

Molybdenum- The New Battery Metal 2018



Why Molybdenum?

- 2018 Molybdenum has been one of the best price performing metals traded on the London Metals Exchange (LME) up 62.5% in the first 4 months of 2018.
- Current official LME Mo stocks are at zero tonnes (April 17 2018)

Reference: London Metal Exchange Website <https://www.lme.com/en-GB/Metals/Minor-metals/Molybdenum#tabIndex=0>

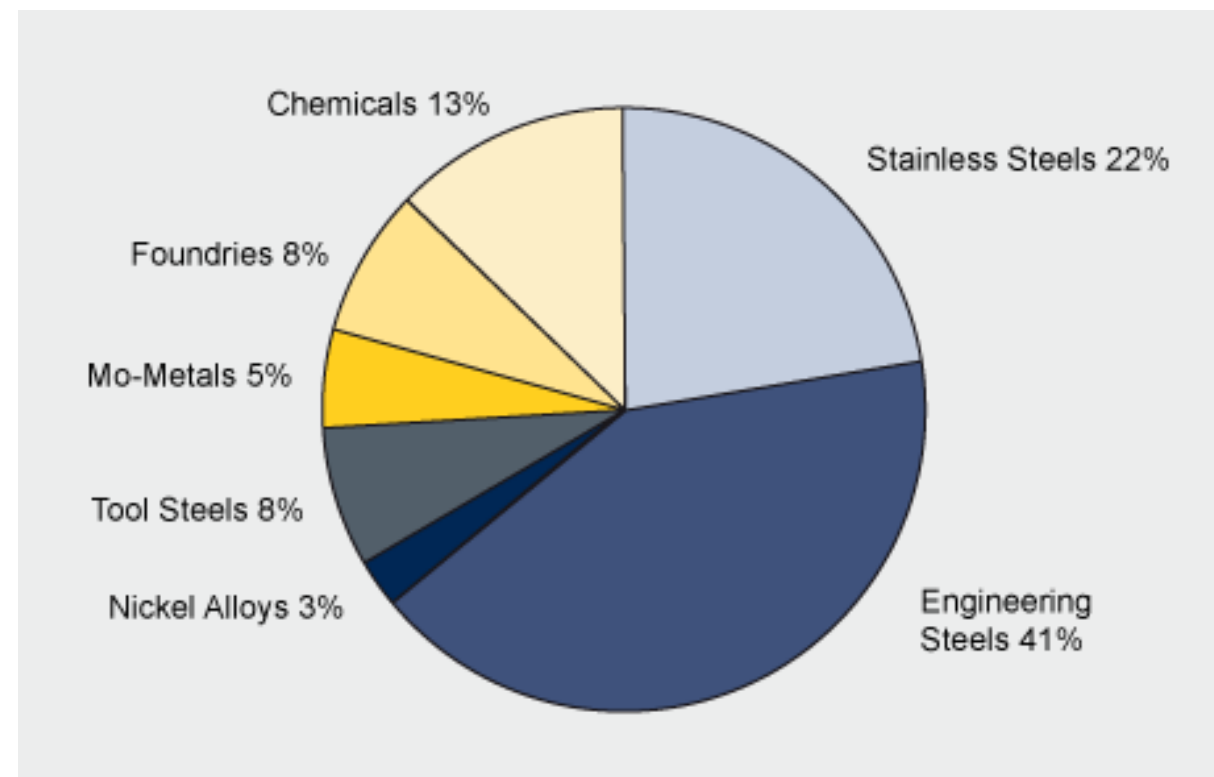
Historical Price Graph: 5 Year, LME 3Month, USD



The Future of Molybdenum in Batteries

- Recent battery research and development are proving molybdenum makes significant improvements to battery performance when used in the electrodes mixed with graphene/graphite.
- The introduction of a new consumption could significantly further restrict an already tight market

Reference: Ternary lithium molybdenum oxide, $\text{Li}_2\text{Mo}_4\text{O}_{13}$: A new potential anode material for high-performance rechargeable lithium-ion batteries; Rakesh Verma a, Chan-Jin Park b, R. Kothandaraman a, U.V. Varadaraju a,; (India and Korea); December 2, 2017; *Electrochimica Acta* (2017), 12,008.



