ASX Announcement (ASX: HMX)

27 September 2016

Kalman Resource Update

HIGHLIGHTS

- Kalman Mineral Resource estimate comprises a combined **20 million tonnes at 1.8% copper equivalent (CuEq)** at 0.61% copper, 0.34 g/t gold, 0.14% molybdenum and 3.7 g/t rhenium in the Indicated and Inferred categories at revised cut-off grades.

- Resource incorporates 8 new drill holes and applies higher cut-off grades to both the open pit and underground portions of the orebody.

- 13.3 million tonnes fall above the 100m RL level which is classed as potentially open-pittable based on previous pit optimisation studies. Of this shallower material 6.2 million tonnes at 1.6% CuEq are now in the Inferred category and 7.1 million tonnes at 1.5% CuEq in the Indicated category.

- Previous high level pit optimisation and underground mining exercises conducted suggest that the deposit has good prospects for economic extraction.

- Kalman deposit remains open along strike and down plunge.

- Follow up diamond and RC drill program currently being planned to extend resource.

Table 1 Kalman Mineral Resource

Classification	Mining Method	CuEq Cut-off	Tonnes Kt	CuEq %	Cu %	Mo %	Au ppm	Ag ppm	Re ppm
Indicated	Open Pit	0.75%	7,100	1.5	0.48	0.12	0.27	1.4	2.9
Inferred	Open Pit	0.75%	6,200	1.6	0.44	0.15	0.24	1.5	3.9
Inferred	Underground	1.4%	7,000	2.4	0.89	0.16	0.50	2.9	4.5
Total			**20,000**	**1.8**	**0.61**	**0.14**	**0.34**	**1.9**	**3.7**

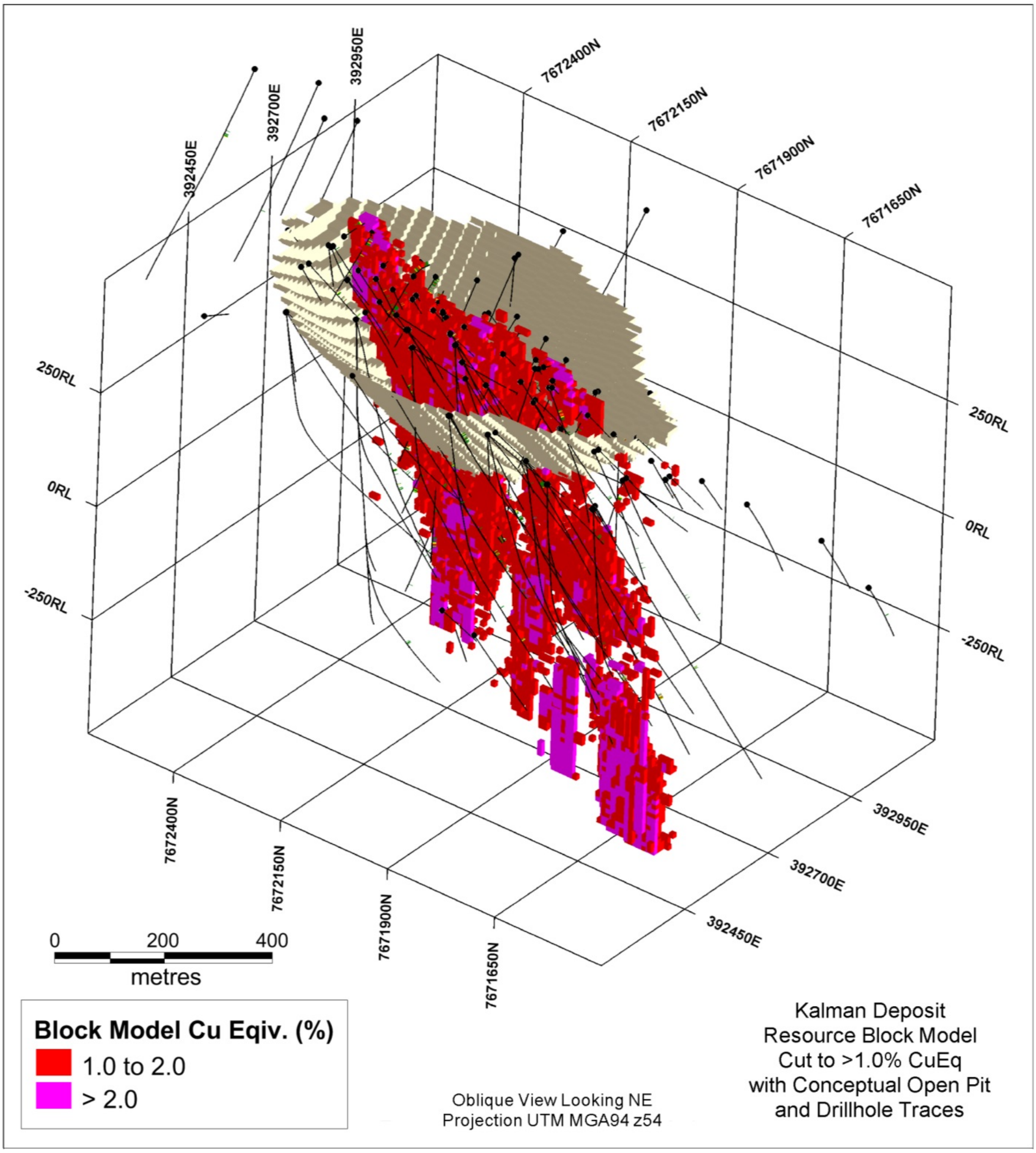
Note – Totals may differ due to rounding

- The copper equivalent equation is:

$$CuEq = Cu + (0.864268 * Au) + (0.011063 * Ag) + (4.741128 * Mo) + (0.064516 * Re)$$

Table 2 Grade Tonnage Report by Copper Equivalent (CuEq) Cut-off

Cut-off	Tonnes	CuEq	Cu	Mo	Au	Ag	Re
2.00	6,509,025	3.05	0.86	0.27	0.51	3.05	6.78
1.95	6,763,922	3.01	0.85	0.27	0.50	2.99	6.68
1.90	7,064,170	2.96	0.84	0.26	0.50	2.96	6.55
1.85	7,388,381	2.91	0.82	0.26	0.49	2.91	6.43
1.80	7,741,406	2.86	0.81	0.25	0.49	2.86	6.30
1.75	8,140,120	2.81	0.80	0.24	0.48	2.80	6.15
1.70	8,595,703	2.75	0.79	0.24	0.48	2.74	5.99
1.65	9,173,967	2.68	0.78	0.23	0.47	2.68	5.81
1.60	9,652,500	2.63	0.77	0.22	0.46	2.63	5.68
1.55	10,177,397	2.58	0.76	0.22	0.46	2.57	5.55
1.50	10,819,913	2.51	0.74	0.21	0.45	2.52	5.40
1.45	11,462,428	2.46	0.73	0.21	0.44	2.46	5.26
1.40	12,160,083	2.40	0.72	0.20	0.43	2.41	5.11
1.35	12,932,620	2.34	0.71	0.19	0.42	2.35	4.95
1.30	13,791,431	2.27	0.70	0.19	0.41	2.30	4.81
1.25	14,830,889	2.20	0.68	0.18	0.40	2.23	4.63
1.20	15,878,320	2.14	0.67	0.17	0.39	2.18	4.45
1.15	17,022,403	2.07	0.66	0.17	0.38	2.13	4.27
1.10	18,273,895	2.01	0.65	0.16	0.37	2.07	4.09
1.05	19,604,869	1.95	0.64	0.15	0.36	2.01	3.93
1.00	21,039,666	1.88	0.63	0.15	0.35	1.96	3.77
0.95	22,639,289	1.82	0.61	0.14	0.34	1.90	3.61
0.90	24,239,503	1.76	0.60	0.13	0.33	1.84	3.47
0.85	26,007,792	1.70	0.59	0.13	0.32	1.79	3.32
0.80	27,853,917	1.64	0.58	0.12	0.31	1.75	3.18
0.75	30,020,878	1.58	0.57	0.11	0.30	1.69	3.03
0.70	32,253,694	1.52	0.55	0.11	0.29	1.65	2.89
0.65	34,626,909	1.46	0.54	0.10	0.28	1.59	2.76
0.60	37,553,541	1.40	0.52	0.10	0.27	1.54	2.62
0.55	40,753,463	1.33	0.51	0.09	0.26	1.49	2.48
0.50	44,259,244	1.27	0.49	0.08	0.24	1.44	2.35
0.45	48,549,628	1.20	0.47	0.08	0.23	1.38	2.20
0.40	53,316,647	1.13	0.45	0.07	0.22	1.32	2.06
0.35	58,550,597	1.06	0.43	0.07	0.20	1.26	1.92
0.30	63,805,345	1.00	0.41	0.06	0.19	1.21	1.80
0.25	69,184,716	0.94	0.39	0.06	0.18	1.15	1.69
0.20	75,022,664	0.89	0.37	0.05	0.17	1.10	1.58
0.15	80,812,223	0.84	0.35	0.05	0.16	1.05	1.49
0.10	87,930,563	0.78	0.33	0.05	0.15	0.99	1.38
0.05	96,288,075	0.72	0.31	0.04	0.14	0.93	1.27
0.00	100,400,302	0.69	0.29	0.04	0.13	0.90	1.22



Kalman Resource (looking northeast) showing a conceptual Open Pit with Resource Blocks >1% Copper Equivalent

Hammer Metals Limited (Hammer) (ASX: HMX) is pleased to advise that Haren Consulting has completed an updated Mineral Resource Estimate for the Kalman Deposit in accordance with the guidelines of the JORC Code (2012 Edition).

