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resources limited

+Cg
The other side of the Battery – anodes and graphite

Building A Vertically Integrated Graphite Business

Supplying high growth demand in the energy and industrial sectors

Argus LiCoNi-2018
Singapore
28 August, 2018

Clear Business Strategy

To produce quality graphite products into a diverse range of premium end-use markets

"Hexagon is creating shareholder value through developing a vertically integrated graphite business to supply high-specification graphite materials, including synthetic graphite substitutes".

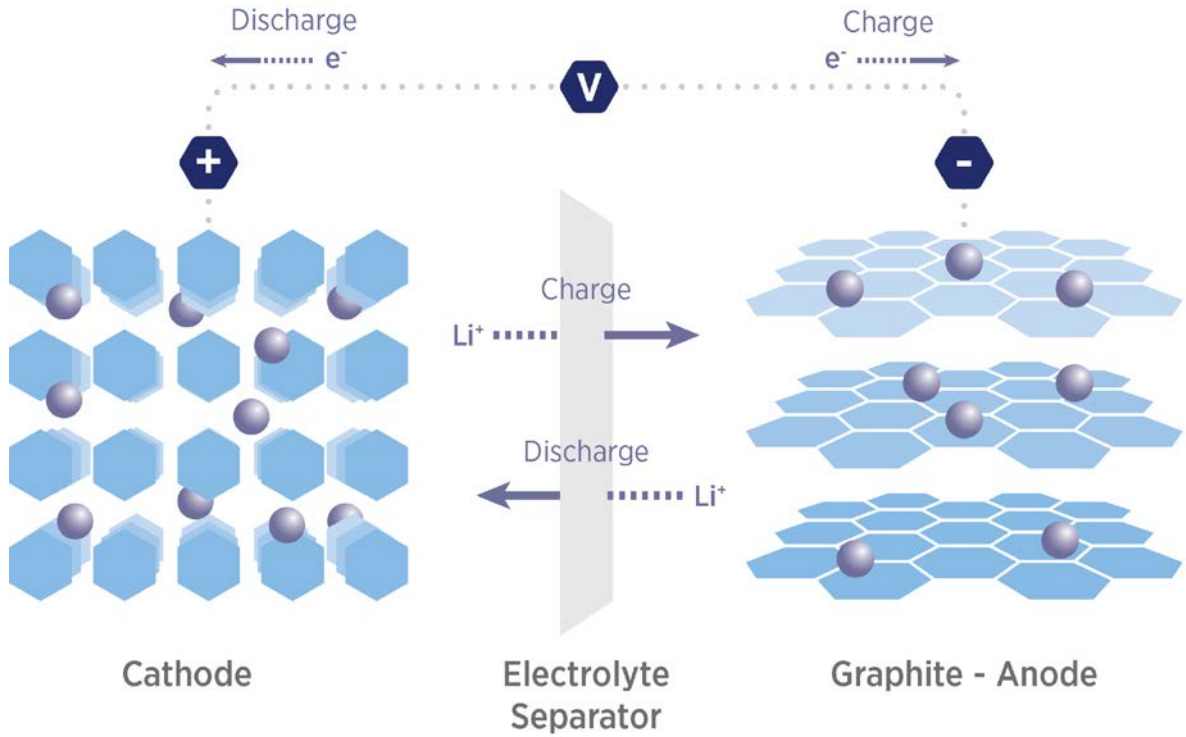
- HXG is moving downstream to capture additional value…."*because it can, not because it has to*"
- High purity graphite for high-value markets, e.g. graphite components for rockets not just cars

The view from across the battery

Graphite is a versatile and essential part of the EV/electrification story

- Graphite has applications across a wide range of battery chemistries, including Lithium ion, Lithium primary, alkaline even lead-acid batteries.
- Graphite is utilised on both sides of the battery in cathodes and anodes.

This is a LiCoNi event – so will provide examples around lithium ion batteries and anode graphite in the context of Hexagons business strategy.



- Cathode is c.40-50% of the cell cost.
- Anode is c.30% of cell cost;
- Graphite is c.50% of Anode Cost
- Graphite is c.15% of the cell cost.

The view from across the battery

Lets get some nomenclature right!

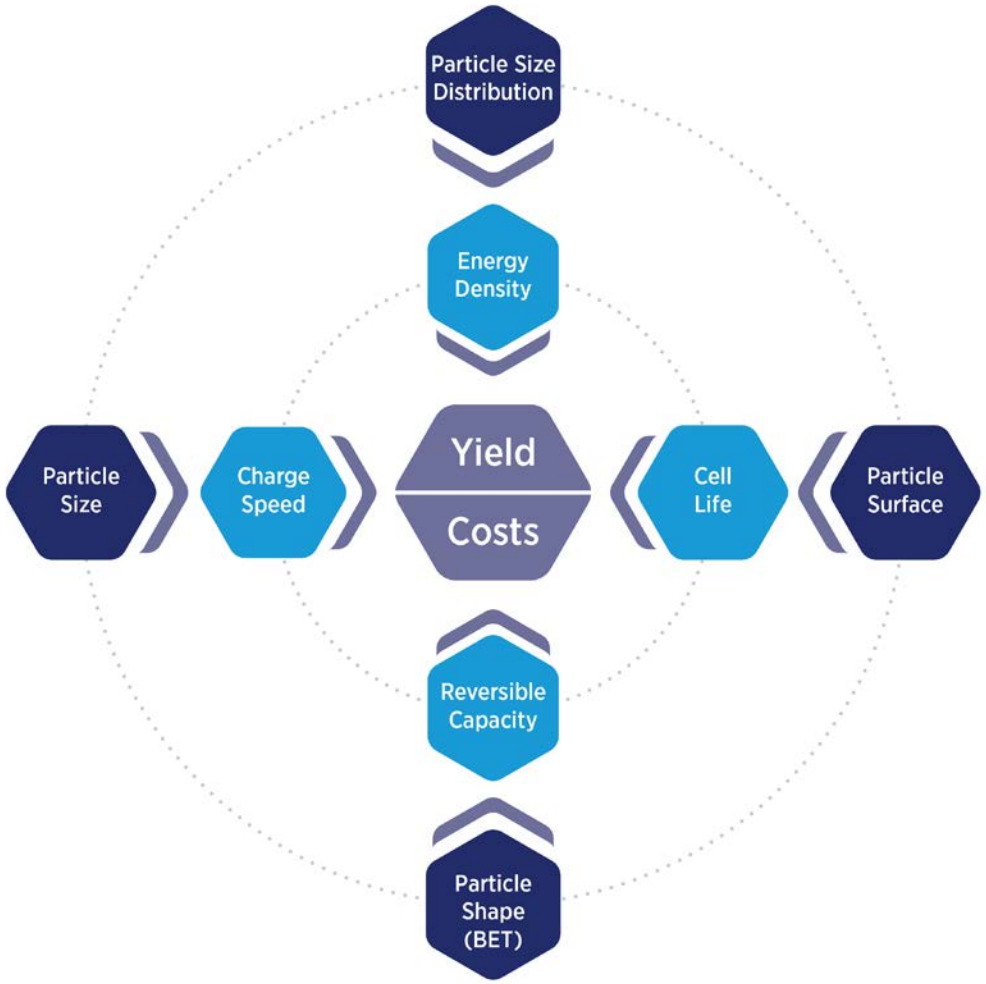
- **LIB, GLIB or NGLIB??**
- **Graphite-Lithium Ion or Nickel-Graphite-Lithium Batteries!**
- **Anode is Graphite - c.7x more graphite in a GLIB than Li & Co.**
- **Cathode is Nickel – with a "sprinkling" of Li & Co.**

Anode graphite is an approximately, 30:70 mixture of natural flake graphite to synthetic, respectively.

Spherical graphite from natural flake graphite is cheaper than synthetic graphite and as quality issues are overcome the proportion of natural in battery anodes is increasing.

100% of natural spherical graphite for battery anode material is currently supplied from China.

End users have specific criteria for specific battery chemistries which determines their demand and price.

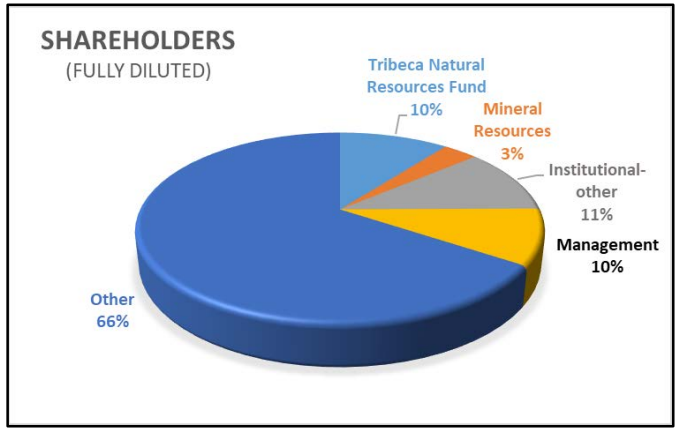


Hexagon is aiming for high-spec materials for top – quality batteries.

