for copper porphyry ores at a grind of 80% passing 106um (Table 13-1 and Fig. 13-1).

ALS reported the following conclusions:

- Copper minerals responded well to flotation at pH11.5, with lime and a selective copper collector. High copper recoveries were achieved from all samples, although copper recoveries were lower from samples with higher iron sulphide content (as indicated by sulphur assays).
- Gold head grades and recoveries varied widely, with no clear relationship between gold recovery and copper or gold head grades.
- Molybdenum head grades were variable (45-365ppm Mo), but for samples with more than 100ppm Mo, molybdenum recoveries to copper concentrate exceeded 75%.
- Silver head grades were low (mostly <2g/t Ag), but silver was upgraded in the copper concentrate.
- Arsenic levels in samples and copper concentrates were low (< 10ppm As for all but one sample).
- All samples and concentrates report high levels of fluorine, but it is likely that this is associated with gangue minerals, which could be mostly rejected by regrinding and cleaner flotation.

Harmony assumed a molybdenum recovery of 70%, but report that there is a difference between skarn material (55%) and porphyry (89%) – with no explanation?

Table 13-1: Preliminary testwork - rougher concentrate grades and recoveries. Samples represent porphyry and skarn.

Test #	Rougher 6 Concentrate								
		Grade					Recovery		
	Mass%	Cu %	Au g/t	S%	Mo ppm	F ppm	%Cu	%Au	S%
P0831T1	10.8	9.5	2.90	19.2	219	203	92.5	51.2	21.8
P0831T2	10.0	10.4	3.25	18.3	1586	412	98.1	46.3	59.1
P0831T3	13.7	10.2	1.77	14.6	1680	396	98.4	56.0	84.3
P0831T4	16.9	9.1	4.57	10.4	531	543	97.5	85.3	93.0
P0831T5	12.8	13.5	5.40	16.8	1458	269	98.6	69.3	77.4
P0831T6	6.5	10.1	1.77	20.1	39	148	85.1	14.5	7.2
P0831T7	9.1	4.8	3.33	14.4	323	493	95.4	47.0	38.4
P0831T8	10.0	4.3	1.11	7.0	1382	632	96.6	48.7	53.2
P0831T9	12.9	4.3	1.05	7.7	2680	441	96.6	31.4	42.8

Copper and gold recoveries, based on the testwork and similar deposits in the Kili Teke area, for use in preliminary mining studies (see Section 16), are reportedly 95% and 65%, respectively – which are considered reasonable (AMC, 2017).

Harmony note that future work should include:

- Additional rougher testwork – to investigate and optimise the reagent suite.
- Pyrite flotation – and subsequent gold recovery from the pyrite.
- Cleaning work – to remove more gangue and upgrade the final concentrate.

Much more metallurgical testing will be required, as and when the lithological and grade variability within the deposit is better understood.

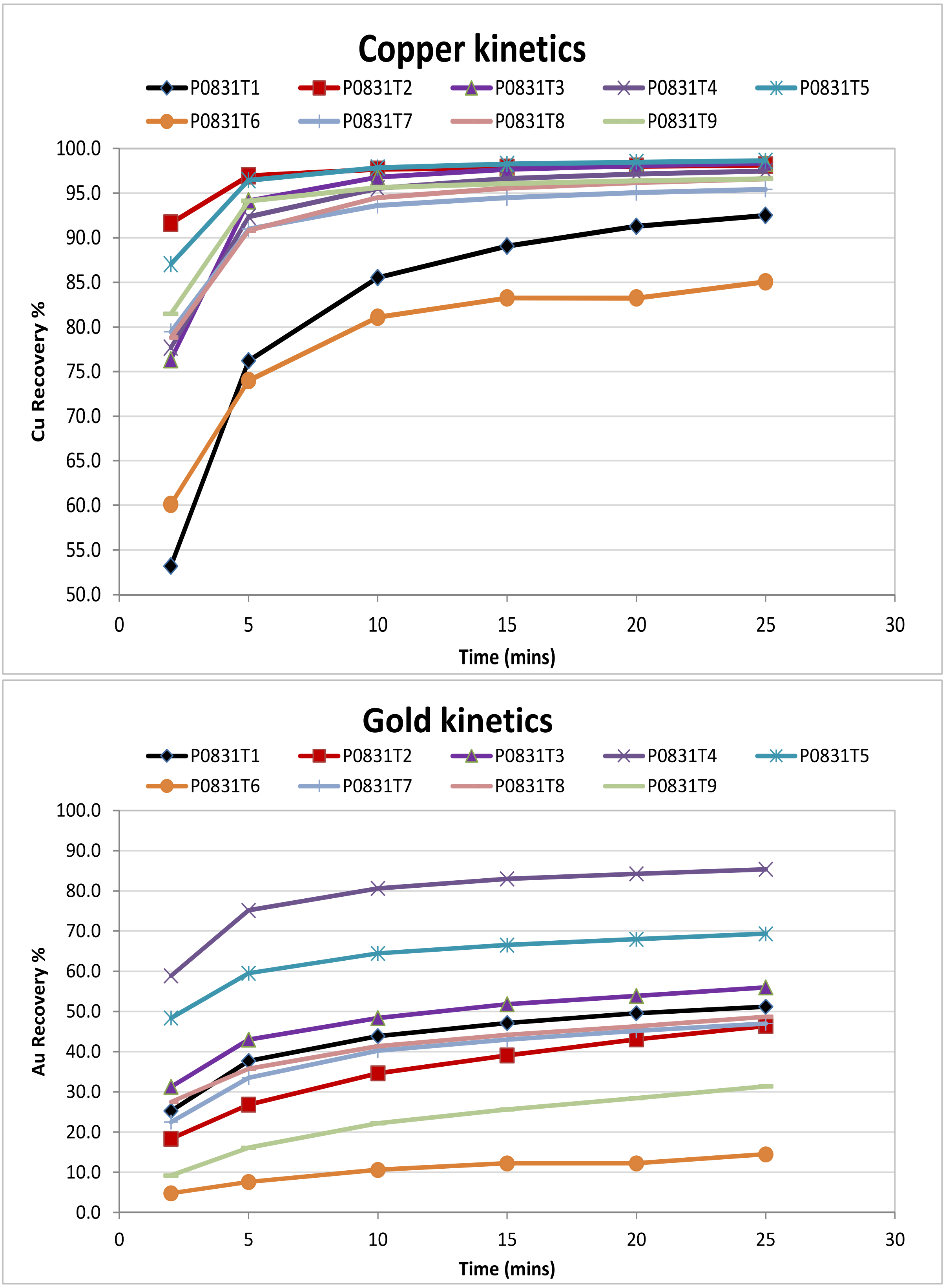


Figure 13-1: Preliminary metallurgical testwork - recovery curves for Cu and Au. Samples represent porphyry and skarn mineralisation.

14.MINERAL RESOURCE ESTIMATE

The latest Mineral Resource estimate (MRE) for Kili Teke was completed in January 2017. The previous MRE, completed in June 2016 was validated using an independent Inverse Distant Weighted (IDW) estimation, but this step was not repeated in 2017. The diffuse nature of the mineralisation, the stationarity of the estimation domain and the low Coefficients of Variance for all grade data (Cu, Au & Mo) are all conducive for a robust Ordinary Kriged estimate. According to Harmony, given the current constraints of drill coverage, the latest estimate is considered to be high quality. The estimate was generated in Micromine (v15); all steps were recorded and documented as a Micromine macro, to ensure repeatability.

14.1. Geological Model

Geological modelling and domaining for Resource estimation was completed using implicit modelling in both Leapfrog Geo and Micromine software. The modelling was completed on all drilling and incorporated information including mapping, geophysics and remotely sensed data. Given the low data density the implicit modelling approach was considered the best to generate a coherent and unbiased interpretation. Wireframes generated by the Leapfrog Implicit Modelling algorithm were edited using polylines and points to ensure the modelled surfaces conformed to the interpreted geology. There was very little scope for the implicit modelling engine to generate undirected shapes, so the geological model conforms to the current understanding (Fig. 14-1). Further drilling is required to better define the detail of the geological model.

However, the overall features of mineralisation in the CMP modelled well enough, with a steeply dipping pipe-like geometry, within a moderately ENE-dipping host sequence of limestone and siltstone. Within the intrusive complex, a number of phases have been modelled. The later intrusive phases appear to have intruded into the centres and along the contacts of the earlier intrusive phases – this is how blocks of marble and skarn within the intrusive complex are explained. The internal contacts would have been pathways of weakness for the younger pulses of magma.

Mineralisation within the intrusive complex comprises two main pipe-like zones of stockworking, hosted primarily in the early-mineral phases of Hornblende Porphyry (PH) and Feldspar Hornblende Porphyry (PFH1): the Northern Stockwork Zone (NSZ) and the Southern Stockwork Zone (SSZ). At surface the two stockwork zones are separated by 200-300m, but they are closer at depth where they potentially merge together? The orientation of the two stockwork zones appears to be slightly different, with the NSZ plunging steeply (at 73°) to the east and the SSZ plunging at a shallower (~67°) to northeast.

The Yalopi Creek Fault Zone, which separates the NSZ and SSZ is comprised of numerous faults and skarn breccia zones, and on some sections this can be modelled with a distinct hangingwall and footwall surface. However, at this stage, the Yalopi Creek Fault Zone has not been modelled separately because later mineralisation, associated with D vein assemblages and phyllic alteration, overprint the zone.

A variably developed skarn zone surrounds the pipe-like geometry of the entire CMP intrusive complex. Initially this was modelled as footwall and hangingwall zones to the main stockwork, but it is now interpreted as a discontinuous zone – further drilling is required to confirm the interpretation.

The deposit appears to be closed off to the north and northwest, with the best potential for extensions to the east and southeast, and at depth down-plunge. The topography of the host limestone supports this interpretation; it forms an intact sequence to the west of the deposit, but appears to be disrupted and “jacked apart” to the southeast (Fig. 14-2).

For the maiden Mineral Resource estimate, there was insufficient drill data to model a base to weathering. Indeed, most drill holes were collared in the cover, Darai Limestone. However, subsequent drilling, collared on the outcrop of the CMP, has shown that weathering in the intrusive phases typically extends to a maximum depth of 20m (although oxidation does penetrate deeper along fractures). With only limited drilling information as control, a Base Of Partial Oxidation (BOPO) was generated by lowering the topographic surface vertically by 20m. This surface adequately represents the base of oxidation in the intrusive phases. No significant zone of supergene enrichment has been identified.

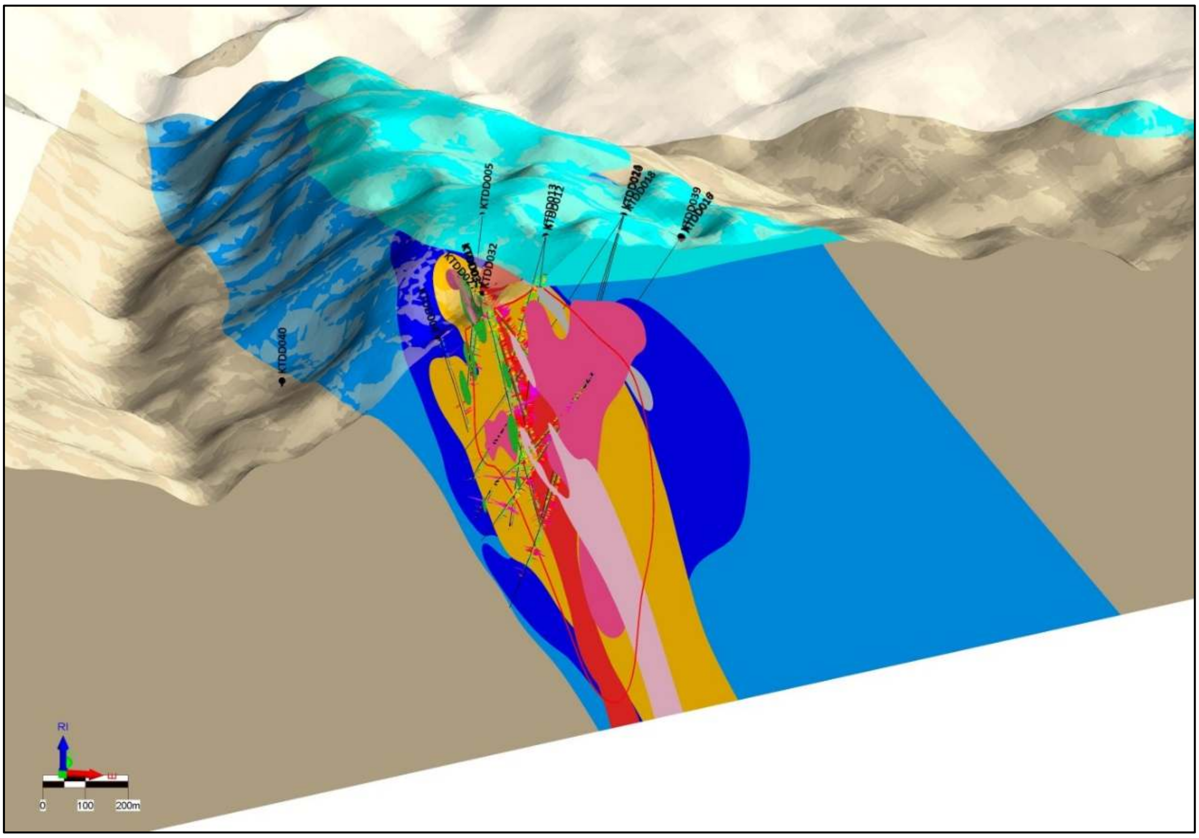


Figure 14-1: Leapfrog geological model of the Kili Teke porphyry Cu-Au deposit.

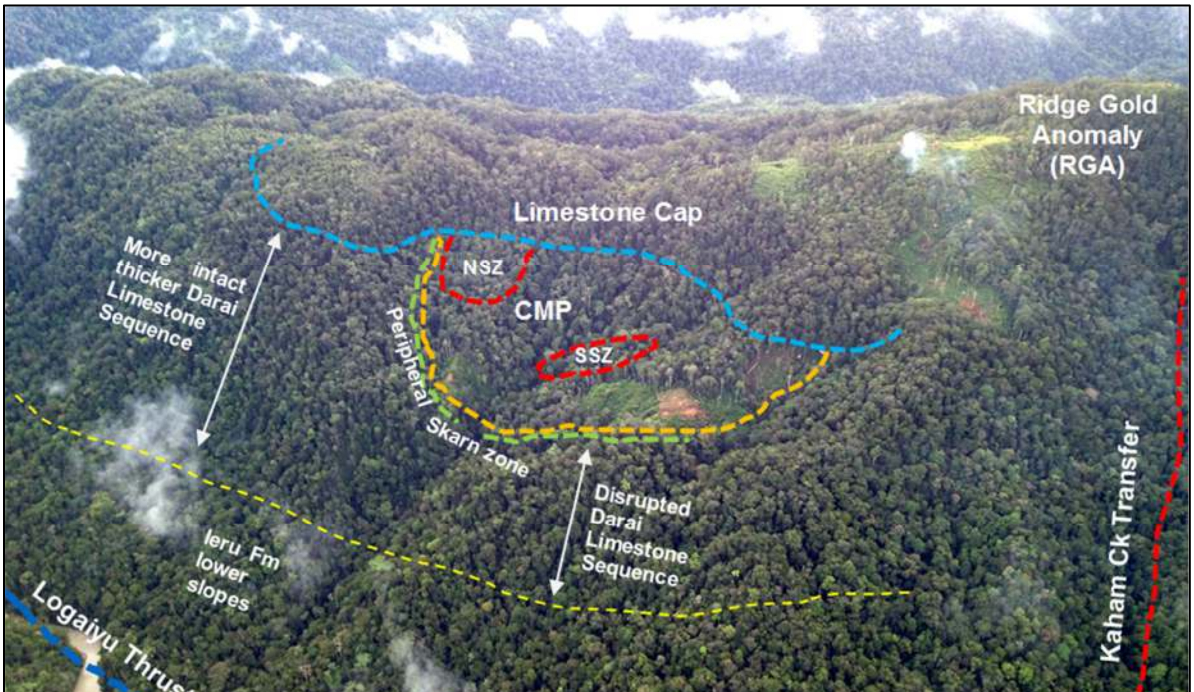


Figure 14-2: View to the northeast across the Kili Teke prospect, to show the host rock geology.

14.2. Data Analysis

14.2.1. Global Analysis

The global dataset comprises raw assays from drilling taken at either 1m or 2m intervals (Table 14-1 and Fig. 14-3). Note that raw assay data was edited so that "below detection limit" results are set to half the detection limit, as defined in Table 14-1. The data are generally negatively skewed but low Standard Deviations (SD) and Coefficients of Variation (COV) demonstrate consistent grade, which suggests that the Mineral Resource estimate should be relatively robust.

Table 14-1: Summary statistics for raw assays (MRE, 2017), Kili Teke.

Category	*Au g/t*	*Cu %*	*Mo ppm*
Number of samples	16006	16006	*16006*
Minimum	0.0025	0.00005	*0.05*
Maximum	27.0	20.119	*10,011*
Mean	0.209	0.283	*120*
Variance	0.177	0.202	*45,570*
Standard deviation	0.421	0.449	*213.5*
COV	2.014	1.587	*1.78*
Median	0.12	0.180	*62.0*

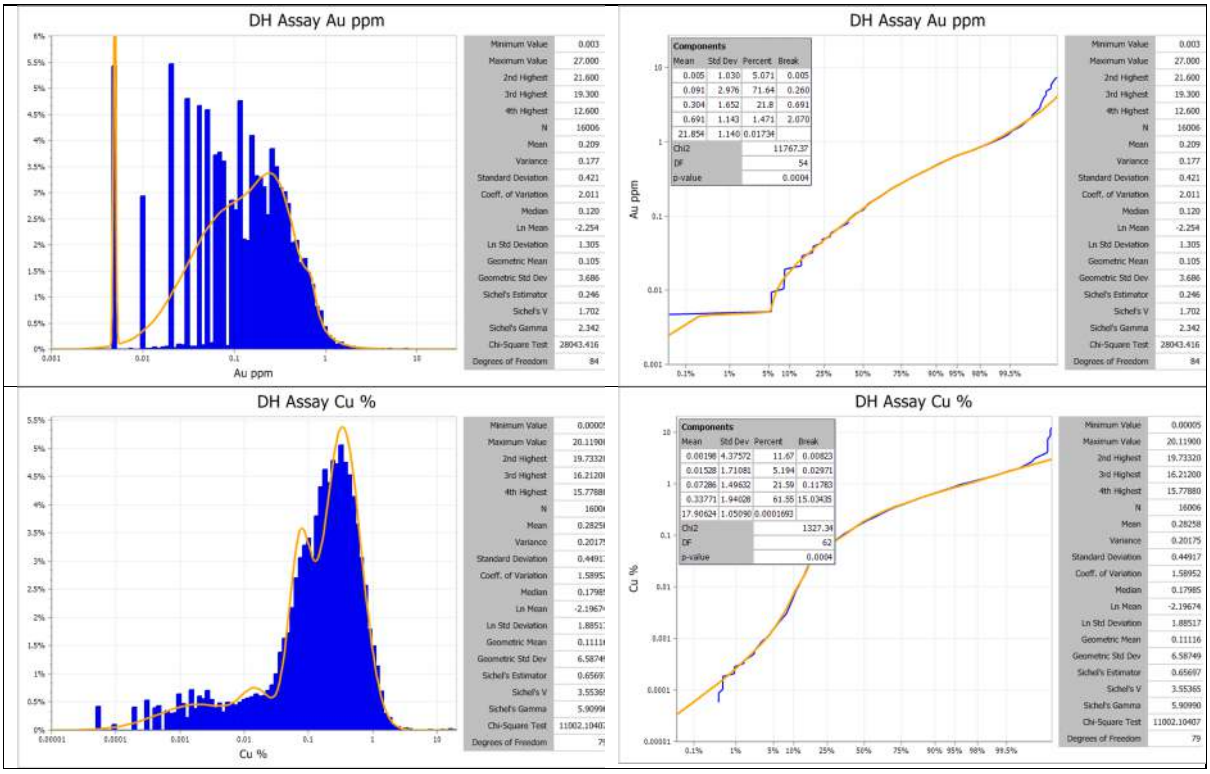


Figure 14-3: Histogram plots of all assay data – Au and Cu (MRE 2016).

14.2.2. Element Correlations

Scatterplots demonstrate there is a strong Cu-Au correlation, and moderate Cu-Mo and Cu-Ag correlations, but little else of signioficance (Fig. 14-4). These relationships are consistent with the overprinting relationships and mineral assemblages observed in drill core. Chalcopyrite is better developed in early quartz veins, with associated potassic alteration, and molybdenite is more common in later D veins, with phyllic alteration.

The Cu-S scattergram illustrates a minor population of copper oxide and investigation of these samples show they are predominantly from the weathered section, at the top of drill holes collared in the near surface expression of the NSZ. Harmony suggest that the Cu-Fe and Cu-S illustrate the pyrite-dominant assemblage associated with argillic alteration.

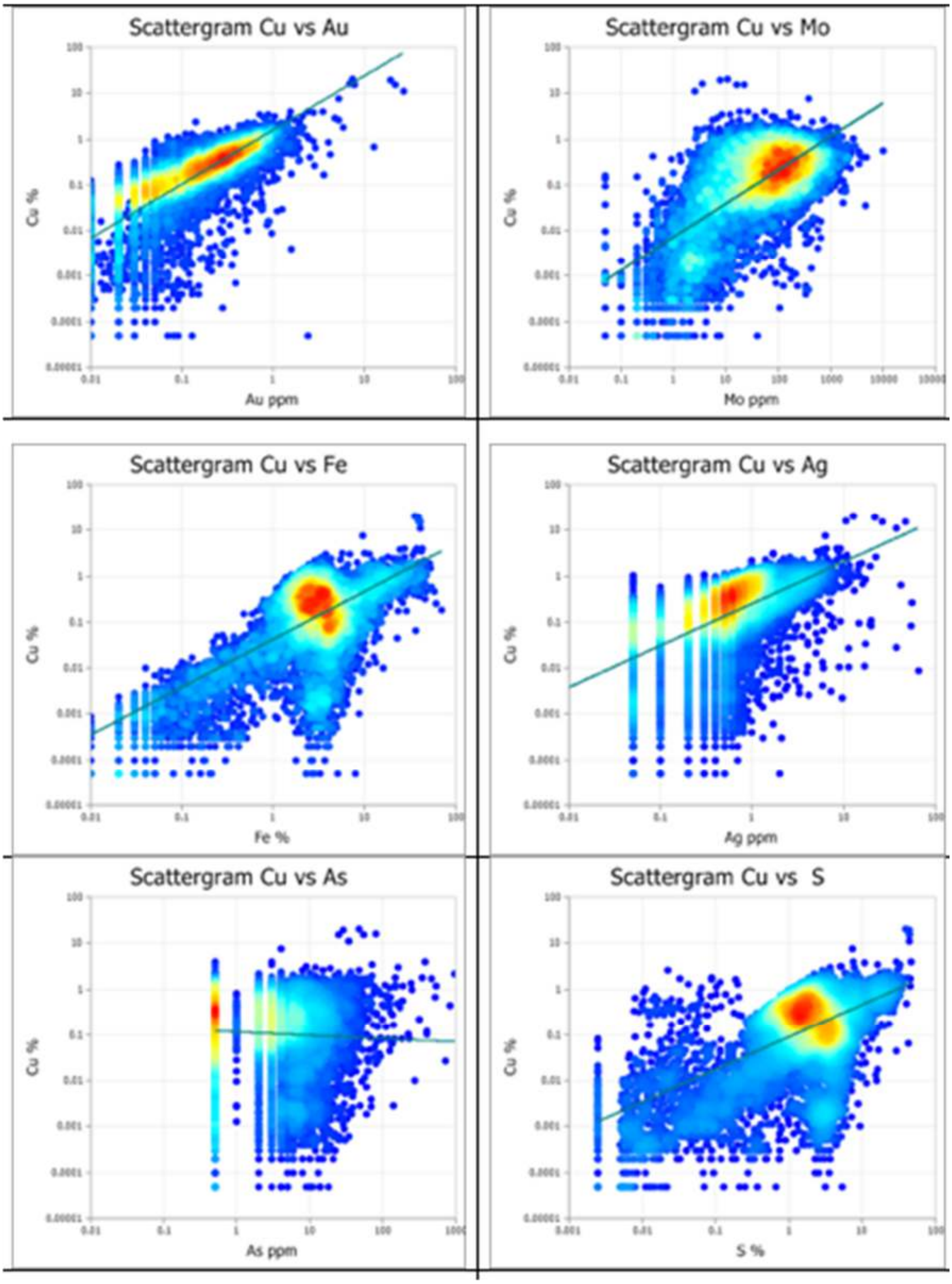


Figure 14-4: Scattergrams illustrating element correlations from raw assays (MRE 2016).

14.2.3. 4m Composites

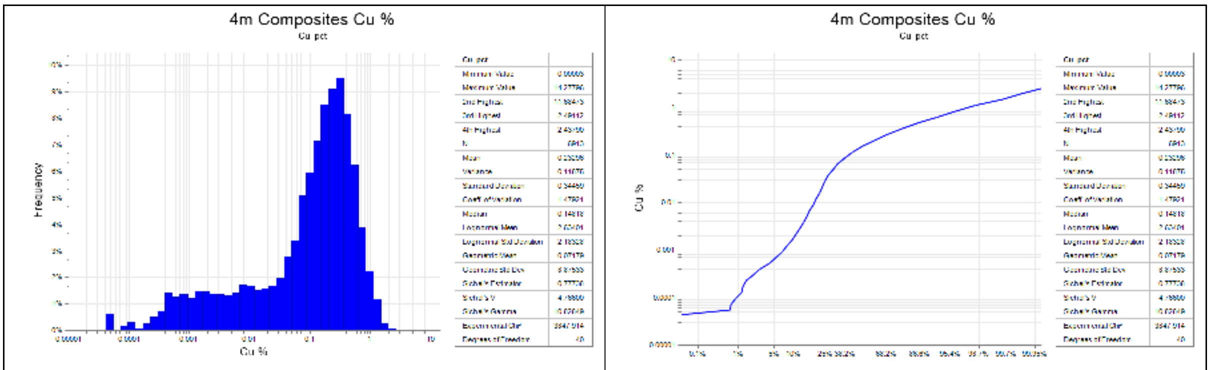
An assessment of various composite intervals was undertaken for the maiden Mineral Resource estimate and 4m was selected as a suitable compromise between generating too much detail, given the 60m block size, and providing enough detail, to generate a representative model and reduce the variance of the data set (Habermann and Reid, 2015).

