HEXAGON resources limited

ASX Announcement **18 December, 2018**

Hexagon achieves 99.999% graphite purity from pilot scale McIntosh sample

HIGHLIGHTS

- **99.999 wt. % C purity achieved from large 20kg sample – confirming ability for McIntosh graphite to exceed carbon purity specification of "Nuclear Graphite" industry.**
- **Previously the Company had announced similar purity for five, (sub 0.5kg) samples and is now increasing the scale of testing as the pilot and "downstream" feasibility programs are progressed.**
- **No notable levels of any potentially deleterious elements for most advanced high-tech applications, to include batteries, expandable graphite and electric arc furnace electrodes.**
- **Work on establishing a pilot facility for purification is well advanced as the Company focuses on fast-tracking opportunities to cash flow.**
- **Latest results:**
  - ✓ **are part of a focused program to establishing an electro-thermal fluidised bed purification furnace at pilot, qualification, and subsequently production scale; and**
  - ✓ **confirm the amenability of McIntosh flake to undergo this planned purification process to achieve exceptionally high purities for industry-leading low operating costs.**
- **Production of ultra-high purity, highly crystalline McIntosh flake graphite enables Hexagon to access unique, deep markets, and receive a premium price in value-added natural graphite product sales.**

OVERVIEW & COMMENTARY

Hexagon Resources Ltd (ASX: **HXG** or the **Company**) is pleased to report that follow-up purification test work on a large-scale, 19.5kg (43lbs) graphite sample from its McIntosh flake graphite project in Western Australia yielded, ultra-high purity, up to "five nines" (99.999%) graphite results. This further confirms and underpins Hexagon's downstream graphite strategy focussed on low-cost purification targeting high-end specialty markets.

Test work also confirmed virtually no notable concentrations of critical elements potentially deleterious to advanced batteries and to a number of other high-tech applications with the purified large sample batch.

NAmLab[1], Hexagon's US-based technical partner, successfully purified a 19.5kg batch of natural graphite concentrate from McIntosh grading 97.5 wt. % total graphitic carbon (TGC) to up to 99.9991 wt. % TGC. The purification process being simulated through this test work comprises an electro-thermal fluidised bed (EFB) furnace operating at approximately 2,500° C. EFB is an established

[1] NAmLab refers to Hexagon's US based technical partner whose identity cannot be disclosed due to confidentiality obligations.

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technology particularly suited to the thin McIntosh flake where minor impurities are readily accessible, occurring on the flake surface as opposed to inter-grown within the flake layers. This means that exceptional purities and a high production rate can be achieved with a short flake residence time in the "hot-zone" of the furnace without any halide gas addition or hydrofluoric acid leaching being deployed in the final flow sheet.

Hexagon is targeting industry leading low purification costs for refining of its graphite concentrate feed based on the operating parameters stated above. It considers these operating costs will compare favourably with acid purification techniques utilising mixed HF / H_2SO_4 acids as currently employed in China with low environmental and occupational safety management standards.

"*Five-nines* purification results for a 20kg batch sample is another important outcome towards commercialising our downstream graphite process," Hexagon's Managing Director, Mike Rosenstreich said.

"Hexagon is targeting specific larger scale markets. We have seen that our flake is easily purified, and when refined through the highly productive EFB furnace technology available to us, we expect to achieve an industry-leading low purification cost, producing an ultra-high purity graphite material. The issue is not whether the material is 99.95% pure; but what is in that remaining 0.05% - with critical impurity specifications for each element generally at the 1 to 100 ppm level (i.e. .0001 wt.% and less). There is an increasing awareness of the importance of purity in mitigating risks in high-tech applications.

"The carbon purity level of our material exceeds standards for "Nuclear Graphites". In combination with its highly crystalline structure, ultra-high purity opens unique access into deep markets such as displacing, high cost synthetic graphite; an existing market twice the size of natural graphite."

Hexagon has a Joint Venture Agreement over its upstream, McIntosh Project with Mineral Resources Limited (ASX: **MIN**) under which MIN funds all project development work to achieving Commercial Production. Hexagon intends to use its 49% allocation of graphite concentrates as feedstock for its downstream processing strategy, which includes purification to add value to its graphite resource.

Hexagon allocated a major portion of the $7 million it raised in May 2018 towards establishing a prototype purification facility. A pilot scale facility is currently under construction at NAmlab and is expected to be available to Hexagon in mid-2019. Hexagon will utilise this facility to finalise design parameters of a larger-scale qualification furnace and also continue to generate samples for marketing purposes. The Company is in discussions with NAmLab to fast track the establishment of a larger scale facility to be utilised for production qualification with Hexagon's customers.

A scoping study evaluating the downstream business case is in progress and expected to be complete in early Q2, 2019. This will comprise purification and downstream processing into two product lines: Battery Materials and Electrode Lines (refer to Figure 1) with generalised product price expectations illustrated in Figure2. The production target of 50ktpa in Figure 1 has been calculated on the basis of Hexagon's 49% (i.e. 50ktpa) joint venture equity allocation of 100ktpa bulk graphite concentrate production, which is derived from the production target presented in the Prefeasibility Study outcomes reported to ASX on 31 May, 2017. The Company confirms that it is not aware of any new information or data that materially affects the production target information included in the market announcement dated 31 May 2017 and, in the case of estimates of production targets, that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. A Feasibility study is currently under way for the upstream being managed by MIN. The key input parameters for Hexagon's, 100% owned downstream business scoping study are: power costs, logistics and labour which drive the location of the downstream facilities – which ideally is close to either the upstream graphite concentrate source or the customers for the final products.