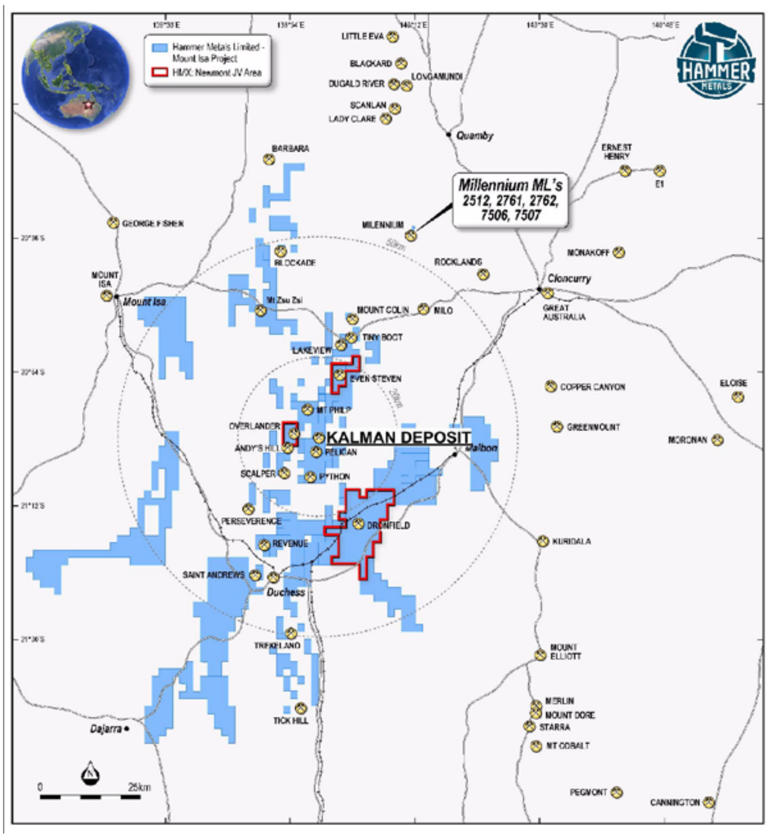
The update was completed in order to incorporate a series of 8 holes (K131-K132 and K134-K139) drilled by Hammer in 2014 into the resource model. The drill holes intersected a number of relatively shallow high grade molybdenum and copper intersections which were considered to have the potential to enhance the existing mineral resource model.

The 100%-owned Kalman polymetallic deposit is situated 60 kilometres to the southeast of the mining centre of Mount Isa in North West Queensland. Hammer holds a strategic tenement position covering approximately 2,600km^2 within the Mount Isa region and surrounding Kalman. Hammer's recently drilled Overlander North and Overlander South copper deposits are situated 6km west of Kalman.

Alexander Hewlett, CEO of Hammer Metals said that: *"This updated resource estimate lays the foundations for further resource definition drilling and mining studies into Kalman and we consider there to be potential for Kalman to become a significant producer of copper and molybdenum concentrates with gold and rhenium credits.*

Our early exploration success at Overlander North provides additional confirmation of the project's exploration potential."

"Kalman also has the advantage of being located in an established mining district. The extensive geological, environmental and metallurgical studies already completed on Kalman will assist in fast-tracking the project towards production."



Project Location

A summary of the background and information used in the resource estimation is as follows:

In September 2016 Haren Consulting ("Haren") was contracted by Hammer Metals Ltd. ("Hammer") to complete a Mineral Resource estimate for the Kalman Polymetallic deposit. This estimate is an update with the addition of eight drill holes and substantial exploration mapping to achieve an enhanced understanding of the mineralization. The calculation of copper equivalent (CuEq) has been updated to reflect current and expected commodity prices.

The Mineral Resource estimate is reported here in compliance with the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves' by the Joint Ore Reserves Committee (JORC). Therefore it is suitable for public reporting.

Ownership

The Kalman polymetallic deposit is situated on EPM13870 and EPM 14232 owned 100% by Mt Dockerell Mining Pty Ltd – a wholly owned subsidiary of Hammer Metals Limited. There is a 2% NSR payable to a third party on metal produced from EPM 13870.

Geology and Supporting Information

The Kalman Project area is located within the Eastern Fold Belt of the Mount Isa Inlier and straddles the Wonga Sub-Province of the Eastern Succession. The boundaries of the sub-province are mapped as significant strike-slip faults. The Kalman deposit occurs on the Pilgrim Fault Zone which is a major crustal suture transecting the Mount Isa Inlier and separates the Wonga Sub-Province from the Quamby-Malbon Sub-Province. The Pilgrim Fault is interpreted as an east dipping listric fault with a surface expression of multiple east stepping, stacked semi-vertical shears.

Exploration in the area has been completed by several companies with historic drill holes and trenches dating back to the 1970's. The database comprises 110 holes for a total of 42,703.5m of drilling.

Drilling extends to a maximum down hole depth of 998.3m and the mineralisation was modelled from surface to a depth of approximately 800m below surface. The estimate is based on good quality RC and diamond core drilling data. The drill hole spacing is approximately 100m along strike with some 50m infill drilling.

Drilling Techniques

The drilling database consists of both diamond core (DD), reverse circulation (RC) drilling and trenching completed by numerous companies dating back to the 1970s. Drilling conducted between 2005 and 2016 used for the estimate is summarised in Table 3.

Table 3 Drilling used for Mineral Resource

Company / Hole Type	Number of Drill holes	Metres
Cerro - DD	73	36,997.5
Cerro - RC	14	2,059
SMD - RC	15	2,195
Hammer - RC	8	1,452
Total	110	42,703.5

Sampling and Sub-Sampling Techniques

All RC drilling was completed with large capacity rigs capable of +200m depths. The rigs were configured with both inbuilt and auxiliary compressors and boosters.

The holes were drilled with 4.5" (112 mm) face sampling hammers. The samples were fed through a splitter from a collection cyclone. The sample for analysis was collected for dispatch to the assay laboratory; a second sample was retained on site in sample farms adjacent to the drill collar.

All diamond core was photographed. The core was then cut using an automatic core-saw and the core halves placed back into their original positions in the tray. The right hand side was then hand selected for sampling, in one metre composites corresponding to the metre marks.

Sample Analysis Methods

All samples were assayed by ALS Laboratory Group in Townsville. Gold was assayed using 30g fire assay with an AAS finish. Base metals were determined by aqua regia digest with an ICP finish on a broad multi-element suite. Anomalous molybdenum zones (defined as more than 50ppm Mo) were re-submitted for assay using four acid total digest with an ICP mass spectrometer determination of a broad multi-element suite.

Mineral Resource Estimate

The Mineral Resource estimate is reported here in compliance with the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves' by the Joint Ore Reserves Committee (JORC). Therefore it is suitable for public reporting.

As a result of recent reviews of the Copper Equivalence equation, applying revised metal prices and high-level economic analyses applying both Open Cut and Underground mining parameters, the Kalman Mineral Resource has been reported to two separate cut-off grades as this is relevant to the longer term expectations of eventual economic extraction. A cut-off of 0.75% CuEq for Open Cut type material above 100mRL and 1.4% CuEq for Underground material below 100mRL has been applied for reporting Mineral Resources in Table 4. The copper equivalent equation is:

$$CuEq = Cu + (0.864268 * Au) + (0.011063 * Ag) + (4.741128 * Mo) + (0.064516 * Re)$$

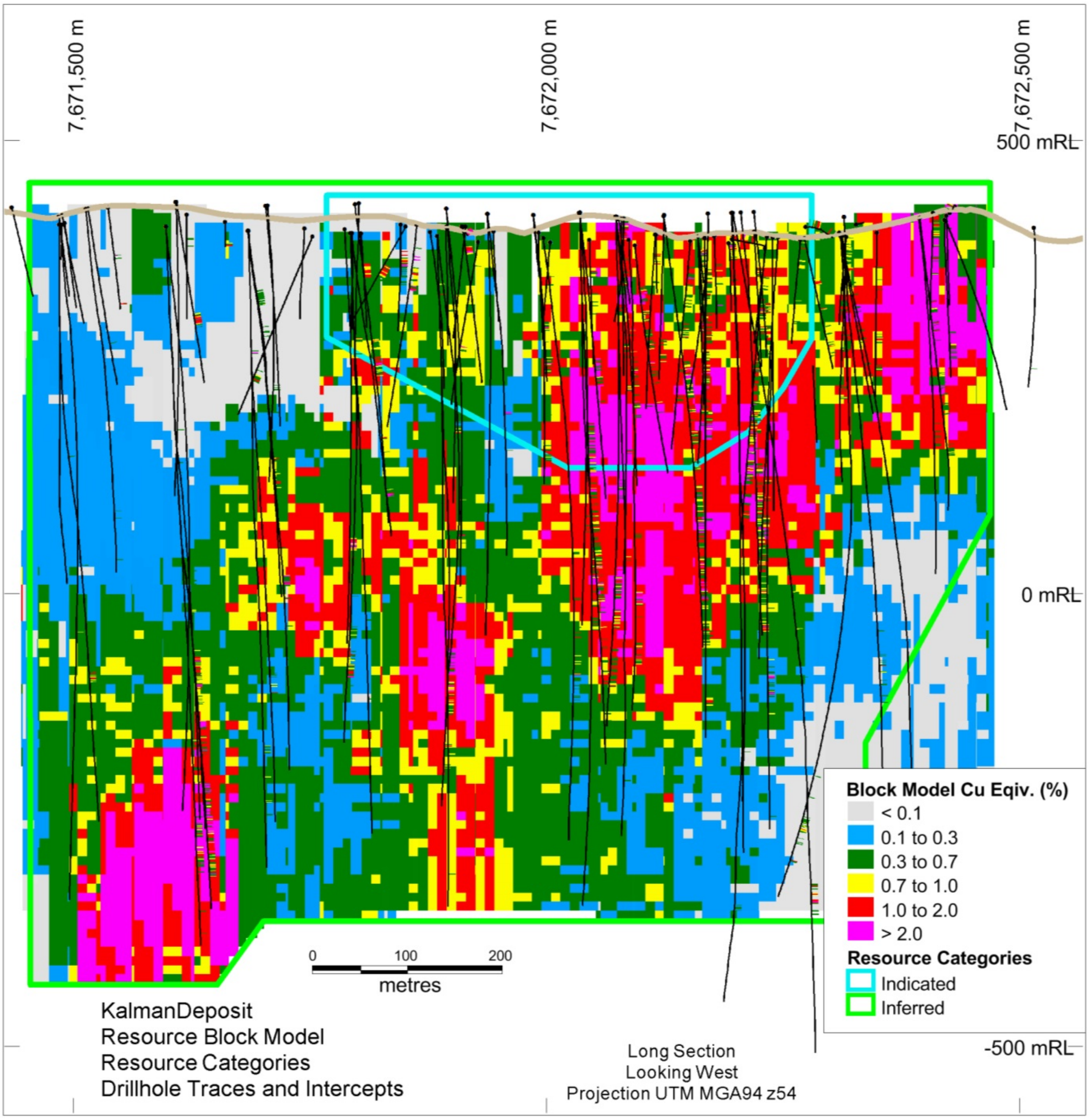
Table 4 Kalman Mineral Resource

Classification	Mining Method	CuEq Cut-off	Tonnes Kt	CuEq %	Cu %	Mo %	Au ppm	Ag ppm	Re ppm
Indicated	Open Pit	0.75%	7,100	1.5	0.48	0.12	0.27	1.4	2.9
Inferred	Open Pit	0.75%	6,200	1.6	0.44	0.15	0.24	1.5	3.9
Inferred	Underground	1.4%	7,000	2.4	0.89	0.16	0.50	2.9	4.5
Total			**20,000**	**1.8**	**0.61**	**0.14**	**0.34**	**1.9**	**3.7**

Note – Totals may differ due to rounding

The deposit was estimated by Haren using Ordinary Kriging (OK) grade interpolation, constrained by mineralisation envelopes interpreted into four domains based on using a 0.1% Cu or 0.03% Mo cut-off or assumed geological continuity.