A number of sub-populations are recognised within the 4m composite data set, which correlate with different mineralisation styles, as follows:

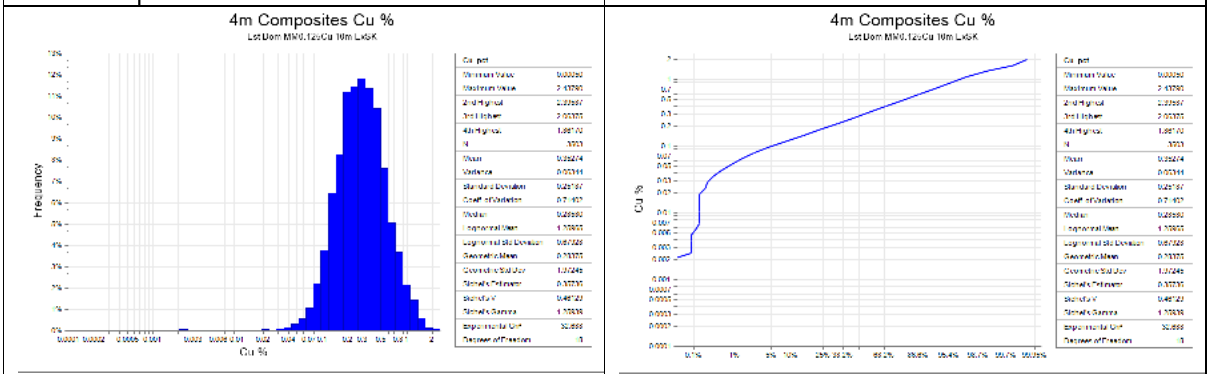
- Early stockworking, with potassic alteration.
- Late D veins, with phyllic alteration.
- Weak pervasive calc-silicate altered diorite, unaltered diorite, PFH3 and limestone/marble.
- High-grade massive sulphide assemblage (in KTDD025)

Figure 14-5 illustrates the population distribution of Cu grades for *all* 4m composites compared to a restricted data set for just the estimation domain (see below). The restricted data effectively removes most of the low and high grade outliers, and results in a lognormal distribution of 4m composite Cu data – these data were used to complete the Mineral Resource estimate. Summary statistics for the 4m composite samples are listed in Table 14-2.

Figure 14-6 illustrates the 4m composite data for Au and Mo within the Estimation Domain. Two sub-populations are clear within the Mo distribution, which correspond to low-grade Mo mineralisation, associated with the early, pervasive, potassic alteration and stockworking, and high-grade Mo, associated with later D veins and overprinting phyllic alteration. Further work is required to investigate and review the spatial distribution of the higher grade Mo zones, to determine if they can be domained and estimated separately.



All 4m composite data



4m composite data constrained to the estimation domain

Figure 14-5: Histograms of 4m composite Cu grades for all data, compared

Table 14-2: Summary statistics for 4m composites grades within the Estimation Domain

Category	*Au g/t*	*Cu %*	*Mo ppm*
Number of samples	3603	3603	3603
Minimum	0.005	0.0002	0.76
Maximum	2.60	2.396	2726
Mean	0.247	0.041	168
Variance	0.041	0.065	28696
Standard deviation	0.201	0.255	169
COV	0.814	0.744	1.01
Median	0.200	0.279	123

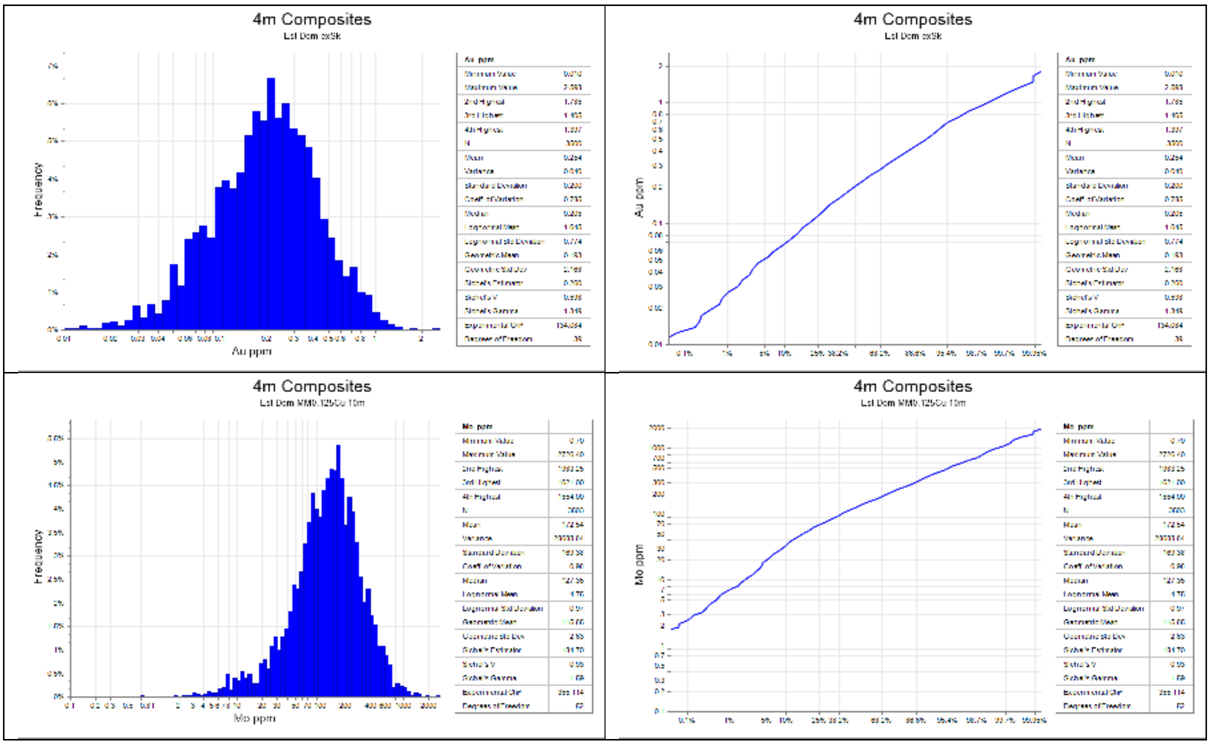


Figure 14-6: Histograms of 4m composite Au and Mo grades within the Estimation Domain (MRE 2017).

14.2.4. Cu-Au Ratios

Within the bulk of the Kili Teke deposit there is a strong Cu:Au correlation (Fig. 14-7), but there are some local zones of dramatic variation to the norm. For example, in the deeper part of the NSZ (in KTDD017: 642-677m – Figs. 14-8 and 14-9), an interval of well-developed, early A-B veining, with associated potassic alteration, reports very high Cu:Au ratios compared to normal (which is approximately 2:1). This anomalous zone has been tracked both up and down dip (in KTDD025 and KTDD014, respectively), which suggests that it is a specific zone of early potassic mineralisation, which is depleted in Au.

Further domaining of the intrusive phases is required, but this is not possible at the current drill spacing. Relationships observed in drill core clearly show that the later intra-mineral porphyry phases (PFH2 & 3) have stoped out earlier mineralisation (with hard boundaries). Composites from the later intrusive phases are included in the latest Mineral Resource estimate, and likely impact the estimate by diluting some block grades.

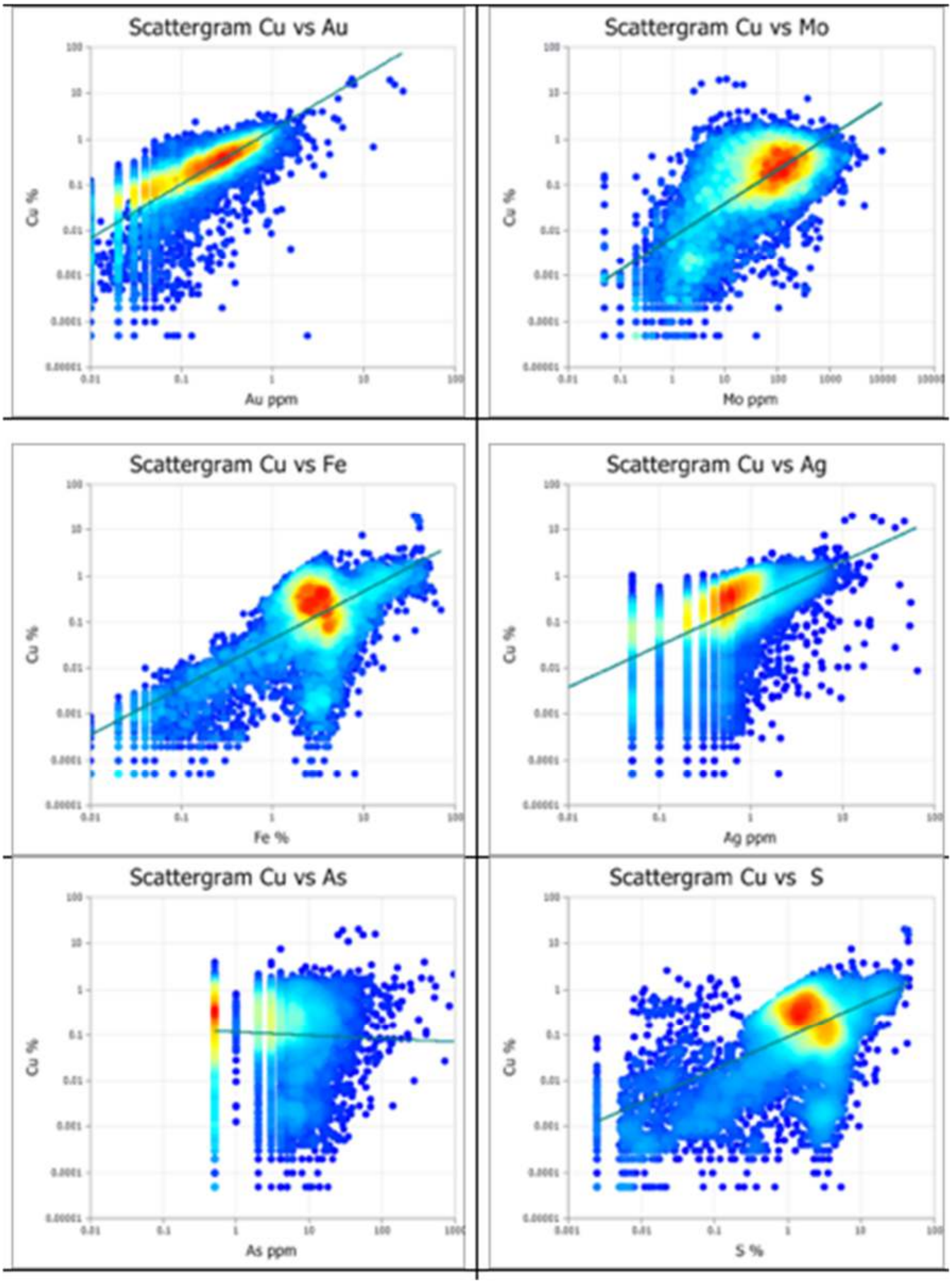


Figure 14-7: Scattergrams illustrating element correlations from raw assays (MRE 2016).

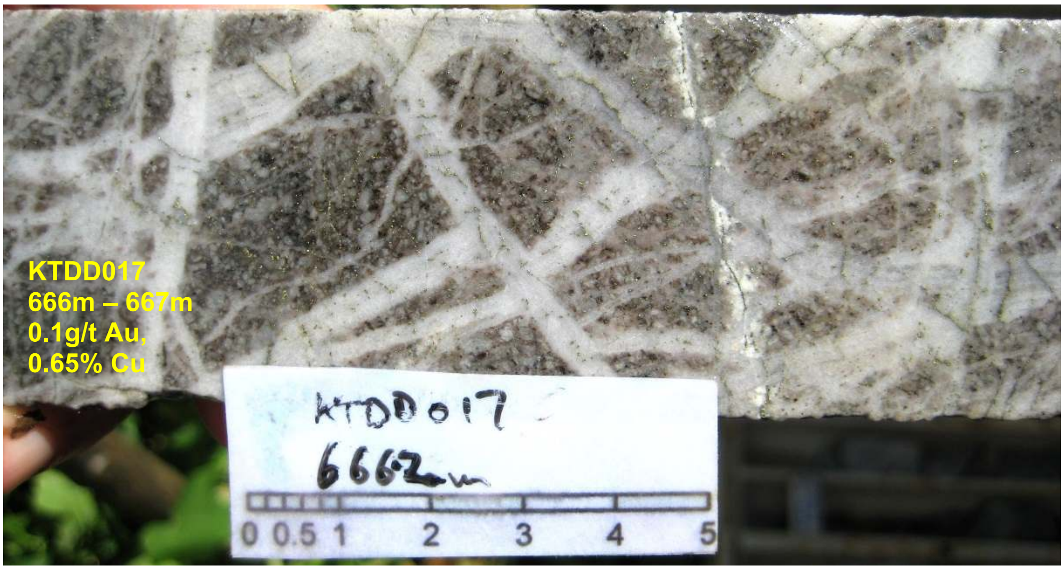


Figure 14-8: Example of mineralisation from zone with anomalously high Cu:Au ratios.

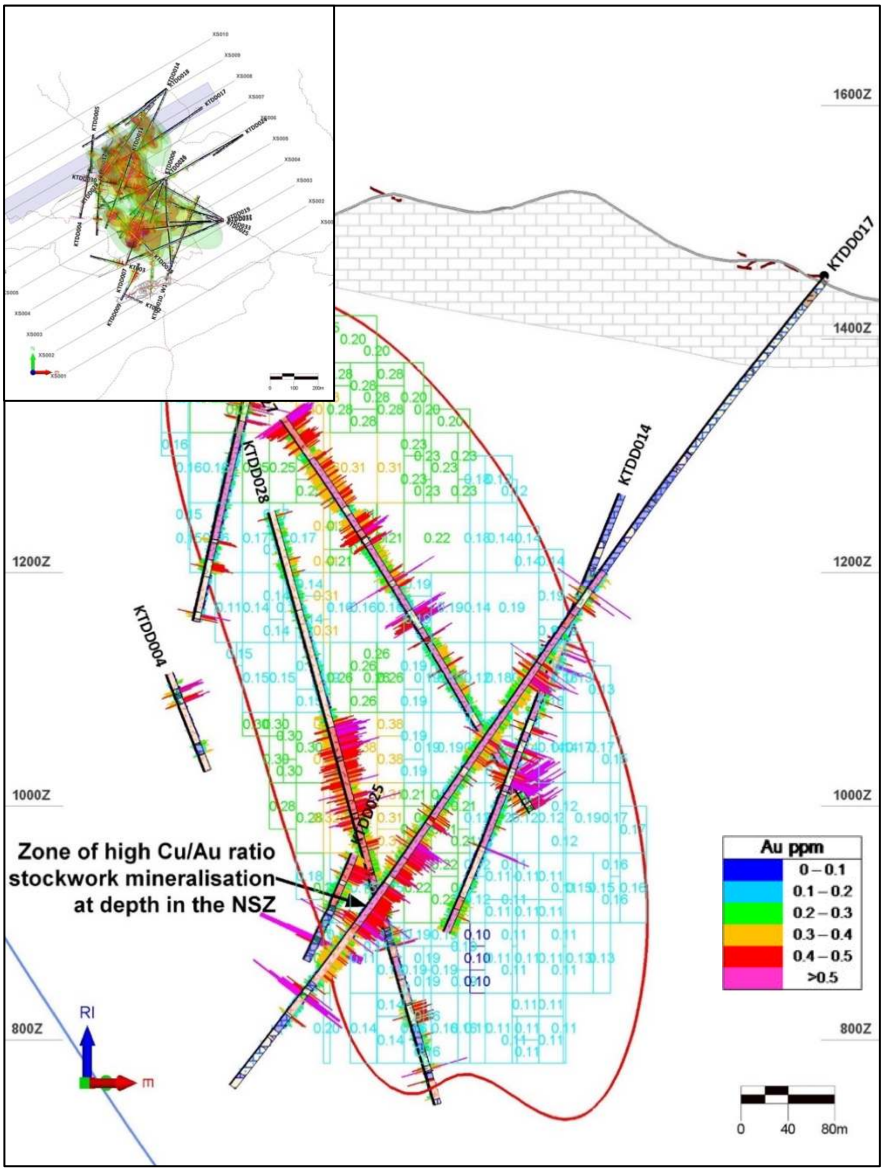


Figure 14-9: Deep zone of high Cu:Au mineralisation in the NSZ (KTDD017: 642-677m).

Skarn mineralisation, which is typically high grade material, was not excluded from the Estimation Domain for calculation of the latest Mineral Resource estimate, because the drilling coverage is insufficient to define skarn domains, specifically. Caution was exercised to prevent high-grade skarn material influencing the grades of relatively large blocks in the block model. The summary statistics for 4m composite grades, inclusive of skarn material, are presented in Figure 14-10.

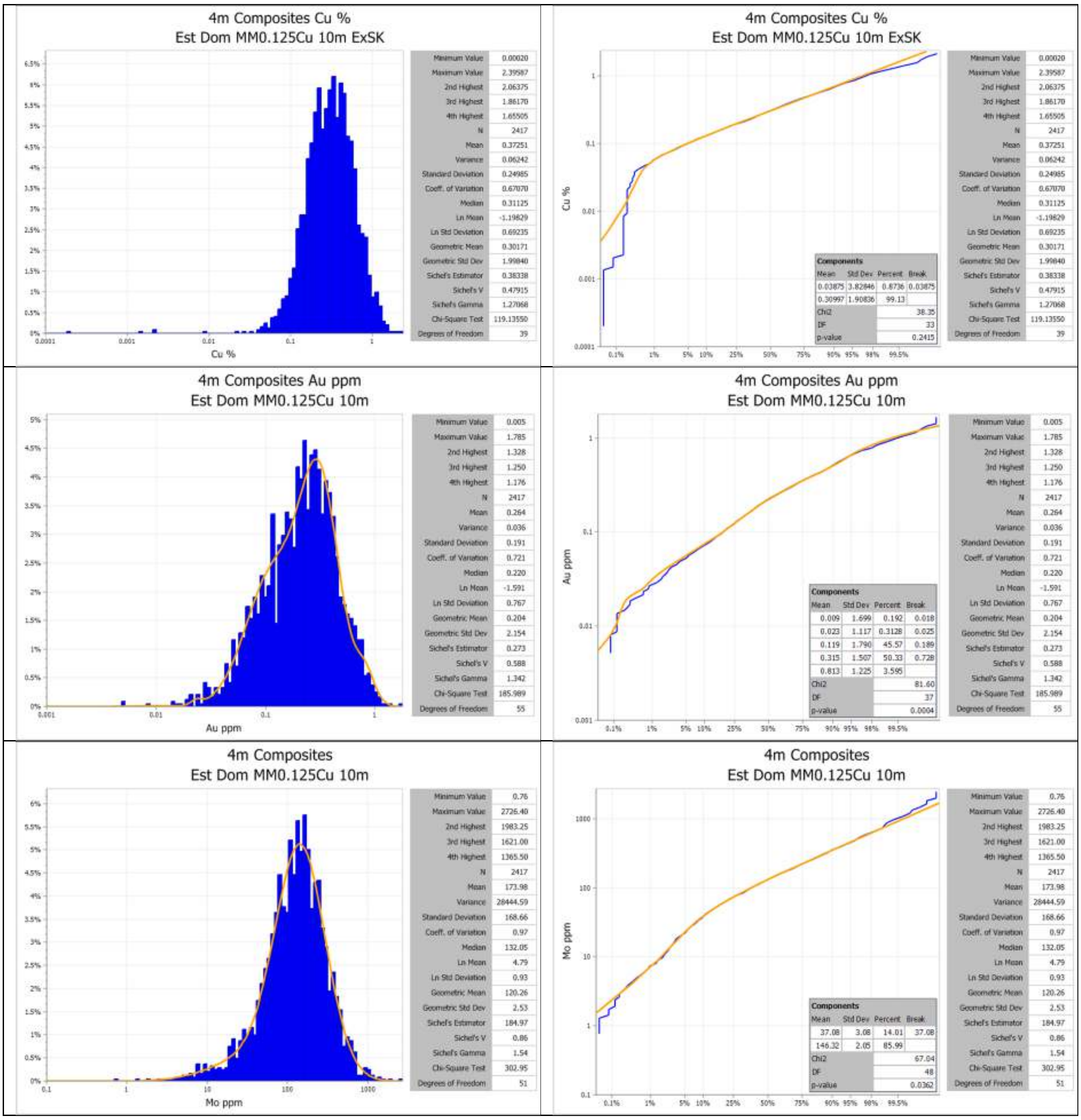


Figure 14-10: Histogram of 4m composites within the estimation domain including skarn type (MRE 2016).

14.2.5. Declustered Analysis, Diffusivity and the Proportional Effect

The data is not clustered, as confirmed by a decluster analysis, conducted for the maiden Mineral Resource estimation (Habermann and Reid, 2015).

Similarly, data was assessed for diffusivity (where mineralisation varies from low- to high-grade gradually) and the proportion effect (where higher grade = higher variability) for the maiden Mineral Resource estimate; both were confirmed (Habermann and Reid, 2015).

No more tests of these parameters were carried out for the Mineral Resource updates (2016/17).

14.2.6. Contact Analysis

Contact analysis of the Estimation Domain, based on the 0.125% Cu indicator, confirms that the boundary of the domain represents a natural cut-off.

Analysis of grade changes across contacts of the early, high-grade, porphyry phases (PH and PFH1) demonstrates that there is no significant step change in grades across contact zones (Fig. 14-11) – which supports the use of “soft” (transitional) boundaries. However, there is opportunity to improve the estimate by using hard boundaries for the later, low-grade intra-mineral intrusives (PFH2 and PFH3) because these clearly stope out and truncate the earlier high-grade phases – although there is insufficient drilling data to allow this at present.

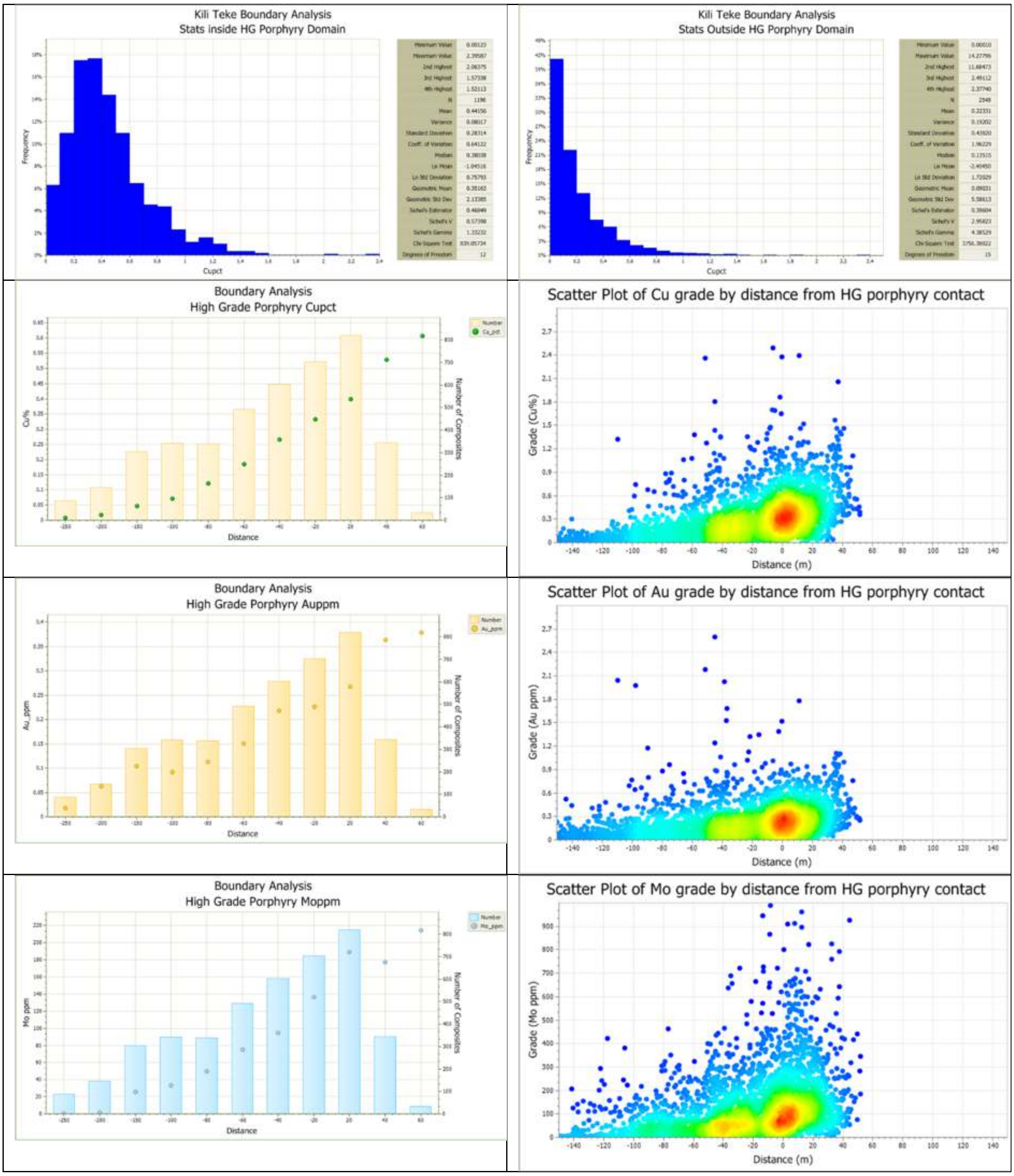


Figure 14-11: Boundary analysis results for Cu, Au and Mo on the contact of the PH and PFH1 porphyry models.

14.2.7. Top Cut Determination

The domained and composited data was assessed for the requirement of top cutting. Statistically, this was considered unnecessary (COV<1), but a few values were cut from each element data set (Table 14-3), based on where the relevant histograms disintegrated into what was interpreted as separate high-grade populations. The data were plotted as RL profiles to assess the spatial distribution of high grades to ensure that no distinct populations were being removed (when they could have been separated by domain).

Table 14-3: Top-cut analysis of the domained composites.