Figure 1: Planned Graphite Product Lines based on McIntosh flake source

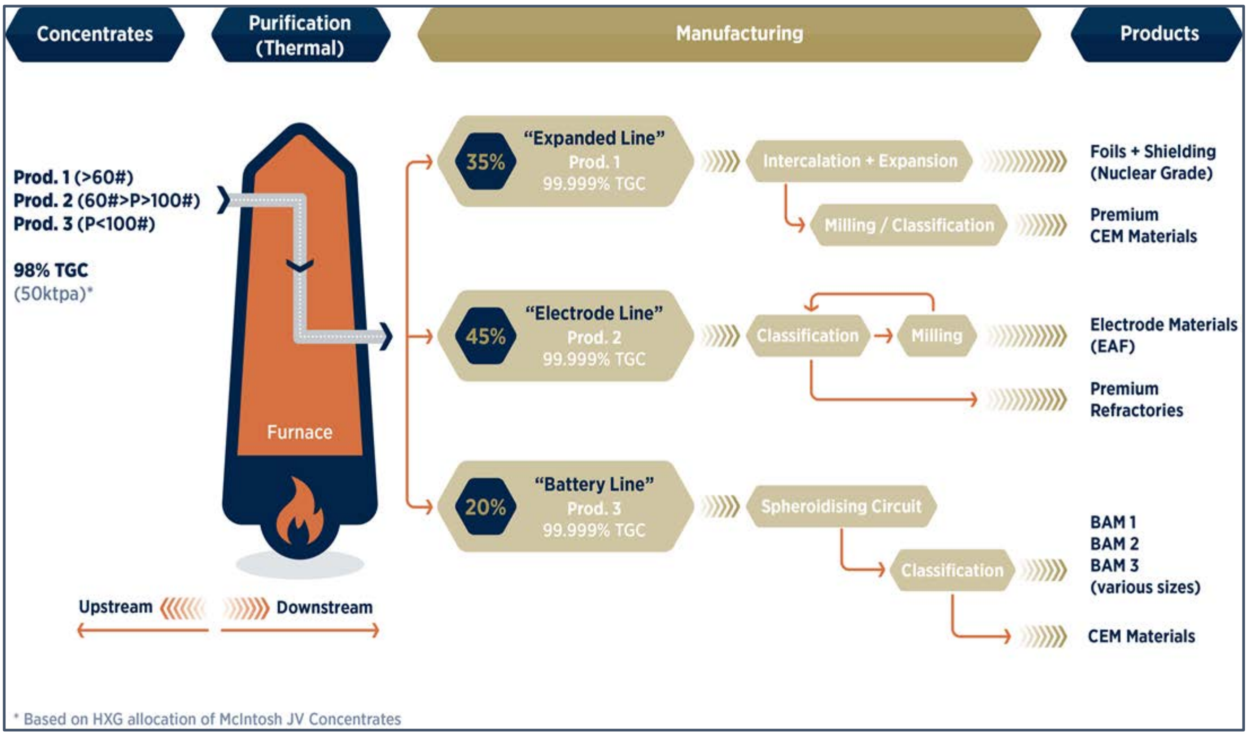


Figure 1 note: downstream test work currently underway on the following lines:

1. "Electrode" Line:

- Planned to comprise range of milled and classified graphite materials, including feedstocks to UHP electrodes (in EAF furnaces), high purity, ultra-fine lubricants and premium refractories used in speciality applications.

2. "Battery" Line for advanced battery applications:

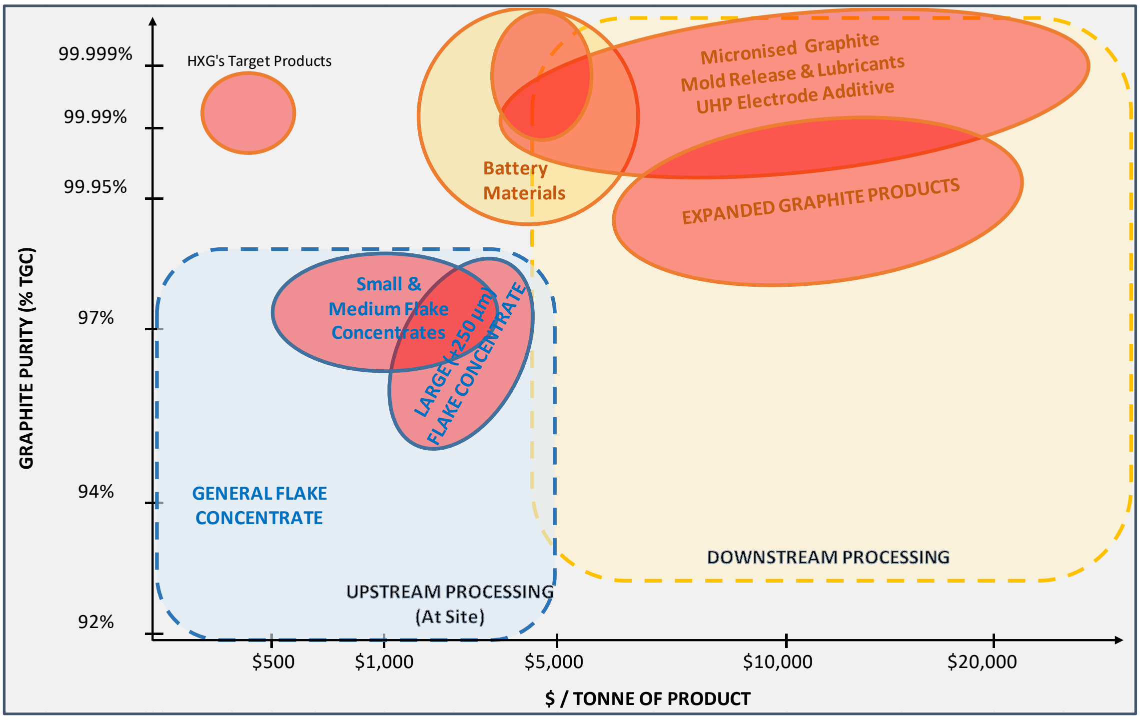
- Battery Anode Material (**BAM**) in several, narrow size distribution specifications
- Conductivity Enhancement Materials (**CEM**)