"Batteries for rockets not cars"

Hexagon at a Glance

ASX Code	HXG
Shares on Issue	291.8M
Options on issue (unlisted)	24.4M
Share price (24/8/18)	A$0.15
12 Month high/low	A$0.28/A$0.09
Market Capitalisation	A$47.4M
Debt	Nil
Cash (30/06/2018)	A$7.4M

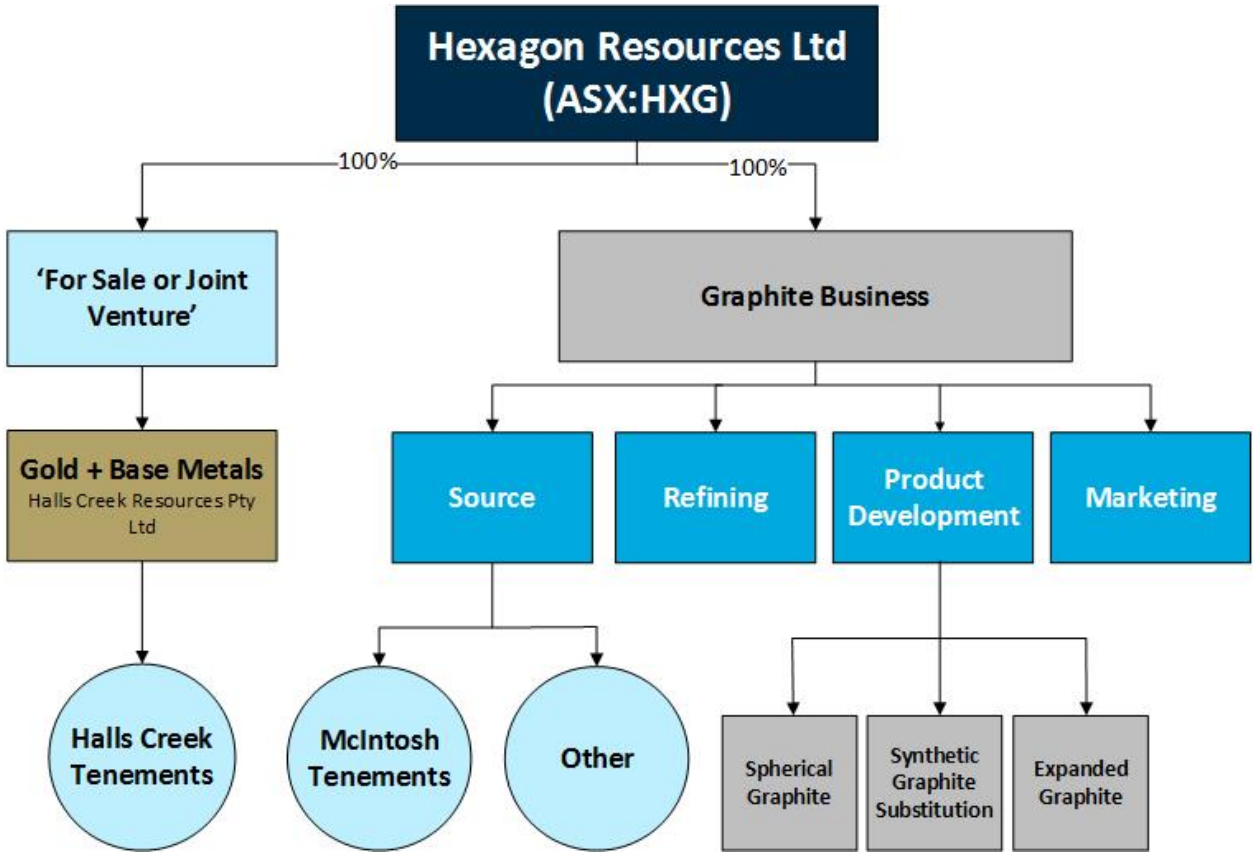


Board of Directors: (from Left); M. Rosenstreich (MD), Charles Whitfield (Chair), Garry Plowright (NED) and Rowan Caren (CoySec.)

Emerging, low-risk, funded graphite business

- ✓ McIntosh is a high purity graphite deposit in Western Australia.
- ✓ Stage 1 development c. 100ktpa of high-grade graphite concentrates for a diverse range of premium priced end uses.
- ✓ Stage 1 is fully funded to commercial production with Mineral Resources (ASX:MIN) earning 51% project interest, subject to positive Feasibility Study.
- ✓ Exceptional downstream processing attributes and cost profile – suitable for premium end of energy storage, tech applications and traditional industrial uses.
- ✓ Safe, stable jurisdiction with project located in Western Australia.

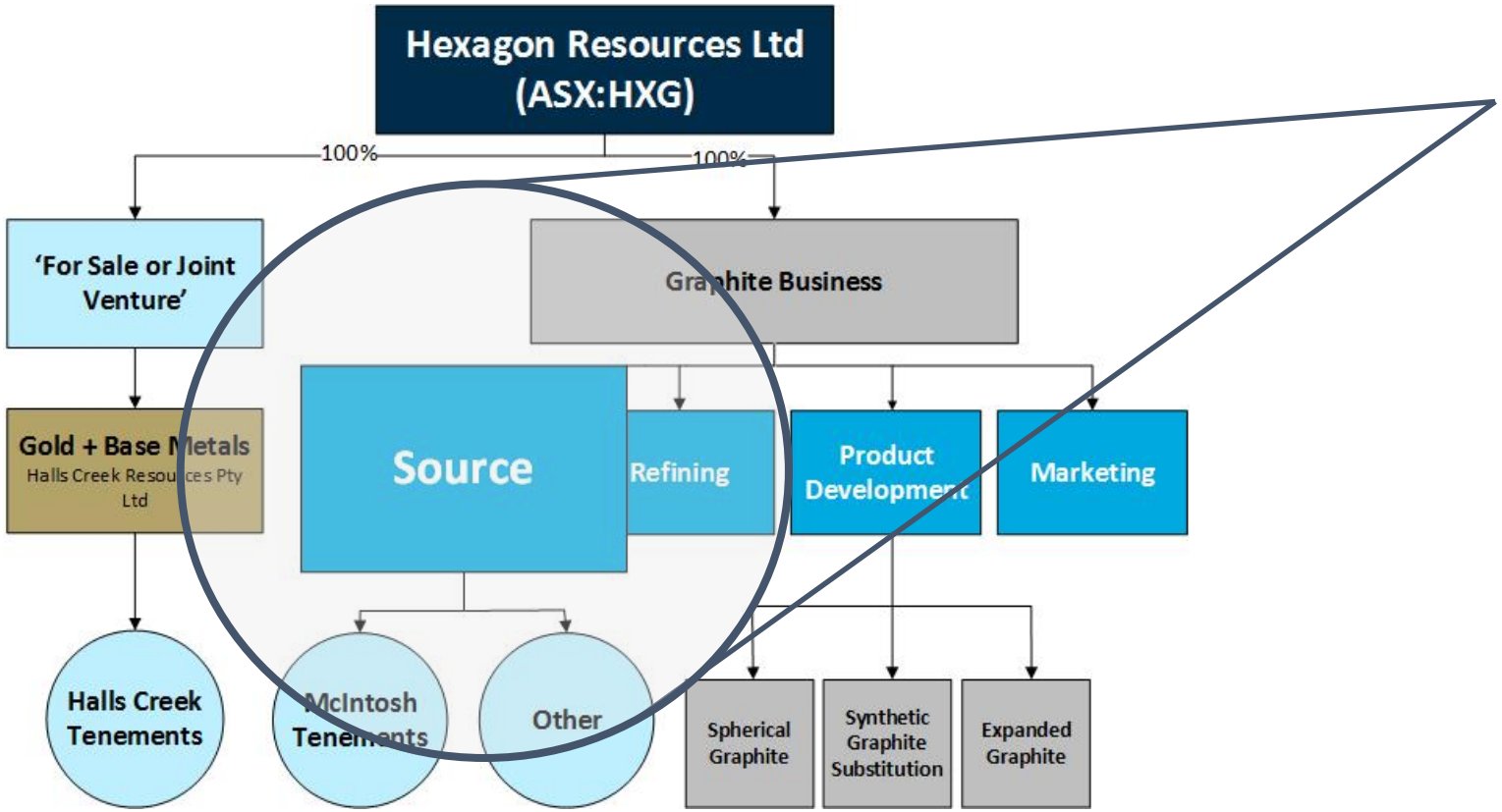
Business Structure



Key Elements

- **Source** – demonstrated high-purity, crystalline, natural flake graphite
- **Refining** – proprietary, low cost process to achieve ultra high purity
- **Product Development** – to cater to a diverse range of premium end users
- **Marketing** – building a McIntosh brand and creating awareness
- "**For Sale**" – non core but highly prospective exploration assets

Business Structure



Source – of the "right" graphite concentrates.

McIntosh Project (Western Australia)

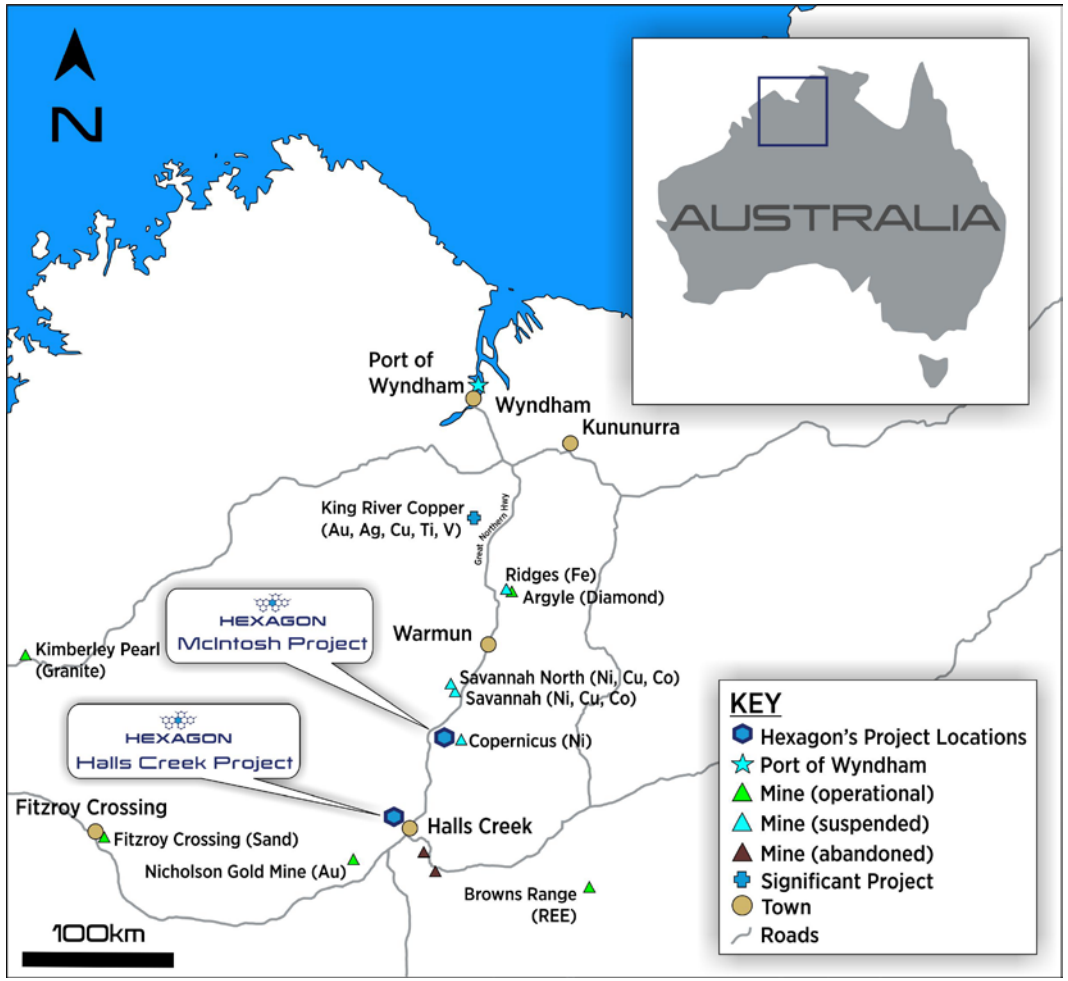
- Mineral Resources Ltd funding all feasibility, development and ramp-up costs to Commercial Production to earn a 51% share.