The block dimensions used in the model were 5m EW by 30m NS by 10m vertical with sub-cells of 1.25m by 5.0m by 2.5m. Statistical and geostatistical analysis was carried out on Mo, Re, Cu, Au and Ag by domain. High grade cuts have been applied where appropriate.



Kalman Long Section showing Resource Blocks and Categories

Copper equivalent (CuEq) grades were calculated using estimated block grades for Cu, Au, Ag, Mo and Re. The CuEq calculation is based solely on commodity prices without assumptions about recovery or payability of the different metals. Prices agreed to by Hammer were a reflection of the market as at May 14 2016 and forward looking forecasts provided by consensus analysis. Metal prices used were:

- Cu: US$4,650/t;
- Au: US$1,250/oz;
- Ag: US$16/oz;
- Mo: US$10/lb; and
- Re: US$3,000/kg.

The CuEq equation is:

$$CuEq = Cu + (0.864268 * Au) + (0.011063 * Ag) + (4.741128 * Mo) + (0.064516 * Re)$$

Assumed Metallurgical Recoveries

Based on the testing completed and the current understanding of the material characteristics it has been assumed that the Kalman material can be processed using a "typical" concentrator process flowsheet. The mass balance and stage metallurgical recovery of the four major elements were based on the metallurgical test results from the molybdenum zone sample and benchmarks. The final overall recovery (Table 5) was established from the mass balance and benchmarked against other operations and projects.

Table 5 Assumed Metallurgical Recoveries

Process Stage	Molybdenum Recovery (%)	Rhenium Recovery (%)	Copper Recovery (%)	Gold Recovery (%)	Silver[1] Recovery (%)
Bulk Rougher	95	86	95	82	82
Overall	86	77	86	74	74

(1) No data available for Silver recoveries so they have been assumed similar to Gold Recoveries

It is the company's opinion that the metals used in the metal equivalent equation have reasonable potential for recovery and sale based on metallurgical recoveries in flotation test work undertaken to date. There are a number of well-established processing routes for copper-molybdenum deposits and the sale of resulting copper and molybdenum concentrates.

Molybdenum concentrates with rhenium require roasting to capture the rhenium from the process off-gas. There are several offshore facilities that process molybdenum concentrates of which Molymet is the world's largest molybdenum processer and the largest producer of rhenium.

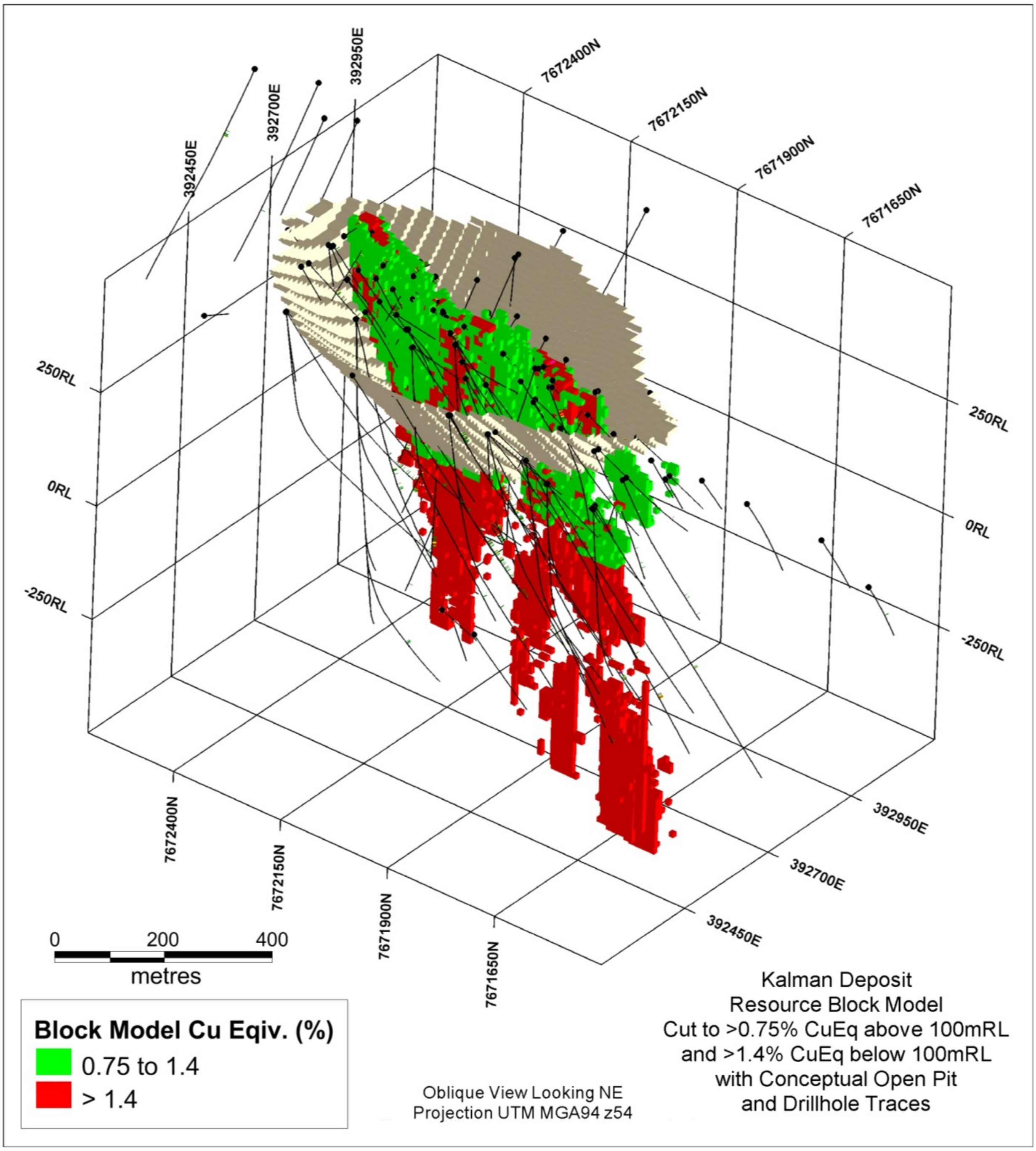
Because of the relatively small market for rhenium there is limited public information available for the payment of credits for rhenium. Preliminary enquiries by the company provide the company with sufficient confidence to believe that a credit for the rhenium content of the molybdenum concentrate can be obtained.

Prospects for Economic Extraction

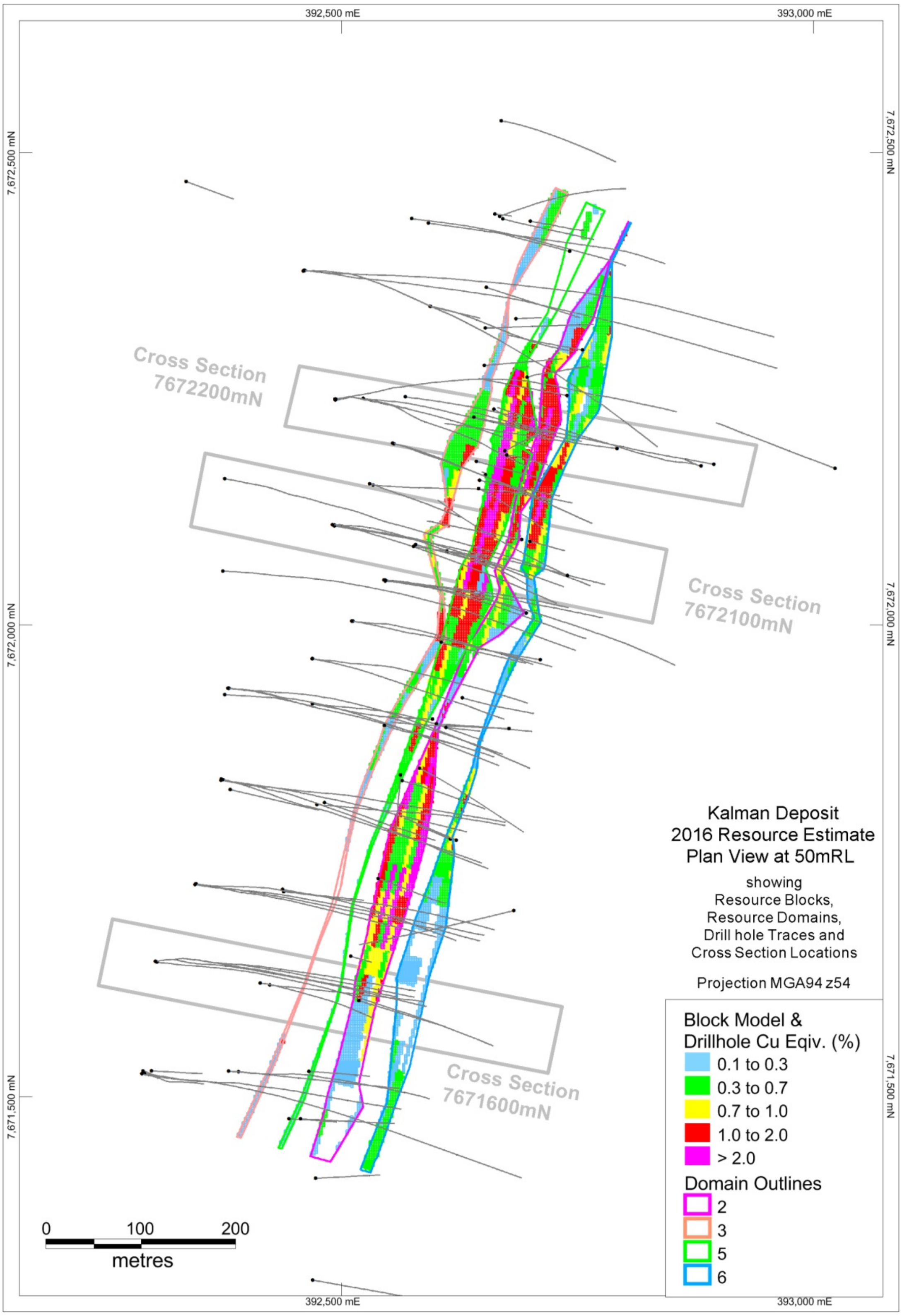
As part of the previous 2014 estimate a high level pit optimisation exercise was completed to determine if a portion of the project would have reasonable prospects for eventual economic extraction by open pit mining methods.