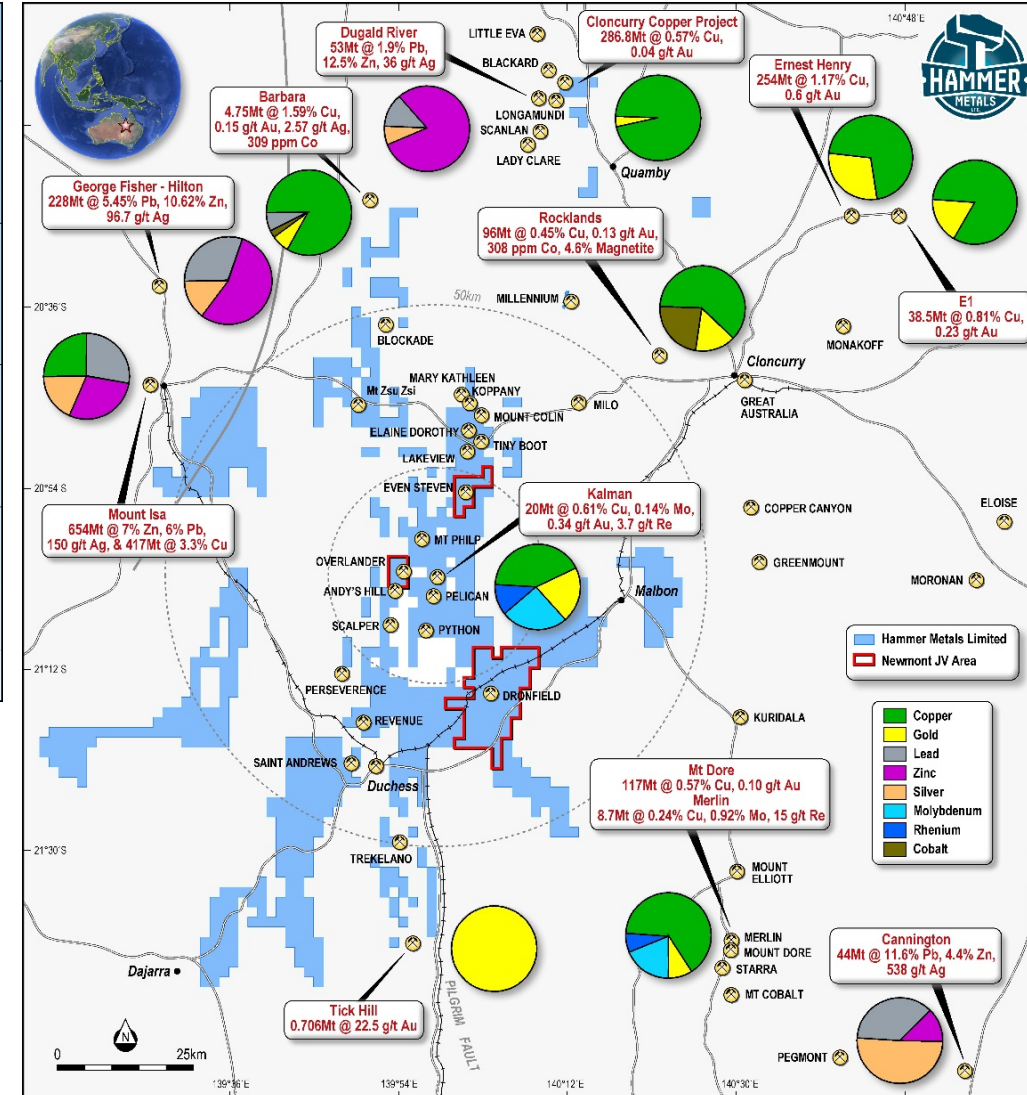
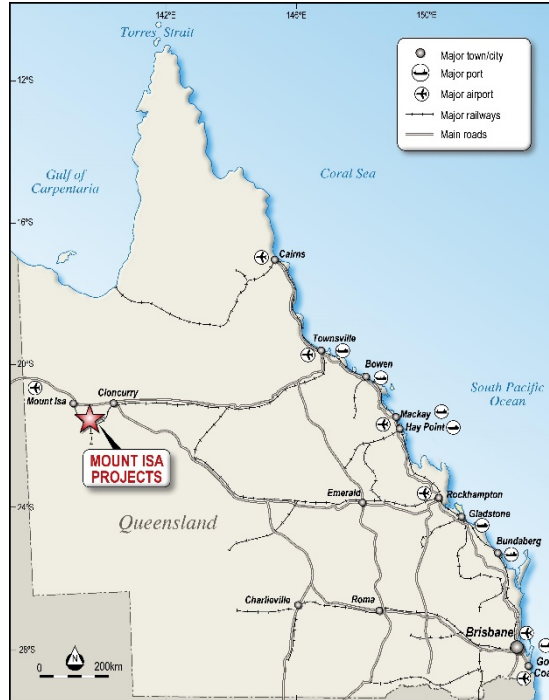
What is Molybdenum?

- Most molybdenum is produced in the Americas and China as a by product of copper production
- Molybdenum can withstand extreme temperatures without significantly expanding or softening, making it useful in environments of intense heat, including military armour, aircraft parts, electrical contacts, industrial motors, and filaments
- Most high-strength steel alloys contain 0.25% to 8% molybdenum. Even in these small portions, more than 43,000 tonnes of molybdenum are used each year in stainless steels, tool steels, cast irons, and high-temperature superalloys.



Why Hammer?

- Hammers principal asset is the Kalman molybdenum – copper - gold - rhenium deposit which is located in the globally significant Mount Isa Mineral Province in NW Queensland.
- Mount Isa is also home to the world class Merlin molybdenum - rhenium deposit 70km to the south east owned by private company Chinova Ltd.