TECHNICAL DISCUSSION

Hexagon's US technology partner, NAmLab completed thermal purification test work on a 19.5kg (43lbs) sample of McIntosh graphite concentrate grading 97.5 wt. % TGC. Tests were aimed to generate simulation data for the design and operating parameters of Hexagon's planned EFB furnace(s) and demonstrate consistent purification results for a larger sample size (Refer Attachment 1; JORC Table 1).

In an EFB furnace, graphitic material is cascaded down into a counter current of upwelling nitrogen gas around a central electrode core and a crucible creating millions of short-lived electrical arcs to generate temperatures of between 2,000 and 3,000^{o}C. This is a continuous process with purified graphite collecting at the base of the furnace and impurities and ultra-fines being carried up the furnace flu and ultimately captured in a scrubber and baghouse system. This is in contrast to slow, static thermal purification systems such as Acheson furnaces, which operate in a batch mode with very long (approximately 3 weeks) residence times.

Figure 2: HXG's Planned Product Lines for Upstream & Downstream; Price and Purity Matrix*



**Schematic concept diagram to illustrate relationship between purity and price for HXG's planned products.*

For Hexagon's flake, the advantages of employing EFB furnaces include:

a. short-residence time required to volatilise the impurities due to the impurities located predominantly on flake surface and not embedded within the structure of flake as gangue;

b. uniformity of purification outcomes across the bulk feedstock;

c. precise control of the residence time via the counter-current control, and

d. the continuous nature of the operation.

These factors combined should achieve significantly lower operating costs than other graphite refining techniques.

To benchmark the EFB furnace performance, Hexagon also submitted a sub-sample from the same concentrate batch to a well credentialed laboratory[2] employing more traditional and widely utilised "Acheson style" furnaces – but with proprietary technical advances reducing the residence time to c. 8 days at 2,500 °C.

The purification outcomes utilising standard LOI carbon (C) analysis techniques were:

1. EFB prototype method:
   99.9991 wt. % TGC and 99.998 wt. % TGC to give average result of 99.999 wt. % TGC

2. Acheson Style:
   99.9845 wt. % TGC

Full ICP elemental analytical scans were run for both samples to determine the level of any potentially deleterious elements. A review of the results for typical battery contaminants such as

[2] Note: Acheson furnace test work was undertaken independently by Hexagon and not NAmLab.

silica, molybdenum, copper, aluminium, vanadium, uranium, iron, sulphur, tin or thorium indicated levels either below detection limits (sub ppm levels) or significantly below the specifications for advanced battery applications.

The refined concentrate grade of 99.999% wt. % TGC achieved is greater than the purity requirement of the advanced battery industry (i.e. 99.95 wt.% TGC) and even greater than the overall 99.995 wt.% TGC purity requirement identified in ASTM Standard D7219-08 "Standard Specification for Isotropic and Near-Isotropic Nuclear Graphite" – which is well understood by Hexagon. Processed materials of this stated purity have average basket prices (portfolio pricing) in excess of US $20,000 per tonne based on the commercial data sheets and pricing obtained by Hexagon from several international, specialist graphite suppliers for a range of comparable applications such as BAM, CEM and other expanded graphite products such as nuclear grade foils; relevant to the specific markets that it is targeting. This is supported by US Dept. of Energy reporting which highlights pricing of between $15 to $60/kg for high-specification battery materials.

It is important to understand that specification in relation to purity has two components; a minimum total graphitic carbon (TGC) content and a list of contaminants with maximum levels for each element. By way of example, a standard battery grade anode material (BAM) graphite has to have a minimum carbon content of 99.950 % wt. TGCC. That is, all impurities cannot exceed 0.05% or 500 ppm (parts per million). Note, in Hexagon's case impurities have already been reduced to .001% or less than 10 ppm. The second aspect of purity relates to "what is in that non-carbon 0.05%" because contaminants increase risk (e.g. risk of gassing inside a battery system), and the concentration of certain critical contaminants must be less than the specific maximum permitted level. Therefore, purity results must be qualified in conjunction with the data on graphite concentration of potentially deleterious elements. Naturally, the concentration of critical elements, such as arsenic, tin, molybdenum, antimony, silica, lead, cadmium, cobalt, nickel, iron, manganese, chrome, vanadium, copper, calcium and aluminium must be kept below their expected maximum levels, established in specifications for a particular battery manufacturer and cell model. Table 1 provides an elemental scan for the purified McIntosh concentrate focussing on critical battery contaminants indicating that battery contaminants comprise less than 9 ppm in total and each element falls well below the maximum limit specification.