The results from this analysis indicate that a significant portion of the Kalman deposit has reasonable prospects for economic extraction using open pit methods. A high-level underground mining analysis exercise was also completed and the results indicate that a significant portion of the deposit has reasonable prospects for economic extraction using underground mining methods.

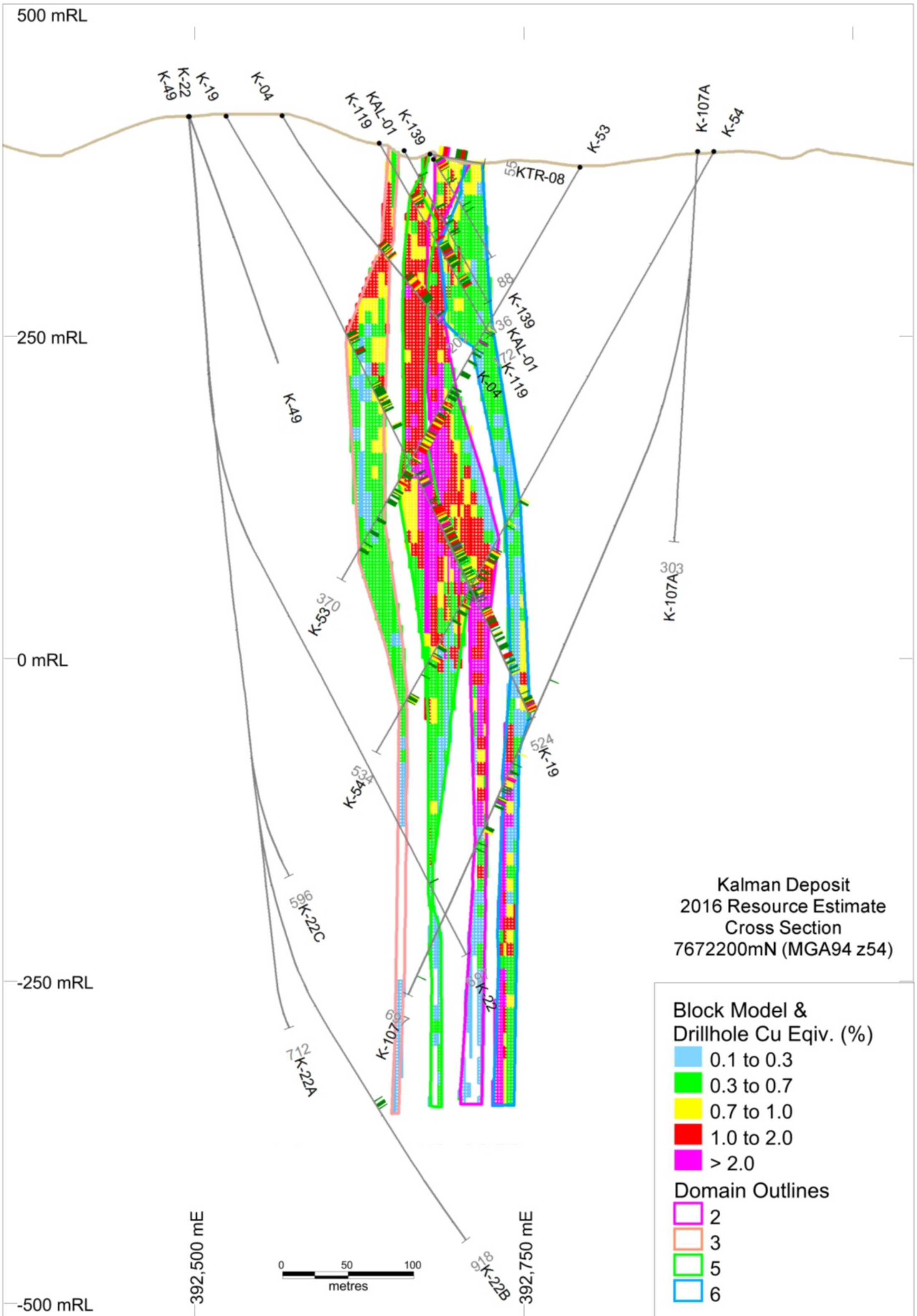
The Kalman deposit is considered to have good potential for extension of the defined resource with further exploration drilling.



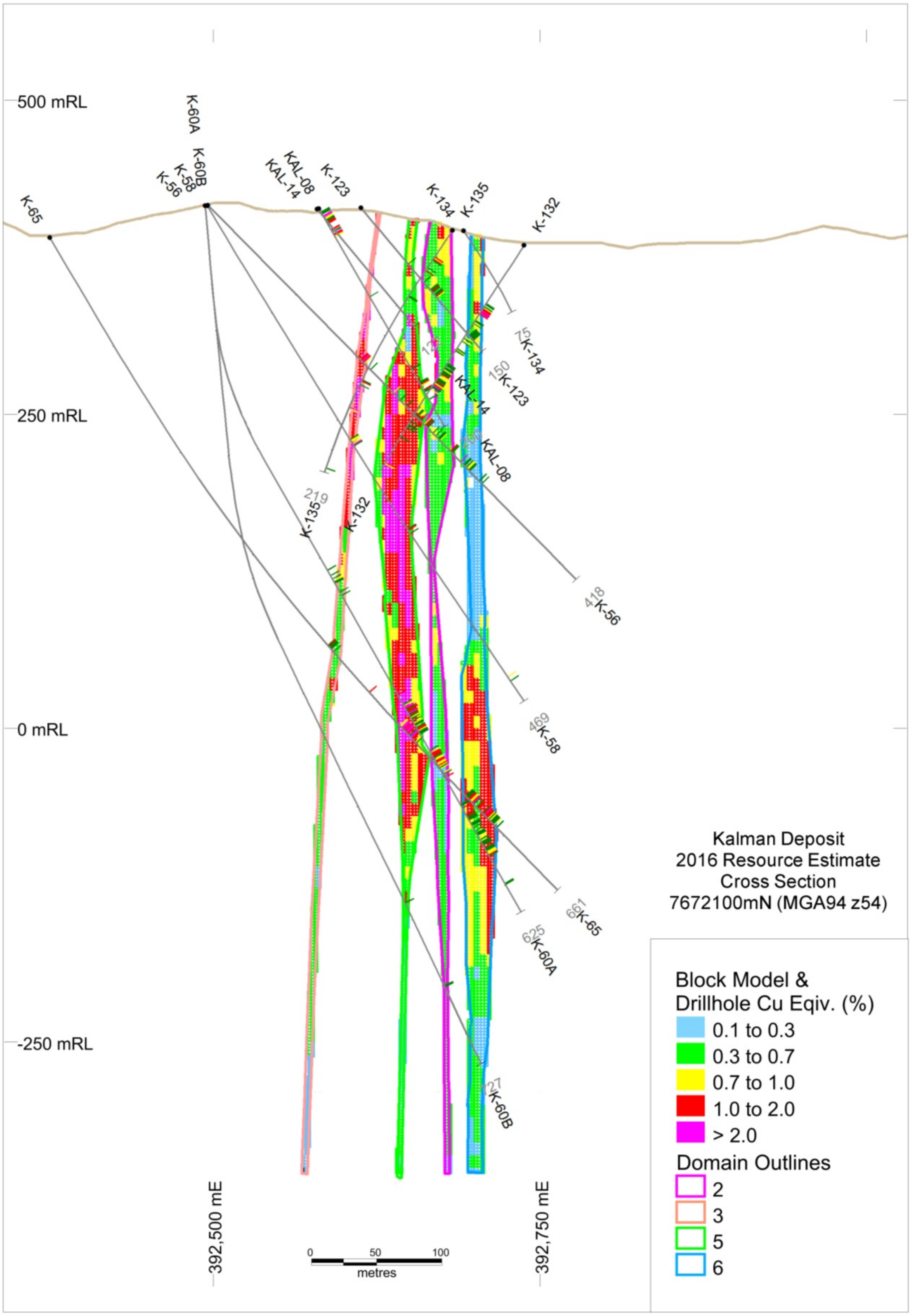
Kalman Resource (looking northeast) showing a conceptual Open Pit with Resource Blocks Cut to >0.75% Copper Equivalent above 100m RL (open pit) and Cut to >1.4% Copper Equivalent below 100m RL (underground)



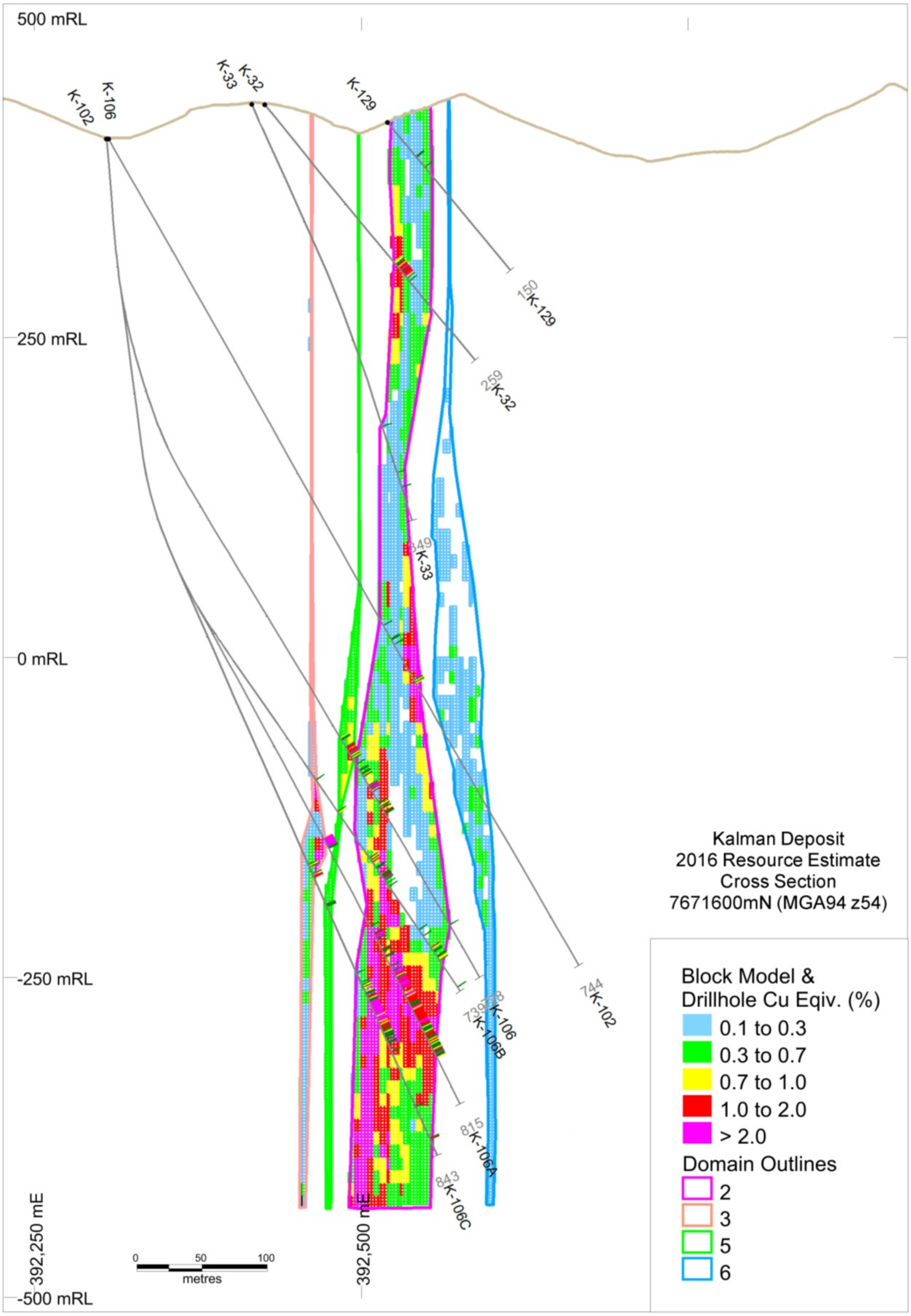
Kalman Plan showing Resource Blocks, Drill Traces and Cross Section Locations