Element	*Composites*	*Top cut value*	*Number of samples cut*	*% Metal*	*Uncut mean*	*Cut mean*
Au	2429	1.18	5	1.45	0.266	0.265
Cu	2429	1.80	5	0.89	0.374	0.374
Mo	2429	1266	6	2.45	173	172

14.3. Estimation Domains

Drilling at Kili Teke has defined mineralisation to a depth of approximately 650m below surface (at the 780m RL), but the drilling density is still inadequate to resolve the internal boundaries of the later low-grade or barren intrusive phases (PFH 2 & 3), and late-stage faulting which has offset mineralisation. As such, the Estimation Domain was defined by assays alone, using Micromine's Decompose function, to identify and model separate populations within the assay data set. The 0.125% Cu shell was the domain used for the Mineral Resource estimation (NB: it is flagged as 100 in the EstDom attribute in the blockmodel).

According to Harmony, experience at other porphyry deposits has shown that the first trace of chalcopyrite in logged drill core commonly defines the edge of a mineralised domain, which occurs at about 0.1% Cu. At Kili Teke, this is not as clear-cut. Analysis reveals that the natural cut-off is somewhere between 0.017-0.191% Cu and between 0.067-0.154g/t Au. The 0.125% Cu shell was selected as a reasonable compromise, on the understanding that while there might be a little mineralised material beyond the Estimation Domain, it would be well below any economic cut-off (and therefore not material). The Estimation Domain parameters for the 4m composite data are presented in Figures 14-5 (Cu) and 14-6 (Au and Mo), and the Estimation Domain is illustrated in Figure 14-12.

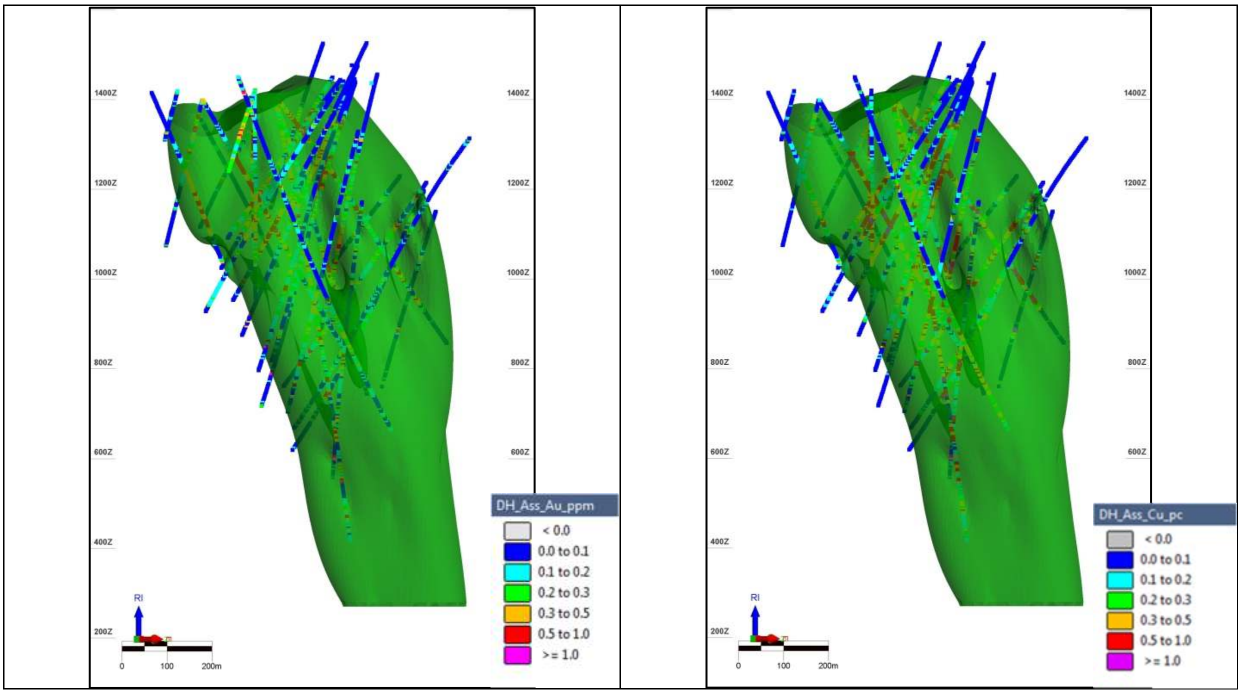


Figure 14-12: Estimation Domain, defined by the 0.125% Cu shell.

14.3.1. Stationarity

Domain stationarity was assessed using swath plots of grade mean (Fig. 14-13) and standard deviation. The Estimation Domain is considered to be relatively stationary, with little drift evident across the domain.

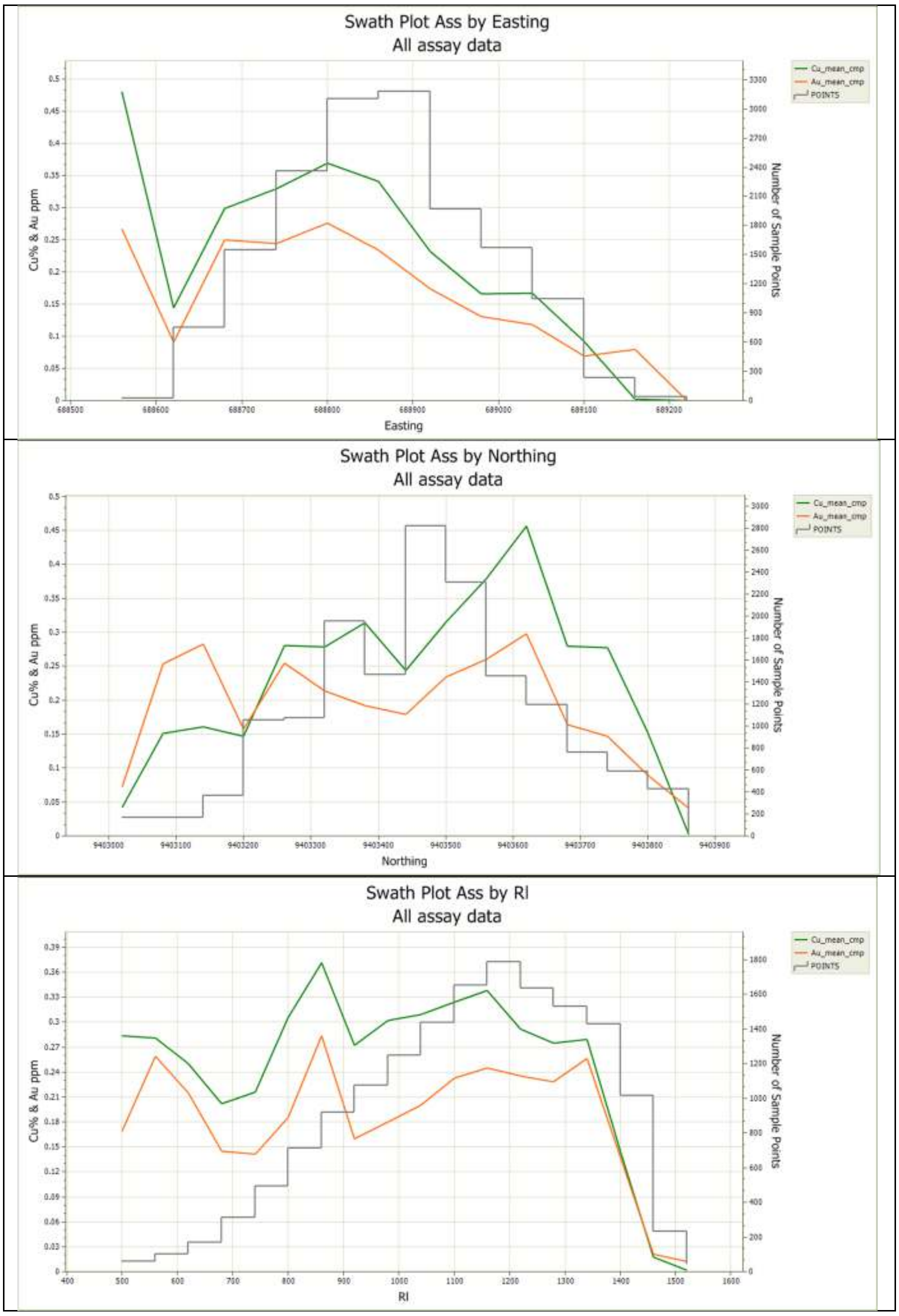


Figure 14-13: Swath plots of raw data, to show grade variation by Northing, Easting and RL.

The inability to model the relatively small (?) and discontinuous skarns (and the significant metal carried within them), due to the inadequate drill density, is a significant factor that affects the accuracy of the Mineral Resource estimate. The skarns contain some of the higher grades reported from the Kili Teke deposit, and any estimation that did not seek to constrain these grades would result in an unrealistically elevated global grade. Various methods were tested (e.g. applying minimum search distances, heavy top-cutting of skarn material) to reduce the influence of the high-grades, but in the end it was decided to simply filter out the skarn data for the estimation. The missing metal is a potential upside for any future Mineral Resource estimate.

14.3.2. *Variography*

The calculation of variography for Kili Teke was difficult because there is too little data to drive the variograms. To counter this, Harmony opted to use *Pairwise Variograms* to model variability – for two reasons:

1. Pairwise Variograms are particularly useful to model variography for small datasets – because they effectively "double" the number of samples.
2. Pairwise Variograms remove the influence of any proportional effect – by reducing the apparent variability in the variogram.

According to Harmony, the pairwise semi-variograms improved the interpretability of the models (the standard semi-variograms were poorly formed and difficult to fit to a reasonable model). Downhole variograms (for Cu, Au and Mo) were first built to determine the nuggets (Fig. 14-14), and then directional variograms were modelled, subsequently (Fig. 14-15). The variogram axes were mapped using the variogram mapping function and maximum intensity projection (MIP) functions in Micromine v15 software. The variogram parameters are listed in Table 14-4.

Note that the same variogram model was used to estimate Cu and Au grades so that the strong positive correlation, observed in the sample and composite data, was maintained in block grades and not impacted by different sample weights during the estimation process.

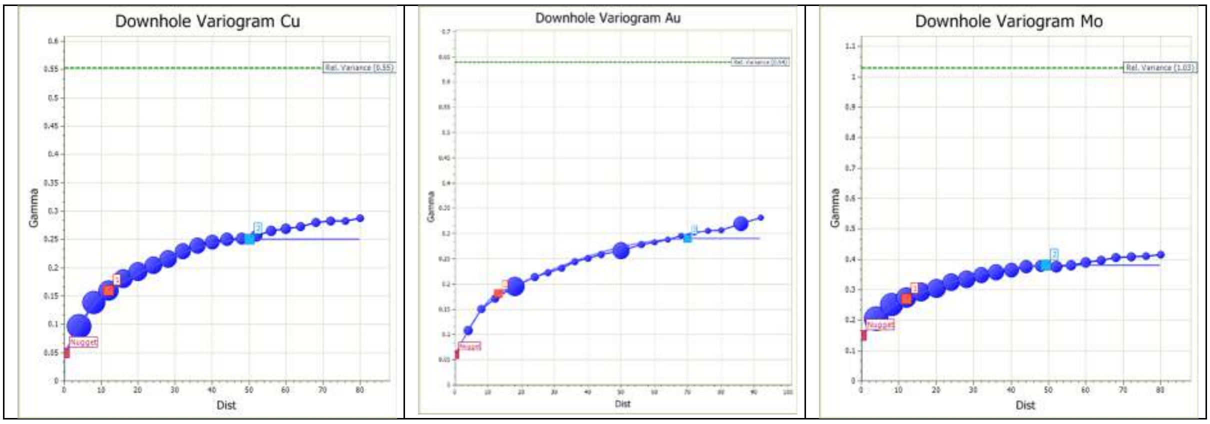


Figure 14-14: Downhole semi-variograms for Cu, Au and Mo.

Table 14-4: Variogram parameters for Cu, Au and Mo. (Rotation is Geological US Right Hand Rule (Strike, Dip & Pitch); structure range in metres).

	Rotation (geological RHR)	Nugget (C0)	Structure 1				Structure 2			
			Sill1 (C1)	Major	Semi Major	Minor	Sill2 (C2)	Major	Semi Major	Minor
Copper	320/76/80	0.05	0.1	90	50	30	0.18	300	130	110
Gold	320/76/80	0.05	0.1	90	50	30	0.18	300	130	110
Molybdenum	290/50/70	0.10	0.18	40	60	40	0.22	250	160	110

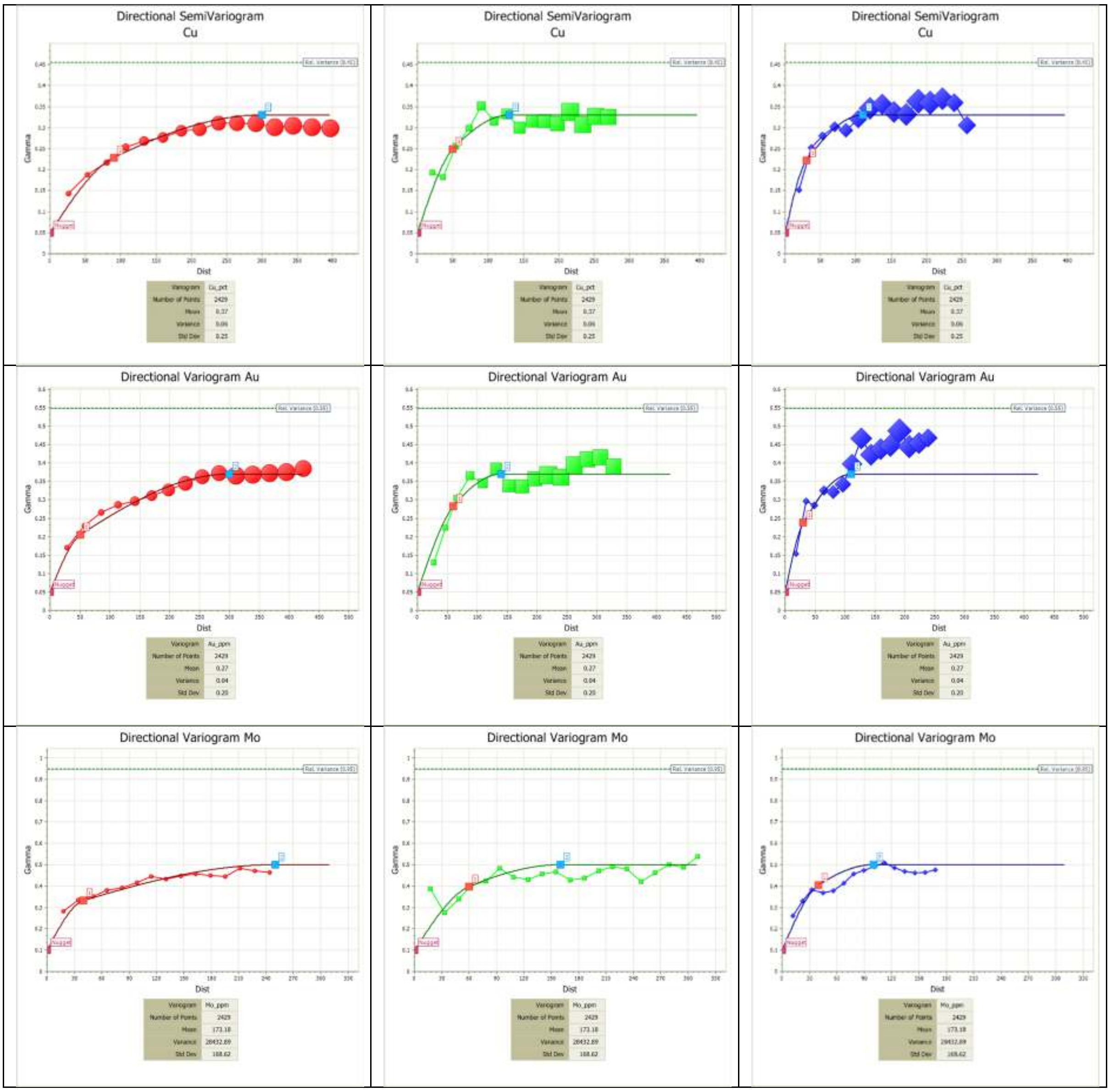


Figure 14-15: Directional pairwise semi-variograms for Cu, Au and Mo.

14.3.3. QKNA

A kriging neighbourhood analysis (QKNA) was carried out utilising six block centroids within the estimated volume. The kriging efficiency and slope of regression was assessed based on variations in the block size, search ellipse and maximum number of samples (Fig. 14-16). The estimate is poorly informed at four of the six centroids assessed, with only blocks 2 and 6 being (relatively) well informed. The optimal parent block size, indicated by the QKNA, is closer to 100m, compared to the 60m selected, but the estimate would be overly smoothed using the larger block size. The 60m block size is an acceptable compromise given the drill hole spacing and observed grade variation.

The sample search ellipse dimensions were based on the variogram models and the approximate range at which the model reached the sill. The QKNA suggests these search ranges are the minimum acceptable. Sample selection parameters from the QKNA indicates that 40 samples are the minimum number of samples required to inform parent block estimates. In Harmony's maiden Mineral Resource estimate, the first pass was restricted to a maximum of 24 samples, with a maximum of 16 per individual drill hole. This parameter was increased to a maximum of 40 samples in the first pass, with the maximum samples per drill hole maintained at 16. This results in block estimates being informed from at least three surrounding drill holes and improves the block support – although it results in a slightly more smoothed estimate.

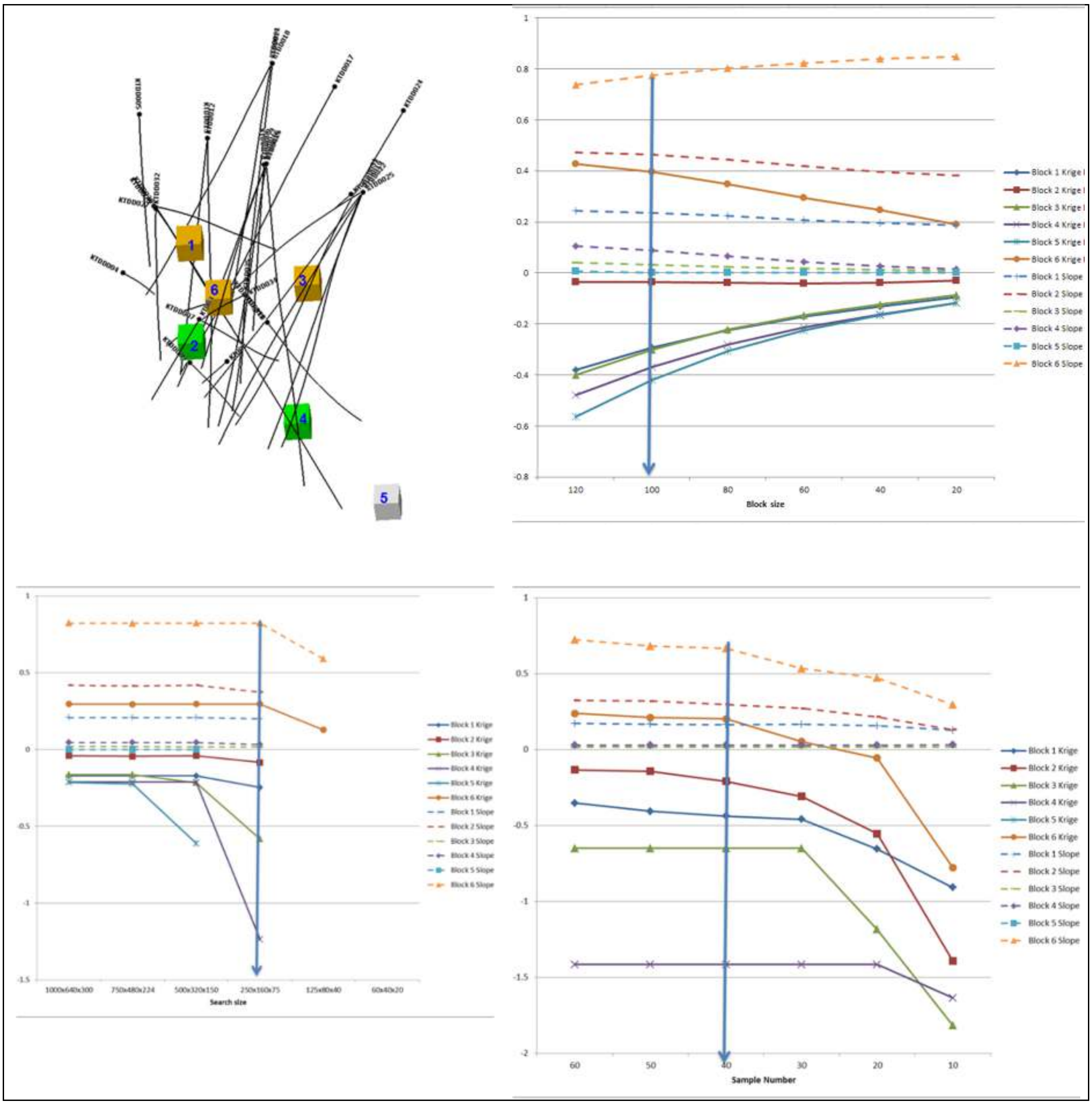


Figure 14-16: Results of QKNA carried out on 6 block centroids.

14.4. Block Model

The Kili Teke Resource is a porphyry deposit and as such would only be mined using bulk tonnage methods of open pit and/or block caving. As such, the deposit is modelled with large parent blocks. The block model is structured to cover the mineralisation with enough surrounding volume captured, to enable full analysis by first-pass, high-level, pit optimisation studies. Parent block sizes are based on one half to one third the average drillhole spacing, which equates to blocks of 60x60x60m, with sub-blocks of 20x20x20ma to better resolve the volume estimate at the Estimation Domain boundary (Table 14-5).

Table 14-5: Summary of the block model (MRE 2017), Kili Teke.

Variable	X	Y	Z
Origin	687,450	9,402,250	240
End X Offset	2,760	2,820	1,560
Parent block size	60	60	60
Sub block size	20	20	20
No. of blocks	46	47	26

Attribute	Type	Width	Decimals	Description
East	R	8	6	East Centroid
North	R	8	6	North Centroid
Rl	R	8	6	RL Centroid
_East	F	4	4	Block Size East
_North	F	4	4	Block Size North
_Rl	F	4	4	Block Size RL
Density	R	8	2	Density
Res_Cat	S	2	0	Res_Cat (Meas = 1, Ind= 2, Inf = 3)
Topo	N	12	3	Topo
Lith	C	7	0	Rocktype flag
Weathering	C	1	0	Weathering flag (1 = Weathered)
Est_Dom	C	3	0	Estimation Domain flag (dom=100)
Cu_ExSK	R	8	7	Cu % estimate excluding skarn composites
Au_ExSK	R	8	5	Au ppm estimate excluding skarn composites
Mo_ExSK	R	8	4	Mo ppm estimate excluding skarn composites
KR_Var_ExSK	R	8	3	Kriging Variance ex skarn run
KR_Eff_ExSK	R	8	3	Kriging efficiency ex skarn run
Slope_ExSK	R	8	3	Cond Bias Slope ex skarn run
Pass_ExSK	S	2	0	Estimation pass number ex skarn run
POINTS_ExSK	S	2	0	Number of composites ex skarn run
Count_ExSK	S	2	0	Number of drillholes ex skarn run
AVG_dist_ExSK	F	4	3	Average composite distance ex skarn run
Cu_InSK	R	8	7	Cu % estimate excluding skarn composites
Au_InSK	R	8	5	Au ppm estimate including skarn composites
Mo_InSK	R	8	4	Mo ppm estimate including skarn composites
KR_Var_InSK	R	8	3	Kriging Variance including skarn run
KR_Eff_InSK	R	8	3	Kriging efficiency including skarn run
Slope_InSK	R	8	3	Cond Bias Slope including skarn run
Pass_InSK	S	2	0	Estimation pass number including skarn run
POINTS_InSK	S	2	0	Number of composites including skarn run
Count_InSK	S	2	0	Number of drillholes including skarn run
AVG_dist_InSK	F	4	3	Average composite distance including skarn run
Cu_IDExSK	R	8	7	Cu % Inverse Distance ex skarn
Au_IDExSK	R	8	5	Au ppm Inverse Distance ex skarn run
Mo_IDExSK	R	8	4	Mo ppm Inverse Distance ex skarn run
Pass_IDExSK	S	2	0	Estimation pass for IDW
POINTS_IDExSK	S	2	0	Number of composites for IDW run
Count_IDExSK	S	2	0	Number of drillholes in IDW run
AVG_dist_IDExSK	F	4	3	Average composite distance for IDW run

Three sets of grade data are included: (a) OK, excl. skarns; (b) OK, incl. skarns; (c) Inv Dist, excl. skarns.

14.4.1. Interpolation

The block model grade interpolation was completed after three passes of a search ellipse. A first pass was based on the drill hole spacing, modelled variogram ranges, and the QKNA – with a slightly lower maximum sample count (to reduce smoothing of the results); the second and third passes are multiples of the first pass, with an increase in the maximum number of samples (Table 14-6 and Fig. 14-17).

The search ellipse, based on sample support, variogram axes and the overall trend (strike and dip) of the mineralised volume (the Estimation Domain), was built using a combination of Micromine's Variogram Maps and Maximum Intensity Projection (MIP) functions; it was visually assessed against grades in the drill holes. (NB: MIP is a facility to looking "down the plunge" of high-grade zones in a deposit –thus allowing you to select the plunge, strike and dip of the search ellipse, so that it best matches grade continuity, as observed in a deposit).

Trial runs to assess the impact on the max number of samples used in the first pass were reviewed by section and grade-tonnage curves. Restricting the first search pass to a maximum of 24 samples (as for the maiden resource), to generate a more selective estimate, produces more local grade variability in places – but, given the results of the QKNA, the maximum number of samples used in the first pass was increased from 24 to 40 – so each block was estimated from at least three surrounding drill holes.

Table 14-6: Summary of the basic interpolation parameters used for the Kili Teke deposit.