COMMERCIAL IMPLICATIONS

Achievement of "5-Nines" purity at this larger, pilot scale sample size is another major milestone towards commercialisation that the Company is very excited about.

Hexagon is targeting enhanced purities with its natural crystalline flake graphite products in order to access higher-priced and higher margin market segments. This focused strategy also creates a more robust value proposition; namely lower impurities means lower risk for the customer and in any market downturns, McIntosh graphite would remain the preferred material in preference to the lower quality products.

The "premium" markets that Hexagon is targeting are some of the highest value in the industry sector, for example, those meeting or exceeding the ASTM Standard D7219-08 "Standard Specification for Isotropic and Near-Isotropic Nuclear Graphite", in excess of US $20,000 per tonne. As well, Hexagon's target markets have scale.

Many of these markets are currently supplied by synthetic graphite, which is a much larger market by volume and value than that of natural graphite. Examples of large volume markets that demand high purity and specific particle sizing include the electric arc furnace electrode market (e.g. iron, steel, magnesium, and aluminium smelting) which is a +1,000,000 tpa industry segment, the specialty refractory market comprising 80,000-120,000 tpa and the high grade mould release lubricant materials with a total market scale of 80,000 to 100,000 tpa.

Hexagon's current test work regimen is relevant to all these market segments and further test work and collaboration with customers is in progress to help focus our future product mix and specifications as the company matures to the level of commercial supply of its graphite. Pilot scale purification test work, is planned to transition to Qualification scale to lock in customer contracts and rapidly to full Production scale.

Table 1: ICP Elemental Scan of Purified McIntosh Graphite – critical battery impurities.

Element	Concentration PPM	Common* Max. Limit
S	7.4010	100
As	0.0000	1.0
Sn	0.4920	2.0
Mo	0.1538	2.0
Sb	0.0000	2.0
Si	0.5724	200
Zn	0.0000	2.0
Pb	0.0000	5.0
Cd	0.0000	5.0
Co	0.0000	3.0
Ni	0.0000	5.0
Fe	0.0000	30
Mn	0.0000	10.0
Cr	0.0000	5.0
V	0.0000	10.0
Cu	0.0000	5.0
Ca	0.0000	30
Al	0.0000	10

** Indicative for advanced battery grade graphite.*

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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 and Halls Creek Projects 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 and 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(s) 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 NAmLab planned, supervised and interpreted the results of the NAmLab test work. Mr. Michael Chan of Hexagon Resources, Ltd. 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.

Attachment 1: JORC Table 1.

JORC Table 1 Summary

- Geology – interpretation was undertaken based on a combination of geological logging data from drill holes, surface mapping and modelled conductive plates from the VTEM survey of 2014.
- Drilling method – the drilling method used is a combination of reverse circulation "RC" and diamond. The mineralisation for Emperor is defined by 9 RC drill holes for a total of 1,134 m, 21 diamond drill holes for a total of 2,940.5 m and 9 RC precollar / diamond tail holes for 1,369.3 m. The mineralisation for Longtom is defined by 37 RC drill holes for a total of 4,146 m, 1 diamond drill hole for a total of 54.9 m and 4 RC precollar / diamond tail holes for 620.6 m. The mineralisation for Wahoo is defined by 26 RC drill holes for a total of 2,023 m and 11 diamond drill holes for a total of 1,257.8 m. The mineralisation for Barracuda is defined by 35 RC drill holes for a total of 2,883m and 3 diamond drill holes for a total of 294.0m. Additional RC and diamond tail drilling was undertaken from mid-August to end of October, 2018 at the Emperor, Wahoo mineral resource areas and several prospects, namely Threadfin and Mahi Mahi. This data is still to be compiled and all assays are pending.
- Sampling – one-metre drill chip samples were collected throughout the RC drill programme in sequentially numbered bags. Core samples from diamond drill holes were collected based on geology and a minimum interval of 1m and a maximum of 2m.
- Sub-sampling - analysis was undertaken at ALS laboratory where samples initially undergo a coarse crush using a jaw crusher to better than 70% passing 6mm. Samples exceeding 3 kg were spilt using a Jones Riffle Splitter 50:50. Pulverising was completed to 85% passing 75µm in preparation for analysis.
- Sample analysis method – all samples were sent to ALS for preparation and for Total Graphitic Carbon (TGC), Total Carbon and Total Sulphur (S) analyses. A 0.1 g sample is leached with dilute hydrochloric acid to remove inorganic carbon. After filtering, washing and drying the remaining sample is roasted at 425°C to remove organic carbon. The roasted residue is analysed for carbon using a high temperature LECO furnace with infrared detection for percentage units.
- Duplicate analysis and analysis of Certified Reference Material (standards) and blanks was completed and no issues identified with sampling reliability or contamination.
- Estimation methodology – grade estimation was undertaken using Surpac software to model graphitic mineralisation using a nominal 3% TGC cut-off grade and to estimate TGC by ordinary kriging at Emperor, Longtom and Wahoo and inverse distance (cubed) at Barracuda.
- Resource Classification – classification is based on confidence in geological and grade continuity using the drilling density, geological model, modelled grade continuity and conditional bias measures (slope of the regression and kriging efficiency) as criteria. Indicated Mineral Resources are defined where the drill spacing is sufficient to assume geological and grade continuity and where diamond drill samples have been assessed for graphite quality. As a general rule, drill spacing of 40 m by 40 m or less resulted in an Indicated classification for Emperor and Wahoo and areas with broader spacing are classified as Inferred. For Longtom drill spacing of approximately 25 m by 100 m or less resulted in an Indicated classification and areas with a broader spacing are classified as Inferred. The results from metallurgical test work at the McIntosh project have been considered for Mineral Resource classification. The likelihood of eventual economic extraction was considered in terms of possible open pit mining, likely product specifications, possible product marketability and potentially favourable logistics to port and it is concluded that graphite at the McIntosh Project is an Industrial Resource in terms of JORC Code Clause 49.
- Cut-off parameters – the Mineral Resource is reported above a 3% TGC cut-off grade.
- Mining modifying parameters – planned extraction is by open pit mining and mining factors such as dilution and ore loss have not been applied.
- Metallurgical methods - no metallurgical assumptions have been built into the resource model. Data from mineralogy and preliminary metallurgical test work has been considered for Mineral Resource classification.