Cross Section 7672200mN (northern) showing Resource Blocks and Drill Traces



Cross Section 7672100mN (central) showing Resource Blocks and Drill Traces



Cross Section 7671600mN (southern) showing Resource Blocks and Drill Traces

Classification

The Kalman Mineral Resource was classified on the basis of data quality, sample spacing and grade and geological continuity of the mineralised domains. The deposit shows consistent continuity of mineralisation within well-defined geological constraints which have been largely confirmed by the recent drilling by Hammer. The drill hole spacing throughout the project is approximately 100 to 120m along strike with some 50 to 60m infill drilling. Drill spacing down dip is of similar dimensions. The drill spacing is sufficient to allow the grade intersections to be modelled into coherent wireframes for each domain. The geological and mineralisation continuity has been demonstrated with sufficient confidence to allow a portion of the mineralised domains to be classified as an Indicated Mineral Resource and the majority classified as an Inferred Mineral Resource. Haren considers the data underlying the estimate to be reliable. Where significant extrapolation past drilling has occurred the material remains unclassified.

The resource model is undiluted, so appropriate dilution needs to be incorporated in any evaluation of the deposit. The Total Mineral Resource at a range of cut-off grades is shown in Table 2 and Figure 1 (below).

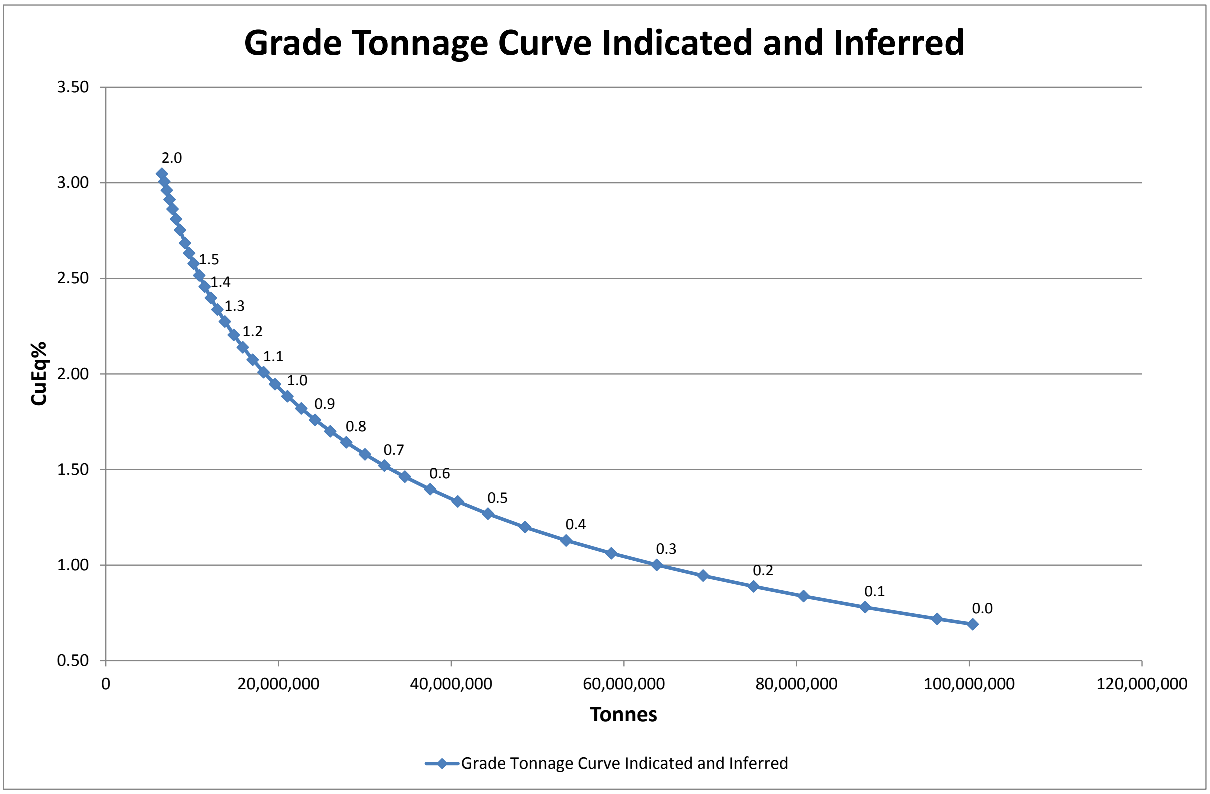


Figure 1 Kalman Grade Tonnage Curve – Indicated plus Inferred

Competent Persons Statement

The information in this report that relates to Mineral Resources is based on information compiled by Ms Elizabeth Haren, a Competent Person who is a Member and Chartered Professional of the Australasian Institute of Mining and Metallurgy and a full time employee of Haren Consulting Pty Ltd. Ms Haren has no economic, financial or pecuniary interest in Hammer and there is no issue that could be perceived as a conflict of interest. Ms Haren has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which she has undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for the Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Ms Haren consents to the inclusion in the report of the matters based on her information in the form and context in which it appears.

Elizabeth Haren MAusIMM CP(Geo)

The information in this report that relates to Sampling Techniques and Data and Exploration Results is based on information supplied by Mr John Downing, a Competent Person who is a Member of the Australian Institute of Geoscientists and a long-term contractor to Hammer. Mr Downing has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he has undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for the Reporting of Exploration Results, Mineral Resources and Ore Reserves'. John Downing consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

For further information, please contact:

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JORC Code, 2012 Edition

Table 1 report – Kalman Deposit Resource Update

Mr John Downing supplied the information in Section 1 and Section 2 of JORC Table 1 in this Mineral Resource report and is the Competent Person for those sections. Haren Consulting Pty Ltd ("Haren") has included these sections in their entirety to ensure that all relevant sections of Table 1 are included in this report.

Haren Consulting Pty Ltd reviewed the information in Sections 1 and 2 and has found no reason to change any parts from what was earlier reported by Hammer Metals Limited other than the addition of drill holes completed since the previous Mineral Resource was reported.

Section 1 Sampling Techniques and Data

(Criteria in this section apply to all succeeding sections.)

Criteria	JORC Code explanation	Commentary
Sampling techniques	• Nature and quality of sampling (eg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling. • Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used. • Aspects of the determination of mineralisation that are Material to the Public Report. • In cases where 'industry standard' work has been done this would be relatively simple (eg 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be	• The mineralised lodes at the Kalman deposit were sampled using surface diamond drill holes ("DD") , reverse circulation holes ("RC") and trenches. Drilling was conducted primarily on nominal 100m by 60m spacing, and drilled on the MGA94 National Grid system. • Drill holes used in the resource estimate included 73 diamond holes and 37 reverse circulation holes for a total of 42,703.5m within the modelled area. The supplied database contained a total of 155 drill hole and trench records for a total of 52,176m. Drill holes were generally angled at -60° towards the east (average of 98° azimuth) to optimally intersect the mineralised zones. • All accessible drill hole collars and starting azimuths and downhole deviations were accurately surveyed by DGPS using the Trimble satellite network. Dip and azimuth values were measured at 30m intervals down hole using an Eastman camera or Ranger or Reflex electronic units. Selected drillholes received gyro re-survey. • Drilling was conducted by Texins, Pimex, MIM, Cerro, SMD and Hammer. The Pimex drilling and the trenching data was not included in the data used for Mineral Resource estimation, but was used as an aid in the determination of mineralisation domains. Diamond drilling used 47.6mm core diameter (NQ) with sampling at 1m intervals or

Criteria	JORC Code explanation	Commentary
	required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (eg submarine nodules) may warrant disclosure of detailed information.	based on geological boundaries. Half-split core was sampled and sent for analysis. RC drilling used a 4.5" face sampling bit, a cyclone and an industry standard riffle splitter. All samples were sent for preparation (crushing and pulverising) and analysed using fusion fire assay / AAS methods for gold and the Aqua Regia and 4 acid digest with ICP determination methods for base metals, all assaying was carried out by the ALS Laboratory Group in Townsville Queensland.
Drilling techniques	• Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).	• Diamond or reverse circulation drilling was the primary technique used at Kalman. Diamond holes make up 87% of the total metres drilled. Core diameter was generally 47.6mm. Hole depths ranged from 73m to 998m. Reverse circulation drilling makes up 13% of the total holes drilled with depths ranging from 36m to 334m.
Drill sample recovery	• Method of recording and assessing core and chip sample recoveries and results assessed. • Measures taken to maximise sample recovery and ensure representative nature of the samples. • Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.	• Recoveries from diamond core were recorded but no recovery information is stored in the database; however drill core generally appears very competent and intact. A review of the bulk reject bags suggests the RC drill sample recoveries were also excellent. • All diamond core was oriented where possible. Diamond core was reconstructed into continuous runs for orientation marking with depths checked against core blocks. Most RC samples were visually checked for recovery and moisture content and the data recorded. • No relationship was qualitatively noted between sample recovery and grade. The mineralised zones have been intersected with generally good recoveries. The consistency of the mineralised intervals suggests sampling bias due to material loss or gain is not an issue.
Logging	• Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies. • Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography. • The total length and percentage of	• All recent drill chips were geologically logged in detail by Hammer Metals geologists recording lithology, alteration and mineralisation, weathering, colour and structure, and any other features of the sample to a level of detail to support appropriate studies. The majority of historical holes were logged geologically. • It was standard practice by Cerro, SMD and Hammer that all diamond core be routinely photographed, both wet and dry. • 40,508.5m or 95% of drill holes within the