Mineral Resource Estimate

- ▶ Open pit and underground potential
- ▶ Remains open at depth with along strike potential

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	1.40%	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

(Reported at 0.3% CuEq cut-off above 100m RL and 1.0% CuEq cut-off below 100m RL)

Refer to ASX release dated 27/9/16 for details

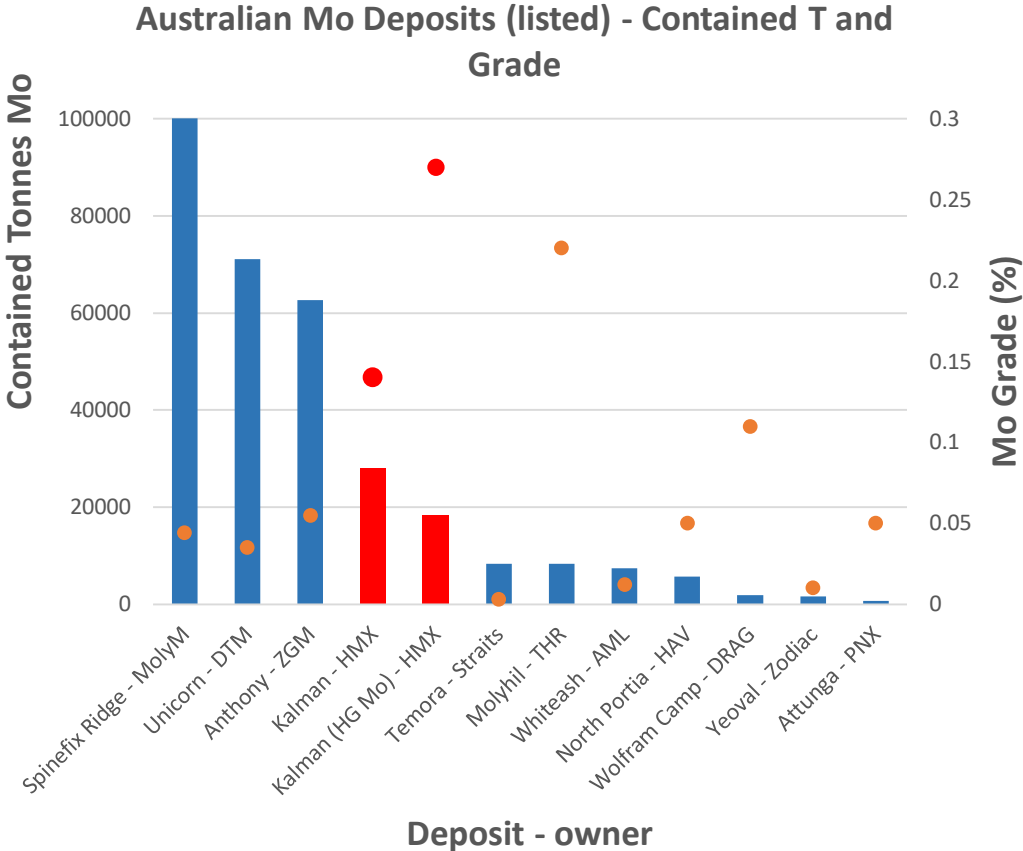
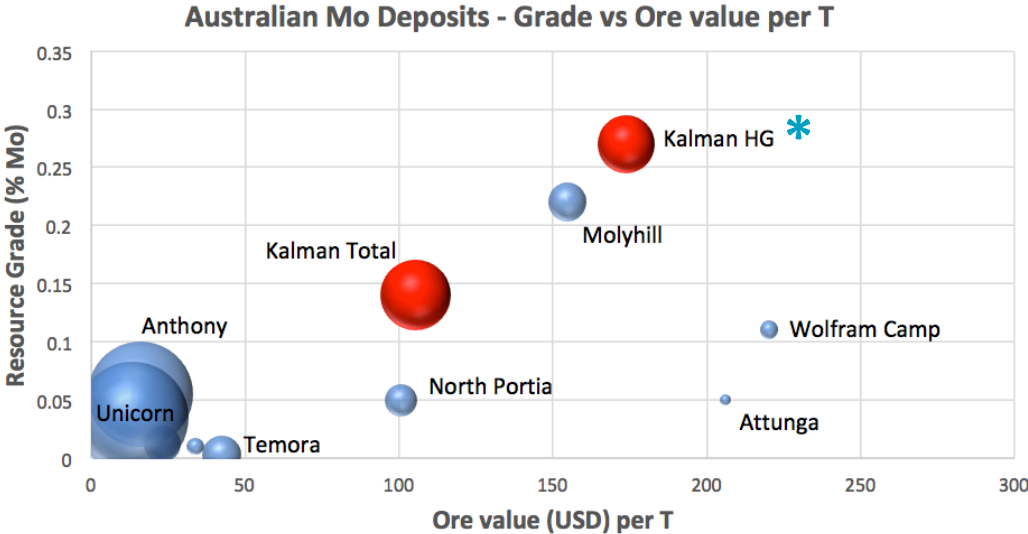
-Note: (1) Numbers rounded to two significant figures