- In June, 2017, ALS completed pilot processing program of a 2.4 tonne bulk composite sample collected from diamond core drilling at Emperor and generated 100kg of concentrate to provide samples for potential offtake companies. This material achieved a high graphite grade of 97.6% TGC but because it was targeting a flake size of c. 106 microns, this sample was not representative of the potential recoverable flake size distribution. This is because at that time the Company's marketing focus was solely on a product for the lithium ion battery anode market and the perceived optimum feed size for those plants of c. 106 microns.

  The 445 drill core samples utilised for the ALS bulk sample which were processed into graphite concentrate were each weighed (total weight was 2,383.8kg). Head grade was calculated on a weighted average basis as well as assayed from the 2.4t composite sample (4.77% TGC).

  The 20kg of concentrate that was purified was a subsample of the 100kg generated by the ALS Piloting process obtained by splitting.

  Following purification a spinning riffle splitter was utilised to extract two 15g samples which were then assayed.

  The latest mineralogical examination of drill samples indicates that graphite occurs across a range of sizes from fine to very large flake, with the majority (80%) being in the size range of 150 to greater than 450 microns. Results of metallurgical test work on core samples collected from Emperor and Wahoo indicate a potentially saleable product for a variety of end uses including the advanced battery market and various industrial applications. Recent screen size analysis of concentrate indicates 84% of the graphite flake is greater than 180 microns. The convergence of these two data sets indicates the presence of predominantly larger flake material at the Emperor Deposit.

  The concentrate assaying and sizing work was undertaken at an ISO 9001:2008 accredited laboratory in the US, highly experienced in graphite applications and test work, utilising conventional assaying and sizing techniques. This same facility has completed two rounds of refining test work; the first on five – sub samples of the concentrate generated at ALS (see above) and the second on a bulk 19.6 kg sample from the same source. Both results indicated the ability to achieve graphite purity of greater than 99.95 wt. % graphitic carbon.

  There is a large body of test work, in progress from sample sources from the Emperor Resource, this comprises two distinct programs:

  a. What is referred to as the "Upstream" test work which is aimed at refining and optimising g the upstream flotation concentration of the ore to a range of graphite concentrate products with specific size specifications;.
  b. What is referred to as the "Downstream" test work is to examine and verify the downstream or secondary processing flowsheet parameters and responses to develop a marketing strategy based on the technical attributes of the material and to match it with end-users requirements.

Appendix 1: JORC Table 1 Emperor Resource

Section 1 Sampling Techniques and Data

Criteria	JORC Code Explanation	Commentary
Sampling techniques	• *Nature and quality of sampling* • *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.*	**1. Reverse Circulation** • RC drilling used high pressure air and a cyclone with a rotary splitter. • Samples were collected at one-metre intervals. • Approximately 50% of samples were not submitted for assay due to the visual non-mineralised nature of the material collected. All graphitic intervals were submitted for analyses. • Duplicate and standards analysis were completed and no issues identified with sampling reliability. • Samples were sent to the ALS laboratory in Perth for assay preparation and then sent to ALS in Brisbane for Total Graphitic Carbon (TGC) analyses. • All samples were pulverised to better than 85% passing 75µm with a 10 g aliquot taken for assay. • Sampling was guided by Hexagon's protocols and QA/QC procedures. • RC drilling samples of 3 to 5 kg weight were shipped to the laboratory in plastic bags; samples were pulverised and milled for assay. **2. Diamond Drilling** • Drill samples in this program were collected based on geology, varying in thickness from 0.1 m to 2 m intervals. Sampling was completed so samples could be composited to one metre intervals within the geological units. • Core samples were quarter split HQ3 core using a diamond bladed saw and sent to the ALS laboratory in Perth for assay preparation and then sent to ALS in Brisbane for Total Graphitic Carbon (TGC) analyses. • All samples were pulverised to better than 85% passing 75µm with a 10 g aliquot taken for assay. • Duplicate samples, CRM standards and blank material were used during the drill programs. Duplicates collected after each 50 samples. Standards were inserted for samples ending in *00,*20,*40,*60 and *80 and blanks for samples ending in *01,*21,*41,*61 and *81.Sampling was guided by Hexagon's protocols and QA/QC procedures.
Drilling Techniques	• *Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (e.g. 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).*	**1. Reverse Circulation** • RC drill holes (total of 2,154 m from 18 holes) – completed with face sampling hammers and collected through a cyclone. Sample recovery was estimated at a percentage of the expected sample, sample state recorded (dry, moist or wet), samples tested with 10:1 HCl acid for carbonates and graphite surface float. • RC drilling was completed by Egan drilling using an X400 drill rig and United Drilling Services using a DE840 drill rig. **2. Diamond Drilling** • Diamond drill holes (total of 2,940.5 m for 21 holes) – collected HQ_3 core using a 3m core barrel and drilled by Terra Drilling using a Hanjin Powerstar 7000 track mounted rig. Core orientation was recorded using a Reflex EZ Shot instrument. • RC pre-collars were drilled with HQ_3 diamond tails for a total of 1,369.3 m from 9 holes.
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.*	**1. RC Drilling** • A face sampling hammer was used to reduce contamination at the face. • 1 m drill chip samples, weighing approximately 2 kg were collected throughout the drill programme in sequentially numbered bags. • Split samples were recovered from a cyclone and rig-mounted cone splitter. The sample recovery and physical state were recorded. • Every interval drilled is represented in an industry standard chip tray that provides a check for sample continuity down hole. **2. Diamond drilling** • Core recovery was excellent. Recoveries were measured for each run between core blocks and measurements recorded. Core was photographed and logged for RQD and geology.