Criteria	JORC Code explanation	Commentary
	the relevant intersections logged.	modelled area were logged.
Sub-sampling techniques and sample preparation	• If core, whether cut or sawn and whether quarter, half or all core taken. • If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry. • For all sample types, the nature, quality and appropriateness of the sample preparation technique. • Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples. • Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling. • Whether sample sizes are appropriate to the grain size of the material being sampled.	• Diamond core is cut in half using a core saw with half core submitted for assay. • RC drill samples were mostly collected at 1m intervals. The PN series were sampled at 2m intervals. Samples were collected at the rig and split with a riffle splitter at the drill site. Samples were predominantly dry. • Sampling of diamond core and RC chips used industry standard techniques. • Cerro, SMD and Hammer used systematic standard and field duplicate sampling since 2005. Detailed data indicates that a sequence of every 20th sample is submitted as a standard, a different sequence of every 20th sample is inserted as a field duplicate. • The duplicate and standard system used results in 10 samples in every 100 being a QAQC sample or 10%. • Sample sizes (3-5kg for core and 2-5kg for chips) are considered appropriate to correctly represent the mineralisation based on: the style of mineralisation, the thickness and consistency of the intersections, the sampling methodology and assay value ranges for the various elements of interest.
Quality of assay data and laboratory tests	• The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total. • For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc. • Nature of quality control procedures adopted (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.	• The assay methods used for all drill samples were fusion fire assay / AAS for gold and Aqua Regia /ICP for base metals. Anomalous Mo zones were re-submitted for assay (Mo and Re) using four acid digestion / ICP methods which give a more reliable assay for higher Mo grades. • No geophysical tools were used to determine any element concentrations used in this resource estimate. • The various programs of QAQC carried out by Cerro, SMD and Hammer and the previous exploration companies have produced results that support the sampling and assaying procedures used. Three matrix matched standards representing grades from 0.2% Cu to 0.28% Cu and 0.02% Mo to 0.1% Mo were inserted regularly during the drilling program. Results highlighted that the Cu and Mo sample assays are within accepted values, showing no obvious bias.
Verification of sampling	• The verification of significant intersections by either independent or alternative	• Haren has not independently verified any intervals. • Haren acknowledges that a previous independent consultant to Hammer did independently verified

Criteria	JORC Code explanation	Commentary
and assaying	company personnel. • The use of twinned holes. • Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols. • Discuss any adjustment to assay data.	significant intersections of mineralisation with a site visit inspecting drill core and noting similar identification of geological features. • No twinning of holes was undertaken during the drilling programs. • Geological logging was on paper copies which were subsequently recorded digitally. The assay data was checked against logging for confirmation. • Assay values below detection limit were adjusted to equal half of the detection limit value for resource calculation purposes. Intervals with no samples were left blank in the database.
Location of data points	• Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation. • Specification of the grid system used. • Quality and adequacy of topographic control.	• All Cerro, SMD and Hammer drill holes have been accurately surveyed by differential GPS methods using the Trimble satellite network. A number of collar surveys have been repeated during different surveys with insignificant differences in results. For the majority of holes, down hole surveys have been conducted at regular intervals, initially using single shot cameras and subsequently using Ranger and Reflex electronic units. • Drill hole locations were positioned using the MGA Grid System. • LiDAR survey data was used to create a topographic surface; this was confirmed by the drill hole collar data.
Data spacing and distribution	• Data spacing for reporting of Exploration Results. • Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied. • Whether sample compositing has been applied.	• The drill hole spacing throughout the project is approximately 100 to 120m along strike with some 50 to 60m infill drilling. Drill spacing down dip is of similar dimensions. • The Kalman deposit shows consistent continuity of mineralisation within well-defined geological constraints which have been largely confirmed by the recent drilling by Hammer. • The drill spacing is sufficient to allow the grade intersections to be modelled into coherent wireframes for each domain. • For Mineral Resource estimation samples have been composited to 1m lengths using 'best fit' techniques. • The mineralised domains have demonstrated sufficient continuity in both geological and grade continuity to support the definition of Indicated and Inferred Mineral Resources, and the classifications applied under the 2012 JORC Code.
Orientation of data in relation to	• Whether the orientation of sampling achieves unbiased sampling of possible structures	• Drill holes are orientated predominantly to an azimuth of approximately 90° and drilled at an angle of -60° to the east which is approximately

Criteria	JORC Code explanation	Commentary
geological structure	and the extent to which this is known, considering the deposit type. • If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.	perpendicular to the orientation of the mineralised trends. Some drill hole targeting deeper mineralisation intersections are drilled at steeper angles. • The orientation of the drilling is usually at a high angle to the strike and dip of the mineralisation. • No orientation based sampling bias has been identified in the data.
Sample security	• The measures taken to ensure sample security.	• Diamond half-core and RC samples are packed in poly bags which are stacked on pallets and shrink-wrapped for road transport to the laboratory. Bags are individually numbered and addressed. • For Hammer RC drilling pre-numbered bags are used and transported by company personnel to the ALS Laboratory in Mount Isa. ALS transports samples to its laboratories in Townsville or Brisbane when required. • No information is available regarding security of historical diamond drilling samples.
Audits or reviews	• The results of any audits or reviews of sampling techniques and data.	• Independent consultant RPM completed a project review with a site visit in September 2011. No significant issues were identified in geological understanding or exploration data integrity.

Section 2 Reporting of Exploration Results

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

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	• Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings. • The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.	• The Kalman deposit lies within EPM 14232 and EPM 13870. The tenements are wholly controlled by Hammer. There are no environmental liabilities current at Kalman and environmental baseline surveying has not identified any significant environmental considerations. • The tenements are in good standing and no known impediments exist.
Exploration done by other parties	• Acknowledgment and appraisal of exploration by other parties.	• Previous exploration over the tenement area has been conducted by a number of parties since 1969, including Texins, Pimex, MIM, Kings Minerals, Cerro Resources and SMD. Midas Resources Ltd (now Hammer) acquired the project area in 2013. Where available the historical data has been appraised and is of acceptable quality.
Geology	• Deposit type, geological setting and style of mineralisation.	• The Kalman Deposit is located within the Eastern Succession of the Mount Isa Inlier. It occurs adjacent to the Pilgrim Fault Zone, a major crustal suture transecting the Mount Isa Inlier that separates the Wonga Sub-Province from the Ewan-Malbon Sub-Province. In the vicinity of Kalman the fault abuts the Corella Formation against Overhang Jaspillite. • The project area is principally underlain by the Palaeoproterozoic Corella Formation. This is described as a sequence of mixed siliclastic/carbonate rocks possibly deposited as fine grain pelites and evaporates in an ephemeral playa lake. Local accumulations of basic volcanics are present within the Corella Formation as both fine grained lavas with inter-mixed volcaniclastics and medium grained porphyritic high level intrusives. These sediments and volcanics have been regionally metamorphosed to amphibolite facies. • Kalman represents an intrusion-related style of hydrothermal Mo-Re-Cu-Au mineralisation hosted by calc-silicate rocks originally comprised dominantly of alkali feldspar with lesser tremolite,

Criteria	JORC Code explanation	Commentary
		apatite, biotite and sphene.
Drill hole Information	• A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes: o easting and northing of the drill hole collar o elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar o dip and azimuth of the hole o down hole length and interception depth o hole length. • If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.	• A complete table of all relevant drill holes is attached to this report as Appendix 2. • Trench information and KAL-prefix holes from the 1980s were used to guide mineralisation interpretation but were excluded from the Kalman estimate. This reflected the historical nature of the data, assay quality concerns and the uncertain location of the samples.
Data aggregation methods	• In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (eg cutting of high grades) and cut-off grades are usually Material and should be stated. • Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail. • The assumptions used for any reporting of metal equivalent values should be clearly stated.	• Exploration results are not being reported.
Relationship between mineralisati on widths and	• These relationships are particularly important in the reporting of Exploration Results. • If the geometry of the mineralisation with respect to the drill hole angle is known, its	• Exploration Results are not discussed in this report. • Drill holes were orientated predominantly to an azimuth of approximately 90° and angled to a dip of -60°, which is approximately perpendicular to the orientation of the mineralised trends.

Criteria	JORC Code explanation	Commentary
intercept lengths	nature should be reported. • If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (eg 'down hole length, true width not known').	• As the mineralization generally dips vertical to steeply west the true width is approximately 50% of the quoted drill intersections. Diamond drill holes generally intersected the mineralization with dips of 50 to 60°. True widths are therefore between 64 and 50% of the quoted drill intercept. Holes are inclined at 55 to 60° from horizontal to intersect the steeply dipping (~70° to 90°) mineralised structure.
Diagrams	• Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.	• Plan view and section view figures are contained in the body of this report.
Balanced reporting	• Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.	• Exploration Results are not discussed in this report.
Other substantive exploration data	• Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.	• Exploration Results are not discussed in this report. • A detailed field mapping exercise was undertaken in 2016 by Peter Gregory which has aided in the understanding of the geological terrain. Summary Report On Field Mapping Of The Kalman Area Within Epm 13870, Mt Isa Region, June 2016.
Further work	• The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling). • Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	• Extensional drilling is planned but not finalised at the time of this report.