-Note: (2) Totals may differ due to rounding

-Note: (3) $(CuEq = Cu + 0.594464Au + 0.010051Ag + 4.953866Mo + 0.074375Re)$

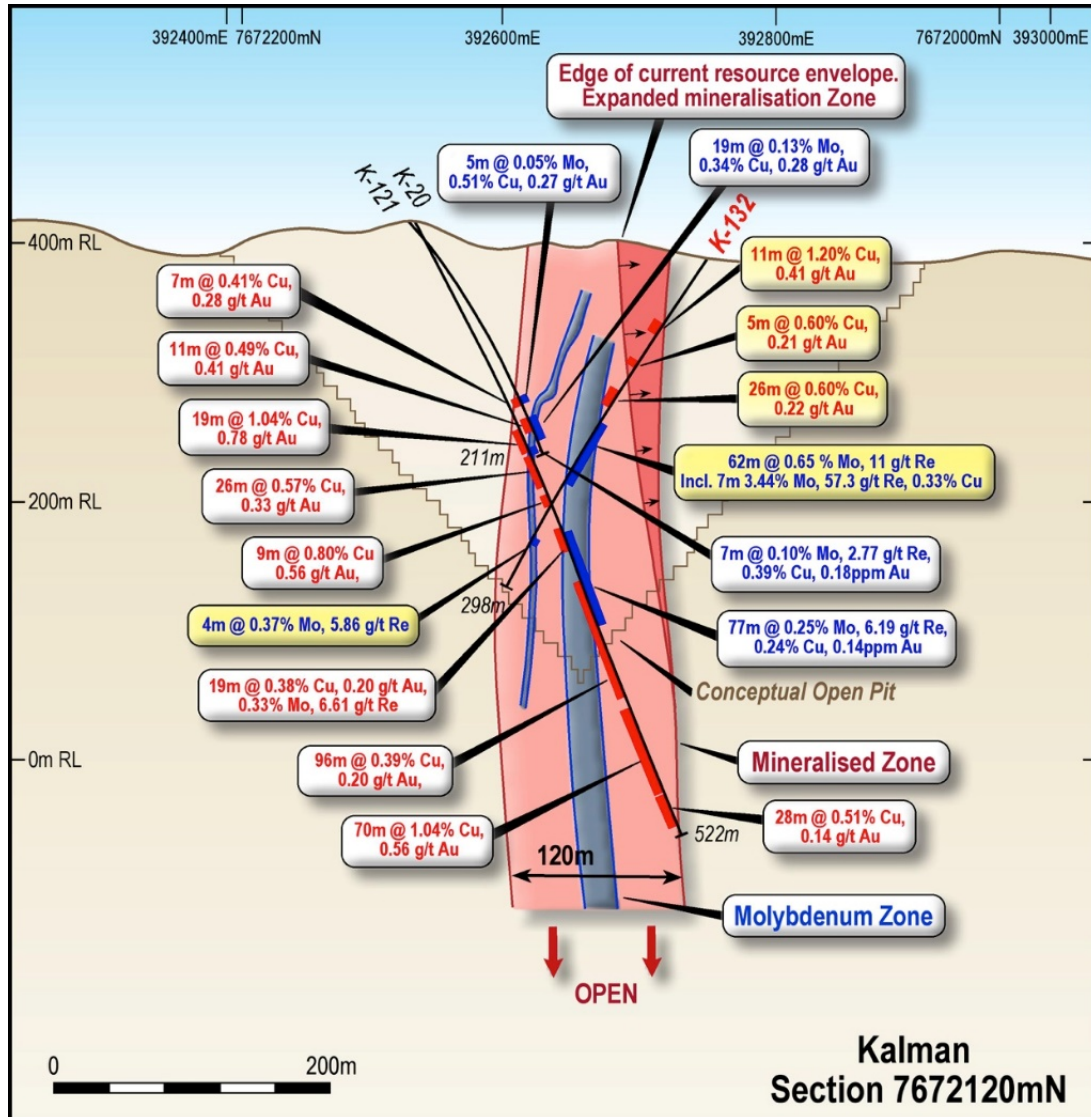
[Refer to Appendix for notes on CuEq grade calculation]

Kalman vs Other Publicly listed Molybdenum Resources



* - Based on global grade-tonnage report for Kalman at a 1.95% CuEq cut-off. Refer to ASX announcement dated 29/7/2016

