



PREMIUM QUALITY GRAPHITE / UNIQUELY TANZANIAN



ASX: KNL
FSE: FMK

EcoGraff : A sustainable alternate source of graphite for
the Lithium-ion Battery Market

Benchmark Mineral Intelligence : Graphite & Anode Conference October 2018

Presented by : Christoph Frey

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Information in this presentation that relates to Exploration Results, Mineral Resources or Ore Reserves is based on information compiled by Mr Andrew Spinks, who is a Member of the Australasian Institute of Mining and Metallurgy included in a list promulgated by the ASX from time to time. Andrew Spinks is a director of Kibaran Resources Limited and 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 2012 Edition of the “Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves”. Andrew Spinks consents to the inclusion in this presentation of the matters based on his information in the form and context in which it appears.



Information in this presentation that relates to Mineral Resources is based on information compiled by Mr David Williams, a Competent Person, who is a Member of the Australasian Institute of Mining and Metallurgy. David Williams is employed by CSA Global Pty Ltd, an independent consulting company. Mr Williams 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 2012 Edition of the “Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves”. David Williams consents to the inclusion in this presentation of the matters based on his information in the form and context in which it appears.

Information in this presentation that relates to Ore Reserves has been compiled by Mr Steve O'Grady, who is a Member of the Australasian Institute of Mining and Metallurgy. Steve O'Grady is a full time employee of Intermine Engineering and produced the Mining Reserve estimate based on data and geological information supplied by Mr Williams. Mr O'Grady has sufficient experience which is relevant to the estimation, assessment, evaluation and economic extraction of the Ore Reserve that he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the “Australasian Code for Reporting of Exploration Results, Minerals Resources and Ore Reserves”. Steve O'Grady consents to the inclusion in this presentation of the matters based on his information in the form and context in which it appears.



NEW GRAPHITE MINING & MANUFACTURING BUSINESS POISED FOR DEVELOPMENT



Shares on issue	Key holders	Financial
Listed 276m F-diluted 279m	Colonial 11% Board 10% Value-on-Gr. 4% GR Engineer. 2%	A\$55m Cash (30/6/18) A\$2.8m
		
Scalable mining project for long term supply of graphite products		Value-add manufacturing of battery (spherical) graphite for lithium-ion batteries
Development ready Epanko Graphite Project		Tanzania / Asia / Europe
Total pre-tax NPV₁₀ US\$356m <i>(geared, nominal terms)</i>		

Strong mix of mining, commercial and graphite experience

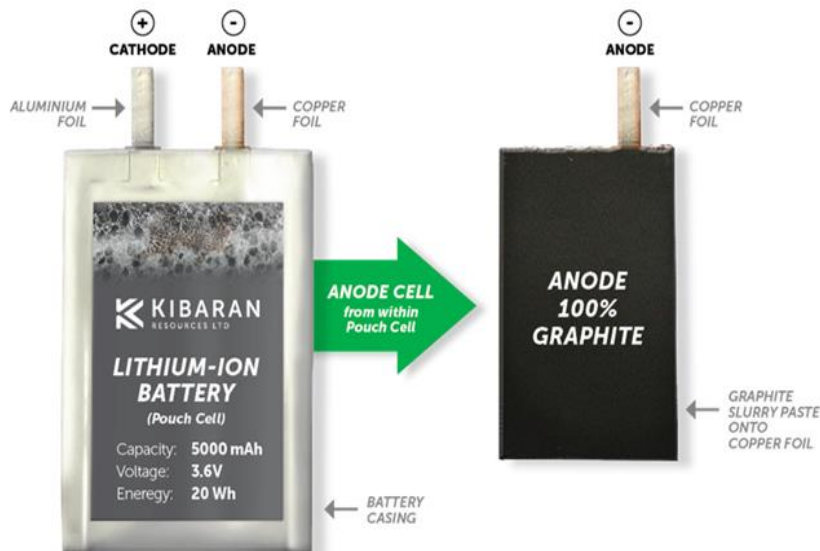
- Kibaran Chairman Robert Pett, Managing Director Andrew Spinks and in-country Project Director Grant Pierce OAM established Tanzania's Golden Pride Mine and are recipients of the President's Award in Tanzania for environmental excellence. German-based non-executive director Christoph Frey (ProGraphite) is a globally recognised graphite expert
- Listed on the Australian and German (Frankfurt) stock exchanges