Section 3 Estimation and Reporting of Mineral Resources

(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

Criteria	JORC Code explanation	Commentary
Database integrity	• Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes. • Data validation procedures used.	• Drill logging data and assay results are generated digitally, compiled and validated prior to import to a central database. Assay results are not compiled for import until final QAQC data and certification has been received from the analytical laboratory. A suite of validation routines are carried out across the database on a regular basis. • Haren understands that Hammer have undertaken detailed and systematic cross checking of historical data to ensure maximum integrity in the data used for Mineral Resource estimation. • Haren also performed general data audits and checks on the supplied data. No errors were found.
Site visits	• Comment on any site visits undertaken by the Competent Person and the outcome of those visits. • If no site visits have been undertaken indicate why this is the case.	• A site visit has not been conducted by Haren.
Geological interpretation	• Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit. • Nature of the data used and of any assumptions made. • The effect, if any, of alternative interpretations on Mineral Resource estimation. • The use of geology in guiding and controlling Mineral Resource estimation. • The factors affecting continuity both of grade and geology.	• The interpretations are guided by the broader regional geological setting and local field observations. The gross geology of the Kalman deposit is well understood. • Drill hole logging by geologists, through direct observation of drill core and percussion samples have been used to interpret the geological setting. The continuity of the main mineralised lodes is clearly observed by relevant grades within the drill holes. The drilling and trench sampling suggest the current interpretation is robust. • The nature of the domains would indicate that alternate interpretations are possible as the higher grade mineralisation is thin however this would have little impact on the overall Mineral Resource estimation as the complete package across strike extent is well defined. • Weathering and lithology were not used in the generation of the wireframes for the Mineral Resource estimation as the mineralisation was restricted to the fresh (unweathered) portion of the calc-silicate host rocks. Wireframes were

Criteria	JORC Code explanation	Commentary
		based on the chemical analyses for Cu and Mo. • The confidence in the geological interpretation is considered to be good. The deposit is similar in style to many polymetallic deposits in Mount Isa Inlier. • The geological logging and the results of the geostatistical analyses have been useful in predicting the continuity of the mineralisation for the Mineral Resource estimation.
Dimensions	• The extent and variability of the Mineral Resource expressed as length (along strike or otherwise), plan width, and depth below surface to the upper and lower limits of the Mineral Resource.	• The interpreted Kalman Mineral Resource mineralisation is interpreted to extend over a strike length of 1060m and from surface to approximately 780m below surface.
Estimation and modelling techniques	• The nature and appropriateness of the estimation technique(s) applied and key assumptions, including treatment of extreme grade values, domaining, interpolation parameters and maximum distance of extrapolation from data points. If a computer assisted estimation method was chosen include a description of computer software and parameters used. • The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data. • The assumptions made regarding recovery of by-products. • Estimation of deleterious elements or other non-grade variables of economic significance (eg sulphur for acid mine drainage characterisation). • In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed. • Any assumptions behind modelling of selective mining units. • Any assumptions about	• Ordinary Kriging ("OK") interpolation with dynamic anisotropy oriented 'ellipsoid' search was used for the estimate. Datamine software was used for the estimations. Three dimensional mineralised wireframes were used to domain the mineralised data. Sample data was composited to 1m down hole lengths using the 'best fit' method. Intervals with no assays were excluded from the estimates. The influence of extreme grade values was addressed by applying top-cuts to the data. These cut values were determined through statistical analysis (histograms, log probability plots, CVs, and summary multi-variate and bi-variate statistics) using Supervisor software. The maximum distance of extrapolation from data points for reportable Mineral Resources was around 50m. • The current Haren estimate is a re-estimate of the February 2012 Mineral Resource estimate (re-reported in February 2014) for the Kalman deposit. • No mining has occurred in the area. Haren has assumed that the deposit will be mined, and the ore processed a suite of elements including Cu, Mo, Au, Ag and Re. The Mineral Resource reporting has assumed forward-looking prices for these elements and a Copper Equivalent ("CuEq") value has been calculated for each block. The Mineral Resource reporting used the CuEq value for reporting cut-off purposes. • No assumptions have been made regarding recovery of by-products. • No non-grade elements have been estimated.

Criteria	JORC Code explanation	Commentary
	correlation between variables. • Description of how the geological interpretation was used to control the resource estimates. • Discussion of basis for using or not using grade cutting or capping. • The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.	• The parent block dimensions used were 5m E by 30m N by 10m RL with sub-cells of 1.25m E by 5.00m N by 2.5m RL. The parent block size was selected through kriging neighbourhood testing and considering the dimensions of the domains and drill hole spacing. • Selective mining units were not modelled. • No assumptions were made regarding correlation of variables. Each variable was estimated independently. • The mineralisation domains were constrained by wireframes constructed using a 0.1% Cu or 0.03% Mo cut-off grade. Four domains were constructed. • Top-cuts were required for some elements in some domains as there were extreme grades which would result in overestimation using ordinary kriging if not addressed. To assist in the selection of appropriate top-cuts, log-probability plots and histograms were generated. • To validate the model, a qualitative assessment was completed by slicing sections through the block model in positions coincident with drilling. A quantitative assessment of the estimate was completed by comparing the average grades of the sample file input against the block model output for all the resource objects. A trend analysis was completed by comparing the interpolated blocks to the sample data within all the lodes. This analysis was completed for northings and elevations across the deposit. Validation plots showed good correlation between the sample grades and the block model grades.
Moisture	• Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.	• Tonnages and grades were estimated on a dry in situ basis. No moisture values were reviewed.
Cut-off parameters	• The basis of the adopted cut-off grade(s) or quality parameters applied.	• The nominal cut-off grade of 0.1% Cu or 0.03% Mo along with geological continuity were used to define the boundary of the mineralisation, it was determined from analysis of log probability plots of all samples at the deposit. • The assumptions underlying the previous high-level economic analyses are not considered to have materially changed. • This analysis applying both Open Cut and Underground mining parameters have indicated that it is appropriate to report the Kalman Mineral Resource using two cut-off grades as this is more

Criteria	JORC Code explanation	Commentary
		relevant to the longer term expectations of eventual economic extraction. • A cut-off of 0.75% CuEq for Open Cut type material above 100mRL and 1.40% CuEq for Underground material below 100mRL has been applied for reporting Mineral Resources.
Mining factors or assumptions	• Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.	• The results of the high-level estimate of Open Cut Ore Reserves indicate that the deposit could potentially be mined using small-scale open pit techniques. In 2014 a high-level pit optimisation was carried out which indicated that open pit mining techniques could be used to a depth of approximately 300m from the surface. Using forward-looking metal price assumptions the project would have a positive, indicative undiscounted net value. Material below the 300m depth could be extracted using underground mining methods.
Metallurgical factors or assumptions	• The basis for assumptions or predictions regarding metallurgical amenability. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential metallurgical methods, but the assumptions regarding metallurgical treatment processes and parameters made when reporting Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the metallurgical assumptions made.	• A metallurgical test program was completed on ten samples from the molybdenum zone of the Kalman Deposit. Sighter flotation tests conducted on the molybdenum composite sample indicated that a primary grind between P80 150 µm and 180 µm and a collector combination of SIPX and diesel generated good recovery of pay metals to the rougher concentrate.
Environmental factors or assumptions	• Assumptions made regarding possible waste and process residue disposal options. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to	• No assumptions have been made by Haren regarding possible waste and process residue disposal options.

Criteria	JORC Code explanation	Commentary
	consider the potential environmental impacts of the mining and processing operation. While at this stage the determination of potential environmental impacts, particularly for a greenfields project, may not always be well advanced, the status of early consideration of these potential environmental impacts should be reported. Where these aspects have not been considered this should be reported with an explanation of the environmental assumptions made.	
Bulk density	• Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples. • The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc), moisture and differences between rock and alteration zones within the deposit. • Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.	• Bulk density is applied based on data collected from the fresh material. • The entire Kalman deposit is considered fresh. • 1,074 bulk density values were used to determine an average bulk density of 2.7 t/m^3 for mineralised material with 4,359 values for un-mineralised material having an average of 2.8 t/m^3. The bulk density was assigned as a dry bulk density.
Classification	• The basis for the classification of the Mineral Resources into varying confidence categories. • Whether appropriate account has been taken of all relevant factors (ie relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data). • Whether the result appropriately reflects the Competent Person's	• Mineral Resources were classified in accordance with the Australasian Code for the Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC, 2012 Edition). • The deposit has been tested with high quality drilling, sampling and assaying. Geological logging has defined structural and lithological controls that provide confidence in the interpretation of mineralisation boundaries. Haren considers that geological and mineralisation continuity has been demonstrated with sufficient confidence to allow the Kalman deposit to be classified as Indicated and Inferred Mineral Resources. The classification is in line with previous estimates and reflects the

Criteria	JORC Code explanation	Commentary
	view of the deposit.	addition of new drilling and exclusion of historical drilling and trenching information at the estimation stage. • The Mineral Resource estimate appropriately reflects the view of the Competent Person.
Audits or reviews	• The results of any audits or reviews of Mineral Resource estimates.	• Internal audits have been completed which verified the technical inputs, methodology, parameters and results of the estimate.
Discussion of relative accuracy/ confidence	• Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate. • The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used. • These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.	• The Kalman Mineral Resource estimates have been reported with degree of confidence commensurate with Indicated and Inferred Mineral Resources. • The data quality is good and the drill holes have detailed logs produced by qualified geologists for all recent drilling. A recognised laboratory has been used for all analyses. • The Mineral Resource statement relates to global estimates of tonnes and grade. • No mining has occurred at the deposit.

Section 2 Reporting of Exploration Results

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

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Mineral tenement and land tenure status	• Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings. • The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.	• The Kalman deposit lies within EPM 14232 and EPM 13870. The tenements are wholly controlled by Hammer. There are no environmental liabilities current at Kalman and environmental baseline surveying has not identified any significant environmental considerations. • The tenements are in good standing and no known impediments exist.
Exploratio n done by other parties	• Acknowledgment and appraisal of exploration by other parties.	• Previous exploration over the tenement area has been conducted by a number of parties since 1969, including Texins, Pimex, MIM, Kings Minerals, Cerro Resources and SMD. Midas Resources Ltd (now Hammer) acquired the project area in 2013. Where available the historical data has been appraised and is of acceptable quality.
Geology	• Deposit type, geological setting and style of mineralisation.	• The Kalman Deposit is located within the Eastern Succession of the Mount Isa Inlier. It occurs adjacent to the Pilgrim Fault Zone, a major crustal suture transecting the Mount Isa Inlier that separates the Wonga Sub-Province from the Ewan-Malbon Sub-Province. In the vicinity of Kalman the fault abuts the Corella Formation against Overhang Jaspillite. • The project area is principally underlain by the Palaeoproterozoic Corella Formation. This is described as a sequence of mixed siliclastic/carbonate rocks possibly deposited as fine grain pelites and evaporates in an ephemeral playa lake. Local accumulations of basic volcanics are present within the Corella Formation as both fine grained lavas with inter-mixed volcaniclastics and medium grained porphyritic high level intrusives. These sediments and volcanics have been regionally metamorphosed to amphibolite facies. • Kalman represents an intrusion-related style of hydrothermal Mo-Re-Cu-Au mineralisation hosted by calc-silicate rocks originally comprised dominantly of alkali feldspar with lesser tremolite,

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		apatite, biotite and sphene.
Drill hole Information	• A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes: o easting and northing of the drill hole collar o elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar o dip and azimuth of the hole o down hole length and interception depth o hole length. • If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.	• A complete table of all relevant drill holes is attached to this report as Appendix 2. • Trench information and KAL-prefix holes from the 1980s were used to guide mineralisation interpretation but were excluded from the Kalman estimate. This reflected the historical nature of the data, assay quality concerns and the uncertain location of the samples.
Data aggregation methods	• In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (eg cutting of high grades) and cut-off grades are usually Material and should be stated. • Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail. • The assumptions used for any reporting of metal equivalent values should be clearly stated.	• Exploration results are not being reported.
Relationship between mineralisation widths and	• These relationships are particularly important in the reporting of Exploration Results. • If the geometry of the mineralisation with respect to the drill hole angle is known, its	• Exploration Results are not discussed in this report. • Drill holes were orientated predominantly to an azimuth of approximately 90° and angled to a dip of -60°, which is approximately perpendicular to the orientation of the mineralised trends.