		• Analysis from one pair of twin holes drilled at Hexagon's Longtom resource (an adjacent and similar style graphite deposit) noted a lower graphite content in the RC samples when compared with diamond core. Insufficient work has been completed on comparing RC and diamond methods to rule out drilling by RC.
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 the relevant intersections logged.*	• All RC and diamond drilling (100%) was logged for geology in the field by qualified geologists. Lithological and mineralogical data was recorded for all drill holes using a coding system developed specifically for the Project. Primary and secondary lithologies are recorded in addition to texture, structure, colour, grain size, alteration type and intensity, estimates of mineral quantities, graphite intensity and sample recovery. The oxidation zone is also recorded. • No adjustments have been made to any assay data • Geological logging is qualitative in nature. • Diamond drilling logging also recorded recovery, structure and geotechnical data. • Diamond core was orientated using the Reflex orientation tool. • Core was photographed both dry and wet.
Sub-sample techniques and sample preparation	• *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.*	**1. RC Drilling** • All samples marked with unique sequential sample number • RC drilling samples were bagged at the drill site in calico bags with a second outer plastic bag to prevent loss of fines. The sample sizes are considered to be appropriate to the grain size of the material being sampled. • 1m RC drilling samples were submitted to either Actlabs Canada or ALS laboratories in Perth. The samples were riffle split on a 50:50 basis, with one split pulverised and analysed for Total Graphitic Carbon (TGC), Total Carbon (TC) and Total Sulphur (TS) using a LECO Furnace, and the other split held in storage. • For RC samples, standards and field duplicates were inserted at an approximate rate of 1 in every 20 samples collected. Duplicate assay results exhibit good correlation with the original assays and no consistent bias is evident. • Sample preparation: 1. Coarse crush using a jaw crushed to better than 70% passing 6mm. 2. For samples exceeding 3kg received mass, riffle split using a Jones Riffle Splitter 50:50 3. Pulverise up to 3kg of coarse crushed material to better than 85% passing 75µm particle size 4. Small aliquot (~10g) taken for assay. **2. Diamond Drilling** • Diamond drill core was cut into half core (used for metallurgical testing) and the remaining half sawn into quarter core using diamond blade core-saw. Quarter core was used for samples and duplicates. Core cutting was carried out under consignment at Westernex in Perth. • Duplicate assay results exhibit good correlation with the original assays and no consistent bias is evident. • Sample preparation: 1. Coarse crush using a jaw crushed to better than 70% passing 6mm. 2. For samples exceeding 3 kg received mass, riffle split using a Jones Riffle Splitter 50:50 3. Pulverise up to 3 kg of coarse crushed material to better than 85% passing 75µm particle size 4. Small aliquot (~10 g) taken for assay. • Sampling procedures and sample preparation represent industry good practice:
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.* • *Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.*	• The assaying and laboratory procedures used are industry standard and are appropriate for the material tested. • Sampling was guided by Hexagon's protocols and QA/QC procedures. • For RC samples, standards and field duplicates were inserted at an approximate rate of 1 in every 20 samples collected. • Field duplicates were inserted into diamond core samples at a rate of 4 every 100 samples, standards at a rate of 4 every 100 samples and blanks at 2 every 100 samples.