Other Opportunities

- HXG has and will continue to secure sources that have the properties to produce premium quality graphites.

Source - Overview

McIntosh Graphite Project – large-scale deposit in mining-friendly jurisdiction



Current Stage 1 – Mineral Resources.

JORC Classification	Tonnes (Mt)	TGC (%)	Contained Graphite (kt)
Total Indicated & Inferred	21.3	4.5%	964

Full Mineral Resources Table & Location Plan in Attachment 1

✓ **12,000 metre drilling program currently underway**

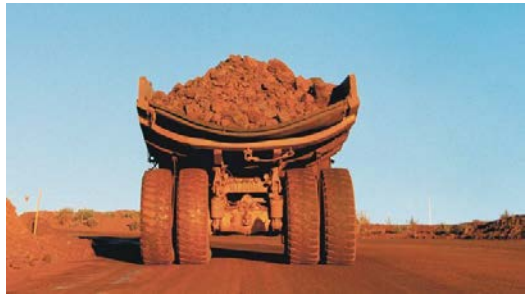
Exploration Target* (additional to JORC Resources)

Prospect	Tonnage Range (Mt)	Grade Range TGC (%)
Total	110 - 220	2.5 – 5.0

Customers are attracted by "long-term supply" from stable, reputable countries with sound environmental and community relations practices.

Cautionary Statement: The potential quantity and grade of the Exploration Targets is conceptual in nature, there has been insufficient exploration work to estimate a mineral resource and it is uncertain if further exploration will result in defining a mineral resource.

Source – McIntosh Project - planning for future development



Stage 1: Multi open pit mining, simple flotation to produce c. 100,000tpa of high-grade (97-98% TGC) graphite concentrate, likely across 3 flake sizes.

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Mineral Resources Ltd (via the JV) contributes technical expertise from “the pit to the wharf” with a strong Western Australian operational presence.

Source – McIntosh Project; Financing & Development

Partnered with ASX listed Mineral Resources Limited (ASX:MIN)

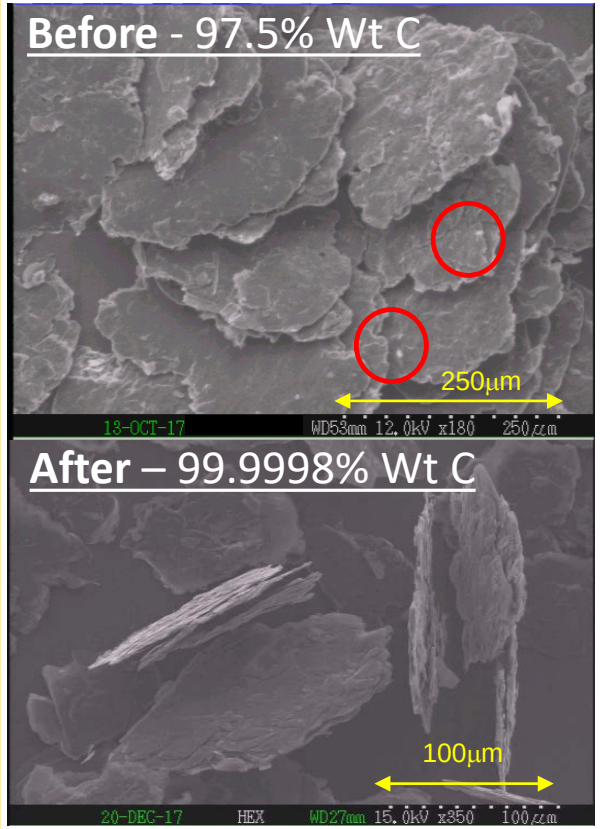
- McIntosh Stage 1 feasibility and development funding de-risked.
- Mineral Resources Limited (**MRL**) to fund all Feasibility Study work, capital development and ramp-up costs to achieve Commercial Production to earn a 51% interest in the McIntosh Project (subject to a positive feasibility study).
- MRL to operate the Stage 1 project through a life of mine Mining Services Agreement – effectively a “pit to wharf” solution for the McIntosh Project.
- MRL to achieve Commercial Production within a 3-year timeline from 14 May, 2018.
- Standard operating JV; each party contributes its shares of OpEx and receives its share of Product which will be marketed by the 50:50 joint entity.

“the joint venture with MRL is a major de-risking event for HXG which is fully funded to commercial production”

Source - McIntosh Graphite™ Marketable Attributes

Purity

High purity, high value & low purification cost

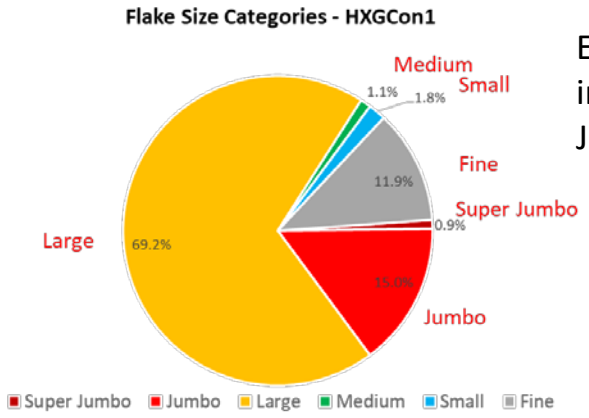


Impurities (circled-top) tend to occur on top of the flakes not embedded into the flake layers making for "easier" purification;

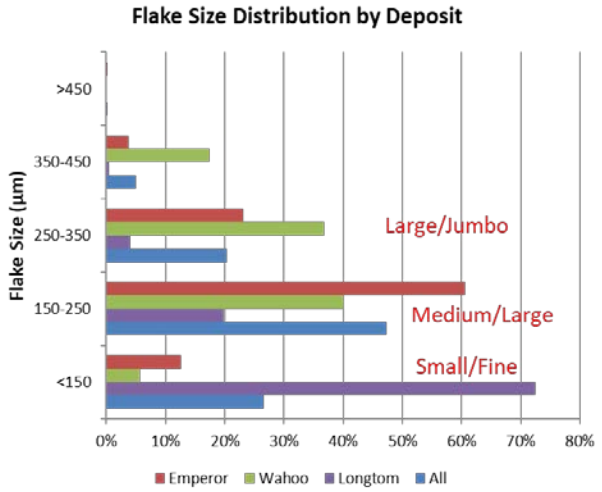
99.9998 wt.% C was achieved by a proprietary thermal purification technique.

- **Price premium**: *Five Nines* is the "nuclear purity world".
- **Low cost:**
  - ✓ Surficial impurities - require only "light" purification.
  - ✓ HXG planning to adopt proprietary but proven, highly efficient, furnace technology.
- **Low Environmental impact:**
  - ✓ No HF acid leach.
  - ✓ Less energy compared to other thermal technologies.

Flake Size



Emperor deposit - 85% of Flake in Concentrate sample is Large, Jumbo & Super Jumbo size.

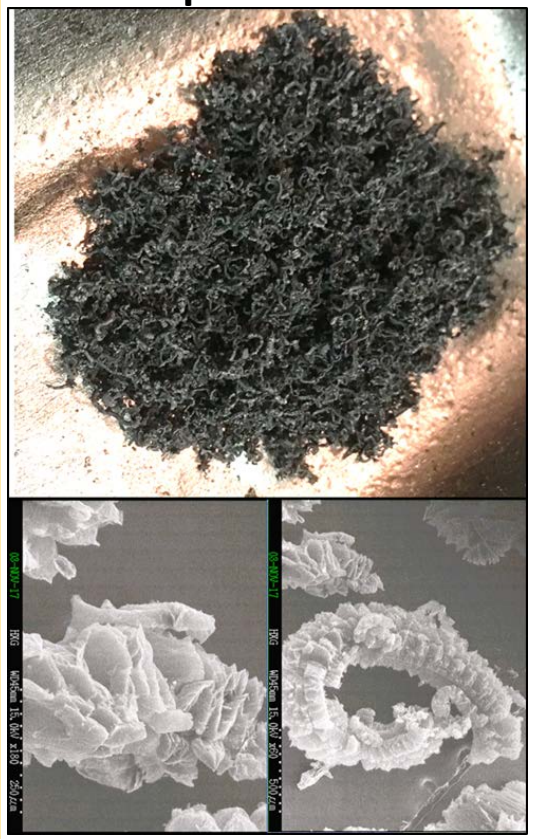


Emperor & Wahoo dominant large/Jumbo flake and comprise 70% of the McIntosh Project Mineral Resource.

Source - McIntosh Graphite™ Marketable Attributes

Expandable

220% Expansion Factor for + 60 Mesh Flake (+250um)



Expanded graphite "worms" produced from +60 mesh fraction of HXGCON 1 precursor flake: optical (top), SEM (bottom).