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intercept lengths	nature should be reported. • If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (eg 'down hole length, true width not known').	• As the mineralization generally dips vertical to steeply west the true width is approximately 50% of the quoted drill intersections. Diamond drill holes generally intersected the mineralization with dips of 50 to 60°. True widths are therefore between 64 and 50% of the quoted drill intercept. Holes are inclined at 55 to 60° from horizontal to intersect the steeply dipping (~70° to 90°) mineralised structure.
Diagrams	• Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.	• Plan view and section view figures are contained in the body of this report.
Balanced reporting	• Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.	• Exploration Results are not discussed in this report.
Other substantive exploration data	• Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.	• Exploration Results are not discussed in this report. • A detailed filed mapping exercise was undertaken in 2016 by Peter Gregory which has aided in the understanding of the geological terrain. Summary Report On Field Mapping Of The Kalman Area Within Epm 13870, Mt Isa Region, June 2016.
Further work	• The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling). • Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	• Extensional drilling is planned but not finalised at the time of this report.

Section 3 Estimation and Reporting of Mineral Resources

(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

Criteria	JORC Code explanation	Commentary
Database integrity	• Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes. • Data validation procedures used.	• Drill logging data and assay results are generated digitally, compiled and validated prior to import to a central database. Assay results are not compiled for import until final QAQC data and certification has been received from the analytical laboratory. A suite of validation routines are carried out across the database on a regular basis. • Haren understands that Hammer have undertaken detailed and systematic cross checking of historical data to ensure maximum integrity in the data used for Mineral Resource estimation. • Haren also performed general data audits and checks on the supplied data. No errors were found.
Site visits	• Comment on any site visits undertaken by the Competent Person and the outcome of those visits. • If no site visits have been undertaken indicate why this is the case.	• A site visit has not been conducted by Haren.
Geological interpretati on	• Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit. • Nature of the data used and of any assumptions made. • The effect, if any, of alternative interpretations on Mineral Resource estimation. • The use of geology in guiding and controlling Mineral Resource estimation. • The factors affecting continuity both of grade and geology.	• The interpretations are guided by the broader regional geological setting and local field observations. The gross geology of the Kalman deposit is well understood. • Drill hole logging by geologists, through direct observation of drill core and percussion samples have been used to interpret the geological setting. The continuity of the main mineralised lodes is clearly observed by relevant grades within the drill holes. The drilling and trench sampling suggest the current interpretation is robust. • The nature of the domains would indicate that alternate interpretations are possible as the higher grade mineralisation is thin however this would have little impact on the overall Mineral Resource estimation as the complete package across strike extent is well defined. • Weathering and lithology were not used in the

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		generation of the wireframes for the Mineral Resource estimation as the mineralisation was restricted to the fresh (unweathered) portion of the calc-silicate host rocks. Wireframes were based on the chemical analyses for Cu and Mo. • The confidence in the geological interpretation is considered to be good. The deposit is similar in style to many polymetallic deposits in Mount Isa Inlier. • The geological logging and the results of the geostatistical analyses have been useful in predicting the continuity of the mineralisation for the Mineral Resource estimation.
Dimensions	• The extent and variability of the Mineral Resource expressed as length (along strike or otherwise), plan width, and depth below surface to the upper and lower limits of the Mineral Resource.	• The interpreted Kalman Mineral Resource mineralisation is interpreted to extend over a strike length of 1060m and from surface to approximately 780m below surface.
Estimation and modelling techniques	• The nature and appropriateness of the estimation technique(s) applied and key assumptions, including treatment of extreme grade values, domaining, interpolation parameters and maximum distance of extrapolation from data points. If a computer assisted estimation method was chosen include a description of computer software and parameters used. • The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data. • The assumptions made regarding recovery of by-products. • Estimation of deleterious elements or other non-grade variables of economic significance (eg sulphur for acid mine drainage characterisation). • In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.	• Ordinary Kriging ("OK") interpolation with dynamic anisotropy oriented 'ellipsoid' search was used for the estimate. Datamine software was used for the estimations. Three dimensional mineralised wireframes were used to domain the mineralised data. Sample data was composited to 1m down hole lengths using the 'best fit' method. Intervals with no assays were excluded from the estimates. The influence of extreme grade values was addressed by applying top-cuts to the data. These cut values were determined through statistical analysis (histograms, log probability plots, CVs, and summary multi-variate and bi-variate statistics) using Supervisor software. The maximum distance of extrapolation from data points for reportable Mineral Resources was around 50m. • The current Haren estimate is a re-estimate of the February 2012 Mineral Resource estimate (re-reported in February 2014) for the Kalman deposit. • No mining has occurred in the area. Haren has assumed that the deposit will be mined, and the ore processed a suite of elements including Cu, Mo, Au, Ag and Re. The Mineral Resource reporting has assumed forward-looking prices for these elements and a Copper Equivalent ("CuEq") value has been calculated for each block. The Mineral Resource reporting used the CuEq value for

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	• Any assumptions behind modelling of selective mining units. • Any assumptions about correlation between variables. • Description of how the geological interpretation was used to control the resource estimates. • Discussion of basis for using or not using grade cutting or capping. • The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.	reporting cut-off purposes. • No assumptions have been made regarding recovery of by-products. • No non-grade elements have been estimated. • The parent block dimensions used were 5m E by 30m N by 10m RL with sub-cells of 1.25m E by 5.00m N by 2.5m RL. The parent block size was selected through kriging neighbourhood testing and considering the dimensions of the domains and drill hole spacing. • Selective mining units were not modelled. • No assumptions were made regarding correlation of variables. Each variable was estimated independently. • The mineralisation domains were constrained by wireframes constructed using a 0.1% Cu or 0.03% Mo cut-off grade. Four domains were constructed. • Top-cuts were required for some elements in some domains as there were extreme grades which would result in overestimation using ordinary kriging if not addressed. To assist in the selection of appropriate top-cuts, log-probability plots and histograms were generated. • To validate the model, a qualitative assessment was completed by slicing sections through the block model in positions coincident with drilling. A quantitative assessment of the estimate was completed by comparing the average grades of the sample file input against the block model output for all the resource objects. A trend analysis was completed by comparing the interpolated blocks to the sample data within all the lodes. This analysis was completed for northings and elevations across the deposit. Validation plots showed good correlation between the sample grades and the block model grades.
Moisture	• Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.	• Tonnages and grades were estimated on a dry in situ basis. No moisture values were reviewed.
Cut-off parameters	• The basis of the adopted cut-off grade(s) or quality parameters applied.	• The nominal cut-off grade of 0.1% Cu or 0.03% Mo along with geological continuity were used to define the boundary of the mineralisation, it was determined from analysis of log probability plots of all samples at the deposit. • The assumptions underlying the previous high-level economic analyses are not considered to have materially changed.

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		• This analysis applying both Open Cut and Underground mining parameters have indicated that it is appropriate to report the Kalman Mineral Resource using two cut-off grades as this is more relevant to the longer term expectations of eventual economic extraction. • A cut-off of 0.75% CuEq for Open Cut type material above 100mRL and 1.40% CuEq for Underground material below 100mRL has been applied for reporting Mineral Resources.
Mining factors or assumptions	• Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.	• The results of the high-level estimate of Open Cut Ore Reserves indicate that the deposit could potentially be mined using small-scale open pit techniques. In 2014 a high-level pit optimisation was carried out which indicated that open pit mining techniques could be used to a depth of approximately 300m from the surface. Using forward-looking metal price assumptions the project would have a positive, indicative undiscounted net value. Material below the 300m depth could be extracted using underground mining methods.
Metallurgical factors or assumptions	• The basis for assumptions or predictions regarding metallurgical amenability. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential metallurgical methods, but the assumptions regarding metallurgical treatment processes and parameters made when reporting Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the metallurgical assumptions made.	• A metallurgical test program was completed on ten samples from the molybdenum zone of the Kalman Deposit. Sighter flotation tests conducted on the molybdenum composite sample indicated that a primary grind between P80 150 µm and 180 µm and a collector combination of SIPX and diesel generated good recovery of pay metals to the rougher concentrate.
Environmental factors or	• Assumptions made regarding possible waste and process residue disposal options. It is	• No assumptions have been made by Haren regarding possible waste and process residue disposal options.

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assumptions	always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider the potential environmental impacts of the mining and processing operation. While at this stage the determination of potential environmental impacts, particularly for a greenfields project, may not always be well advanced, the status of early consideration of these potential environmental impacts should be reported. Where these aspects have not been considered this should be reported with an explanation of the environmental assumptions made.	
Bulk density	• Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples. • The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc), moisture and differences between rock and alteration zones within the deposit. • Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.	• Bulk density is applied based on data collected from the fresh material. • The entire Kalman deposit is considered fresh. • 1,074 bulk density values were used to determine an average bulk density of 2.7 t/m^3 for mineralised material with 4,359 values for un-mineralised material having an average of 2.8 t/m^3. The bulk density was assigned as a dry bulk density.
Classification	• The basis for the classification of the Mineral Resources into varying confidence categories. • Whether appropriate account has been taken of all relevant factors (ie relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality,	• Mineral Resources were classified in accordance with the Australasian Code for the Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC, 2012 Edition). • The deposit has been tested with high quality drilling, sampling and assaying. Geological logging has defined structural and lithological controls that provide confidence in the interpretation of mineralisation boundaries. Haren considers that geological and mineralisation continuity has been

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	quantity and distribution of the data). • Whether the result appropriately reflects the Competent Person's view of the deposit.	demonstrated with sufficient confidence to allow the Kalman deposit to be classified as Indicated and Inferred Mineral Resources. The classification is in line with previous estimates and reflects the addition of new drilling and exclusion of historical drilling and trenching information at the estimation stage. • The Mineral Resource estimate appropriately reflects the view of the Competent Person.
Audits or reviews	• The results of any audits or reviews of Mineral Resource estimates.	• Internal audits have been completed which verified the technical inputs, methodology, parameters and results of the estimate.
Discussion of relative accuracy/ confidence	• Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate. • The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used. • These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.	• The Kalman Mineral Resource estimates have been reported with degree of confidence commensurate with Indicated and Inferred Mineral Resources. • The data quality is good and the drill holes have detailed logs produced by qualified geologists for all recent drilling. A recognised laboratory has been used for all analyses. • The Mineral Resource statement relates to global estimates of tonnes and grade. • No mining has occurred at the deposit.