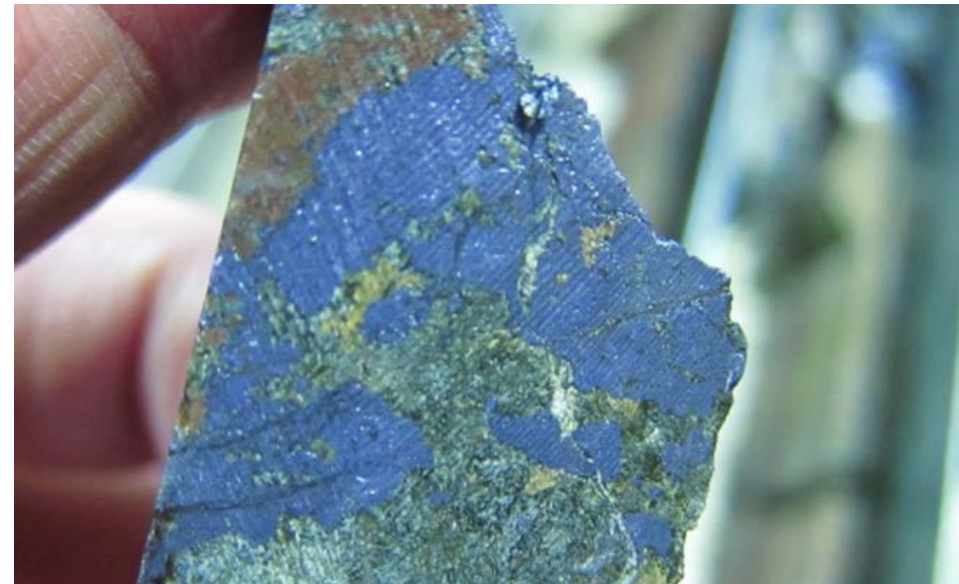
Kalman - High Grade Mo-Re



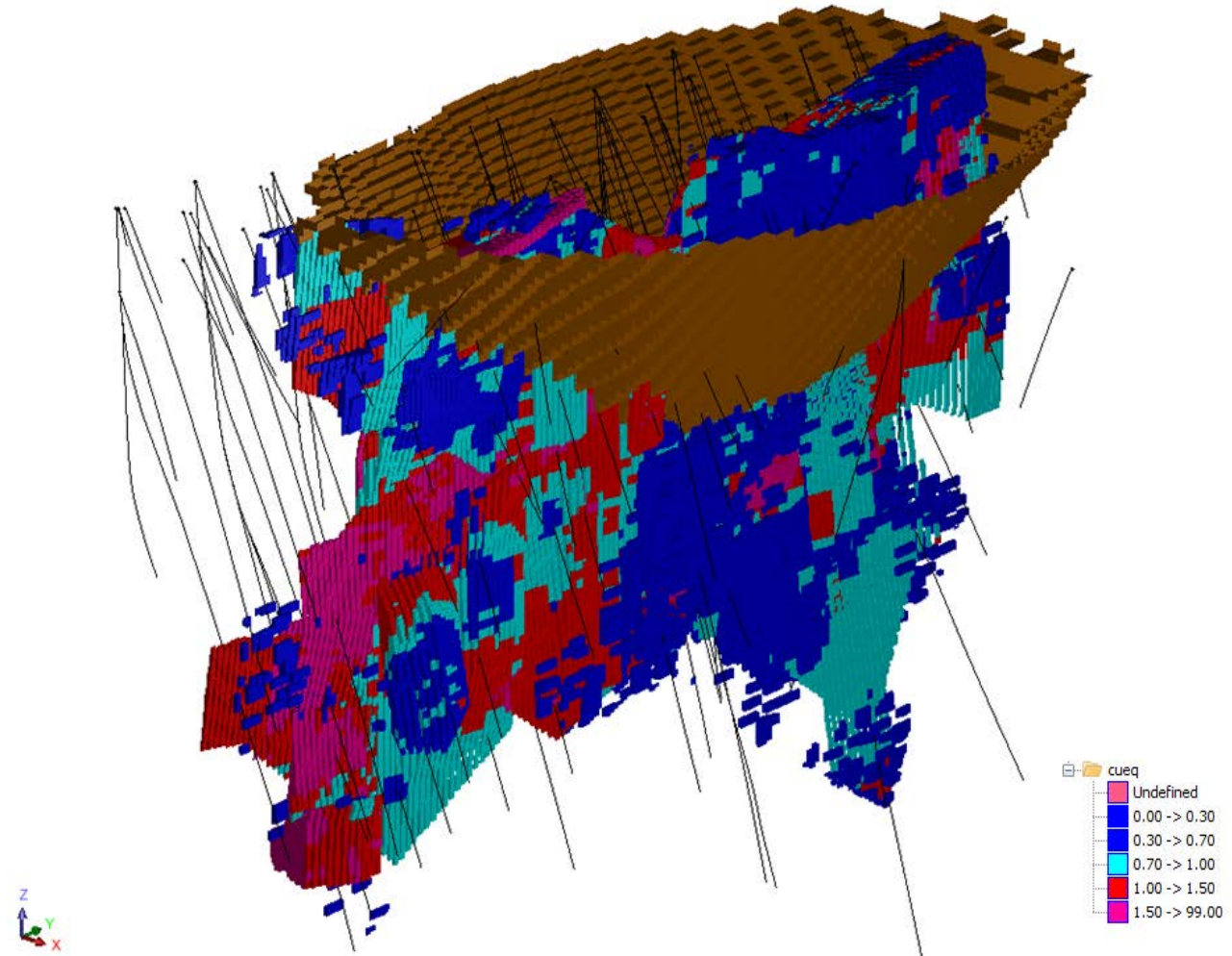
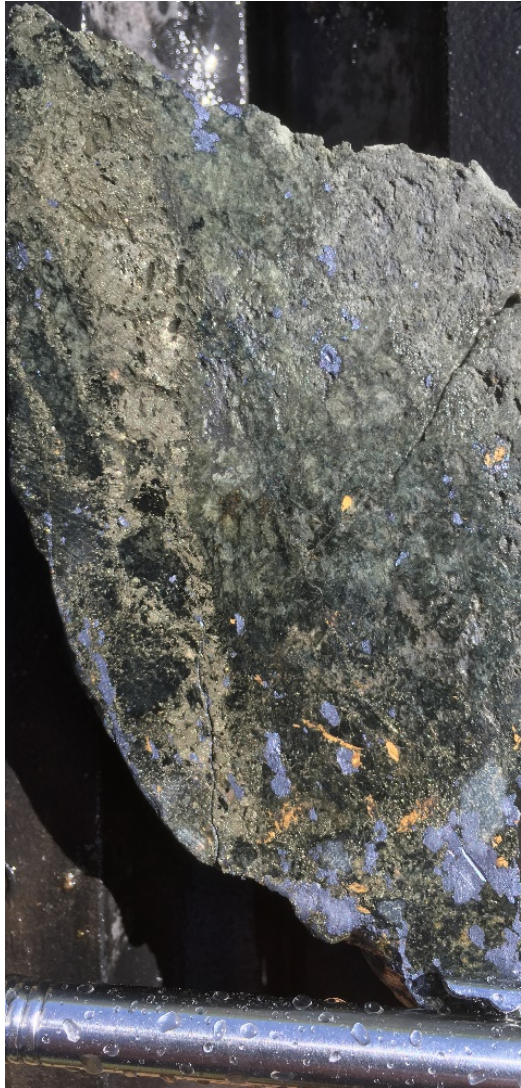
High-grade molybdenum and copper-gold zones require future drilling