High proportion of Large/Jumbo sized flake:

- >78% of concentrate flake (HXGCon1) was larger than 60 Mesh (250 um)

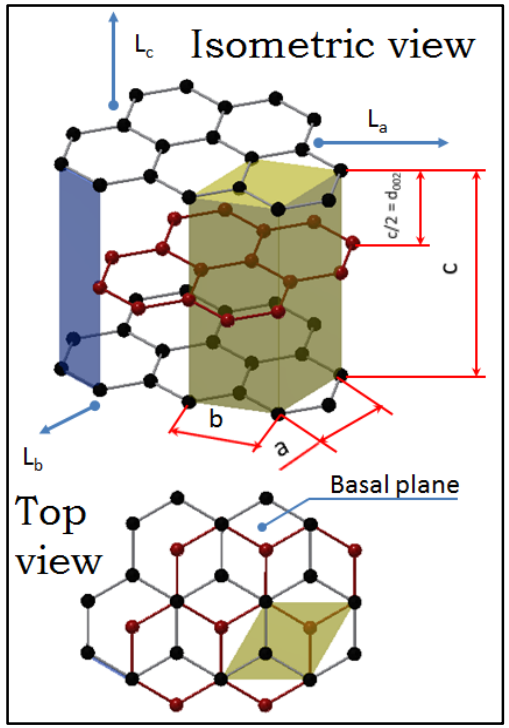
Easy Expansion:

- no exotic chemicals or complicated treatments
- translates to – Low Costs.

Strong demand growth due to:

- Declining supply from China; and
- Increased demand in electronics e.g. as conductivity enhancement material (CEM) in advanced alkaline, lithium and lithium-ion batteries.

Highly Crystalline



HOPG – rare attribute
Highly **O**rdered **P**yrolytic **G**raphite*

Highly crystalline, near all-hexagonal preferred crystal orientation – *vital aspects to compete with premium quality synthetic graphite products*.

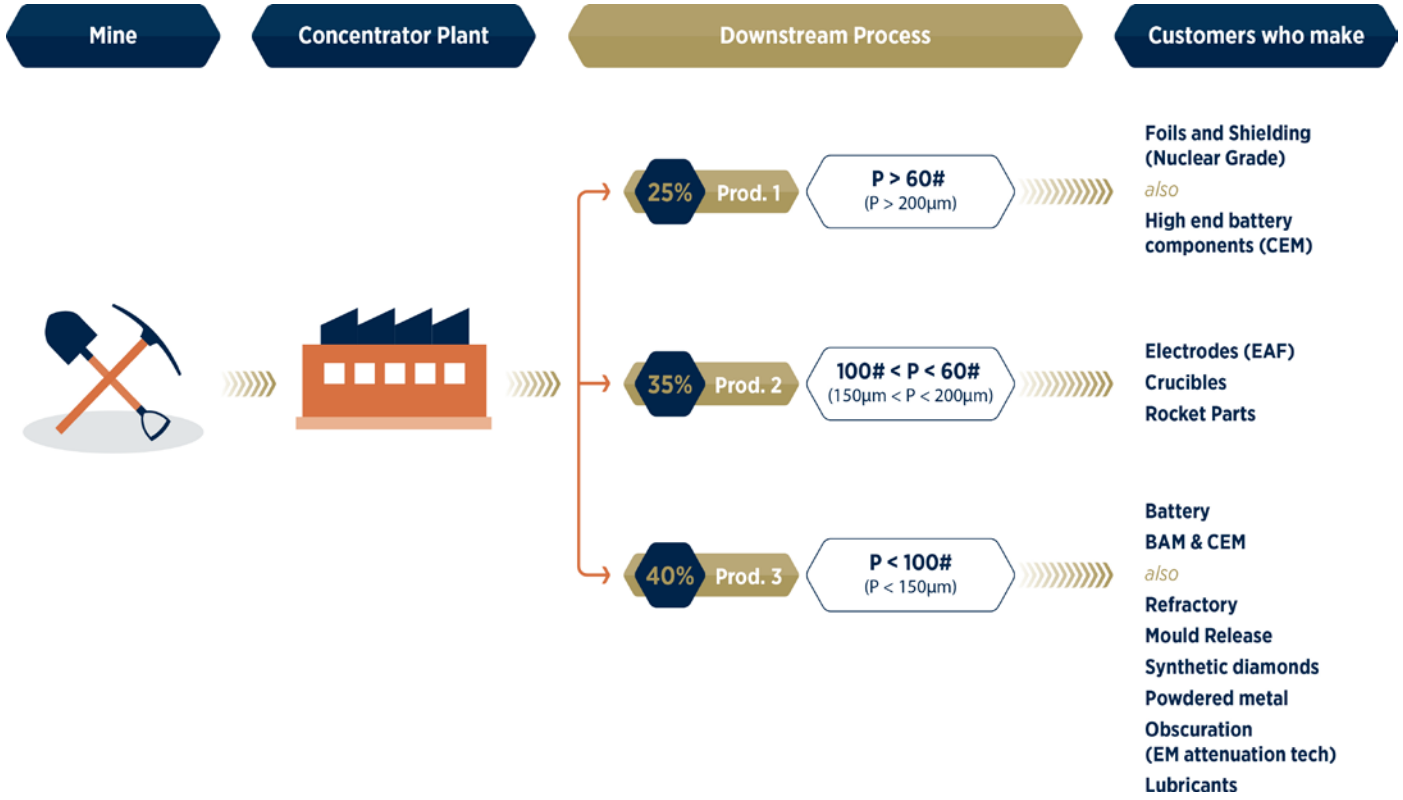
- higher electrical conductivity,
- greater reversible capacity towards lithium ion intercalation,
- superb thermal management properties and
- better lubricity for ultra-purified material.
- Higher selling price.

- **High-cost, synthetic graphite producers aspire to reach these technical specifications.**
- **McIntosh Graphite – can out-compete synthetic on price and quality**

*Independent testing conducted by Argonne National Laboratory which is operated by the US Department of Energy.

Source – the production case

A diverse and sought after product range – from the "Upstream"



Stage 1: 100ktpa planned output, comprising 3 graphite concentrate products:

- ✓ **Product 1 - "Expanded Line"**

  destined for foils and shielding (nuclear grade) and Conductivity Enhancement Materials (**CEM**)

- ✓ **Product 2 - "Electrode Line"**

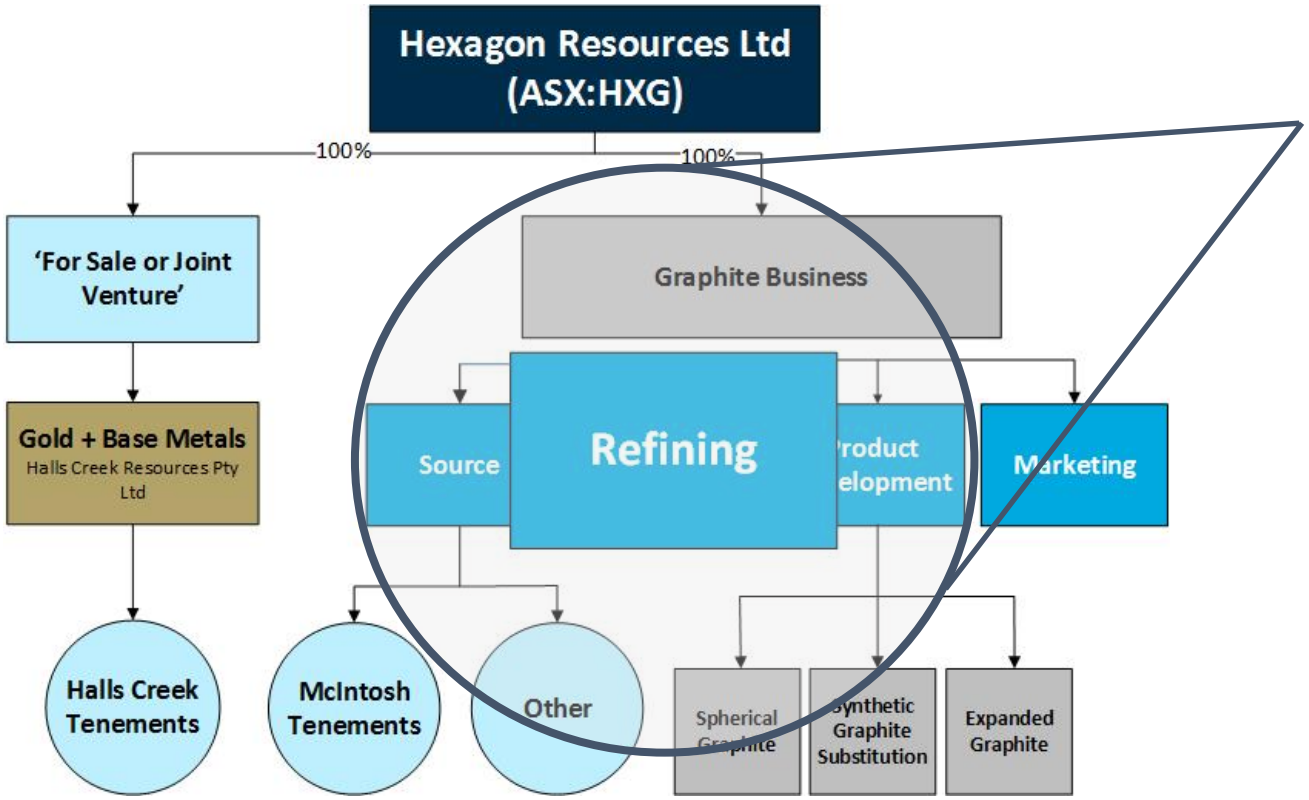
  suitable for a wide range of customers but HXG's focus is on electrodes in Electric Arc Furnaces (**EAF**) substituting for synthetic graphite on the basis of enhanced technical properties.

  (Wide size range – could be split into 2 around the 80 mesh sizing)

- ✓ **Product 3 - "Battery Line"**

  destined for lithium ion Battery Anode Material (**BAM**) and CEM. Also suitable for a range of high-end industrial applications e.g. refractory (in furnace ladles and crucibles), mould release as well as emerging applications such as synthetic diamonds (for semi-conductors) and Obscuration (EM attenuation) technology.