MARKET OPPORTUNITY FOR BATTERY GRAPHITE

Global expansion of electric vehicle markets forecast to drive a 700% increase in annual natural graphite demand by 2025 to over 800,000 tonnes per annum Roskill, UBS

BATTERY RAW MATERIAL COMPOSITION



~55kg Mined natural flake graphite per EV

127,000 tonnes

Used in 2017^{Roskill}

EV penetration rates increasing from 2% in 2017 to 25% by 2025 Roskill, UBS

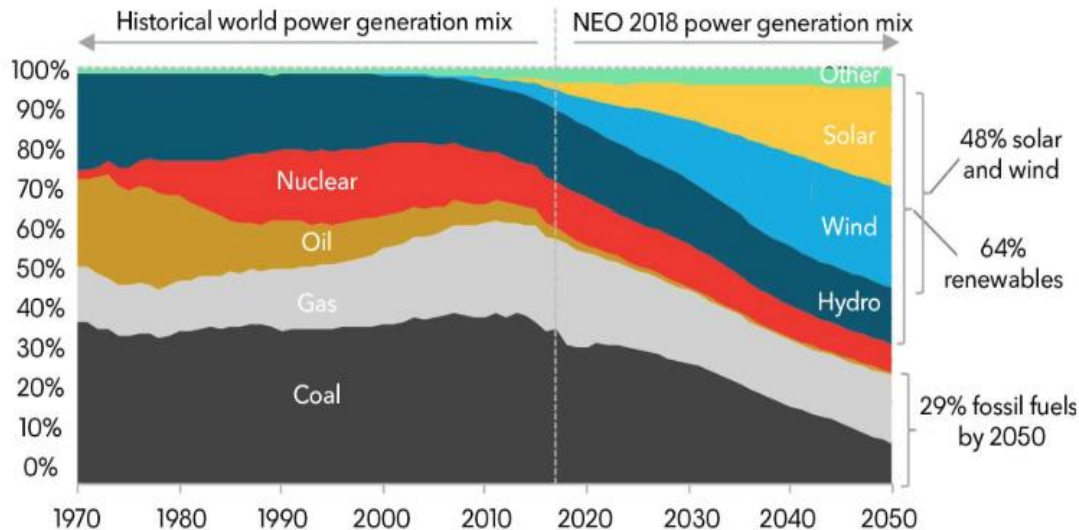


MARKET OPPORTUNITY FOR BATTERY GRAPHITE

Accelerating demand for lithium-ion battery storage from the renewable energy industry

> US\$8 trillion investment in wind and solar to 2050

> US\$500 billion in new battery storage capacity by 2050



Mobile solar powering villages in Mali and Niger

Transported in sea containers set-up in 2 hours



GRAPHITE BUSINESS SUMMARY

Total pre-tax NPV₁₀
US\$356m
(geared, nominal terms)



EPANKO GRAPHITE PROJECT

Natural Flake Graphite (NFG)

Production	60ktpa
NPV₁₀	US\$211m
EBITDA	US\$44.5m



DOWNSTREAM PRODUCTION FACILITY

Spherical Graphite (SpG)
(F) Fines
(UN) Unpurified
(P) Purified

Production	20ktpa
NPV₁₀	US\$145m
EBITDA	US\$30.5m

Products

 **TANZGraphite**

 **EcoGrafi**

Status

Feasibility study Jun 2017
Bank technical review Aug 2017
Debt financing

Feasibility study Dec 2017
Non-HF purification IP developed
Pilot plant optimisation completed