		Search Orientation (Micromine Geology)			Range			Samples			Informing Samples
Domain	**Search**	**Bearing**	**Pitch**	**Dip**	**Major**	**Semi-major**	**Minor**	**Min**	**Max**	**Max /Hole**	**Domains**
Est_dom	Pass1	320	80	76	300	130	110	18	40	16	Est_dom exskarn
Est_dom	Pass2	320	80	76	600	260	220	18	48	16	Est_dom exskarn
Est_dom	Pass3	320	80	76	1000	520	440	18	48	16	Est_dom exskarn

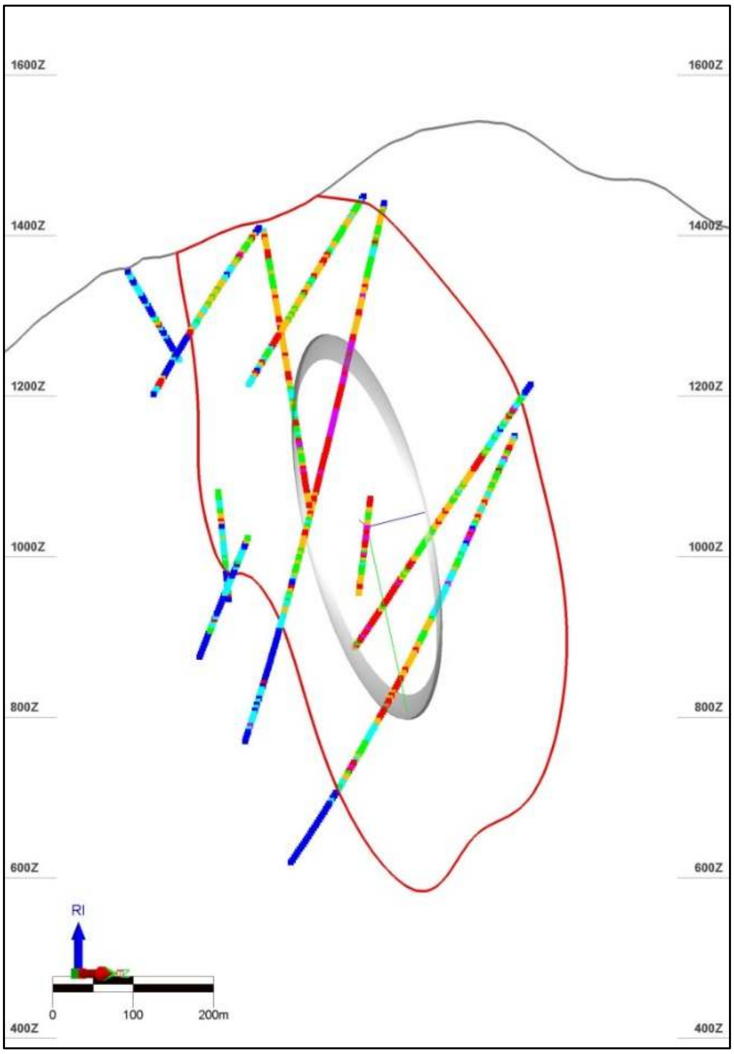


Figure 14-17: Relationship of the the first-pass search ellipse relative to drill

For the MRE (2016), 79% of the estimated blocks were filled by the first pass of the search ellipse, with most of the remainder being populated by the second pass (Table 14-7).

Table 14-7: Proportion of the model estimated by each pass of the searchellipse (MRE, 2016).

	Number of blocks	*% estimated by each pass*
Total Blocks	5815	
Pass 1	4626	79.5
Pass 2	1158	19.9
Pass 3	31	0.6

14.4.2. Block Model Results

The latest Mineral Resource estimate (2017) returns an Inferred Mineral Resource of 237Mt @ 0.34% Cu, 0.24g/t Au and 168ppm Mo, for a total of 802Kt of Cu, 1.81Moz of Au and 40Kt Mo. **Error! Reference source not found.**8 and Fig. 14-18 present the results for the MRE 2016.

Table 14-8: Grade-tonnage data for Kili Teke (MRE, 2016).

Cutoff	*Cu(%)*	*Au(g/t)*	*Mo(ppm)*	*Cu(t)*	*Au(oz)*	*Mo(t)*	*Mt*
0.8	0.86	0.58	129	9,374	20,369	140	1.1
0.7	0.81	0.55	119	21,999	48,318	324	2.7
0.6	0.68	0.47	156	72,264	158,630	1,654	10.6
0.5	0.60	0.40	197	149,029	320,778	4,871	24.7
0.4	0.51	0.35	186	299,717	662,207	10,848	58.4
0.3	0.42	0.29	183	560,269	1,235,463	24,357	133.2
0.25	0.38	0.27	174	682,197	1,520,970	30,937	178.0
0.2	0.35	0.25	170	781,574	1,751,206	37,554	221.5
0.1	0.34	0.24	165	822,801	1,857,320	40,562	245.3
0	0.34	0.24	165	822,801	1,857,320	40,562	245.3

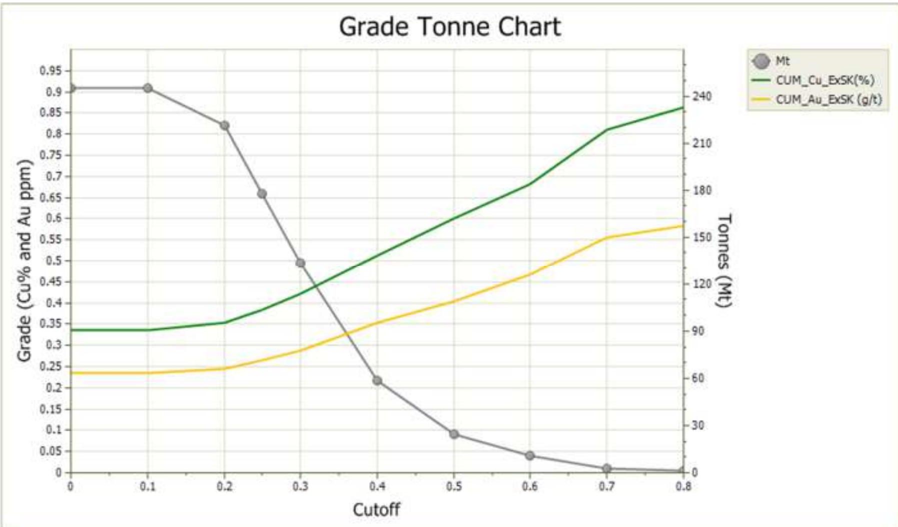


Figure 14-18: Inferred Grade-tonnage chart, Kili Teke (MRE, 2016).

Mineral Resource Updates

Table 14-9 presents a comparison of the maiden Mineral Resource estimate (MRE) for Kili Teke, dated 2015, with the two updates, dated 2016 and 2017. Globally the Inferred Mineral Resource has increased by 56%, since the maiden resource was announced in 2015 (on an ounce equivalent basis). The main contributing factor is the increased tonnage from 128Mt to 237Mt, resulting from additional drilling and the deepening of the base of the deposit, from approximately 450m below surface to approximately 650m below surface, at the 780mRL. The decrease in copper and gold grade to 0.34% and 0.24 g/t from 0.40% and 0.29 g/t, respectively, was due to the combined impact of the low-grade or barren intra-mineral porphyries, stope out the early mineralised phases, along with an apparent decrease in both Cu and Au grade with depth – although the latter might be an effect of drill density, rather than declining grades. Drill intersections in the deeper parts of the deposit are similar in mineralisation style and stockwork intensity to the upper levels of the deposit. Further drilling is required to confirm this.

Table 14-9: Comparison of the maiden MRE (2015), the first updated MRE (2016) and the latest MRE (2017).

Model	Cutoff	Cu %	Au g/t	Mo ppm	Cu t	Au Oz	Mo t	Mt	Ozeq
Maiden MRE_Nov2015	*0.2*	*0.40*	*0.29*	*173*	*506,612*	*1,208,489*	*22,215*	*128*	*4,000,707*
MRE Update_Jun2016	*0.2*	*0.35*	*0.25*	*170*	*781,574*	*1,751,206*	*37,554*	*222*	*6,058,893*
Change%		*-11%*	*-16%*	*-2%*	*54%*	*45%*	*69%*	*73%*	*51%*
MRE Update_Jan2017	*0.2*	*0.34*	*0.24*	*168*	*801,500*	*1,810,187*	*39,720*	*237*	*6,227,695*
Change%		*-4%*	*-3%*	*-1%*	*+3%*	*+3%*	*+6%*	*+7%*	*+3%*

No rounding applied

Skarns Excluded

The effect of incorporating skarn mineralisation into the Mineral Resource estimate was tested for the first update (MRE, 2016). The effect was to increase the Cu and Au grades by 5% and 4%, respectively, and to increase the respective metal contents by 11% and 10% (Table 14-10 and Fig. 14-19). The margins of the resource are most affected because this is where most skarn mineralisation (intersected, to date) occurs. A review of "MRE with skarns" (2016) demonstrated that blocks around the periphery of the deposit appeared to be overestimated, which would result in an overestimation of the contained metal – although the effect was reduced at higher cut-offs (because most of the high-grade material is within the two main stockwork zones, NSZ and SSZ).

As mentioned above, given that the skarns cannot be modelled properly because of inadequate drill coverage, they have been excluded from all declared Mineral Resource estimates.

Table 14-10: The effect of including skarns on the Kili Teke MRE (2016), at 0.2% Cu cut-off.

	Cutoff	Cu(%)	Au(g/t)	Mo(ppm)	Cu(t)	Au(oz)	Mo(t)	Mt
ExSK	0.2	0.35	0.25	170	781,574	1,751,206	37,554	222
InSK	0.2	0.37	0.26	160	865,257	1,926,090	37,410	233
Diff		+5%	+4%	-5%	+11%	+10%	0%	+5%

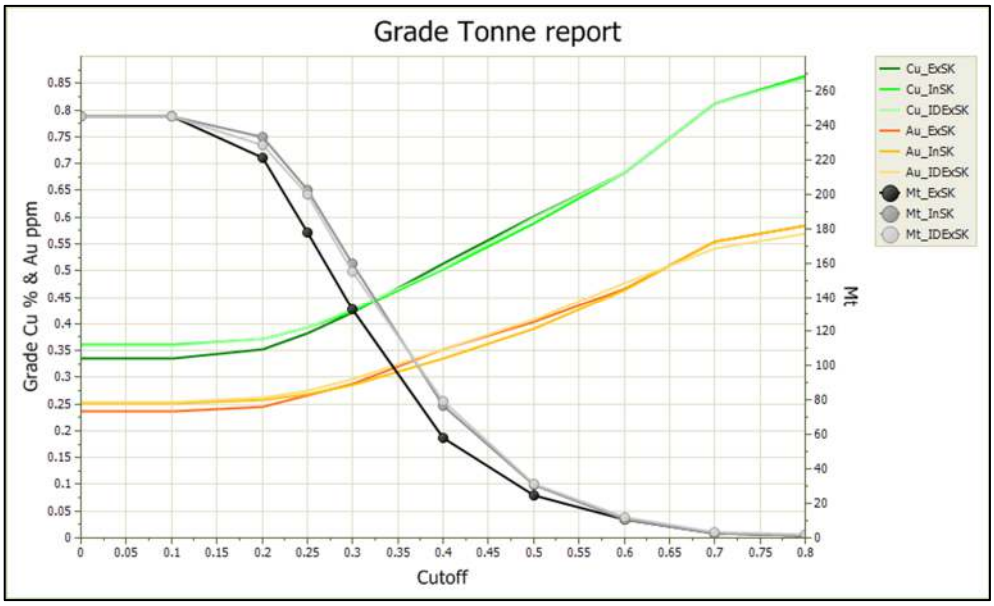


Figure 14-19: The effect of including skarns on the Kili Teke grade-tonnage chart,

14.4.3. Block Model Validation for MRE (2016)

The block model of MRE (2016) was validated by comparing block grades to composite sample grades, graphically and statistically, and by comparing the Ordinary Kriged (OK) estimate with an alternate estimate calculated by the Inverse Distance-Weighted (IDW) method.

Global Validation

The block model was regularised to the sub-block size for comparison with the composite sample grades from drilling. Summary statistics are reported for the sub-blocks within the estimation domain, with an average distance to drill holes less than 180m, which excluded the majority of the poorly informed blocks within the Estimation Domain (Table 14-11), and the comparison with the 4m composite samples from drilling is illustrated in Figure 14-20. The block grades are 13%, 15% and 8% lower, compared to the 4m composite sample grades, for Cu, Au and Mo, respectively and this difference is greater when compared to the declustered grades. The lower mean block grades, compared to the composite and declustered composite sample grades demonstrates that the estimate is *under-reporting* the grade within the Estimation Domain. Further investigation (and refinement of domains?) is required. The lower variance of block grades, compared to composite sample grades, is as expected.

Table 14-11: Composite grade, declustered composite grade and block grade for Cu, Au and Mo (MRE, 2016).

Grade	Mean	Median	Variance	COV
Raw Cu %	0.373	0.312	0.062	0.669
Declus Cu %	0.411	0.319	0.100	0.767
Block Cu %	0.323	0.297	0.015	0.374
Raw Au ppm	0.265	0.22	0.036	0.719
Declus Au ppm	0.297	0.218	0.078	0.942
Block Au ppm	0.224	0.200	0.009	0.432
Raw Mo ppm	174	132	28444	0.97
Declus Mo ppm	197	131	45651	1.086
Block Mo ppm	160	149	4659	0.428

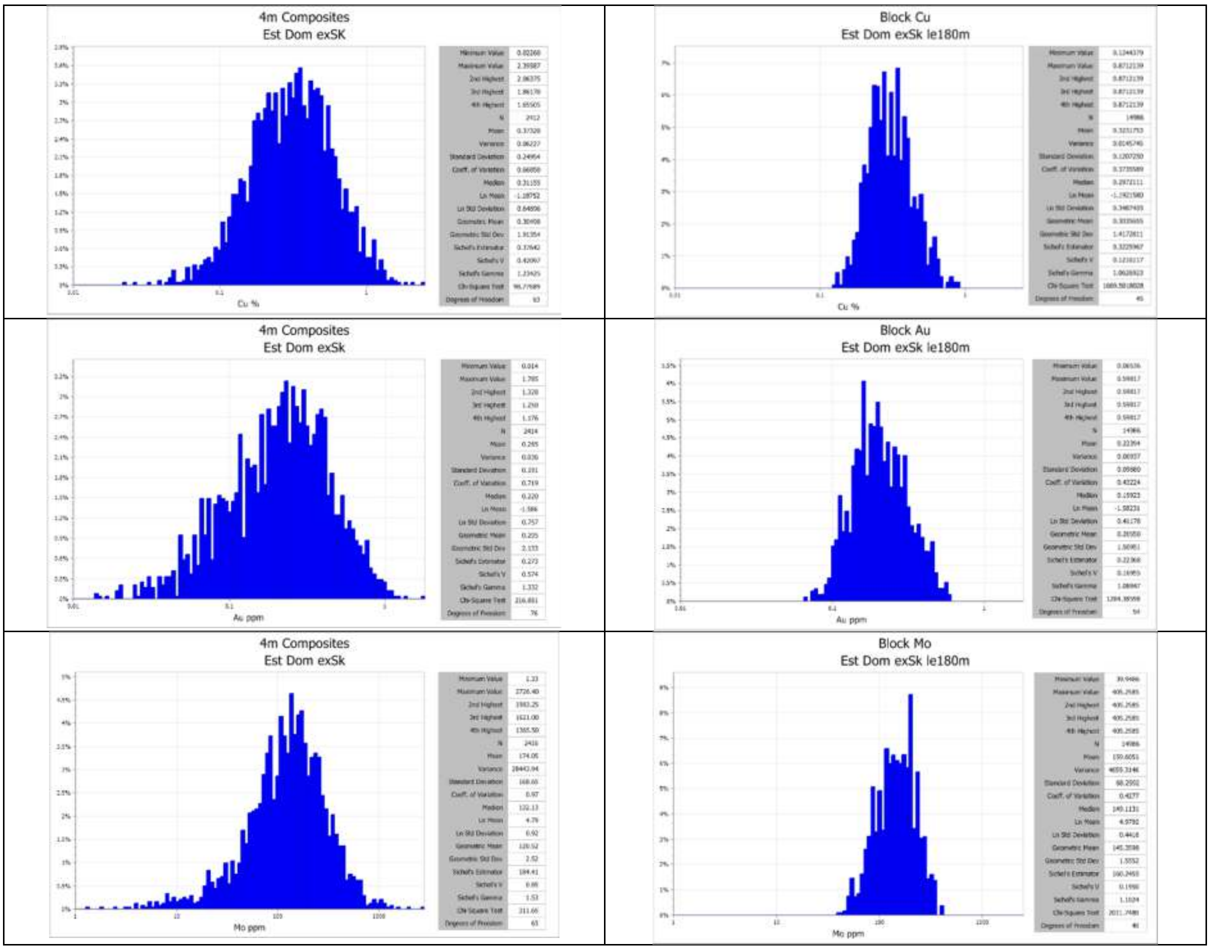


Figure 14-20: Comparison of composite and block grade distribution for copper, gold and molybdenum (MRE 2016).

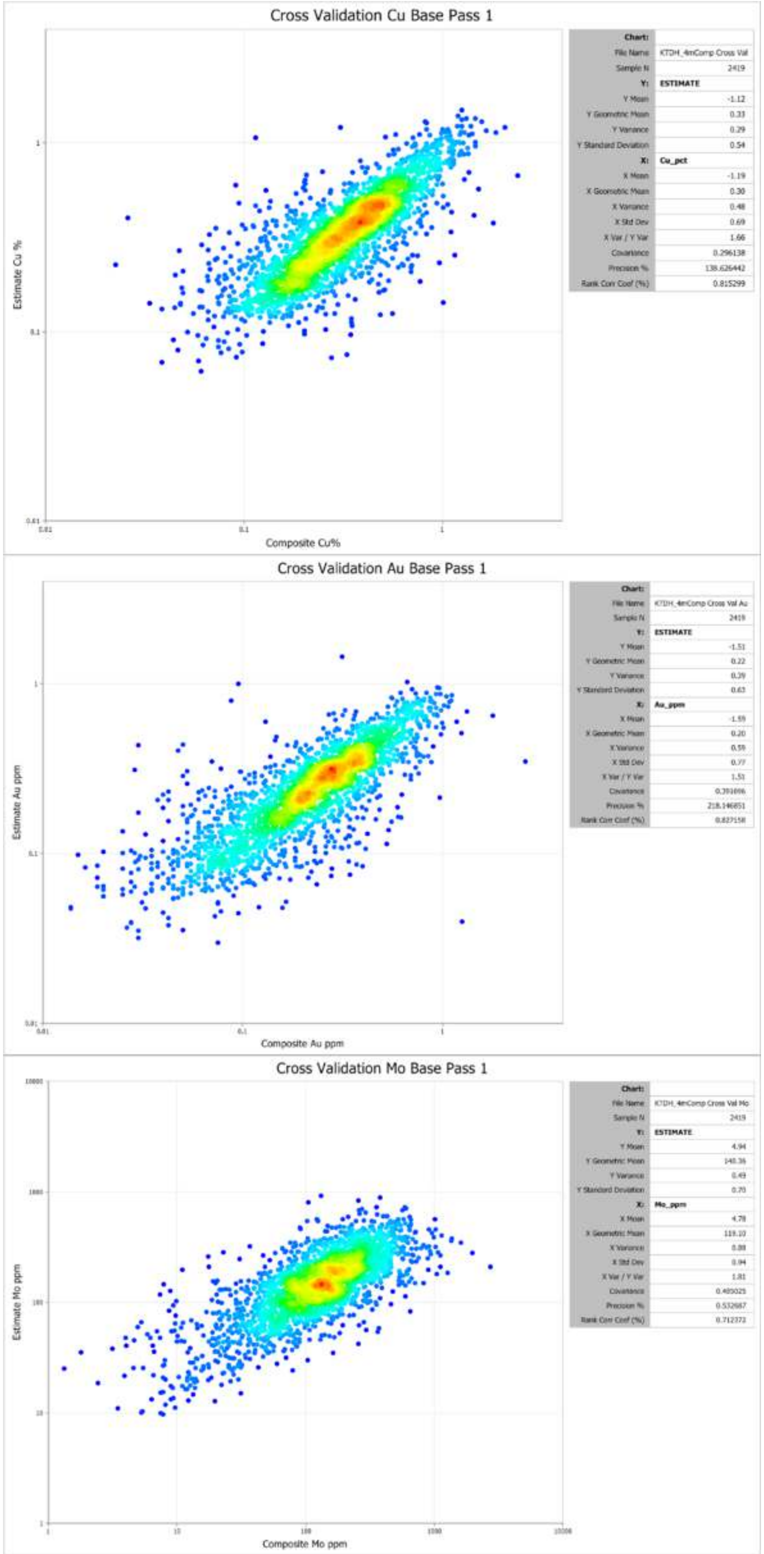


Figure 14-21: Cross-validation plots to compare composite sample values with estimates

Cross-validation plots were also generated, to compare estimation grades against composite sample grades (Fig. 14-21). And, further, a graphical review of the estimated block grades, compared to composite samples from drilling, confirmed reasonable agreement, when the block size and associated smoothing is taken into account (Figs. 14-22/23/24 & Appendix 2). The block model appears to mimic the overall grade trends within the Estimation Domain and reflects the current geological understanding of the Kili Teke deposit.

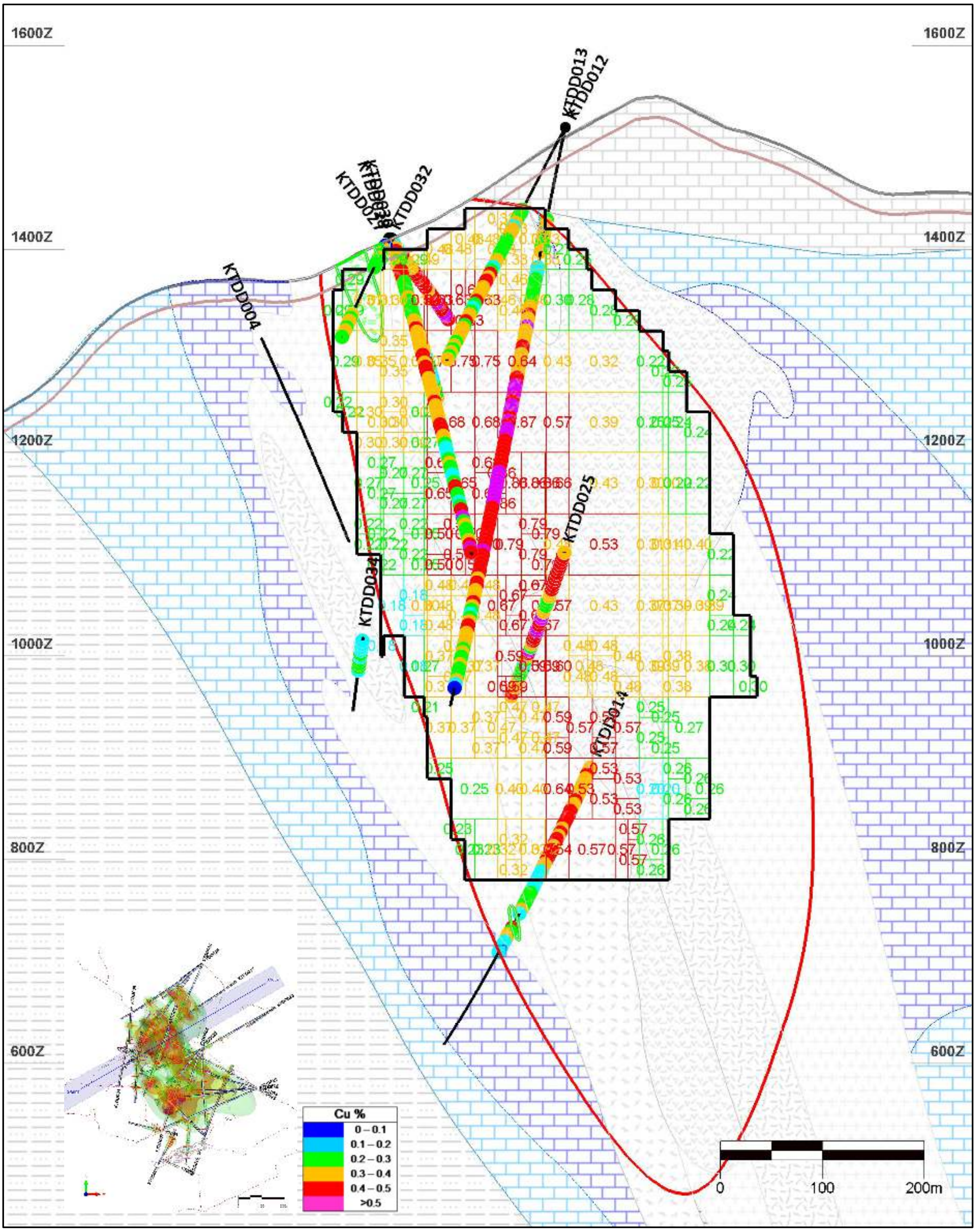


Figure 14-22: Block model vs 4m composite sample grades - Section XS007. Inferred MRE 2016 outline in black.