Business Structure



Refining – a key distinguishing business aspect for HXG, because:

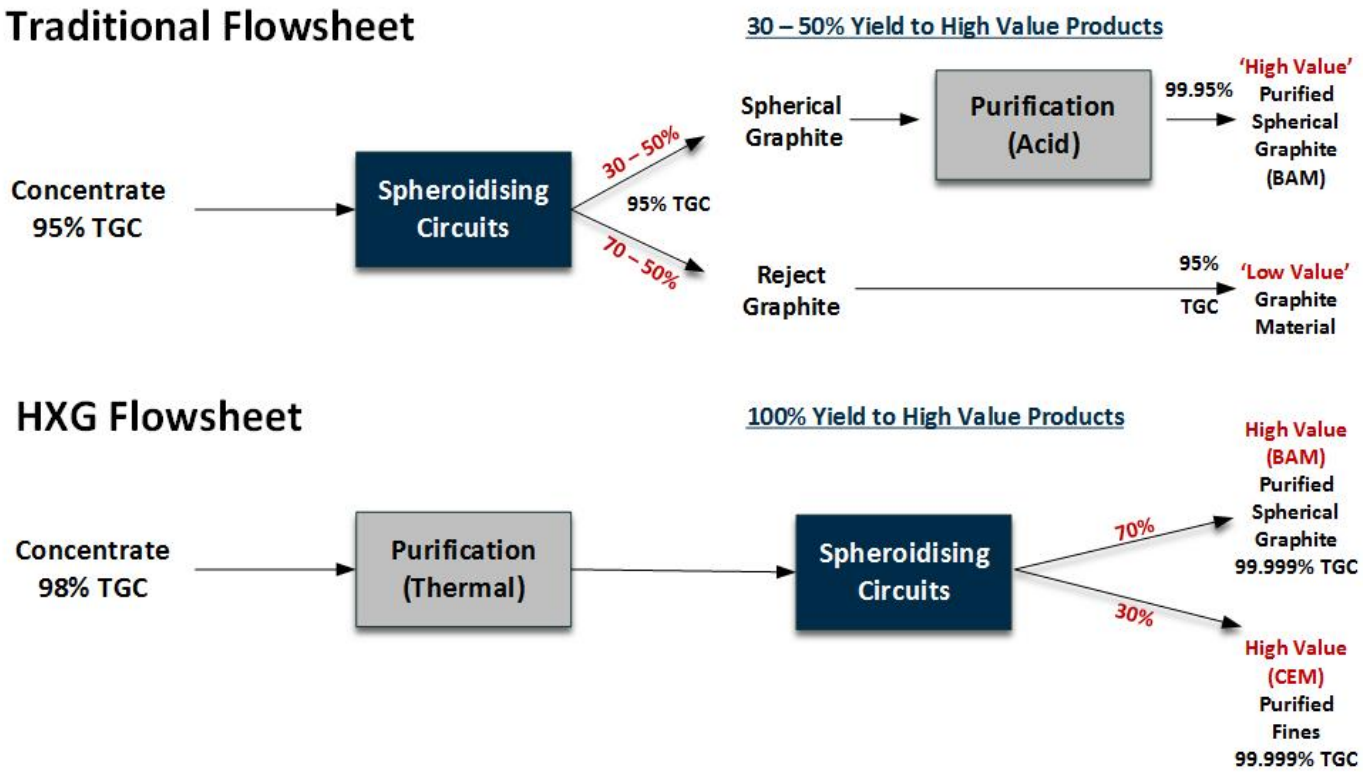
- McIntosh "easy to purify" flake attributes; and
- Utilisation of established, state-of-the-art refining technology under exclusive arrangement.

Refining

A core pillar of the down stream business strategy

HXG's modified flow sheet – refining first; because it is low cost and produces high-value end products.

Here's an example for Prod.3 (battery materials) stream:



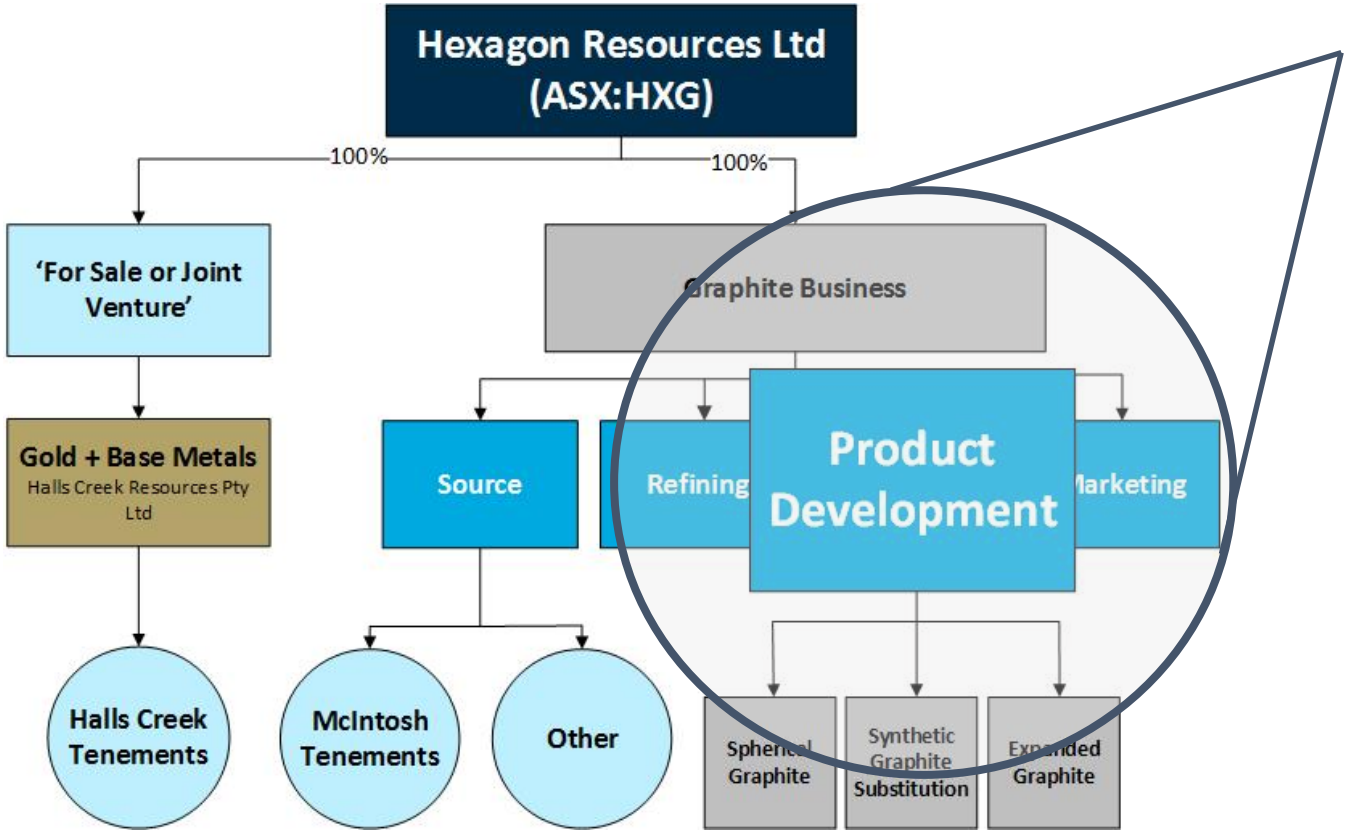
HXG is proposing an innovative downstream flow sheet based on:

- **Low Cost,** first stage purification
  - ✓ Easy purification attributes of the McIntosh flake
  - ✓ Utilisation of a proven, but proprietary refining furnace technology.
  - ✓ Targeting purification costs <u>less than current</u> acid leaching as carried out in China – c.US$600/t.

Resulting in:

- Higher yields to high-value products
- Premium pricing for refined "Raw Materials" as a means to fast track downstream value adding.