Pre-production cost

US\$89m

Pilot plant scale-up US\$4m
5,000tpa US\$25m
20,000tpa US\$41m

Early Works Construction

GR Engineering
13mths

12mths

IRR

38.9%

34.3%

Payback

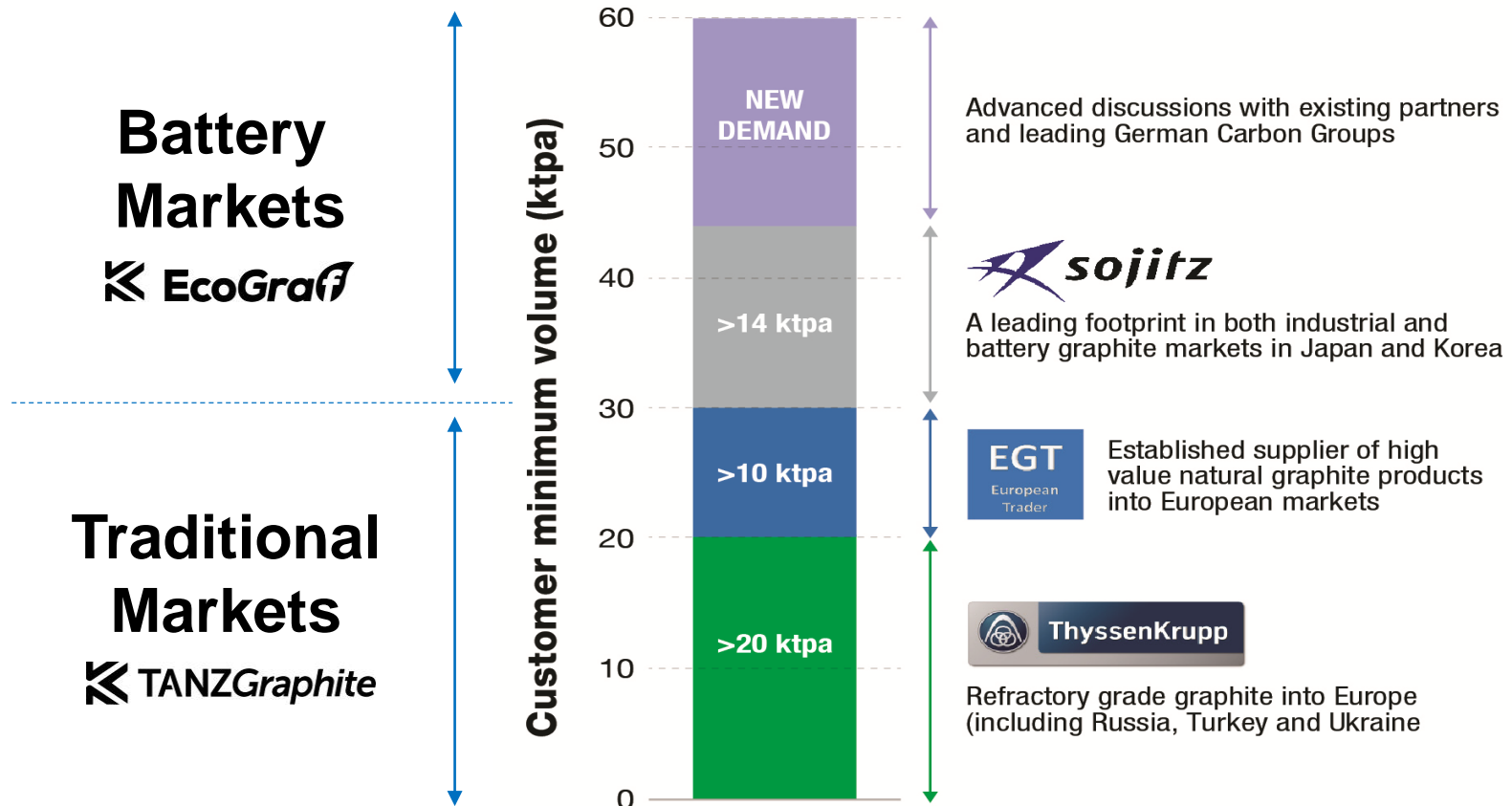
3.5yrs

3yrs


*Refer ASX Announcements 21 June 2017 and 5 December 2017.