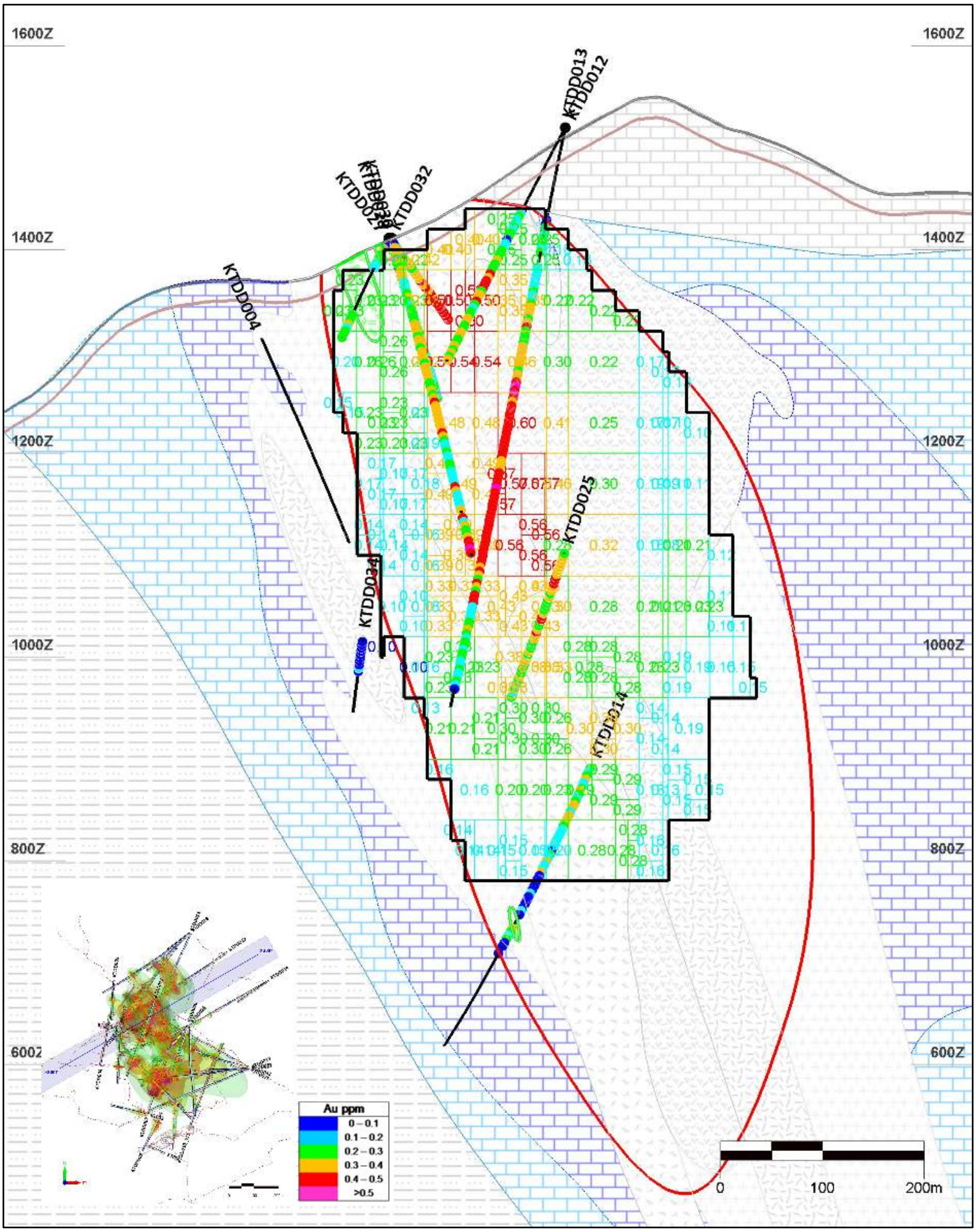


Figure 14-23: Block model vs 4m composite sample grades - Section XS007. Inferred MRE 2016 outline in black.

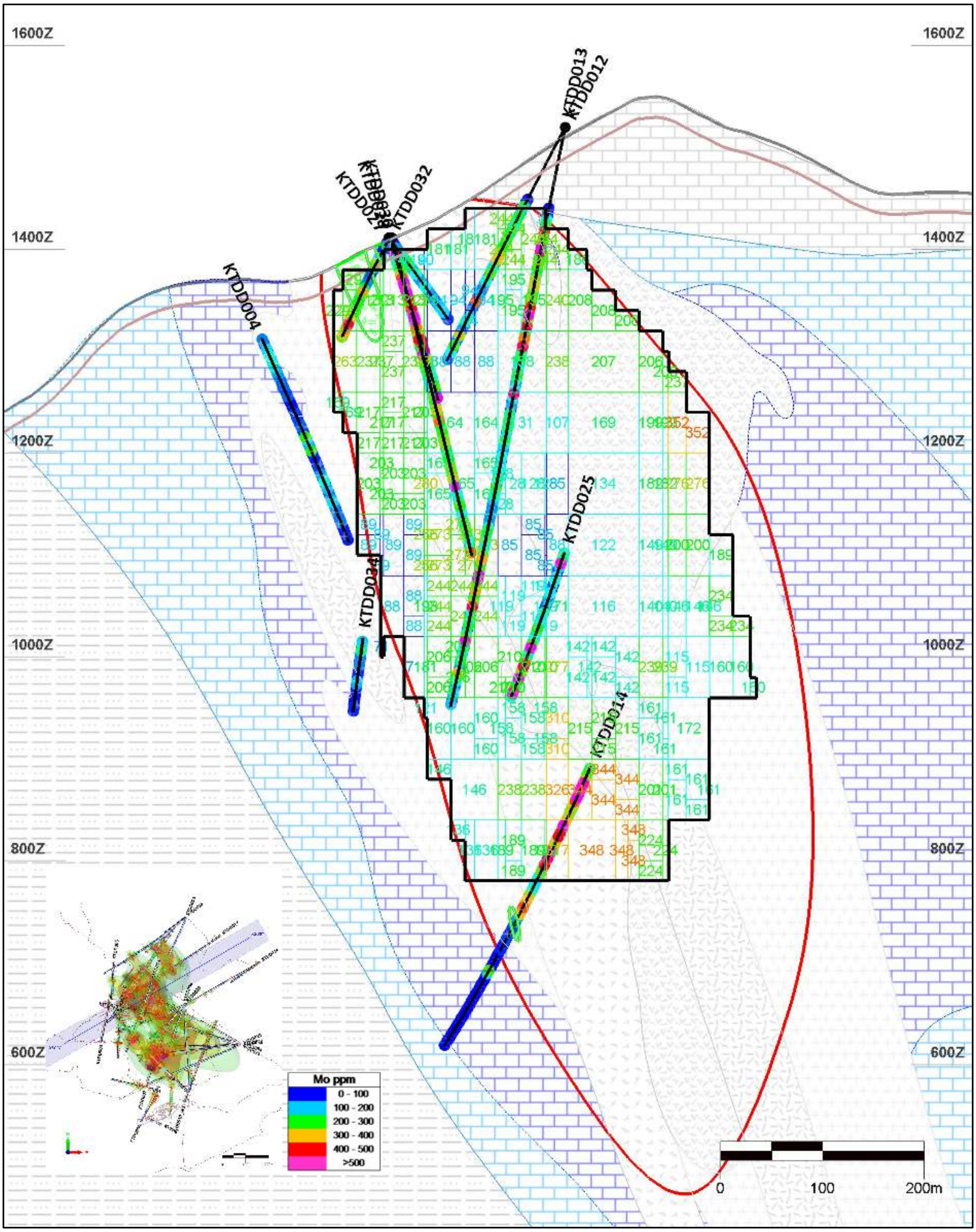


Figure 14-24: Block model vs 4m composite sample grades - Section XS007. Inferred MRE 2016 outline in black.

Swath Plots

Swath plots were generated to compare block grades to composite sample grades for Easting, Northing and elevation slices through the deposit (Fig. 14-25). Block model grades generally follow the composites and display an adequate amount of smoothing.

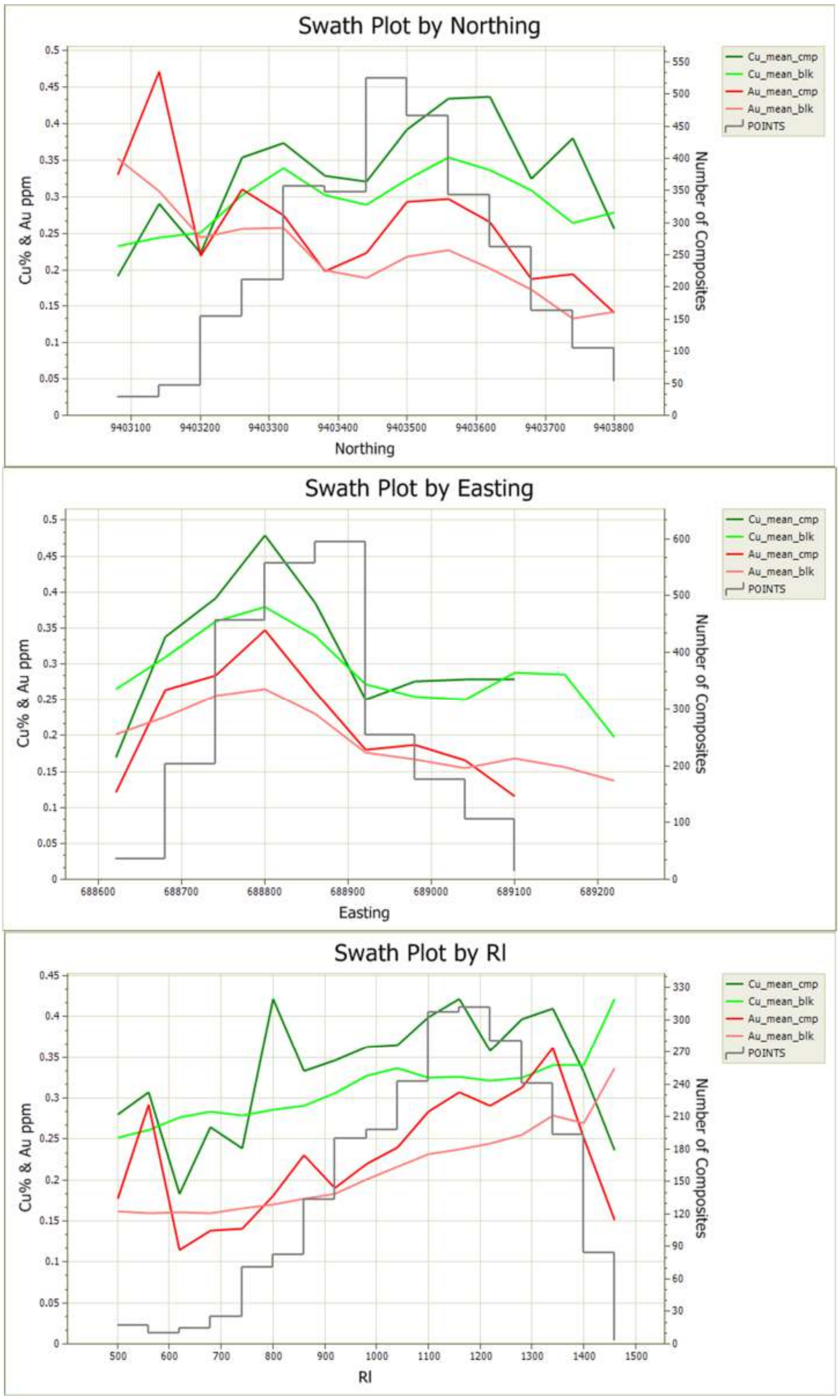


Figure 14-25: Validation swath plots, by Northing, Easting and elevation (in 60m increments),

Inverse Distance-Weighted (IDW) Check of MRE (2016)

The grade-tonnage curve and block grade distribution of the IDW check estimate (excluding skarns) is comparable to the grade-tonnage curve for the Ordinary Kriged (OK) estimate (*including* skarns) (Fig. 14-19). Harmony considers this to be a coincidence, because the grade distribution of the IDW check estimate (excluding skarns) is comparable to the grade distribution for the Ordinary Kriged estimate (*excluding* skarns) (Fig. 14-26). Also, block grades are comparable for the two estimates (Fig. 14-27). The similarity of the estimation results by two independent methodologies suggests there are no issues with the OK method adopted.

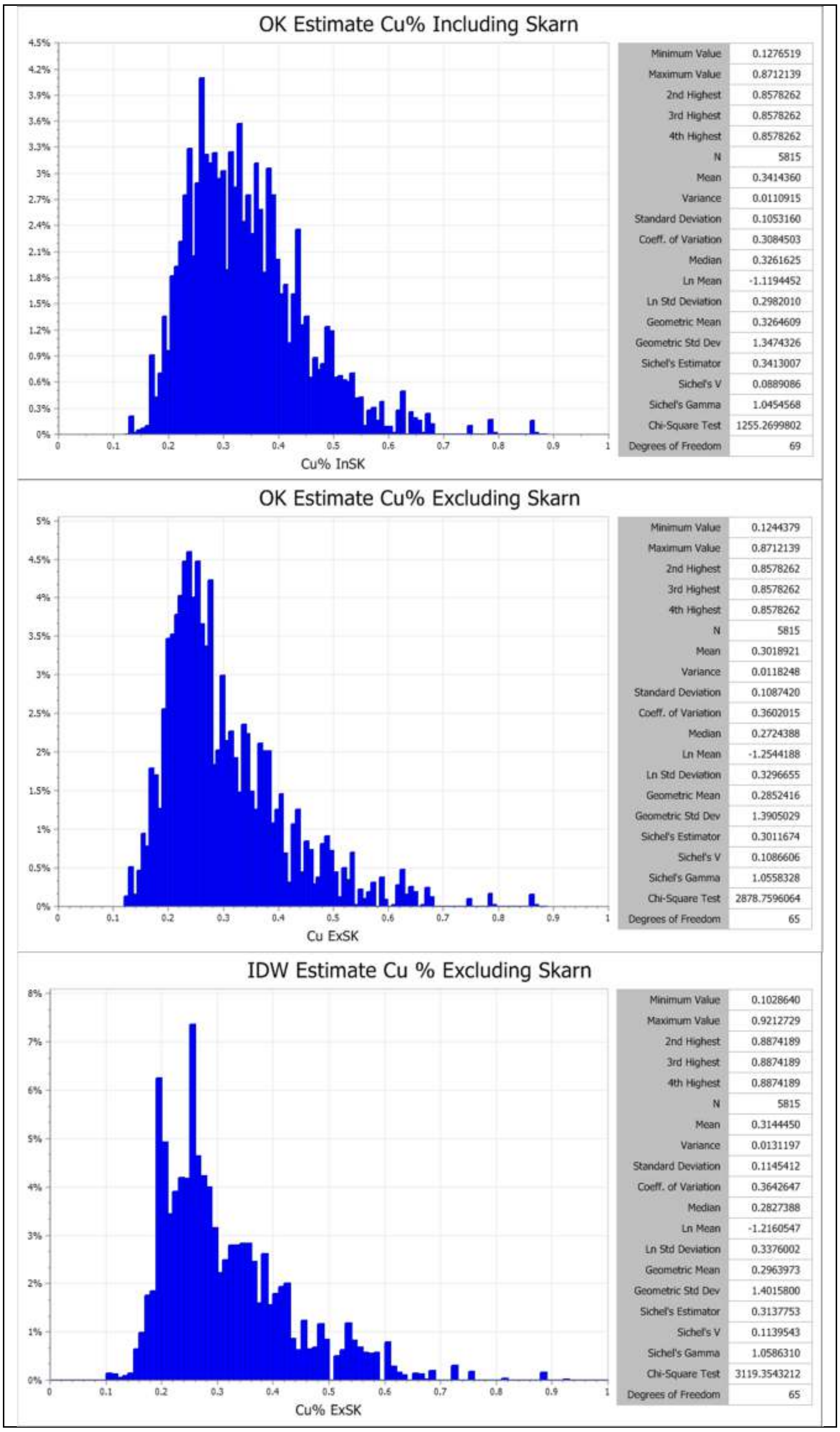


Figure 14-26: Comparison of Cu grade distributions for OK estimates,

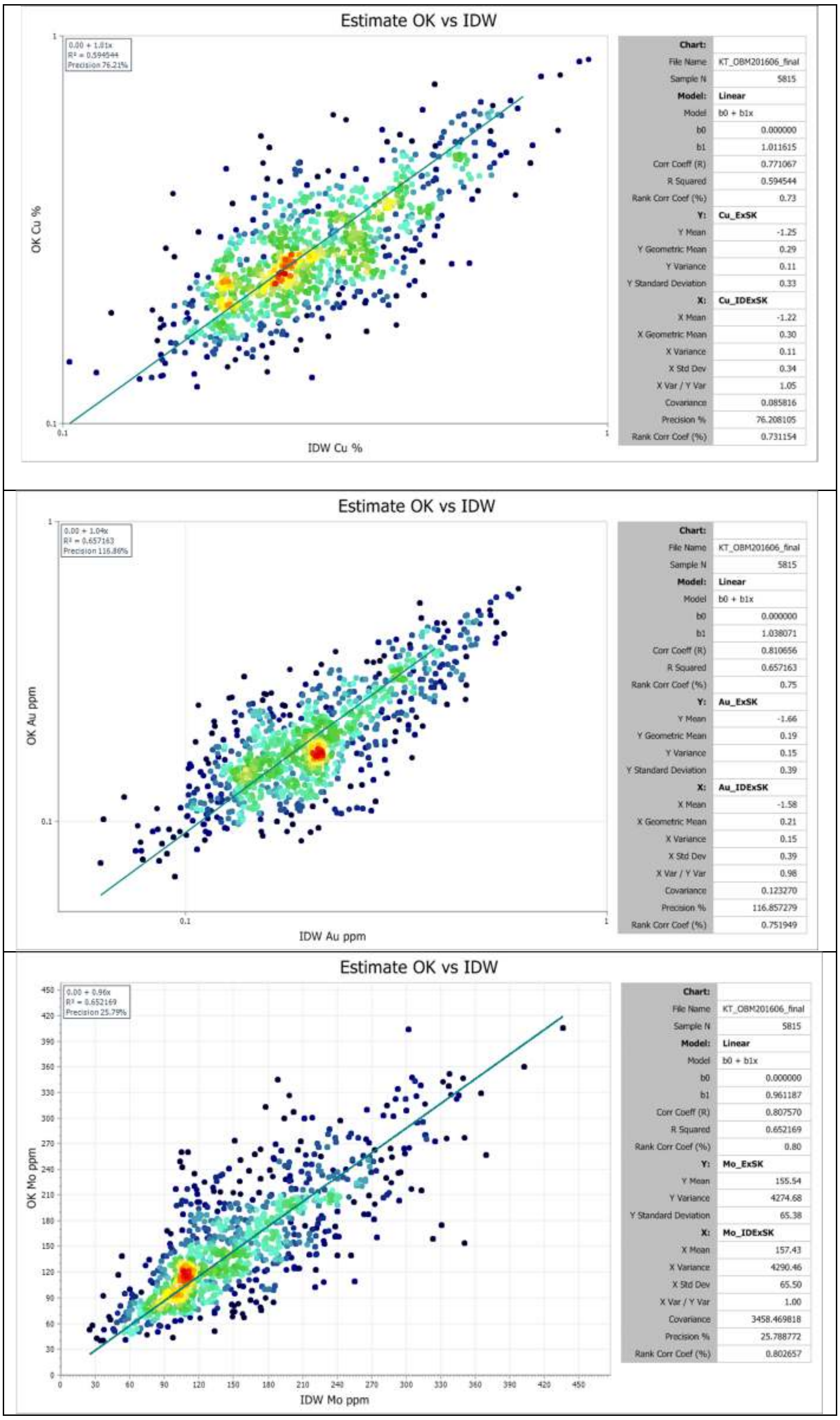


Figure 14-27: Comparison of IDW estimate vs OK estimate, for Cu, Au and Mo (MRE 2016).

Discrete Gaussian Model (DGM)

No Discrete Gaussian Model test was completed at this point due to the early stage of the study.

14.5. Classification

The Kili Teke Mineral Resource is reported at a grade cut-off of 0.2% Cu, above the 780mRL (650m below surface). Only blocks within an average distance of 180m to the nearest drill holes were included in the resource. Any blocks above the base of partial oxidation (20m below the current surface) were excluded from the resource, as were other blocks, less well-supported by drilling, on the eastern side of the deposit (Fig. 14-28).

The drilling data informing the estimate is quite sparse and widely-spaced, so the entire resource defined to date is classified as “Inferred”. Significant infill drilling is required to upgrade the classification to “Indicated” or “Measured”. Estimation quality parameters, including Kriging Efficiency and Slope of Regression were reviewed to confirm the quality of the estimate (Fig. 14-29).

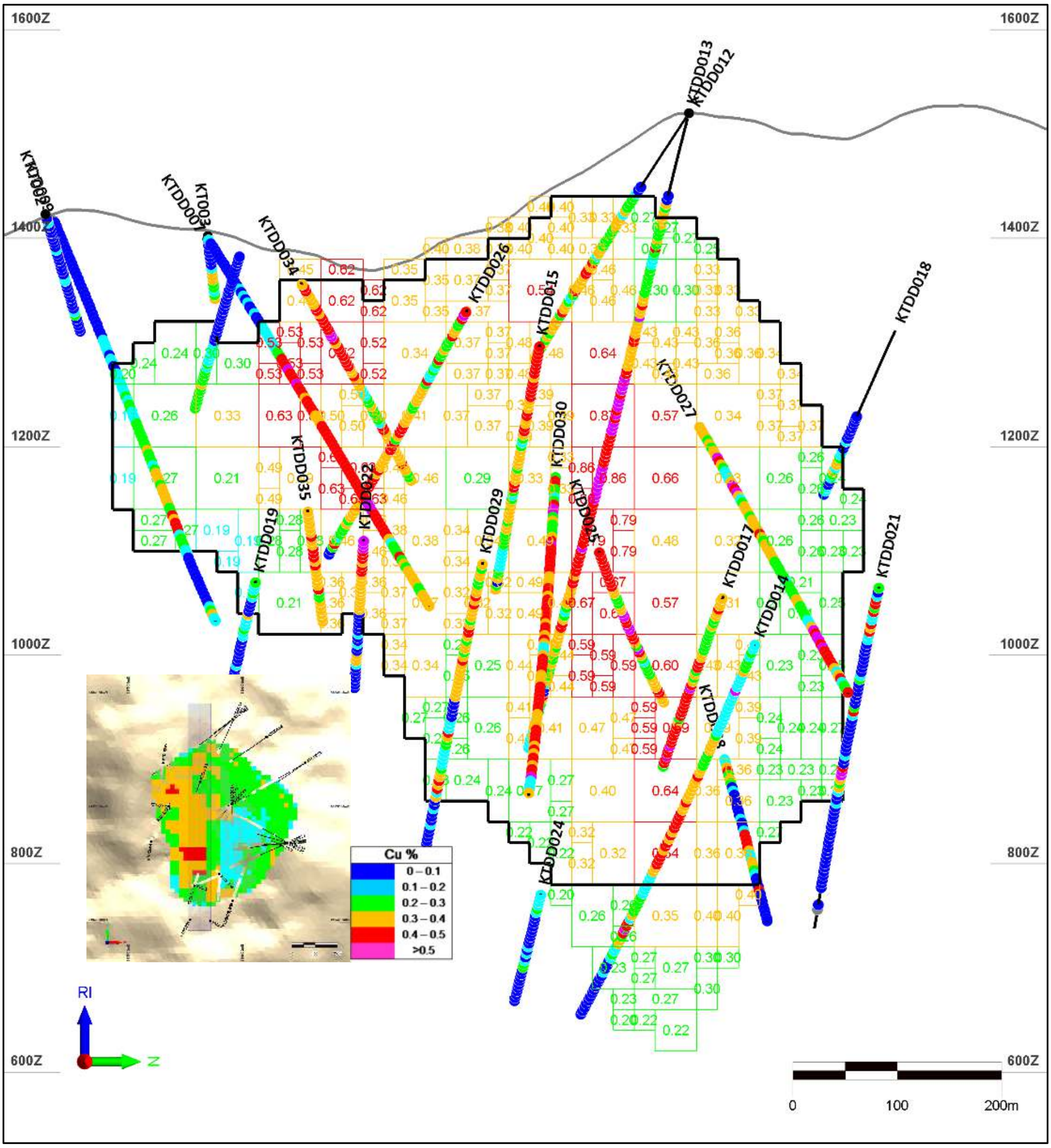


Figure 14-28: Section (facing west) to show the extent of the Inferred Resource (outlined in black).

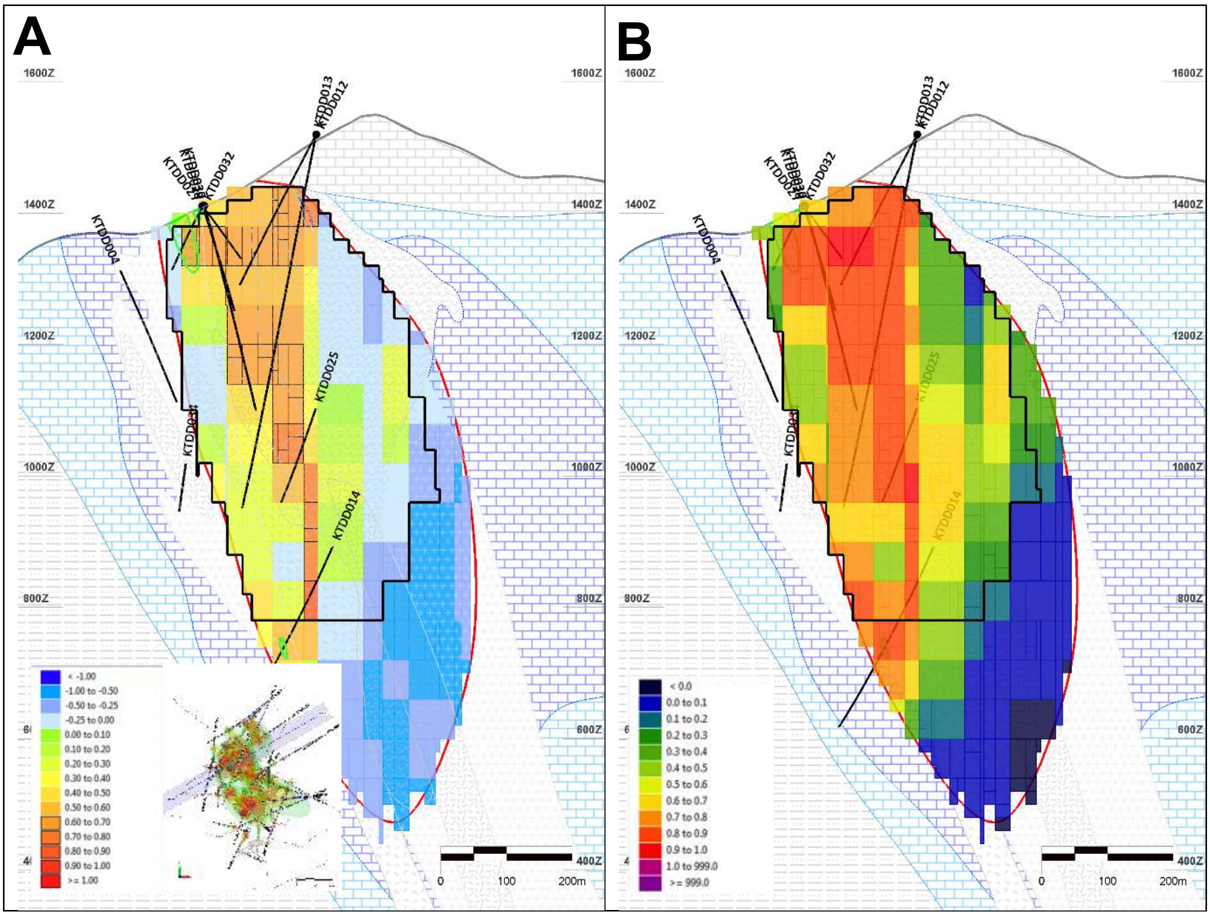


Figure 14-29: Classification guides – (A) Kriging Efficiency and (B) Slope of Regression. Inferred Resource in black.