Business Structure



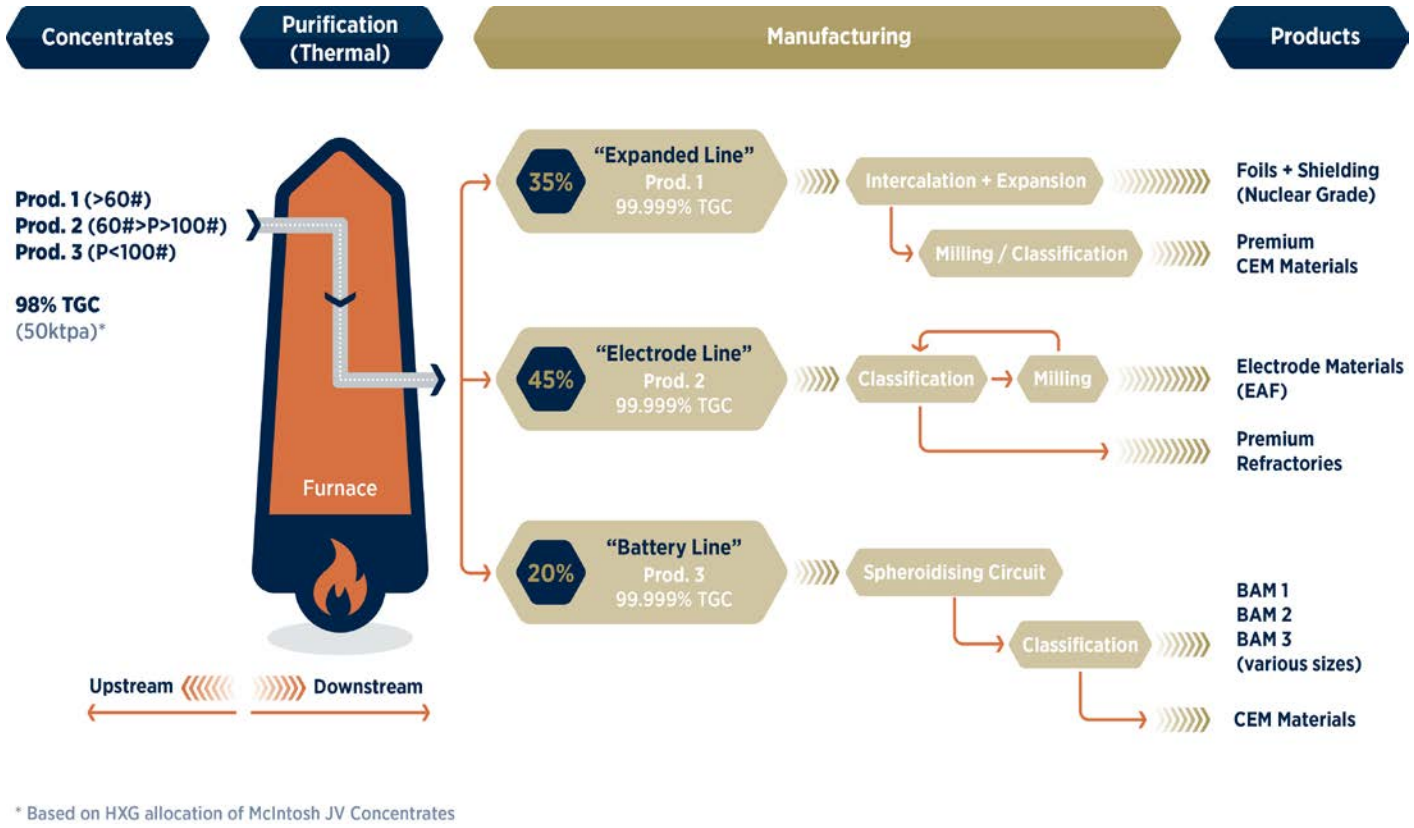
Product Development

The 3 product streams reflect diverse opportunities, enabled by:

- **Purity** – ultra-high and low cost;
- **Large flake** abundance; and
- **Easy milling** – large flake size is desirable for certain end uses, but there is increasing demand for ultra-fine, highly crystalline graphites. McIntosh's thinner flake requires low energy to mill and classify down to the sub 10 µm size specifications. This will make HXG a cost leader in milling, micronising and classifying ultra fine graphites.

Product Development

Graphite – a multi-staged, complex and demanding supply chain



* Based on HXG allocation of McIntosh JV Concentrates

HXG's planned Product Development Flow Sheet

Key Drivers:

- Specifications demanded by the Customers
- Technical attributes of the source flake
- Technology utilised to achieve the milling / shaping and classifying
- Energy costs
- Skilled and experienced labour
- Customer qualification processes for different end users

Customers require "5-M's" Qualification

1. Material Source – consistent
2. Method – production process
3. Machines – utilisation the same process technology
4. Manufacturing Standards – QA/QC & ISO
5. Management & Ownership – consistent

HXG is working to meet these qualification requirements in its Product Development program

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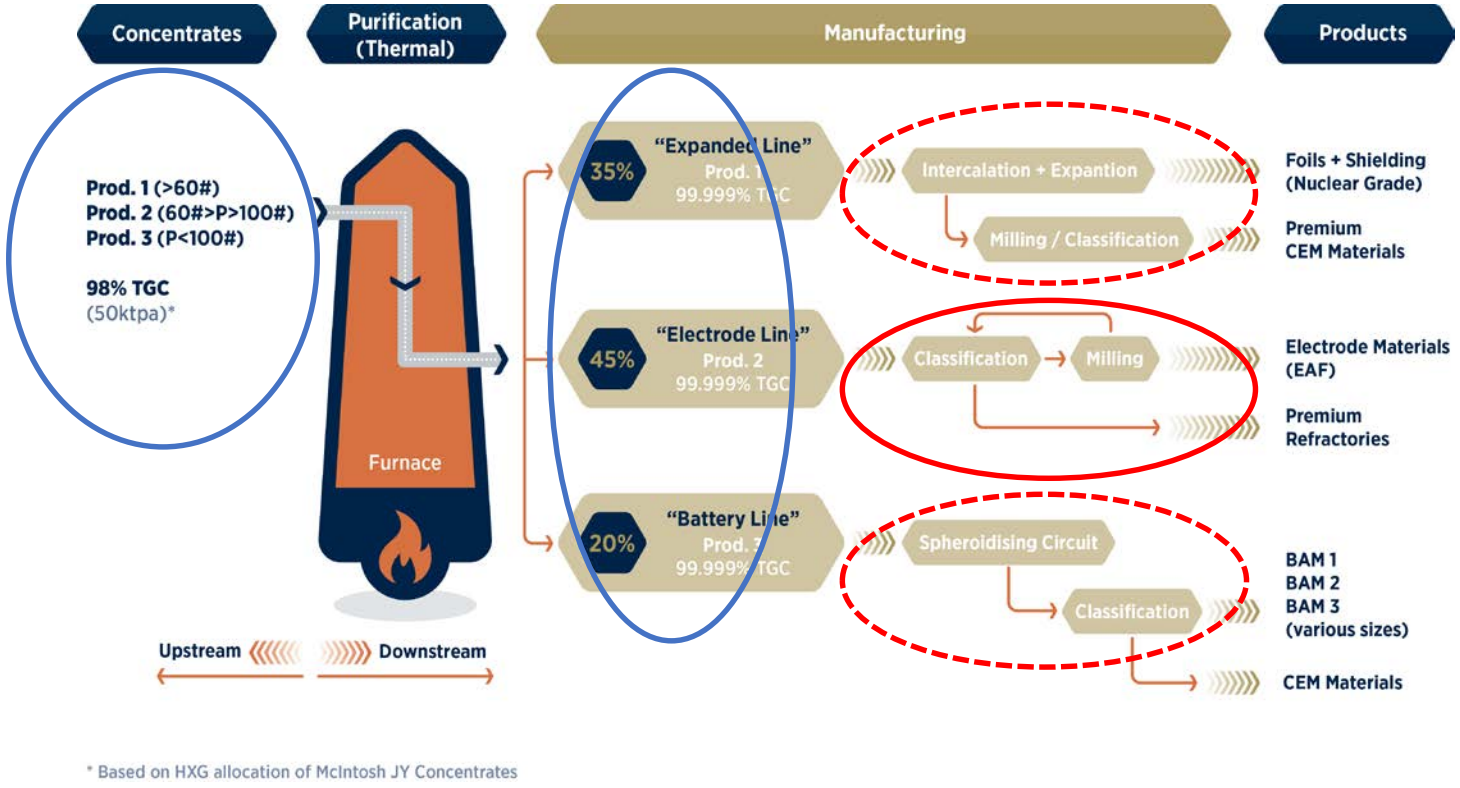
Low Cost purification underpins near 100% utilisation of mine-site concentrate output to value-added products.

Product Development

Fast track to commercialisation



* Based on HXG allocation of McIntosh JY Concentrates

1. Sell Concentrates

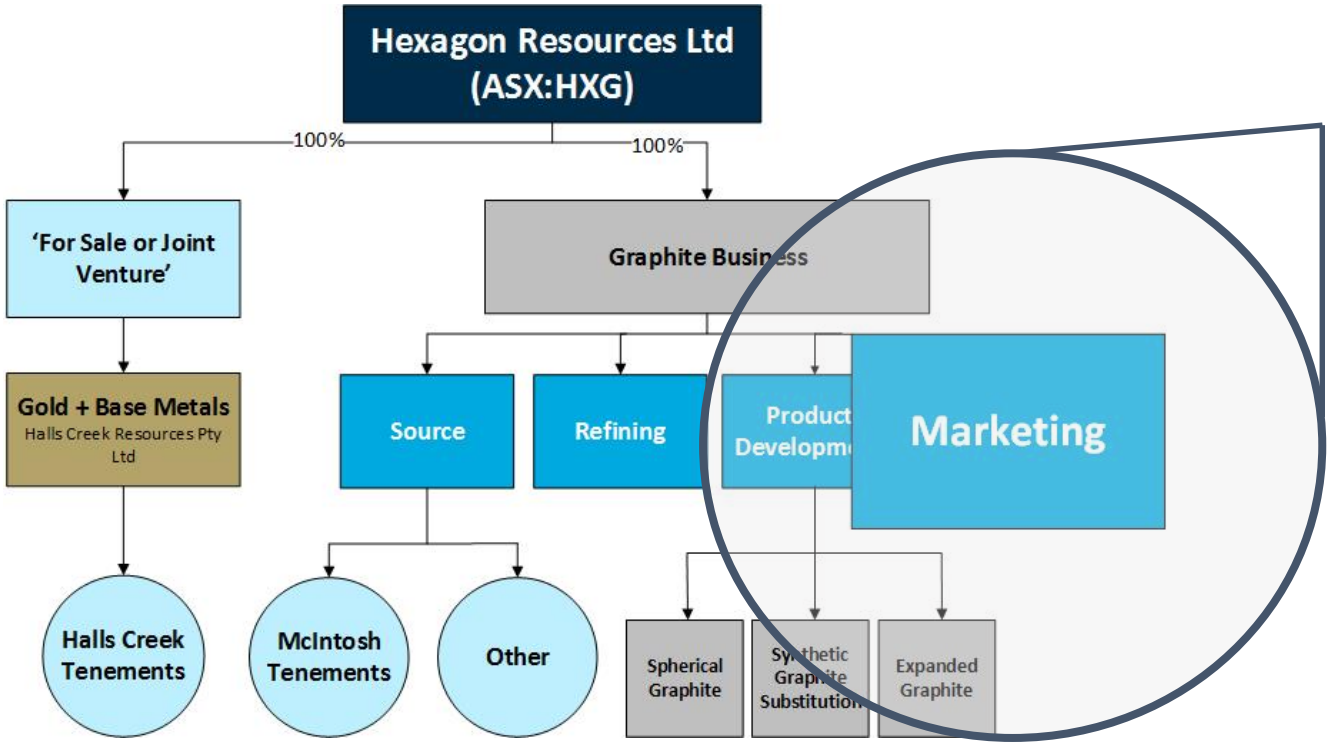
2. Sell Refined Raw Material

3. Prioritise shortest qualification process (Electrodes)

Opportunities to fast track commercialisation:

- ✓ Sell concentrates; excellent prices available for quality materials from stable jurisdictions.
- ✓ Refined, raw materials – can attract price premiums of up to 100%.
- ✓ For HXG – fastest qualification route is via classification and milling for traditional uses; the Electrodes Line - well specified and priced but currently dominated by synthetic graphite.
- ✓ Follow-through with sales of battery and expandable lines which require more flowsheet development and more stringent qualification process.