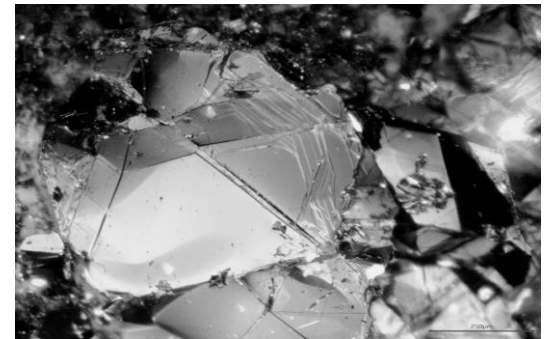
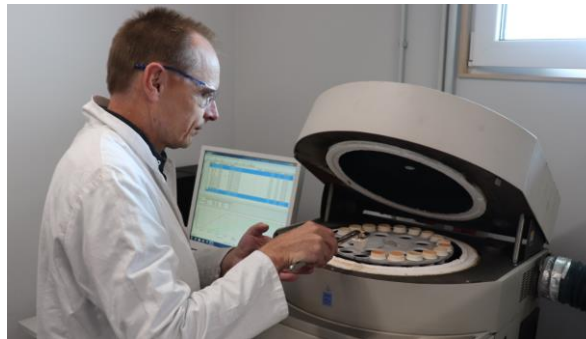
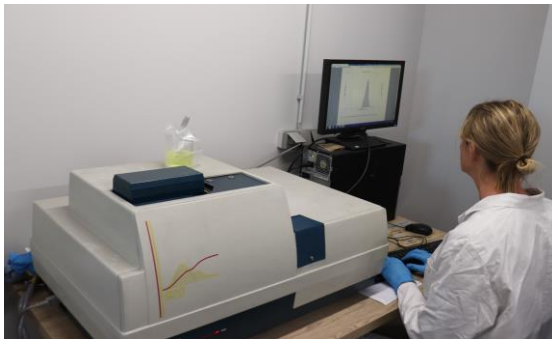


NATURAL FLAKE GRAPHITE OFFTAKE SUMMARY




OPTIMISATION PROGRAM SUCCESSFULLY COMPLETED

- Pilot plant optimisation in Germany to produce commercial quantities of spherical graphite with financial support from German Government completed
- Key achievements:
 - ✓ Treatment of graphite from Kibaran's Epanko Project in Tanzania, including battery (spherical) graphite and fines from spheronization (by-product) produced up to 99.98% carbon
 - ✓ Graphite from 10 other global sources produced up to 99.98% carbon
 - ✓ Seven large natural flake graphite samples produced carbon levels above 99.95%
- A new clean green proprietary processing technology developed under trademark  EcoGraf that is cost competitive and avoids toxic hydrofluoric acid
- Agreement finalised for long-term supply of standard grade graphite (minus 100 mesh at 94% carbon) which will be used as feedstock to support stages 1 and 2 of a stand-alone downstream business



Focus of feasibility study : Development of a purification method, which is:

- ☐ Ecologically sustainable (“green”)
- ☐ Hydrofluoric acid (HF) free
- ☐ Cost competitive with existing HF supplies

 **Solution: Hydrofluoric acid (HF) free purification method, with low energy consumption and low environmental footprint**

- EcoGraf optimised with spherical graphite processed from Kibaran’s Epanko deposit
- EcoGraf tested
 - ✓ Other sources of spherical graphite
 - ✓ Fines from spheronization (d50 of 5 micron)
 - ✓ Large flakes from different sources
 - ✓ Graphite from 10 different origins

Outstanding Results: very robust method, almost all samples reach carbon content of above 99.95%


- Typical results from ICP measurement (highly accurate method): ash 0.02% (200 ppm)

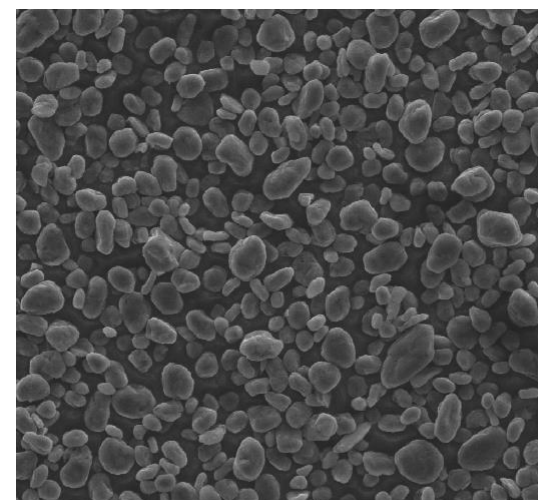
Element	Al	Ca	Fe	Mg	Ni	S	Si	Zr
[ppm]	2.7	4.6	5.5	0.5	7.0	5.0	15.4	0.5