High grade molybdenum & rhenium intersections:

- **62m @ 0.65% Mo**, 11.4g/t Re, 0.16% Cu, 0.07g/t Au & 1.5g/t Ag (62m at 4.3% CuEq*) from 152m,
- Incl. **7m @ 3.44% Mo**, 57g/t Re, 0.33% Cu, 0.16g/t Au and 5.5g/t Ag (7m at 21.8% CuEq*) from 206m

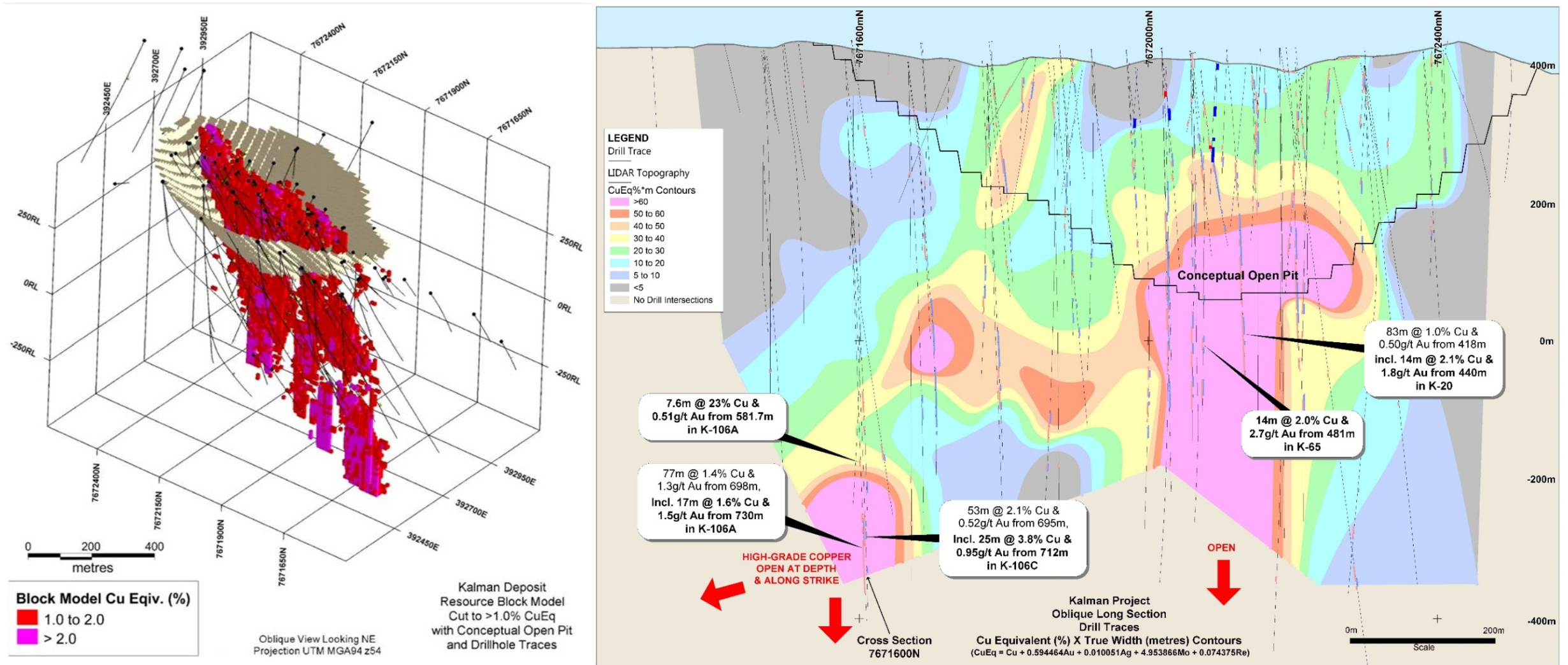


Kalman

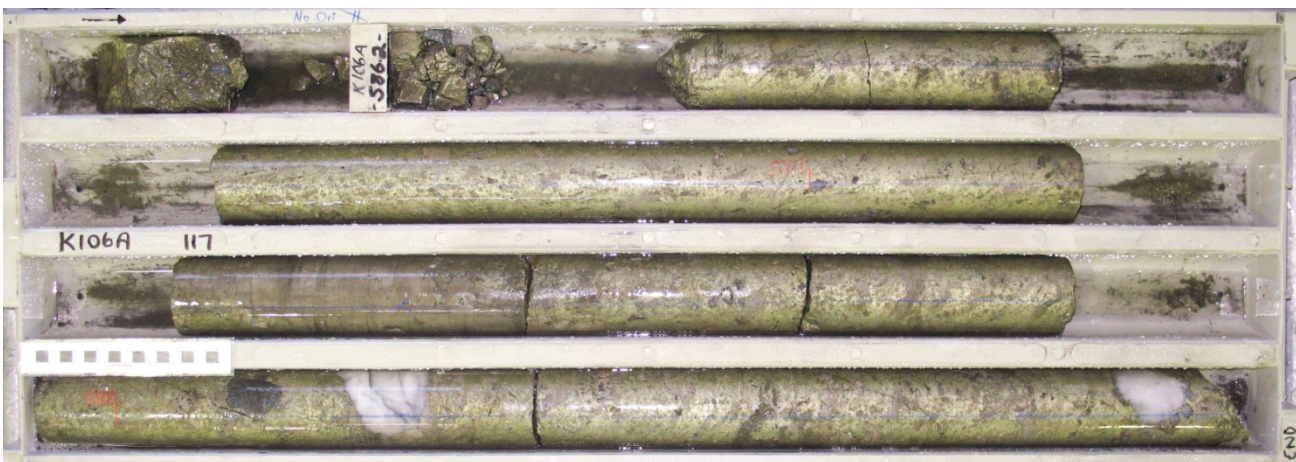
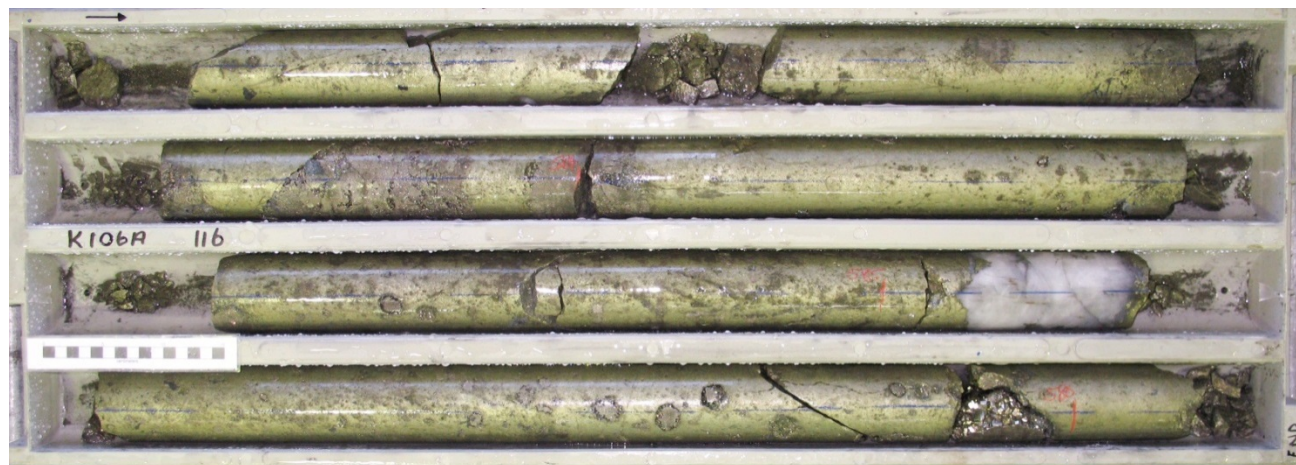


Kalman Conceptual Optimised Pit Shell showing drill traces - looking North West.