Business Structure - Marketing



Marketing

Low risk supply; flake attributes enable diverse products with many premium end-uses and customers, spanning new energy and established (and growing) industrial sectors.

- HXG intends to "Purchase" its own concentrate allocation from the McIntosh JV.
- Downstream Scoping Study in Progress

HXG will establish a dedicated marketing team able to match customer needs with product specifications.

Marketing - global market context for HXG products

Key Facts

- **Scale** – 2.44mtpa of graphite produced globally in 2017*:
  - 1.55 mtpa of synthetic graphite; and
  - 0.90 mtpa of natural (mined) graphite.
  - 76% of all graphite is from China
- **Natural graphite market** comprises:
  - 0.59 mtpa flake (66%)
  - 0.30 mtpa amorphous (34%)
  - .01 mtpa vein-flake (<1%)
- **Natural graphite sources** by country:
  - China – 0.63 mtpa (44:56 flake:amorphous, with flake now almost entirely fine and small sized flake.
  - Brazil – 0.01mtpa, followed by India, Canada and Ukraine
- **Synthetic graphite**:
  - precursor material is a by product from petroleum refining (PetCoke + other varieties)
  - produced by "graphitisation process"– involves heating in an Acheson Furnace for 3 weeks at 2,500 to 2,800^{0C}; Synthetic graphite quality is related to time, temperature and feedstock.

* Roskill; Natural & Synthetic Graphite Report 2018.

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Source:
** Various including, NAmLabs, Benchmark Minerals & 2016 figures from Roskill*

Marketing - global market context for HXG products

Market Drivers – EV's & ESS as well as EAF electrodes and pollution control in China

- **Natural flake graphite** is already flaky and crystalline; "graphitisation" has already occurred over the course of millions of years under the influence of temperature and pressure in the Earth's crust.
- **Synthetic graphite** is expensive but of a consistent quality which is critical for high end applications such as batteries and electrodes – but it is harder and less conductive than natural graphite and does not "expand".
  - Batteries - 0.4 to 0.5mtpa of graphite goes into batteries (*Forecast* growth rate of 20% pa-EV & ESS*)
    - Natural graphite comprises between 50 to 30% of the battery – mainly in the anode and;
    - the other 50 to 70% is synthetic graphite.
  - Electrodes – 1.1 mtpa of synthetic graphite is used for electrodes in electric arc furnaces (EAF), (*Forecast* growth rate of 16-18% pa*).
  - Currently 30% of the world's steel is made in EAF. China accounts for 50% of that steel production, but only 6% of steel in China is made by EAF which presents a major growth opportunity as smaller more efficient EAF replace larger, polluting Induction furnaces. It follows that with increased EAF steel production, there will be increased demand for recarburiser to make ductile steel and iron.
- Demand for graphite in batteries and certain industrial uses such as EAF steel production have strong growth dynamics over next 10 years.

* Roskill; Natural & Synthetic Graphite Report 2018.

Marketing – based on diversity and quality

Graphite is not a commodity, pricing is very opaque

HXG's estimate of Basket Price for Stage 1, 3 Product mix

Planned Product*	Size Specification (ASTM)	% of Output	HXG-97-98 % TGC $US/t FOB	
			Lower price range	Higher price range
Product 1 (Expanded)	P > 60#	**35**	1867	1996
			1931	
Product 2 (Electrodes)	100# < P < 60#	**45**	1332	1516
			1424	
Product 3 (Battery)	P < 100#	**20**	880	990
			935	
Basket Price Range		**100**	**1429**	**1579**
Assumed Price			**1504**	

Based on HXG Market Inquiries; SE Asia, USA and China

**Subject to completion of Feasibility Study*

Stage 1: Concentrate production (Prod. 1-3):

- **Sales**: conservative basket price range of A$1905* – A$2105/t, mid-point of A$2005/t.
- **OpEx**: A$1,038/t, from PFS* (May 2017).
- **Stage 2:** HXG is pursuing downstream processing to achieve higher prices and margins.

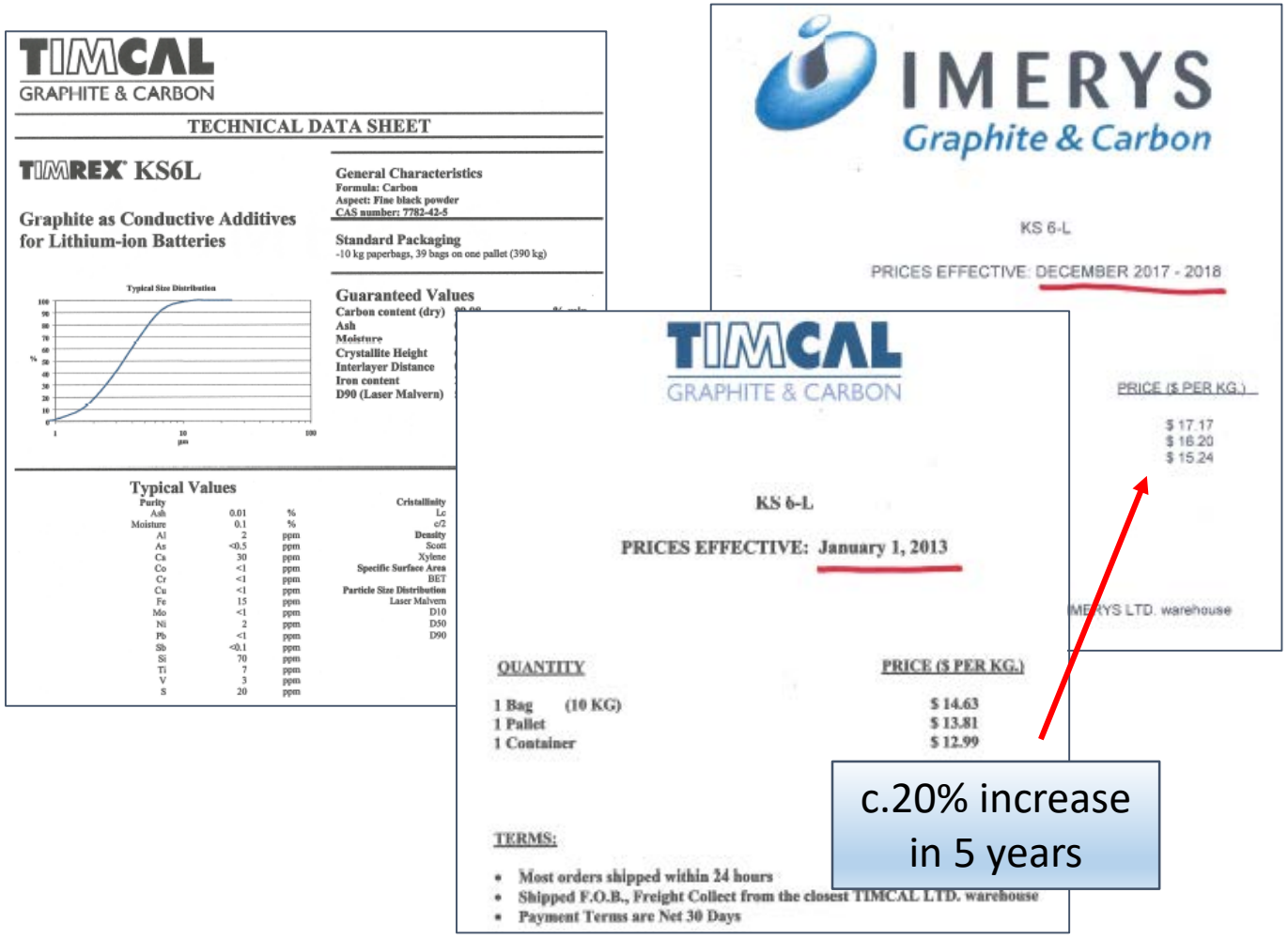
Pricing – Graphite Concentrates

- No OTC market or intermediate traders.
- Sales are via bilateral, confidential agreements – often, long term.
- "Reported" Pricing:
  - ✓ Useful for sentiment and trends;
  - ✓ Generally over-simplified e.g. focussed on concentrate grade and flake size; and
  - ✓ Over represented by pricing from China – volume trade.

- **AUD:USD=0.75*
- ***Now superseded, with Feasibility Study in progress*

Marketing – based on diversity and quality

Some examples of the value chain HXG is pursuing in downstream processing



Pricing – Final Products

- Examples from IMERYS*:

KSL6	c.US$16.2/kg CEM, synthetic graphite
KS15	c.US$9.6/kg CEM, synthetic graphite
BNB90	c.US$19/kg Expanded graphite – CEM, natural graphite
KS44	c.US$6.6/kg CEM, synthetic graphite
KS4	c.US$19.4/kg CEM, synthetic

- HXG is aiming to participate along these types of value chains where there are established and deep markets.
- **Scoping Study underway** to provide technical and financial data to build business case.

***Imerys S.A.** is a French multinational company which specialises in the production and processing of industrial minerals. It owns Imerys Graphite & Carbon a world leader in high-tech, high performance specialised graphite and carbons sold under its brands, such as TIMREX, ENSACO, SUPER P.

Marketing – based on diversity and quality

McIntosh Graphite meets many premium end use requirements

McIntosh Graphite has a unique range of technical attributes, including:

- Purity – ultra-high “5-9’s” achievable at a low cost.
- HOPG-like – rare, highly ordered crystalline structures – suitable to displace synthetic graphite.
- Specific flake morphology; rendering it easy and low cost to spheroidised and mill *(“easy” comparatively speaking).*
- Excellent electrochemical properties as shown by test work and coin cell cycling tests.