15.ADJACENT PROPERTIES

There are no significant adjacent properties to the Kili Teke tenement. The nearest mine is Porgera, 40km to the east.

16.OTHER RELEVANT DATA & INFORMATION

The Kili Teke Project is an exploration project that has not yet warranted detailed studies on mining, ore processing, and potential impacts on the environment and local community. Conceptual studies that have been completed were of a preliminary nature only.

16.1. Mining Studies

In 2017, Harmony completed a Whittle pit optimisation to quantify the impact of the updated Mineral Resource estimate on a potential open pit scenario (PCF, 2021). The Whittle pit optimisation generated a total of 21 pit shells, using metal prices of US$1,200/oz Au and US$3.00/lb Cu, and demonstrated the potential value of an open pit operation. The optimised pit shell returned a potential pre-tax NPV of ~US$198 million, from 46Mt of ore, mined at 0.41% Cu and 0.33g/t Au (for 190kt Cu and 491koz Au).

In May 2017, Harmony subsequently engaged Advisian (an independent consulting business line of the WorleyParsons Group) (WP) to determine an appropriate mine design for an initial open pit operation at Kili Teke, using a 0.1% Cu cut-off, followed by a bulk block-cave underground mine. WP identified value for a resource of 52.5Mt, at 0.38% Cu and 0.30g/t Au, primarily due to the low strip ratio (~1.25:1), high near-surface Cu grades, and the time to first ore.

Shortly after, in June 2017, Harmony engaged AMC Consulting Pty Ltd (AMC) to provide an independent review of the Kili Teke Project, including the WP mine design. Importantly, AMC recognised several issues that would improve the project outcomes, including the recommendation to reduce the parent block size in the Mineral Resource model, from 60x60x60m to 20x20x10m – to better understand grade variability within the deposit and to represent a reasonable *selective* mining unit (AMC, 2017). Also, AMC noted that (at the time), the cut-off should be at least 0.25% Cu to avoid mineralised waste (which destroys value) being included in the mine plan.

Most recently, in 2021, Harmony requested AMC to update their review, based on updated commodity prices and cost inputs. The updated Whittle pit optimisation reported a mineable inventory of 56.7Mt, at 0.42% Cu and 0.33g/t Au (for 217kt Cu and 382koz Au), from a 150m-deep pit.

KRL has completed further preliminary studies, which suggest that an open pit operation could be viable, with robust economic returns, if more high-grade ore can be defined (KRL press release, dated 6 April 2022). Importantly, none of the above scenarios includes high-grade skarn mineralisation, which has been excluded from all Mineral Resource estimates declared, to date.

16.2. Environment

Harmony was granted a Level 2A Environmental Permit for the Kili Teke Project in 2014, prior to commencement of drilling, and maintained the permit is good standing until voluntary surrender, when drilling ceased, in 2017 (PCF, 2021). Project work was completed as per the terms and conditions of Environment Permit, EP-L2A (415), and quarterly reporting was submitted to the Conservation and Environment Protection Agency (CEPA). Drill pads have not been rehabilitated, to date (so they are available for future use) – but all sumps have been backfilled.

Baseline water monitoring was conducted (monthly) prior to, during, and post-drilling, which demonstrates that exploration activity has had no impact on the water quality in the environment. Harmony employed a fulltime Environmental Officer and established a Environmental Database.

A Level 3 Environmental Permit (including a full Environmental Impact Assessment) will be required before a mining lease can be issued.

16.3. Community Relations

16.3.1. Harmony

Harmony completed a social mapping and population census before starting fieldwork in 2014, which revealed that most of the local population had migrated elsewhere, due to lack of services and employment opportunities. All local clans were eligible for casual employment by Harmony (who claim to have employed more than 200 casuals, since 2014). Harmony entered into a Community Engagement and Compensation Agreement with the local people (Harmony, 2021).

Community projects initiated by Harmony, since 2014, have included the building of a Community Hall and water tanks, support for local education (seen as a top priority), including the establishment of the Yambiri Elementary School (>70 students), law and order awareness, and medivacs. Harmony deliberately focused on surrounding centres, rather than the project area.

Regretably, a serious security incident occurred just after midnight on the 6th January 2017. This involved 20-30 armed individuals, who destroyed a drill rig on-site. The incident prompted Harmony to curtail all exploration activity; the Minerals Resources Authority of PNG were notified.

16.3.2. KRL

KRL stakeholders have significant experience operating in the Hela District, where the Kili Teke Project is located, and, based on initial discussions with the relevant community groups (as part of ongoing due diligence), KRL is confident it can work well with the local community (Topo, 2021).

Several reasons have been cited for the “drill rig incident” – which KRL believes can be managed. These include:

1. the disproportionate employment of casuals from various clans, including some outside of the project area;
2. various disputes over compensation payments – in particular, how compensation payments are split between landowners and Landowner Association executives;
3. the conflicting interests of two rival Landowner Associations: the Logayu-Hewa Peoples Association and the Wasa Rindi Auwua Association; and
4. the conduct of company and contractor personnel.

Land disputes are a feature of life in PNG and it is not surprising that they have impacted on the Kili Teke Project. However, community leaders, who were at the project site, when KRL visited, as part of the due diligence process, were unanimous in their support of the project. They pledged to support the company work programme. Disputes with the Landowner Associations will be dealt with separately.

17. INTERPRETATION & CONCLUSIONS

- The Mineral Resource for Kili Teke comprises 237Mt @ 0.34% Cu, 0.24g/t Au and 170ppm Mo (782kt Cu, 1.75Moz Au and 38,kt Mo).

- The deposit is hosted by two early-mineral porphyry phases, intruded into limestone. The best developed stockwork mineralisation is focused in two zones: the Northern Stockwork Zone (NSZ) and the Southern Stockwork Zone (SSZ). Later, low-grade or barren intra-mineral porphyry phases have stoped out the earlier porphyries (which extend all the way to surface), but drilling is too widely-spaced to define the geometries of each porphyry phase accurately. The overall geometry of the deposit is a relatively steeply plunging, pipe like intrusion.

- High-grade skarn mineralisation is developed around the periphery of the host intrusion. This appears to pinch and swell (up to 30-40m thick) as a discontinuous zone, but further drilling is required to confirm this interpretation. Skarn mineralisation is also developed within the host intrusions, where it appears to be focused along internal contacts and/or structures. Given that skarn continuity has not been proven (all intercepts are isolated about single drill holes), all skarn mineralisation has been excluded from the declared Mineral Resource – this represents a significant exploration upside potential.

- The detailed controls on high-grade mineralisation have not yet been established. No clear zonation of sulphides (e.g. chalcopyrite to bornite) has been recognised, to date, but Cu and Au are strongly correlated. Mo is a late addition, associated with D veins and overprinting phyllic alteration. No supergene enrichment exists.

- The RGA target has not been adequately drill-tested and further drilling is justified on this target.

- The exploration potential of the Kili Teke Project remains high with the current Mineral Resource open at depth and to the southeast. There is opportunity to upgrade the open-pittable resource by infill drilling, and there are other targets that are not yet drill-tested.

- The key risks for the Kili Teke Project are:
  - Sovereign – will EL2310 be renewed for a further term?
  - Geological – is there sufficient high-grade mineralisation in the upper reaches of the deposit?
  - Technical – can the controls on mineralisation be determined, to target future drilling?
  - Funding – can KRL raise the funds to pay for infill drilling?

18.RECOMMENDATIONS

5. KRL must engage with the local community at Kili Teke, prior to re-establishing a field camp, from which to base a future drilling programme.

6. Infill drilling should focus on improving the definition of high-grade zones within the upper, open-pittable, parts of the deposit, including the peripheral and internal skarns.

7. The RGA target should be subject to further drill testing, possibly below the cover limestone, which is interpreted to have been thrust over the Kili Teke deposit.

8. A comprehensive review of all previous exploration work should be completed, including field checks, to highlight any targets that may not have been followed up adequately.

19. REFERENCES

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20.Appendices

APPENDIX 1: JORC CODE TABLE 1: Kili Teke Project

(for the MRE, 2016)

Section 1 Sampling Techniques and Data

Criteria	Commentary
Sampling techniques	• Sampling completed using heli-supported triple tube diamond core drilling • Diamond core sampling was on half core (NQ3 & HQ3) or quarter core (PQ3) obtained using a core saw. • Core is metre marked, measured and wrapped in masking tape where required prior to cutting. • Cut 1m samples are bagged into calico bags and dispatched to Intertek Lae for preparation and Gold Fire assay. Prepared pulps are sent to Intertek's Townsville laboratory for ICP OES and ICP MS analysis. • Core is continuously sampled to bottom of hole, specific mineralised zones are not selected out for testing. Sampling in Hole KTDD011 commenced at 92m down hole, excluding most of the limestone caprock sequence (intersected from top of hole to 102.6mdepth). • Sampling follows procedures that conform to internationally accepted best practices. • For holes KTDD004 to KTDD010_W1, KTDD014 to KTDD035 and for hole KTDD013 from 274m to eoh: Cut 1m samples are bagged into calico bags and dispatched to Intertek Lae for preparation and Gold Fire assay. Prepared pulps are sent to Intertek's Townsville laboratory for ICP OES and ICP MS analysis. • For hole KTDD011, KTDD012 and KTDD013 to 274m, a 2m sample interval was used.
Drilling techniques	• Drilling is undertaken with a helicopter portable Coretech YD3H drill rig • Drill types are triple tube PQ, HQ, and NQ core with diamond drilling from surface, no pre-collar is used
Drill sample recovery	• Core has recoveries recorded as part of the standing drilling, geotechnical and geological logging process. Recoveries are continuously assessed and zones of poor recovery investigated. • Experienced drillers are employed by the drilling contractor to oversee and manage the drill rig to ensure maximum recovery is achieved. • Core recovery and grade has been reviewed and there is no correlation between sample recovery and grade which would lead to a bias in the sample results.
Logging	• All core is geologically and geotechnically logged by company geologists and digitally input into the LogChief logging system. Logged data must pass several validation checks within LogChief and then are again validated upon import into the companies SQL database. • Core is digitally photographed and stored in the company's core farm onsite. • All core is logged regardless of its mineralisation status.
Sub sampling techniques and sample preparation	• For PQ core; ¼ core is collected at 1m intervals down hole • For HQ and NQ drill core; ½ core is collected at 1m intervals down hole. • The samples are cut using a core saw, if core is broken the core is first wrapped in masking tape prior to the cutting process. • Very broken core is sampled by taking approximately half of the core over the interval of interest. • Sampling method is appropriate for the mineralization styles. • QAQC procedures are in place and use a variety of duplicates, certified standards and blanks. QAQC is reviewed formally on a weekly and monthly basis. In addition QAQC data is assessed informally as results come in on a batch by batch basis.
Quality of assay data and laboratory tests	• All assaying is completed by a NATA accredited Lab with their own internal auditing and validation processes, including pulverisation fineness (95% passing 75 micron), and laboratory standards and blanks. • Gold is assayed by fire assay (30 gram) • Base metal and multi-element analysis is undertaken utilising a 4 acid digest and a standard ICP OES and ICP MS suite. • Assays are regularly reviewed to ensure they conform to expected results and do not show any form of bias.
Verification of sampling and assaying	• All drilling data is logged digitally and stored in a normalised SQL database with an industry standard front end (Maxwell's Datashed) which handles the management of the SQL database. • All laboratory standards and blanks, together with Harmony's own QAQC samples are captured by the database and reviewed. • Significant intersections are reviewed by the logging geologist and the senior geologist on site.

Location of datapoints	• Historic Aldridge drill hole collar locations picked up with hand-held GPS with accuracy of ±5m • Harmony drill hole collars are surveyed using a Leica TCRA1203 R100 Total Station from control points established using static GPS survey observations by dual frequency GPS receivers. Accuracy of this method for collar pickups is ±0.2m. • Downhole surveys are taken using a Reflex EZ downhole survey tool. Surveys are taken at 30m intervals during drilling and depending on ground conditions, a multishot survey at 6m intervals is completed at end of hole when the casing is retrieved. Downhole surveys are loaded into the SQL database and assessed for magnetic interference and assigned a priority for inclusion in the exported downhole survey results. • Holes are surveyed using the ITRF2008 reference frame and post-processed by the AUSPOS Online GPS Processing Service and converted to WGS84_Zone 54 UTM grid. • A DTM generated from radar altimeter data of a detailed magnetic-radiometric survey together with ASTER DEM is utilised for topography. Accuracy is uncertain, but deemed adequate for the first pass drill program.
Data spacing and distribution	• Drilling is progressing into a more advanced exploration phase. There is sufficient data on which Inferred Resource estimates have been made. • Sampling is completed on 1-2m intervals downhole and reported at 0.1% and 0.3% copper grade cut-off composites.
Orientation of data in relation to geological structure	• Ongoing drilling is being directed to better define the strike, continuity and extent of the mineralisation. • As a porphyry deposit there are no specific target structures with which to orientate the holes, drilling aims to drill normal to the general trend of the porphyries.
Sample security	• Samples are bagged, sealed, and numbered and transported directly to Mt Hagen by company personnel. • Samples are then transferred to Lae via road freight, sealed bags checked at the Laboratory and sample receipts issued on confirmation.
Audits or reviews	• The data and sampling techniques are audited internally by the company's competent persons. • Peer review (formal and informal) of the reports and technical documents generated are also undertaken utilising the company's subject matter experts.

Section 2 Reporting of Exploration Results

(Criteria listed in the preceding section also apply to this section)

Criteria	Commentary
Mineral tenement and land tenure status	• Exploration licence EL2310 is located within the Hela Province of Papua New Guinea, 60km north of Tari. • Under the 1992 PNG Mining Act Exploration licences need to be renewed every 2 years following a standard application process. EL2310 was granted 24 May 2014. Its first statutory renewal is due 23 May 2016. • Under the 1992 PNG Mining Act the State reserves the right to elect to purchase up to 30% interest in any project at a price prorata to the accumulated exploration expenditure, and contribute to expenditure and development accordingly thereafter.
Exploration done by other parties	The area was first highlighted in 1986 when CRA Exploration obtained a 7.5 g/t Au float sample from the Logaiyu river. Subsequent reconnaissance level drainage surveys were completed by Kennecott and Magnum Minerals, but it was Placer (on behalf of the Porgera Extended JV during the period 1995 to 1996) who first located and mapped altered porphyry and Cu-Au skarn breccia at Kili Teke. Aldridge Minerals undertook prospect development at Kili Teke between 2009 and 2011 which included surface geochemistry, IP geophysics and 3 drill holes. Except for sporadic TSX stock exchange releases, the results of Aldridge's program are not available as no annual reports were lodged with the MRA.
Geology	The Kili Teke prospect comprises an Inferred Late Miocene/Pliocene calc-alkaline dioritic to monzonitic intrusive complex hosted by a sequence of interbedded siliciclastics (Ireu formation) and limestone (Dari limestone) of the Papuan Fold Belt. Mapping indicates the host stratigraphy has been fold and thrust repeated and offset along several NE trending fault systems. Alteration and mineralisation styles are typical of porphyry and skarn related copper-gold systems, with variably developed pervasive clay ± sericite + pyrite (phyllic) alteration overprinted locally by fracture controlled, patchy chlorite ± pyrite ± epidote ± carbonate (propylitic) alteration. Localised zones of potassic altered hornblende porphyry with pyrite, secondary biotite and magnetite have been mapped; together with zones of copper stained, brecciated skarn and porphyry at limestone porphyry contacts.
Drill hole information	Refer table below for drill hole details and intercepts • Drilling outlines a zone in excess of 250m wide of alteration and mineralisation (based on first occurrence of copper sulphides) which remains open under the limestone cover to the north, along strike to the east and west, and at depth.
Data aggregation methods	Composited intervals were calculated downhole using a minimum cut-off of 0.1% Cu with a maximum allowable interval of internal waste of 10m. High grades were assessed and no top cut was deemed necessary.
Relationship between mineralisation widths and intercept lengths	Drilling aims to intersect the porphyry mineralisation as close to true widths as possible however the evolving nature of the deposit means that this is not always possible, as a result holes are reported as downhole widths and will not always approximate true mineralisation width.

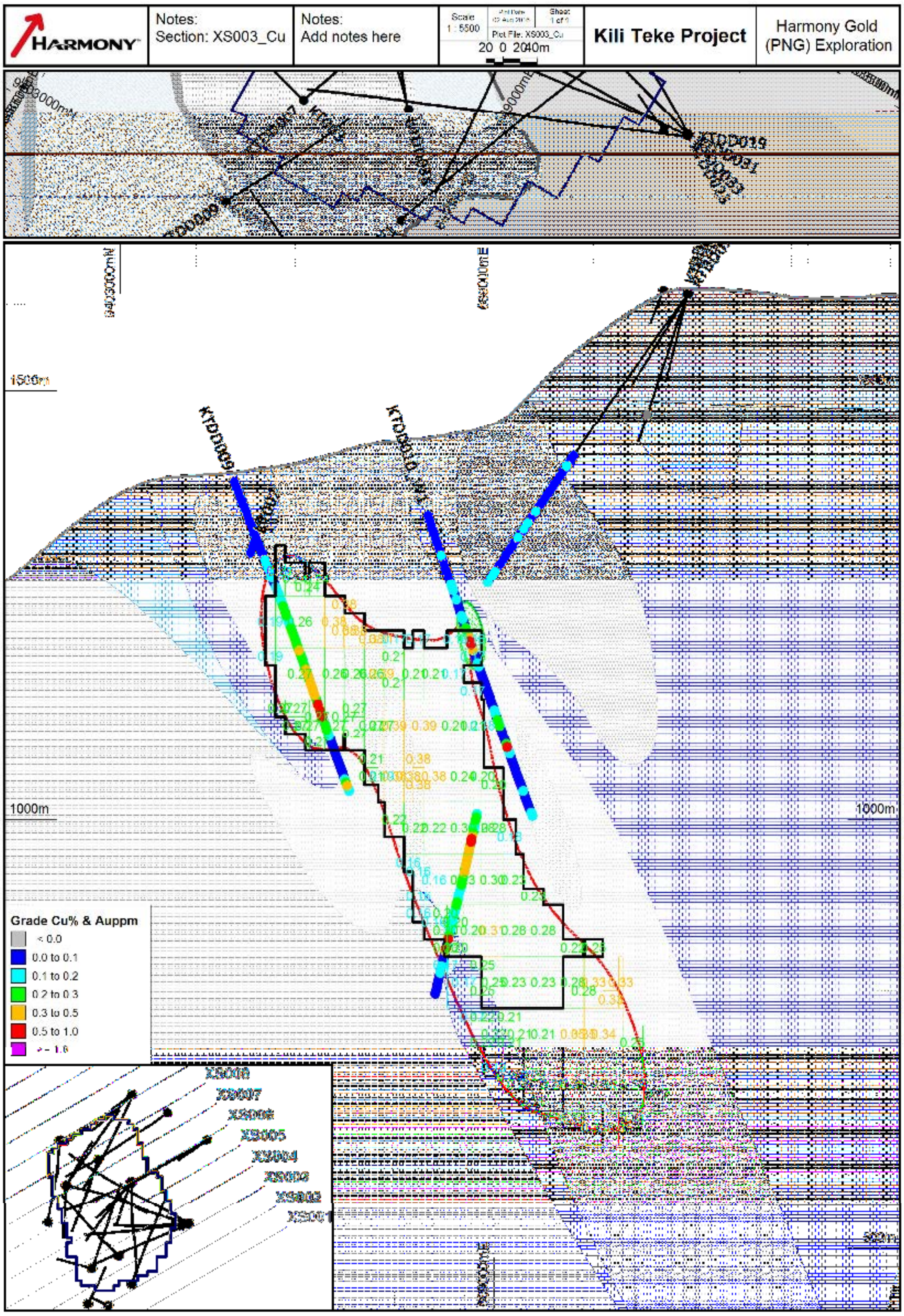
Diagrams	Relevant maps and plans are included within the report
Balanced reporting	All significant results are reported, with 0.1% Cu lower cut-off
Other substantive exploration	Harmony's exploration program has included ridge and spur soil sampling (641 samples), rock chip sampling (458 samples), surface trenching (482 samples), detailed mapping (8 square kilometres), and detailed magnetic radiometric helicopter borne geophysical survey (480 line km). The Kili Teke prospect sits on a gold and copper footprint extending over 2 square kilometers. Peak surface soil samples up to 9.4 g/t Au and 1.0% Cu highlight potential for high grade copper-gold mineralisation mineralisation in the area.
Further work	Additional drilling both along strike and down dip will continue during FY16 to scope out the extent and alteration footprint of the Cu-Au mineralisation encountered thus far. Infill drilling is also planned.

Section 3 Estimation and Reporting of Mineral Resources

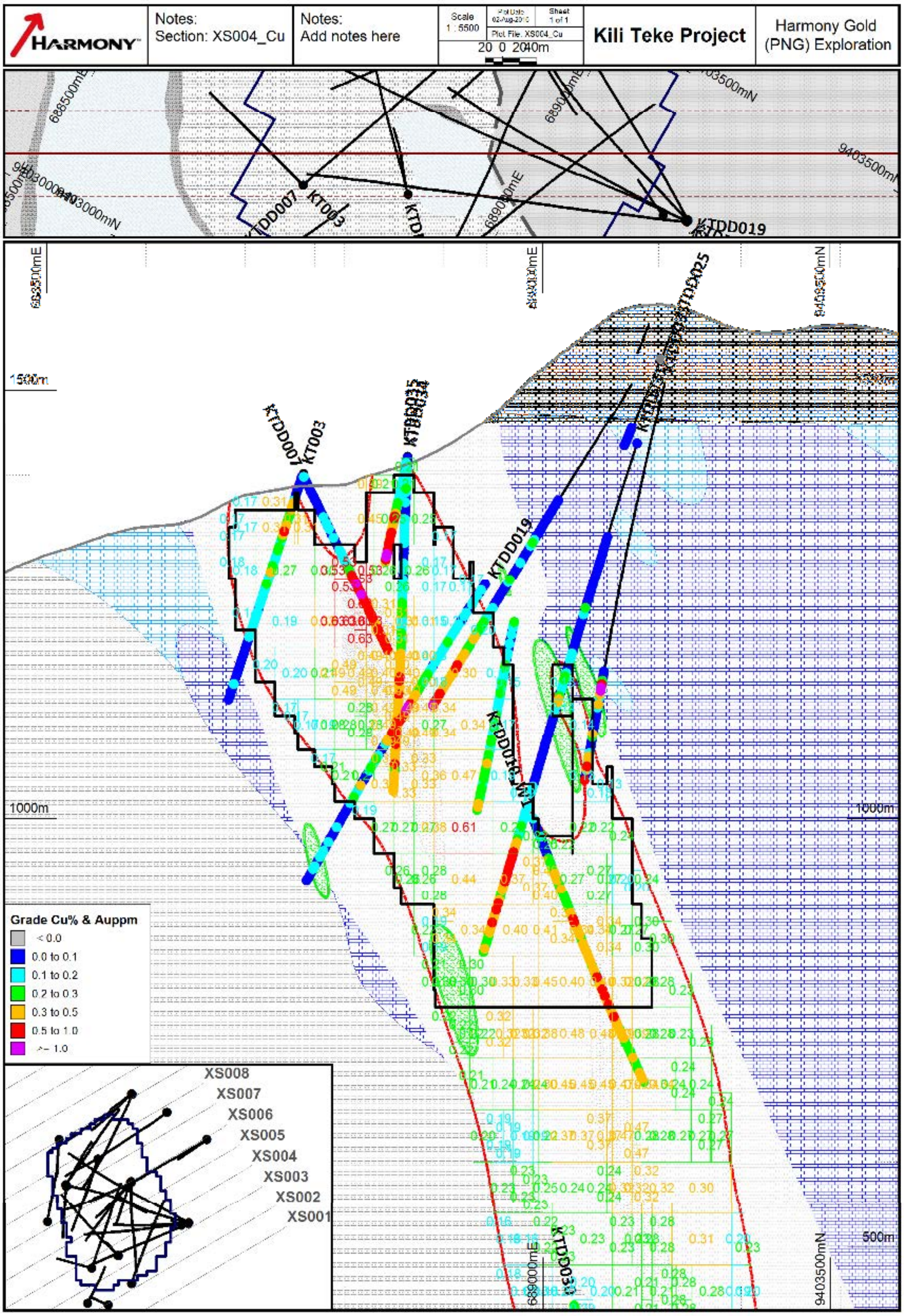
Criteria	Commentary
Database integrity	• All DH logging is completed digitally via the Log Chief logging system and data is loaded into the company's Datashed/SQL database digitally at the end of each shift. • The database is backed up regularly between sites. • The data is then validated using the automatic validation scripts within Datashed, and also upon importing into Micromine. Any discrepancies are noted and fixed in the source database by the company's database administrator. • There are only 3 historic holes in the area for which only limited data was available, these holes have been re-logged by Harmony personnel and core re-assayed.
Site visits	• The site has been visited by Greg Job (Competent Person for Harmony SE Asia) and by one of the two authors (Paul Habermann), who is one of the site geologists responsible for the drill managing program.
Geological interpretation	• The geological model continues to evolve and the estimation method and classification is cognizant of this issue. • The geology is known to comprise of 5 distinct porphyry types intruding into a bedded sequence of marbleised limestone, and sediments. The porphyries comprise a diorite porphyry, a hornblende porphyry and 3 phases of feldspar hornblende porphyry. Cutting these porphyries and the host rock sequence are a series of brecciated and mineralised skarn horizons. • The drilling is quite coarsely spaced and this hampers the construction of the 3D geological model using traditional sectional methods, to account for this a guided implicit modelling (IM) method has been used (Leapfrog Software) that reduces the possible introduction of bias by the modelling geologist. The use of IM as also allowed several various alternative interpretations to be rapidly tested and the model is then modified or replaced if needed. • No geology unit has been used to control the estimate at this early stage, rather a nominal 0.125% grade shell has been modelled to constrain the estimate. Several boundary tests were conducted on the deposit to assess the internal geological boundaries, all boundaries were found to be soft.
Dimensions	• The Inferred Resource is approximately 600m (strike) x 300m (width) x 400m (height) and open in to the southeast and at depth. Mineralisation is known to exist below the 780mRL floor to the Resource and has been modelled but the geological model is not robust enough to merit reporting at this stage.
Estimation and modelling techniques	• The geological model was constructed using Leapfrog Geo software, the estimation was done using Micromine 2014 (v15) software • A total of 32 holes have been used in the estimate, composited to a length of 4m. • The estimate has been estimated using Ordinary Kriging within a nominal 0.125% copper shell, a method well suited to this deposit type given the relatively low nugget, soft boundaries and expected bulk mining methods generally employed. • Estimation parameters are minimum samples 18, maximum of 16 samples from any one drill hole, maximum of 40 samples inside a first pass search ellipse of 300x130x110m based on sample support and variogram ratios. 2 additional passes encompassing a greater search volume were used to fill the modeled area but these have not been reported. • Block size is based on ½ the average drill hole spacing and is considered robust enough for the current purposes. Volume resolution was obtained by using 1/3 (20m) sub-blocks. Estimation was constrained to parent blocks only. • A large block size was selected based on the likely bulk mining method of extraction. • Significant high grades were cut from the estimate using the histogram decomposition method, top cuts were applied to copper and molybdenum, no top cut was found necessary for gold. • All skarn mineralisation grades were removed from the composite file prior to estimation as it was not possible to properly define the skarn horizons and the associated high grade grades were affecting the quality of the estimate. • Check estimates were run as ID estimates and final output was validated using statistical models, swath plots, GT curves and visual examination. • The estimation for copper and gold was based on the one copper variogram due to significant correlation between the two metals. Molybdenum was estimation using its own variogram model. No deleterious elements were estimated, however there are very few deleterious elements found within the orebody during test work. • Pair-wise variograms were modelled to account for the relatively low sample numbers. Variograms were generally well formed. • Similar modelling approach and parameters were used in the maiden Resource estimate completed in November 2015 and the two models were within 10% contained metal when a direct comparison over the 2015 Inferred volume was completed.
Moisture	• Tonnages are estimated as dry tonnes.