		• Statistical analysis of standards, blanks and duplicates during the QAQC process showed that the data was satisfactory. • No issues were identified with sampling reliability
Verification of sampling and assaying	• *The verification of significant intersections by either independent or alternative 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.*	• Hexagon QA/QC checks show that all samples are within acceptable limits. No adjustments to assay data have been made based on the analysis of duplicates, standards and blanks. • Standards from ALS laboratory were found to be acceptable. • Duplicate analysis was completed and no sampling issues were identified. • CSA verified several graphite intersections in core and RC chip samples during a visit to Hexagon's warehouse during January 2015. • During a site visit in October 2015, a geological consultant from CSA verified that the diamond drilling, geological logging and sampling practices were of industry standard. The consultant also verified graphite intersections in core samples. • Analysis from one pair of twin holes drilled at Hexagon's Longtom resource noted a lower graphite content in the RC samples when compared with diamond core. It is suggested that RC samples are biased due to the loss of fine material. The majority of samples used in the estimation for Emperor are diamond core. • The Hexagon database is hosted in a SQL backend database, ensuring that data is validated as it is captured and exports are produced regularly. Assay results are merged into the database from the lab certificates limiting transcription or mapping errors from occurring. • No adjustments have been made to the results.
Location of Data points	• *Accuracy and quality of surveys used to locate drillholes (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.*	• 11 diamond core drill holes were sampled using ½, ½ and ¾ drill core to achieve a composite sample considered representative of the Emperor deposit. • These are a subset of a total 48 drill holes. • 45 drill hole collars, including all of the 11 sampled holes, were surveyed using Differential GPS by a surveyor from Savannah Nickel mines for the 2015 program and a contract surveyor (MNG survey) from Broome. The degree of accuracy of drill hole collar location and RL is estimated to be within 0.1 m for DGPS. 3 collars were surveyed using a handheld Garmin 62S and Garmin 76c Global Positioning System (GPS) with a typical ±5 m accuracy. Topography from contours generated from a LiDAR survey was used to validate collar points and assign RL values to the 3 holes surveyed by GPS that had an RL >2 m different to the topography. • Downhole surveys completed for all holes where possible (48 holes). EZshot survey data was used where downhole surveys were not successful. All holes used in the resource have been downhole surveyed using a gyro by ABIM Solutions. • Topographic control was adequate for the purposes of Mineral Resource estimation. • The map projection used is the Australia Geodetic MGA 94 Zone 52.
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.*	• Drill spacing on an approximate 40 m by 40 m grid throughout the majority of the deposit, dropping to 40 m across strike by 80 m along strike to the south of the deposit. • Geological interpretation and mineralisation continuity analysis indicates that data spacing is sufficient for definition of a Mineral Resource.
Orientation of data in relation to geological structure	• *Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.* • *If the relationship between the drilling*	• Holes generally drilled dipping at -60° targeting the fold hinge and limbs. • Diamond drill core has been orientated using a Reflex ACE tool 9Act II), with α and β angles measured and positioned using a Kenometer. MapInfo software was used to calculate dip and dip direction for each structure.

	orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.	• The relationship between the drilling orientation and the orientation of key mineralised structures is not considered to have introduced a sampling bias.
Sample Security	• *The measures taken to ensure sample security.*	• Unique sample number was retained during the whole process • RC and diamond samples were placed into calico bags and then into self-sealing plastic bags prior to being put into bulka bags. The bulka bags were then transported by road. RC samples were sent to the ALS laboratory in Brisbane for preparation and analysis and diamond core samples were sent to ALS in Perth for preparation and then to ALS in Brisbane for analysis. A small amount of core samples were sent to Actilabs. • Drill core transported to Westernex was secured on pallets with metal strapping and transported to Perth by road train. • The sample security is considered to be adequate.
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	• Sampling techniques and data collected methods have been audited by CSA during a site visit in October 2015 • Field data is managed by an independent data management consultancy Rocksolid Solutions. • All data collected was subject to internal review

Section 2 Reporting of Exploration Results

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.*	• Drilling was recently completed at the Emperor deposit, on exploration leases E80/3864 and E80/4841, Mahi Mahi on exploration lease, E80/4825 and Threadfin, exploration leases, E80/4739 and E80/4931. These tenements are held by McIntosh Resources Pty Ltd, a wholly owned subsidiary of Hexagon Resources. Mineral Resources Limited is managing the current exploration on the project under the Joint Venture Agreement signed 7 November, 2018 whereby Mineral Resources may earn a 51% interest in the tenements by funding all feasibility and development activities through to Commercial Production. .
Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties.*	• The East Kimberley has been largely explored for base metals and diamonds with no active previous exploration for graphite. Graphite had been noted by Gemutz during regional mapping in the Mabel Downs area for the BMR in 1967, by Rugless mapping and RAB drilling in the vicinity of Melon Patch bore, to the east of the Great Northern Highway in 1993 and has been located during nickel exploration by Australian Anglo American Ltd, Panoramic Resources Ltd and Thundelarra Resources Ltd over the last 20 years.
Geology	• *Deposit type, geological setting and style of mineralisation.*	• The McIntosh Project graphite schist horizons occur in the high grade terrain of the Halls Creek Mobile Zone of Western Australia. The host stratigraphy is the Tickalara Metamorphic which extend for approximately 130 km along the western side of the major Halls Creek Fault. The metamorphic rocks reach granulite metamorphic facies under conditions of high-temperature and high pressure although the metamorphic grade in the McIntosh Project area appears to be largely upper amphibolite facies with the presence of key minerals such as sillimanite and evidence of original cordierite. • Hexagon has identified potential graphite schist horizons based on GSWA mapping and EM anomalism over a strike length in excess of 15 km within the project area, with potential for an additional 35 km strike length of graphite bearing material from lower order EM anomalism.

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:*
	  ◦ *easting and northing of the drill hole collar*
	  ◦ *elevation or RL (elevation above sea level in metres) of the drill hole collar*
	  ◦ *dip and azimuth of the hole*
		• 21 diamond drill holes for 2,940.5 m and 18 RC drill holes for 2,154 m and 9 RC precollar diamond tail (RD) holes for 1,369.3 m completed at the Emperor deposit.
		• The location of the 11 diamond drill core holes sampled to provide samples for the 2.4t bulk sample utilised by ALS to generate c. 100kg of graphite concentrate is provided in Table 1 below.
		• Additional drilling was undertaken between August and October 2018, however these samples are still being processed and none of this material is included in any samples relating to this report.