COMPETITIVE ADVANTAGE

- Results support Kibaran's strategy to establish battery graphite processing business with key competitive product advantages:

	EcoGraf	Existing Supply
Purification grades	>99.98%	>99.95%
Purification of fines	Yes	No
Excludes toxic hydrofluoric acids	Yes	No
Ethical and environmentally friendly	Yes	No

- Samples from pilot work tested by and meets stringent standards of major anode manufacturers
-  technology separates spherical graphite development from timing of Epanko Project and can proceed independently of Tanzanian production
- Pilot plant scalable from piloting to commercial production to meet market demand
- Strong interest from Europe and Asia for product supply and co-development



WD: 33.16 mm

Det: SE

Date(m/d/y): 10/10/18

100 μm

DEVELOPMENT SCHEDULE

- Phased commercialisation strategy for 

Phase	Battery (Spherical) Graphite	Feedstock	2018	2019	2020	2021
Stage 1	3,000tpa (unpurified) customer trials and sales	6,000				
Stage 2	5,000tpa (purified)	10,000				
Stage 3	20,000tpa (purified)	40,000				

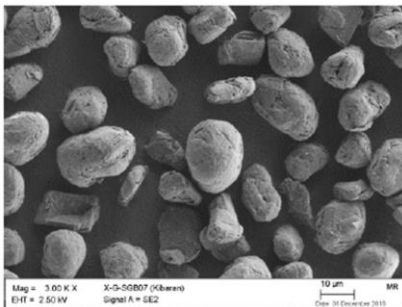


NATURAL BATTERY GRAPHITE SUPPLY CHAIN

Natural Graphite (Purified Spherical Graphite)



Development of European and Asian production hubs to produce battery product



Battery Anode Cells (Coated Spherical Graphite)