- which makes it highly sought after by a diverse range of intermediate processors and End-Users.

From a Customer’s perspective they are also attracted by:

- Diversity - to create a broader product range and a more stable business to build a relationship on.
- Enhanced technical performance compared to synthetic graphite.
- Environmentally sound manufacturing processes.
- Product sources from a stable jurisdiction such as Western Australia.

Near Term Milestones - *on the commercialisation path*

Stage 1: "Upstream" McIntosh Joint Venture (Mineral Resources - Manager)

- Mineral Resources JV Agreement signed (to replace binding HoA). Aug-Sept 2018
- 12,000 metre drill program in progress. Completion in Nov. 2018
- Feasibility study updates; drill results, resources, flowsheets, Opex and CapEx – ongoing until October, 2019

Stage 2: "Downstream" 100% HXG Focus

- Pilot Furnace agreement with US based technical partner. Oct-Nov 2018
- Scoping study on refining and downstream processing business case. December, 2018
- Test work - purification for refinery Feasibility Study. Q4 2018 to H1 2019
- Test work - product qualification for Electrodes Line and Battery Line. Ongoing 2018 & H1 2019

Other:

- Off-takes / Marketing Agreements – ongoing, inline with above test work
- Ongoing review for fast track production/marketing options e.g. other "McIntosh like" deposits
- Halls Creek transaction – IPO, Farm-out or Sale

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Near-term aim is to demonstrate the downstream business case with costs, prices and investment outcomes in scoping study.

Highlights

Low-risk strategy, fully funded graphite source and quality downstream products

- ✓ McIntosh is a high purity, natural crystalline flake graphite resource
- ✓ Stage 1 project to produce c. 100ktpa of graphite concentrates for a diverse range of premium priced end uses
- ✓ Stage 1 Project – fully funded to commercial production with Mineral Resources earning 51% project interest (subject to positive Feasibility Study)
- ✓ Exceptional downstream processing attributes and cost profile making it a highly sought after material by intermediate processors – "*easy means Low Cost and High Yield*", as in:
- ✓ Major downstream test work program and feasibility study underway and ongoing; focussed on:
    - Refining - pilot furnace, transitioning to semi-commercial Prototype Furnace.
    - Product development & qualification across Electrode Line, Expanded and Battery materials.
- ✓ Experienced management team - with specific graphite, project development, marketing and financing experience and leveraging strategic technical partnership with leading US graphite processing and battery group.
- ✓ On-Track to become a global-scale, vertically integrated graphite business.

Important Notices

Competent Persons' Attributions

Exploration Results and Mineral Resource Estimates
The information within this report that relates to exploration results, Exploration Target estimates, geological data and Mineral Resources at the McIntosh Project is based on information compiled by Mr Mike Rosenstreich who is an employee of the Company. Mr Rosenstreich is a Fellow of The Australasian Institute of Mining and Metallurgy. He has sufficient experience relevant to the styles of mineralisation and types of deposits under consideration and to the activities currently being undertaken 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 and he consents to the inclusion of this information in the form and context in which it appears in this report.

Metallurgical Test Work Outcomes
The information within this report that relates to metallurgical test work outcomes and processing of the McIntosh material is based on information provided by a series of independent laboratories. Mr Rosenstreich (referred to above) managed and compiled the test work outcomes reported in this announcement. A highly qualified and experienced researcher at NAmlabs planned, supervised and interpreted the results of the test work. Mr Michael Chan also reviewed the metallurgical test work outcomes. Mr Chan is a Metallurgical Engineer and a Member of the Australasian Institute of Mining and Metallurgy. Mr Chan and the NAmLab principals have sufficient relevant experience relevant to the style of mineralisation and types of test-work under consideration and to the activities currently being undertaken to qualify as a Competent Person(s) as defined in the 2012 edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves and have consented to the inclusion of this information in the form and context in which it appears in this report.

Technical Detail - references to Hexagon Website and recent ASX Reports
This Report aims to provide a high level summary of various technical aspects of the Company's projects. For more details on the underlying technical parameters the reader is referred to the ASX Reports on the Hexagon Resources Limited website, www.hexagonresources.com, in particular: May 31, 2017 on PFS Results, August 16, 2017 on Battery Test Work, November 6, 2017 on Large Flake endowment , November 23, 2017 on Expandability test work, Purification test work on January 16, 2018, Crystallinity determinations on March 6, 2018, Spheroidisation Test Yields on 21 June, 2018, and Cell Cycling results on 17 July, 2018; which contain the full JORC Tables on reporting of test work results.

Forward-Looking Statements
This document includes forward-looking statements. Forward-looking statements include, but are not limited to, statements concerning Hexagon Resources Limited's planned development and exploration programmes and other statements that are not historical facts. When used in this document, the words such as "could," "plan," "estimate," "expect," "intend," "may," "potential," "should," and similar expressions are forward-looking statements. Although Hexagon Resources Ltd believes that its expectations reflected in these forward-looking statements are reasonable, such statements involve risks and uncertainties and no assurance can be given that actual results will be consistent with these forward-looking statements.

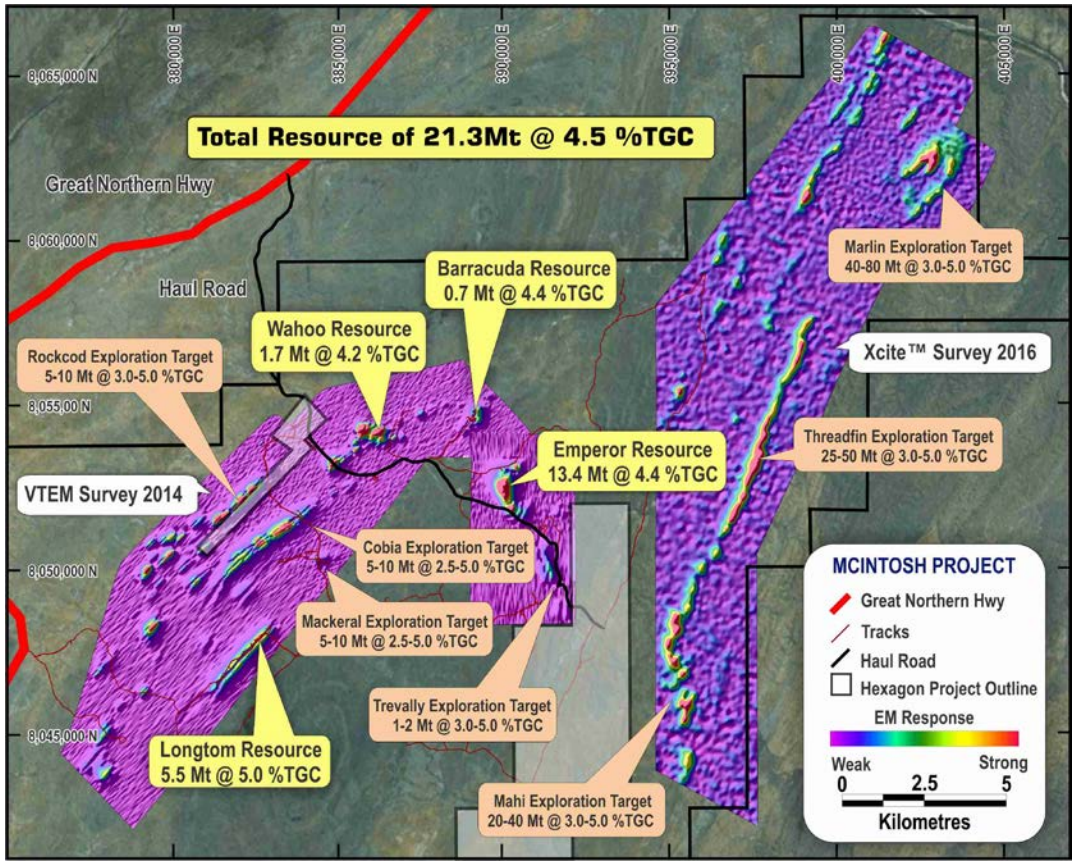
Attachment 1: Mineral Resource Detail

McIntosh Flake Graphite Project Mineral Resource as at May 2017 reported by deposit and above a 3% TGC cut-off grade.
As per ASX Report dated 25 April, 2017

Deposit	JORC Classification	Material Type	Tonnes (Mt)	TGC %	Contained Graphite (Kt)
Emperor	Indicated	Oxide	-	-	-
		Primary	8.2	4.3	352
	Inferred	Oxide	-	-	-
		Primary	5.3	4.5	235
	Indicated + Inferred	**Oxide + Primary**	**13.4**	**4.5**	**587**
Longtom	Indicated	Oxide	0.7	4.7	34.2
		Primary	3.5	5.0	173.4
	Inferred	Oxide	-	-	-
		Primary	1.3	5.2	66.9
	Indicated + Inferred	**Oxide + Primary**	**5.5**	**5.0**	**274.3**
Wahoo	Indicated	Oxide	0.1	4.2	3.5
		Primary	1.1	4.2	44.3
	Inferred	Oxide	0.1	4.1	3.4
		Primary	0.5	4.2	22.4
	Indicated + Inferred	**Oxide + Primary**	**1.7**	**4.2**	**70.1**
Barracuda	Inferred	Oxide	0.2	4.5	11.1
		Primary	0.5	4.4	21.1
	Inferred	**Oxide + Primary**	**0.7**	**4.4**	**32.2**
Total	**Indicated + Inferred**	**Oxide + Primary**	**21.3**	**4.5**	**963.6**

Note: Rounding may result in differences in totals for tonnage and grade

Location Plan – McIntosh Mineral Resources (in yellow). Also shown are Exploration Targets* (in brown) as reported to ASX 12 April. 2017.
Background is EM conductors from VTEM and Xcite surveys.



***Cautionary Statement:** The potential quantity and grade of the Exploration Targets is conceptual in nature, there has been insufficient exploration work to estimate a mineral resource and it is uncertain if further exploration will result in defining a mineral resource.

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