	• *down hole length and interception depth* • *hole length.*	
Data aggregation methods	• *In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.*	• Data compiled in Excel and validated in Datashed by an external data management consultancy. • RC samples were all 1 m in length, diamond core samples vary between 1m and 2 m samples. • Metal equivalents are not reported as this is an industrial mineral project where the mineral properties define grade (e.g. flake size and purity). • A nominal 3% Total Graphitic Carbon cut-off has been applied in the determination of significant intercepts. • The 445 core samples utilised for the ALS bulk sample which was processed into graphite concentrates were each weighed (total weight was 2,383.8kg). Head grade was calculated on a weighted average basis as well as assayed from the 2.4t composite sample (4.77% TGC). • The 20kg of concentrate was a subsample of the 100kg generated by the ALS Piloting process obtained by splitting. • Following purification a spinning riffle splitter was utilised to extract two 15g samples which were then assayed.
Relationship between mineralisation widths and intercept lengths	• *If the geometry of the mineralisation with respect to the drill hole angle is known, its 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.*	• Mineralised widths at Emperor are estimated to be typically between 5 m and 70 m, compared with RC samples of 1m width. There is a very close relationship between the graphitic schist unit and Total Graphitic Carbon (TGC%) assays. The presence of graphitic schist is clearly evident in both the RC chips and diamond drill core so that the assay widths can be clearly related to the geological logs. • The graphitic schist horizon has been interpreted as an anticlinal fold. Angled drill holes (generally 60º) have targeted the mineralised unit with the priority to intersect the limbs perpendicular to the strike of the graphitic schist horizon, although in some areas this was not possible and holes were drilled down dip. However interpreted EM data and the width of intersections where holes were drilled perpendicular to the unit have allowed for a good indication of unit thickness to be made and applied in areas where the information is not available.
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.*	• Not Relevant as metallurgical test work results are being reported. However Figure 1 illustrates where a purification furnace fits in to the downstream flow sheet.
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.*	• Metallurgical results for a bulk 19.5kg sample of concentrate are being reported. Two sub samples were analysed and both results reported. As well, all battery critical deleterious elements are reported.
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.*	• Relevant to the test work being reported – the 2,383,8kg Emperor bulk sample was selected on the basis of being representative of the Emperor deposit. This material was subsequently crushed, milled and concentrated at a pilot scale to produce 100kg of graphite concentrate grading 97.6% TGC. The purification test results relate to a random, 20kg sub-sample of this concentrate. • Metallurgical test work is underway and being reported progressively on McIntosh concentrate material produced from previous test work. The results reported herein are derived from such a sample and is focused on refining or purification of the graphite concentrate as part of a downstream processing route. This recent work is being managed and undertaken by a well credentialed and experienced private company in the US and Hexagon staff have inspected these facilities. Hexagon has a confidentiality obligation not to disclose the entities name and hence refers to it as NAmLab. The test work completed by NAmLab, which achieved 99.999 wt. % TGC was designed to simulate the utilisation of a fluidised bed electrothermal furnace operating at c. 2,500ºC.

		• In an EFB furnace, graphitic material is cascaded down into a counter current of upwelling nitrogen gas around a central electrode core and a crucible creating millions of short-lived electrical arcs to generate temperatures of between 2,000 and 3,000oC. This is a continuous process with purified graphite collecting at the base of the furnace and impurities and ultra-fines being carried up and exit as furnace flue and ultimately captured in a scrubber and baghouse system. This is in contrast to slow, static thermal purification systems such as Acheson furnaces, which operate in a batch mode with very long (approximately 3 weeks) residence times. Another well credentialed and experienced laboratory was also engaged to benchmark the NAmLab purification results utilising traditional Acheson Furnace type technology but carry with a more advanced pyrolysis features in it
Further work	• *The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).*	• Continuation of the test work programs gathering mineralogical data to formulate a geometallurgical model, primary processing test work to improve the Stage 1 process flow sheet and continue the downstream processing test work on material derived from the stage 1 process flow sheet.

Table 1: Location & Drill hole Parameters for Diamond Core Holes sampled for the Pilot Test work undertaken by ALS in 2017.

Hole ID	Hole Type	Grid_ID	East	North	RL	Max Depth
T6GDD164	DD	MGA94_52	389967	8052593	406.0	130.7
T6GDD165	DD	MGA94_52	389908	8052581	408.5	138.24
T6GDD167	DD	MGA94_52	389994	8052435	410.3	183.25
T6GDD168	DD	MGA94_52	390118	8052458	415.2	155.53
T6GDD171	DD	MGA94_52	389954	8052668	399.9	95.05
T6GDD173	DD	MGA94_52	389881	8052655	405.1	141.2
T6GDD176	DD	MGA94_52	389949	8052509	411.8	171.2
T6GDD192	DD	MGA94_52	390004	8052642	405.0	99.2
T6GDD193	DD	MGA94_52	389940	8052547	411.1	201.3
T6GDD194	DD	MGA94_52	389977	8052476	412.6	179
T6GDD195	DD	MGA94_52	389908	8052709	400.3	102.3