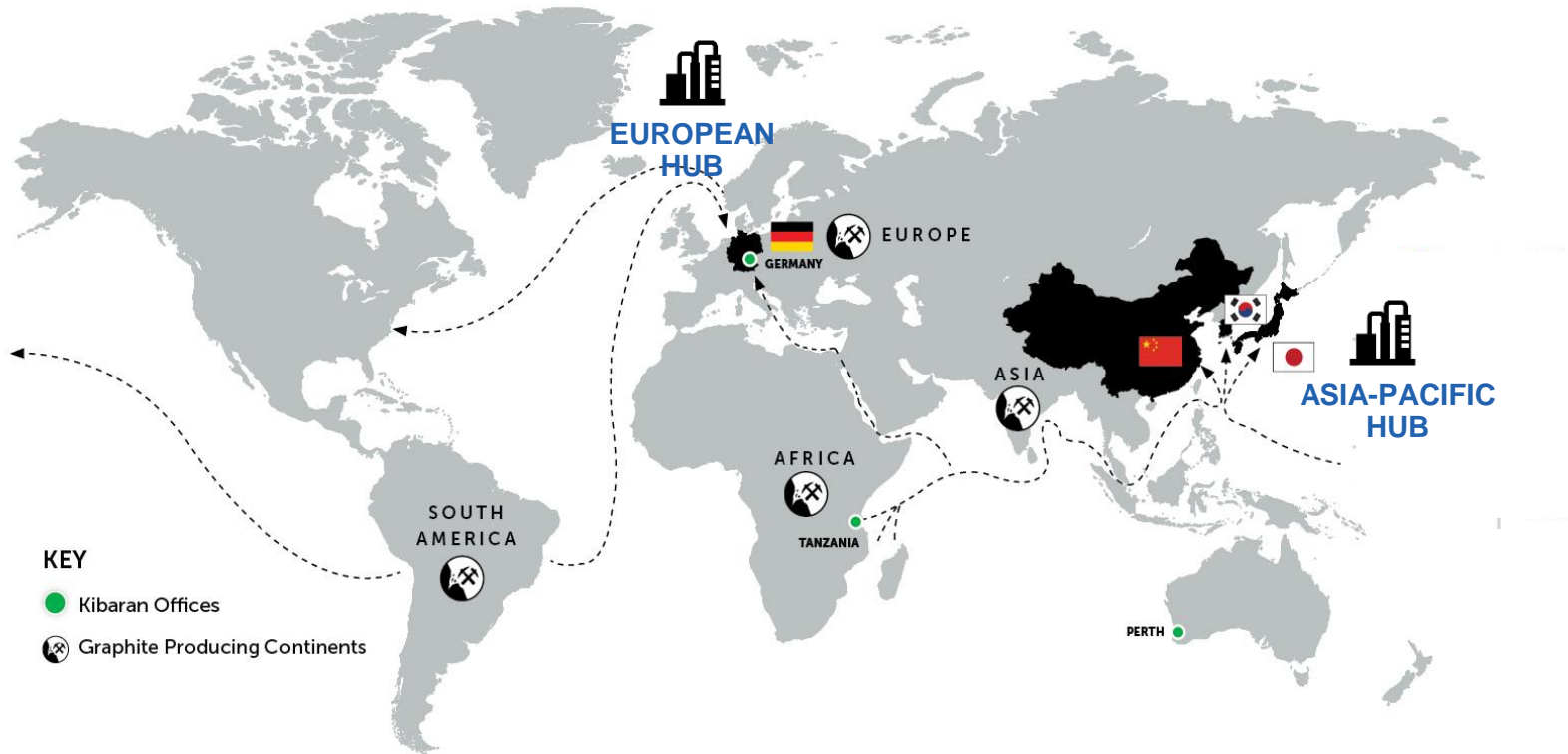


Battery Systems (Integrated Cathode/Anode Cell)



ESTABLISHING A GLOBAL GRAPHITE SUPPLY NETWORK

Awareness from customers is driving demand for environmentally sustainable raw material supply chains



Continent	Product Samples
Europe	2
Africa	2
Asia	3
Americas	2

Tanzania	Mining and production of natural flake graphite (initially 60ktpa) Micronising and spheronising of battery graphite (Dar es Salaam)
Germany	Spherical graphite - pilot plant and expansion up to 3,000tpa
Europe/Asia	Spherical graphite - commercial plant(s) • 5-20,000tpa purified spherical graphite • 4-17,000tpa unpurified fines



SUPPORTED BY KEY STAKEHOLDERS

Investment and financing



Customers



Technical expertise



BOARD AND MANAGEMENT

Board and Management	A strong mix of mining, commercial and graphite experience
Robert Pett (Non-Executive Chairman)	Mineral economist with over 30 years' experience developing projects and mines in Australia and Africa. Founding Chairman of Resolute Mining Limited, with a strong track record of board governance and leadership in listed resources and energy companies.
Andrew Spinks (Managing Director)	Geologist with over 25 years' experience. Expertise in exploration, mining and resources management across a range of commodities and geographies. Former resident of Tanzania at the Golden Pride mine.
Grant Pierce OAM (Executive Director)	Mining engineer with over 25 years' experience, including development of African mines Tulawaka, Golden Pride and Edikan. Order of Australia Medal 2003 for social development in rural Tanzania.
Christoph Frey (Non-Executive Director)	German-based graphite industry professional with over 25 years' graphite experience in Russia, Europe, Africa and China. Direct experience in both traditional and evolving graphite markets including the production of purified spherical graphite.
John Conidi (Non-Executive Director)	Certified Practising Accountant with 20 years' experience acquiring, developing and managing publicly listed businesses, particularly in the technology sector.
Howard Rae (Chief Financial Officer)	Chartered Accountant with over 20 years' experience across the resources industry in Australia, Asia and Africa, focussing on business development and financing new mining operations.
Marshall Hestelow (Consultant)	Certified Practising Accountant with over 30 years' experience in the resources sector in corporate roles with Resolute Mining Limited in Australia and Africa.
Nassor Said (Commercial Manager)	Resources and logistics professional with substantial experience in regulatory and commercial operations within Tanzania.





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THANK YOU