Criteria	Commentary
Cut-off parameters	• The Resource is reported at a cut-off of 0.2% copper, this cut-off was used based on the recent reporting similar deposits around the world to enable a like for like comparison.
Mining factors or assumptions	• No mining assumptions as this is an Inferred Resource but it is likely that this type of deposit would be mined via open pit bulk tonnage mining, later transitioning into block cave underground methods if economics are favourable • Given the high level Inferred nature of the Resource, no advanced mining studies have been completed.
Metallurgical factors or assumptions	• Some preliminary metallurgical test work was completed in November 2015 a variety of 9 samples from site. Initial test work indicates few deleterious elements with good overall recovery of 95% for copper, 65% for gold and 70% for molybdenum.
Environmental factors or assumptions	• Environmental monitoring was initiated from the very beginning of the project and is on-going. Initial studies indicate there is very little in the way of contaminants in the watercourses due to the highly alkaline nature of the water. This is a result of the deposit being hosted within limestone and marble. Whilst a portion of the deposit occurs at surface, there is a barren limestone cap over a significant portion of the deposit that will require removal and storage in waste dumps.
Bulk density	• Densities are calculated using basic Archimedes methods of sample weight in air / sample displacement in water. Work is on-going and dry bulk densities will form part of any future Resource model. • Densities are taken on an average of approximately every 30m down hole, ensuring additional samples are measured where unique or different rock or mineralisation types exist.
Classification	• The Resource has been classified as Inferred where less than an average distance of 180m from a sample and above an RL of 780m (~650m below surface), the better drilled portion of the deposit. This comprises approximately 55% of the modelled volume and passes the tests for the Inferred continuity according to JORC 2012.
Audits or reviews	• The Resource has been subject to internal review by the technical team, there has been no external review completed.
Discussion of relative accuracy/ confidence	• Validation tests of the model indicate that the estimate has a reasonable level of accuracy and can support the Inferred classification as defined by the JORC2012 code. The Resource has passed all internal review by several competent persons and only those portions of the estimate volume deemed reliable given the supporting evidence have been classified. It is believed that the Inferred classification is entirely appropriate at this time and is based on - A realistic geological model that has been subject to a variety of tests and review; - A robust estimation method that has seen extensive use; - Enough data to support the conclusions drawn; - A high quality QAQC process that is assessed daily, weekly, monthly and quarterly to ensure any deviation is caught early and rectified; - A complete set of procedures that are followed and are available for audit. • The estimate is only global in scope and suitable for high level assessment.

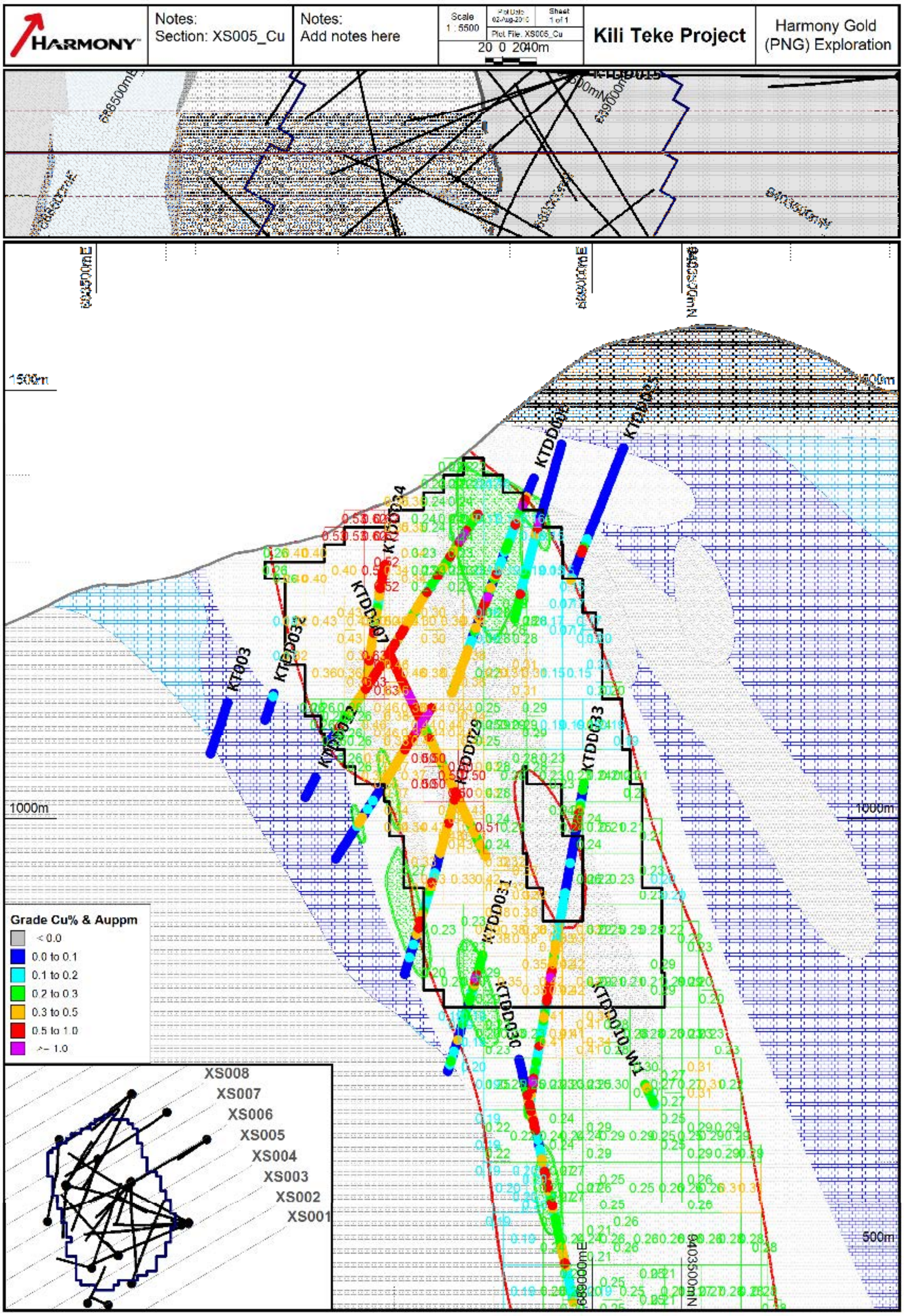
APPENDIX 2: RESOURCE VALIDATION SECTIONS



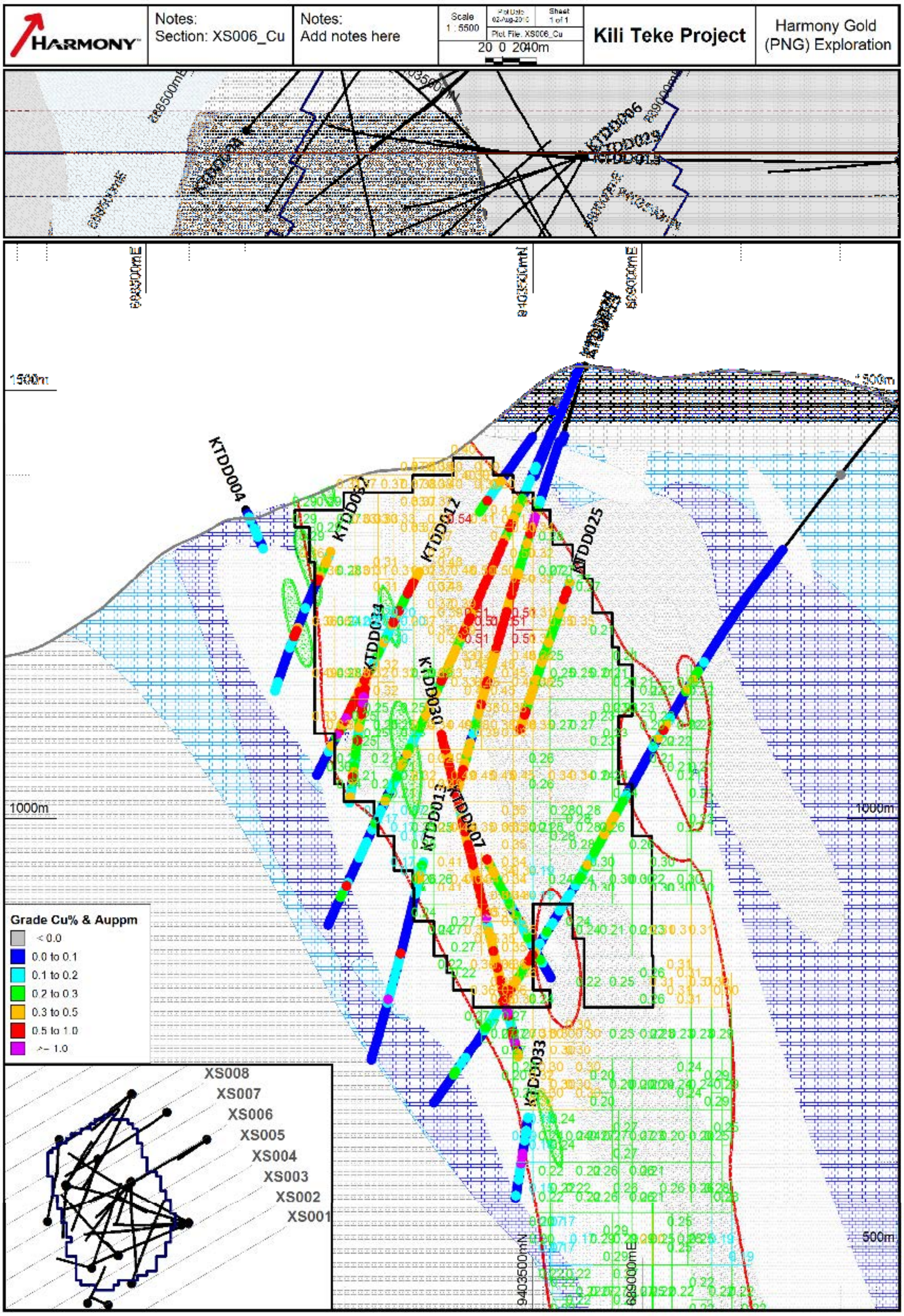
XS003 Copper



XS004 Copper



XS005 Copper



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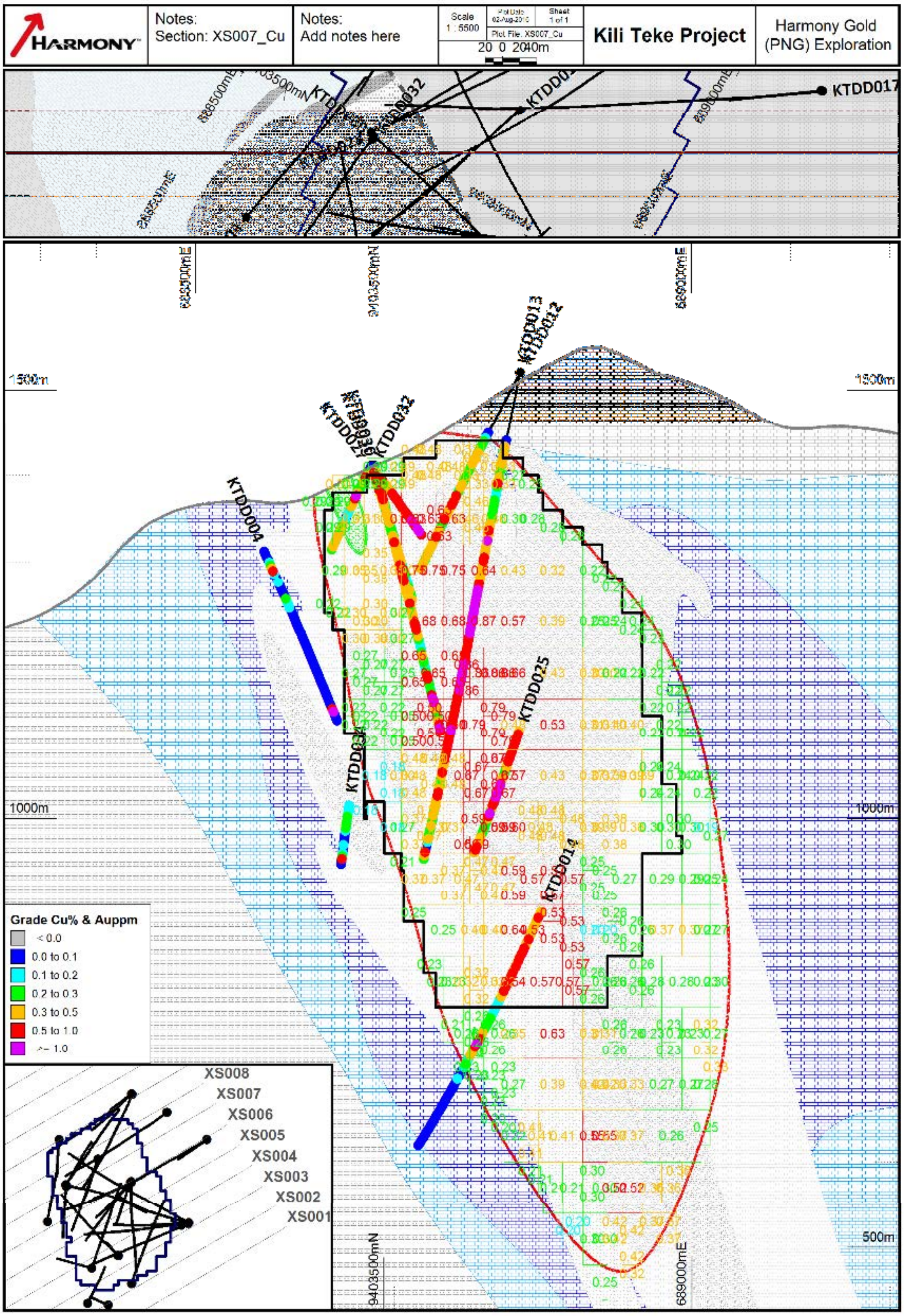

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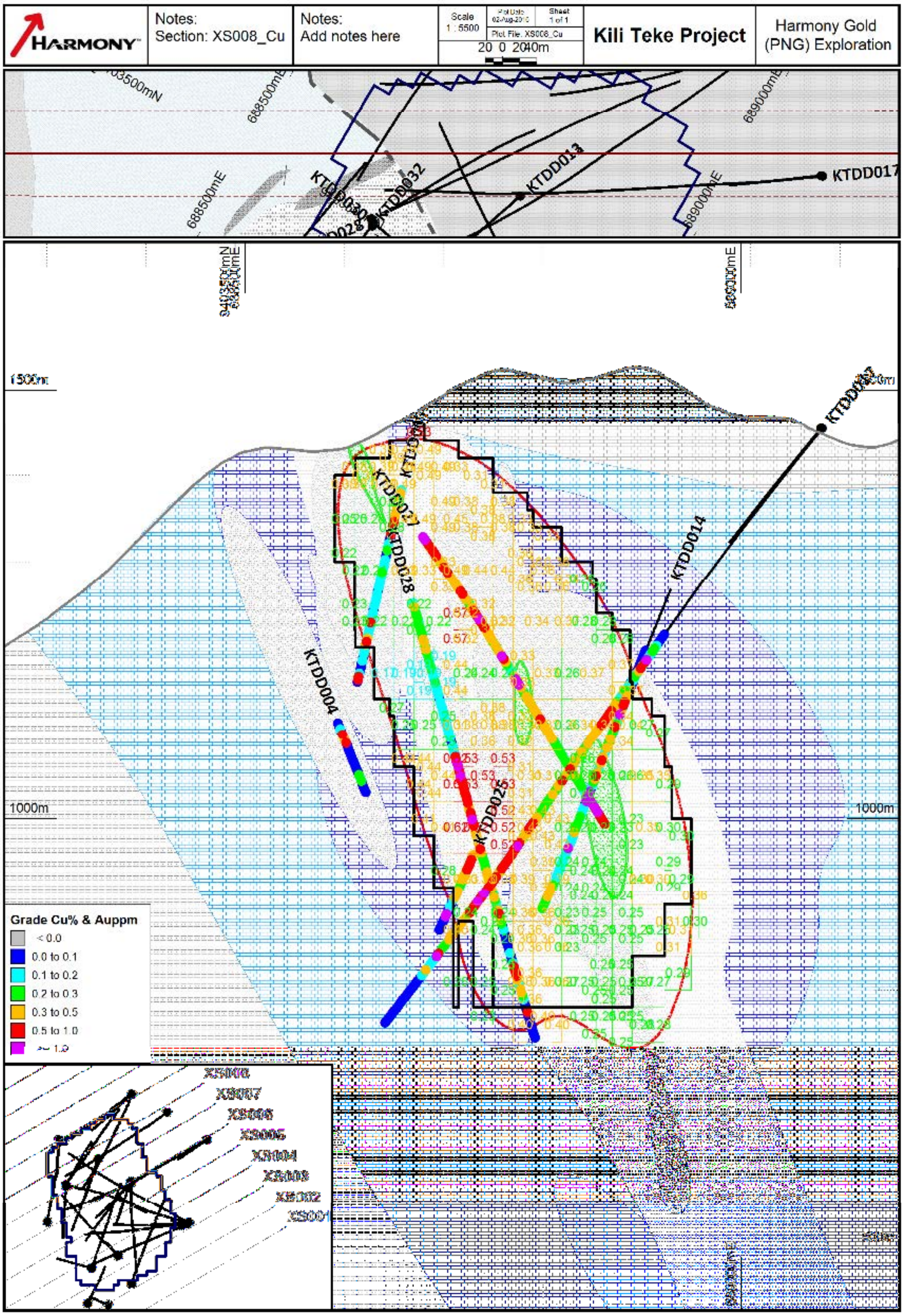
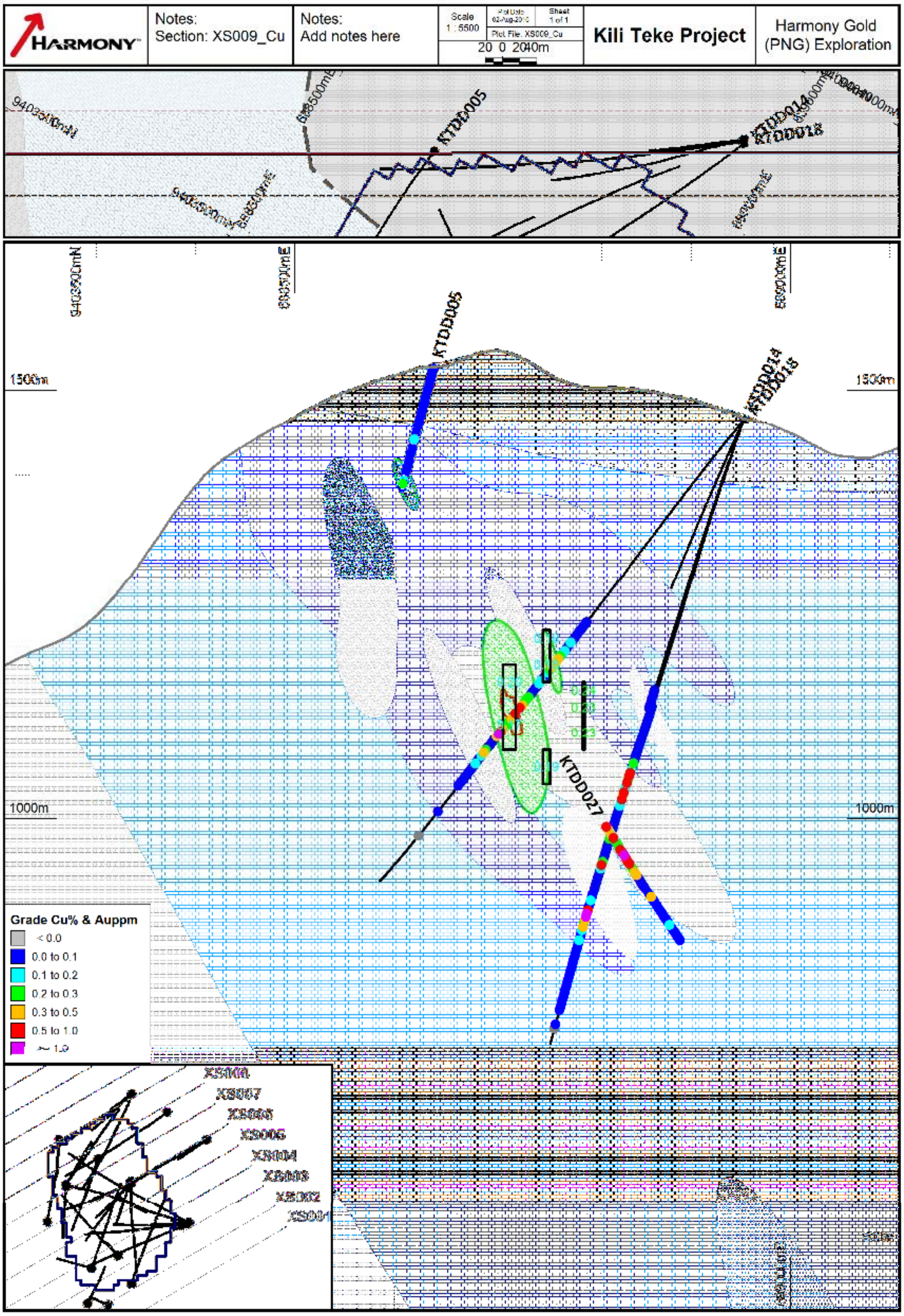
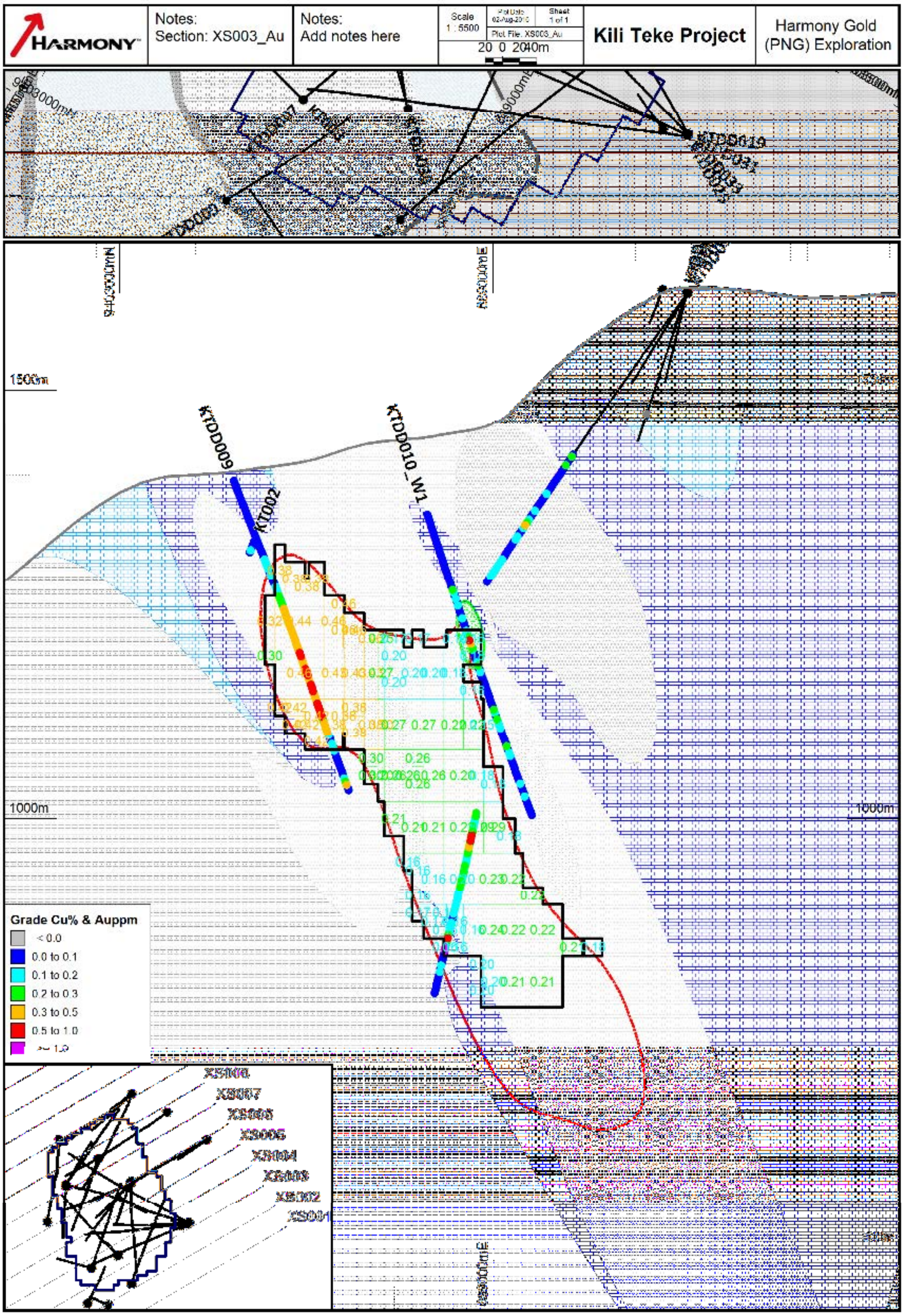