Kalman – Large System - Open at Depth



Kalman - High Grade Copper



K-106A - High Grade Copper Zone

High-grade copper at depth

- Multiple zones, open to the south, very high Copper grades
- 7.6m @ 23.4% Cu, 0.5g/t Au & 20g/t Ag from 581.65m in K106A
 - 77m @ 1.4% Cu & 1.3g/t Au from 700m in K106A
 - 53m @ 2.1% Cu & 0.52g/t Au including 25m at 3.8% Cu & 0.94g/t Au from 712m in K106C

Kalman – Next Steps

- Update earlier scoping-level studies with the improved 2018 copper and molybdenum prices
- If results are positive conduct additional drilling to better define and potentially extend the high grade molybdenum zone in the centre of the deposit.



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Disclaimer

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Competent Persons Statements

Historic Exploration Results

The information in this presentation as it relates to exploration results and geology first reported prior to 1 December 2013 was reviewed by Mr John Downing, who is a Member of the Australian Institute of Geoscientists and a Consultant to the Company. 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 is undertaking to qualify as a Competent Person as defined in the 2004 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'.

Mr Downing consents to the inclusion in the report of the matters based on the information in the form and context in which it appears.

Certain exploration drilling results relating to the Mount Isa Project first disclosed under JORC code 2004 and have not been updated since to comply with the JORC Code 2012 on the basis that the information has not materially changed

Exploration Results

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Resource Estimates

Where the Company refers to Mineral Resource Estimates for the Kalman Deposit (refer ASX 27 Sept 2016), it confirms that it is not aware of any new information or data that materially affects the information included in that announcement and all material assumptions and technical parameters underpinning the resource estimate with that announcement continue to apply and have not materially changed.

The information in this presentation that relates to Exploration Results or Mineral Resources is based on information compiled by Russell Davis who is a member of the Australasian Institute of Mining and Metallurgy. Mr Davis is a Director, shareholder and option holder of Hammer Metals Limited. Mr Davis has sufficient experience which is relevant to the style of mineralisation under consideration to qualify as a Competent Person as defined in the 2012 Edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves" (The JORC Code). Mr Davis consents to the inclusion in the presentation of the matters based on their information in the form and context in which it appears.

The information in this presentation that relates to Exploration Results or Mineral Resources was reviewed by Mark Whittle who is a member of the Australian Institute of Mining and Metallurgy and a Consultant to Hammer Metals Limited. Mr Whittle has sufficient experience which is relevant to the style of mineralisation under consideration to qualify as a Competent Person as defined in the 2012 Edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves" (The JORC Code). Mr Whittle consents to the inclusion in the presentation of the matters based on their information in the form and context in which it appears.

Both Mr Davis and Mr Whittle have an interest in Hammer Metals Limited shares and options.

Kalman Resource Estimate & Notes on Copper Equivalence Calculation

The Kalman Mineral Resource Estimate was updated in August 2016 in accordance with the JORC Code (2012 Edition). (Refer to the ASX Release dated 27th September 2016 for full details of the Resource Estimate.)

Kalman Deposit Inferred Mineral Resource Estimate

(Reported at 0.75% CuEq cut-off above 100m RL and 1.4% CuEq cut-off below 100m RL)

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
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- Note: (1) Numbers rounded to two significant figures
- Note: (2) Totals may differ due to rounding
- Note: (3) $CuEq = Cu + (0.864268 * Au) + (0.011063 * Ag) + (4.741128 * Mo) + (0.064516 * Re)$

Copper equivalent (CuEq) grades were calculated using estimated block grades for Cu, Au, Ag, Mo and Re.

The CuEq calculation is based on commodity prices and metallurgical recovery assumptions as detailed in this release. Prices agreed to by Hammer were a reflection of the market as at 14/02/2014 and forward looking forecasts provided by consensus analysis. Metal prices provided are:

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 14/02/2014 and forward looking forecasts provided by consensus analysis. Metal prices provided are:

Cu: US\$7,165/t

Au: US\$1,324.80/oz

Ag: US\$22.40/oz

Mo: US\$16.10/lb

The forward looking price for Rhenium was estimated using available historical and current prices - Re: US\$5,329/kg

The CuEq equation is $CuEq = Cu + 0.594464Au + 0.010051Ag + 4.953866Mo + 0.074375Re$ and was applied to the respective elements estimated within the resource block model.

Kalman Resource Estimate & Notes on Metallurgical Recoveries

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 3) was established from the mass balance and benchmarked against other operations and projects.

Table 3: 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.