XS008 Copper

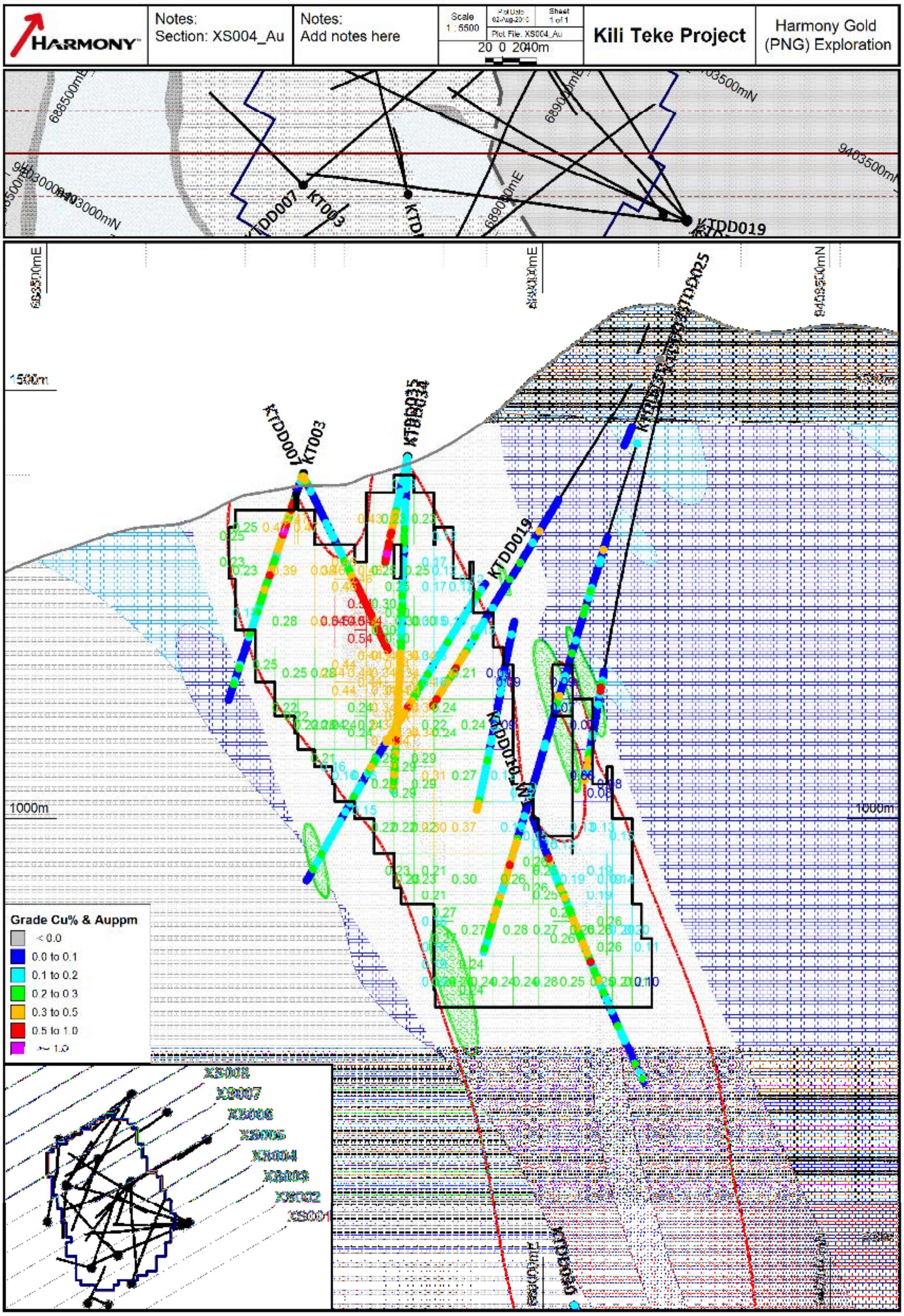


XS009 Copper



Notes:
Section: XS003_Au
Notes:
Add notes here
Kili Teke Project
Harmony Gold (PNG) Exploration
KTDD009
KTDD010_W1
KT002
KTDD019
1500m
1000m
Grade Cu% & Auppm
< 0.0
0.0 to 0.1
0.1 to 0.2
0.2 to 0.3
0.3 to 0.5
0.5 to 1.0

XS003 Gold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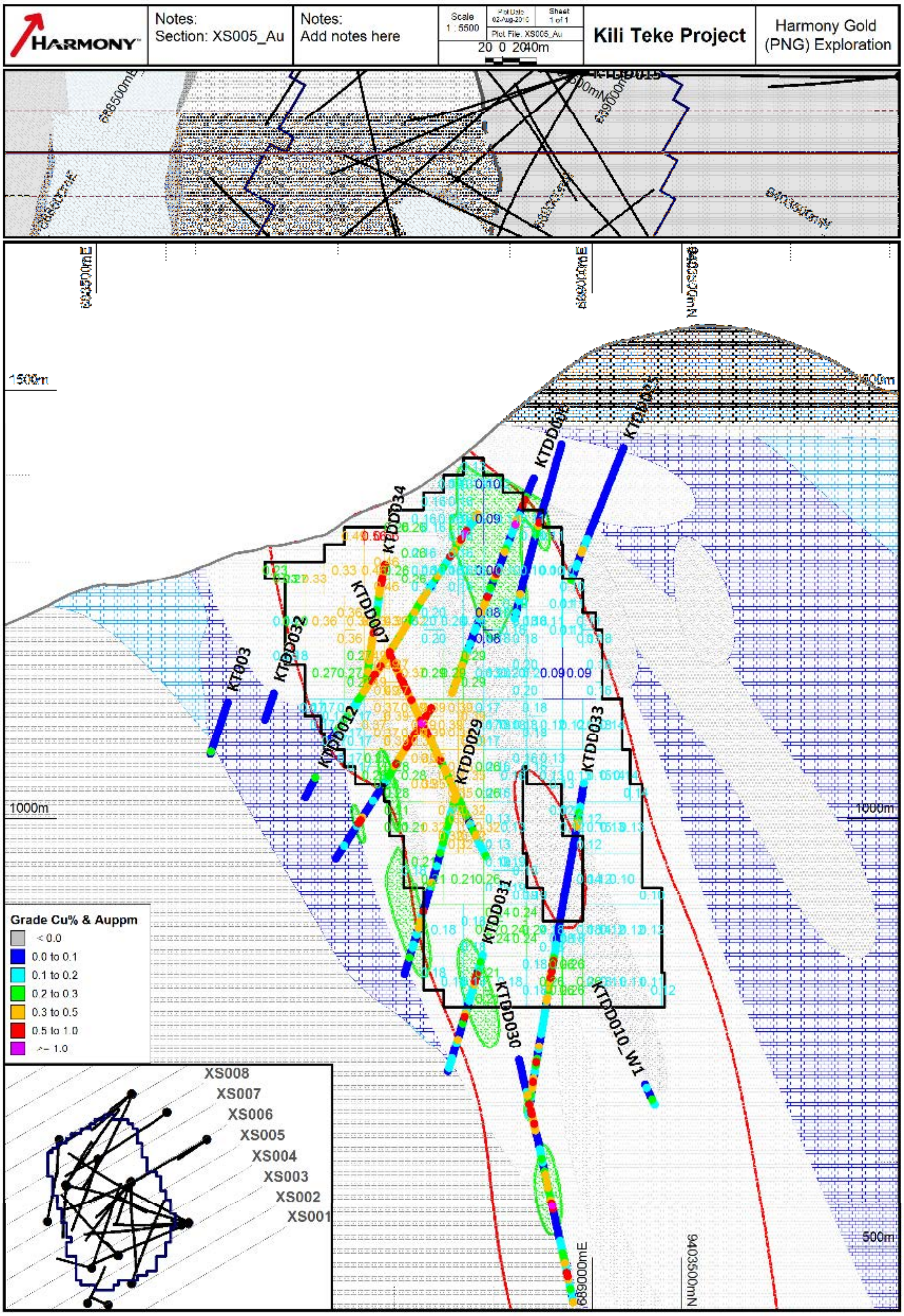
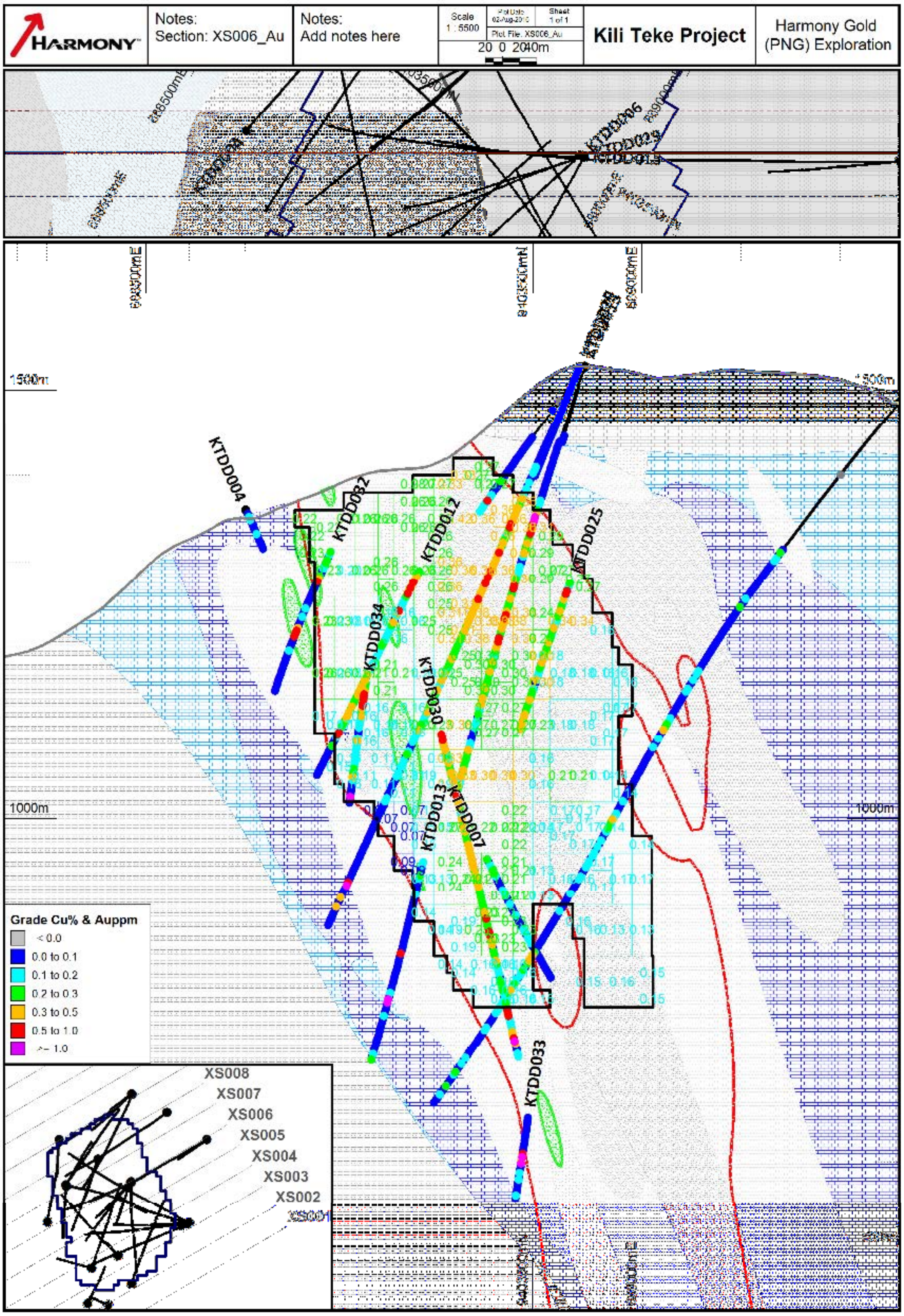
Section: XS004_Au
Notes:
Add notes here
Scale 1 : 5500
Kili Teke Project
Harmony Gold (PNG) Exploration
KTDD019
KTDD007
KT003
KTDD035
KTDD034
KTDD010
1500m
1000m
Grade Cu% & Auppm
< 0.0
0.0 to 0.1
0.1 to 0.2
0.2 to 0.3
0.3 to 0.5
0.5 to 1.0
XS001

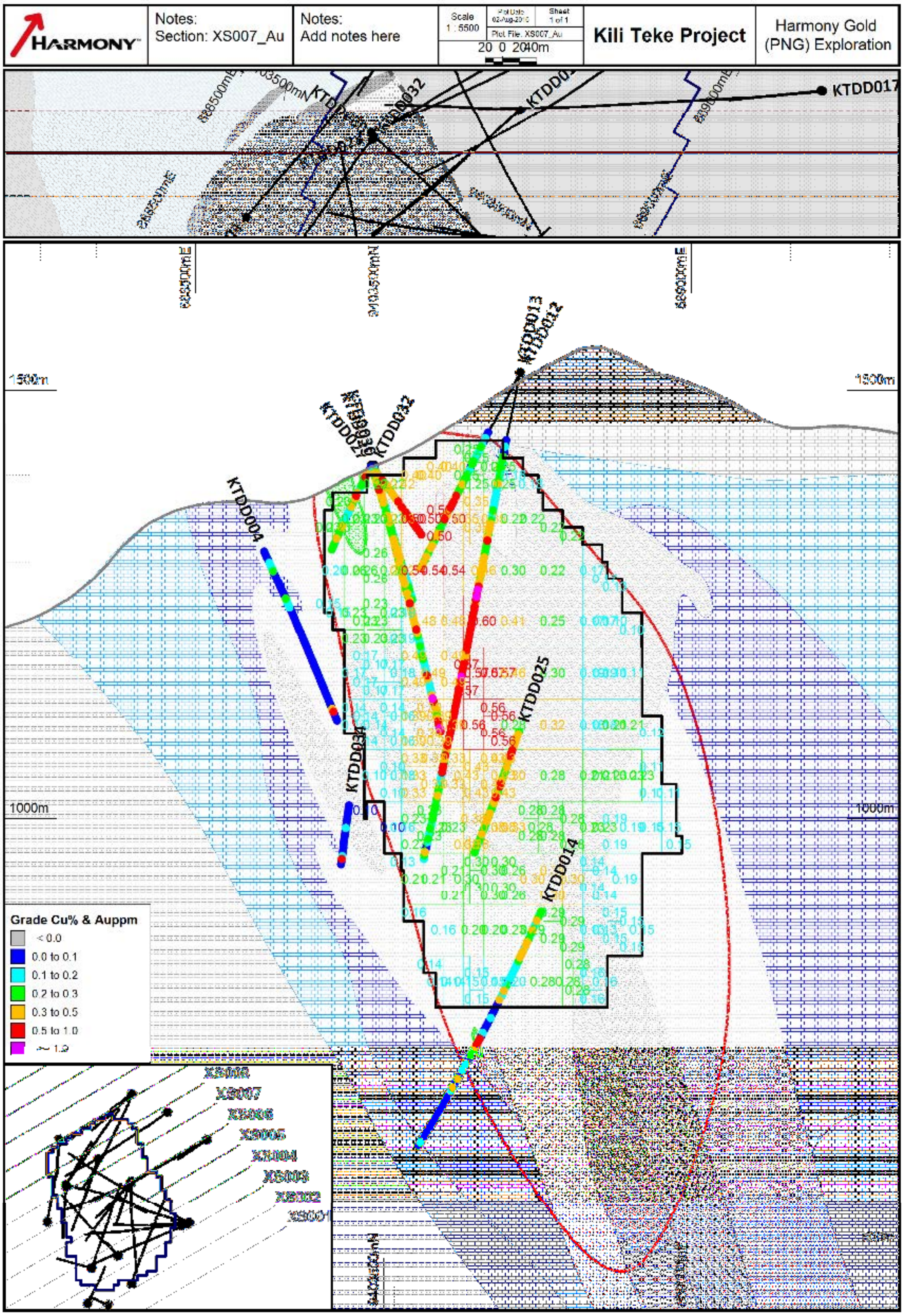
XS004 Gold


Notes:
Section: XS005_Au
Notes:
Add notes here
Scale 1 : 5500
Kili Teke Project
Harmony Gold (PNG) Exploration
1500m
1000m
500m
Grade Cu% & Auppm
< 0.0
0.0 to 0.1
0.1 to 0.2
0.2 to 0.3
0.3 to 0.5
0.5 to 1.0
>= 1.0
XS008
XS007
XS006
XS005
XS004
XS003
XS002
XS001

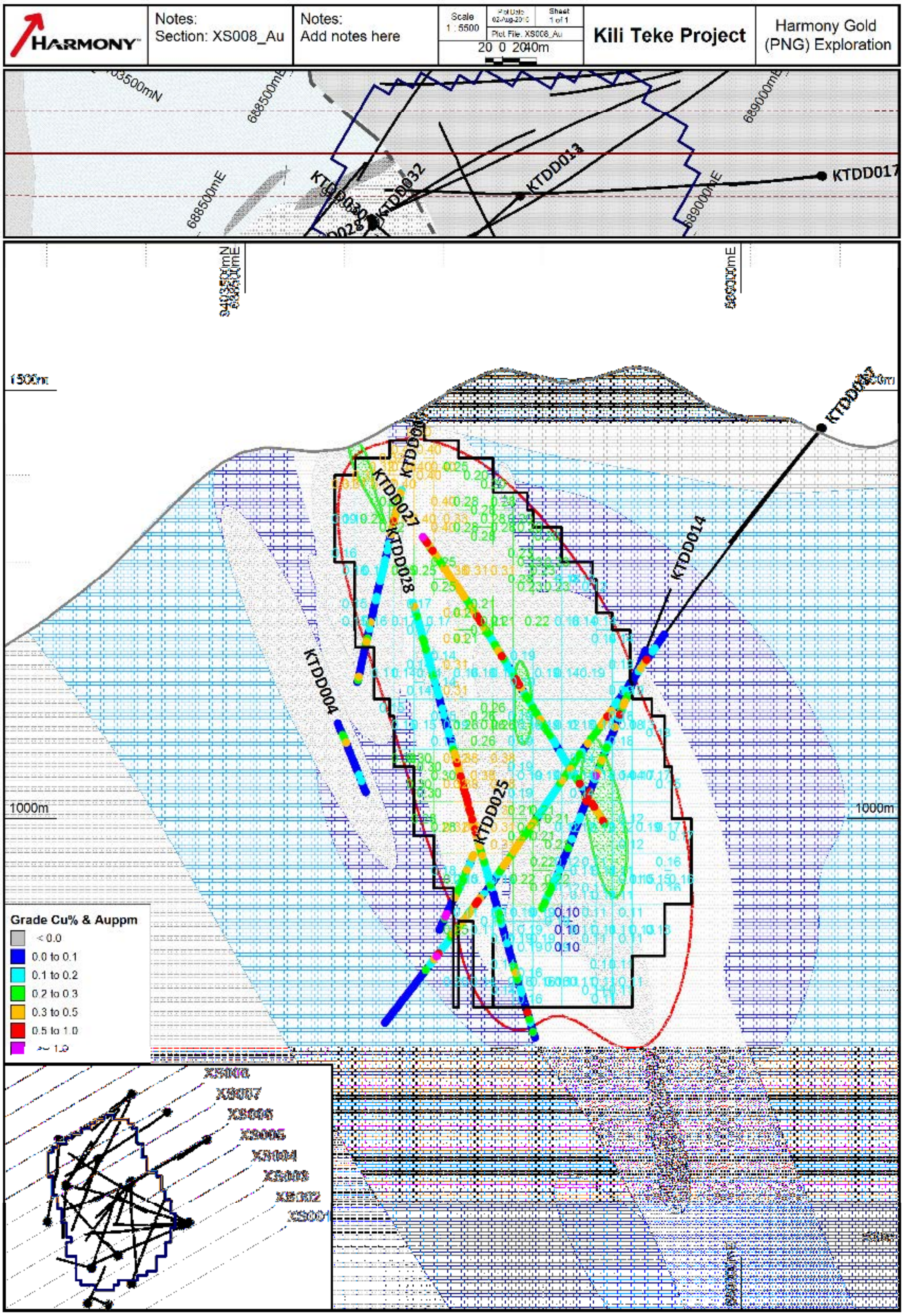
XS005 Gold


Notes:
Section: XS006_Au
Notes:
Add notes here
Scale 1 : 5500
Kili Teke Project
Harmony Gold (PNG) Exploration
KTDD004
KTDD032
KTDD012
KTDD025
KTDD034
KTDD030
KTDD013
KTDD007
KTDD033
1500m
1000m
Grade Cu% & Auppm
< 0.0
0.0 to 0.1
0.1 to 0.2
0.2 to 0.3
0.3 to 0.5
0.5 to 1.0
>= 1.0
XS008
XS007
XS006
XS005
XS004
XS003
XS002

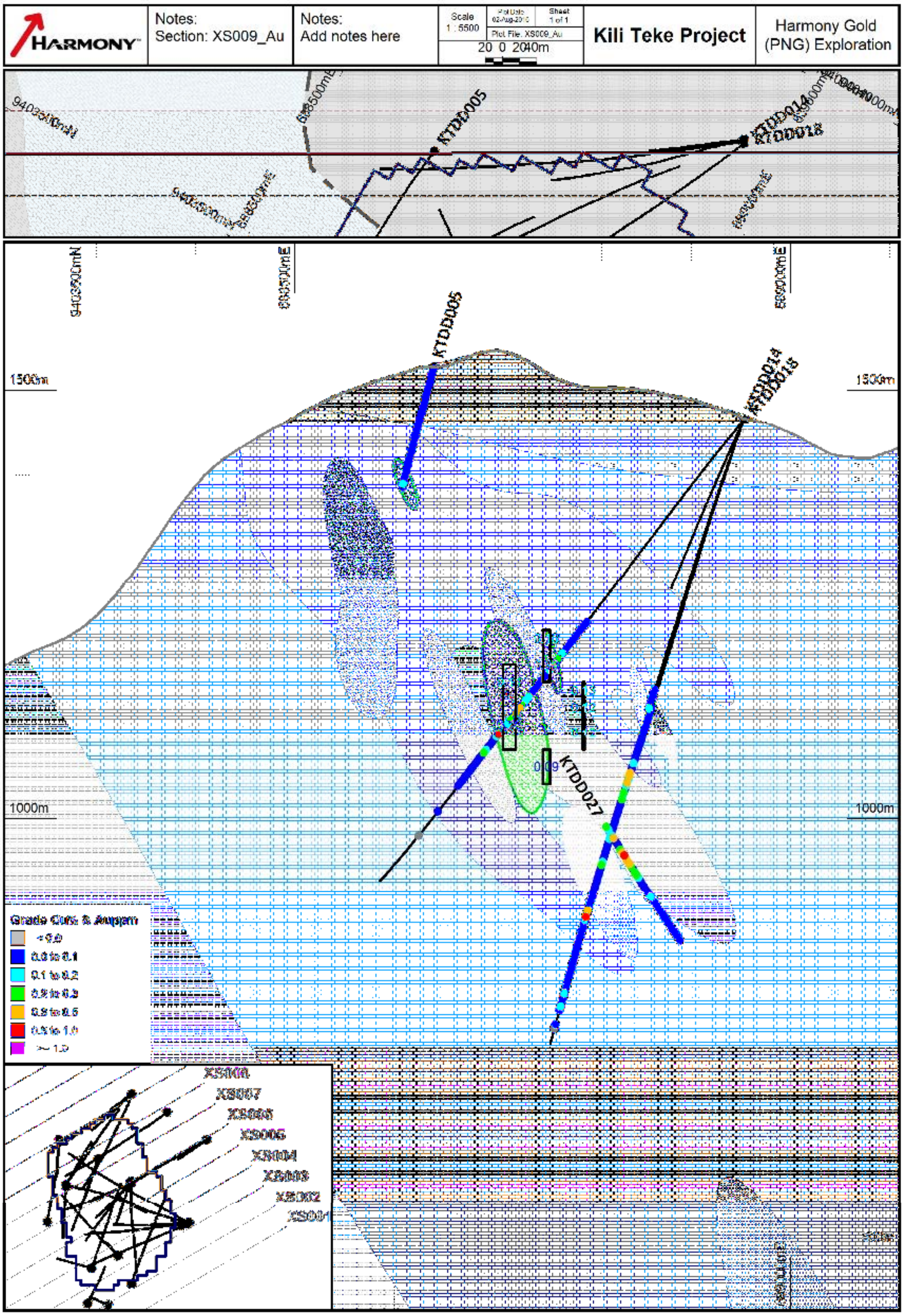
XS006 Gold


Notes:
Section: XS007_Au
Notes:
Add notes here
Kili Teke Project
Harmony Gold
(PNG) Exploration
KTDD017
KTDD013
KTDD012
KTDD032
KTDD004
KTDD025
KTDD014
1500m
1000m
Grade Cu% & Auppm
< 0.0
0.0 to 0.1
0.1 to 0.2
0.2 to 0.3
0.3 to 0.5
0.5 to 1.0
XS008
XS007
XS006
XS005
XS004
XS003
XS002

XS007 Gold


Notes:
Section: XS008_Au
Notes:
Add notes here
Scale 1 : 5500
Kili Teke Project
Harmony Gold (PNG) Exploration
KTDD017
KTDD013
KTDD032
KTDD014
KTDD025
KTDD028
KTDD027
KTDD004
1500m
1000m
Grade Cu% & Auppm
< 0.0
0.0 to 0.1
0.1 to 0.2
0.2 to 0.3
0.3 to 0.5
0.5 to 1.0
XS007
XS006
XS005
XS004
XS003
XS002
XS001

XS008 Gold


HARMONY
Notes:
Section: XS009_Au
Notes:
Add notes here
Scale
1 : 5500
20 0 2040m
Kili Teke Project
Harmony Gold
(PNG) Exploration
KTDD005
1500m
1000m
KTDD027
Grade Cuts & Auppm

XS009 Gold