Lamboo Resources is an Australian company focusing on substantial flake graphite assets located in the East Kimberley and South Korea



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# SIGNIFICANT McINTOSH METALLURGY UPDATE - FLAKE GRAPHITE TARGETS 2, 5 AND 6

## **Highlights**

- Metallurgical testing of RC pulps from McIntosh Targets 2, 5 and 6 have achieved Total Graphitic Carbon (TGC) values of 98.03%, 96.26% and 97.43% TGC respectively after simple flotation and gravity separation techniques coupled with chemical leaching.
- Graphite flake size at Targets 2, 5 and 6 can be classified as medium to coarse grained based on petrographic and MLA studies.
- Flake graphite concentrate from a 1 tonne RC sample aggregate from Target 1 will be sent shortly for testing by potential end users.

Results of initial metallurgical testwork carried out at Guangzhou Research Institute of Non-ferrous Metals (GZRINM) in southern China have now been received and indicate McIntosh Targets 2, 5 and 6 can produce strong preliminary flake graphite concentrates after simple flotation and gravity separation techniques. Ongoing beneficiation culminating in chemical leaching can achieve in excess of 98% TGC with no deleterious minerals. The purity of the graphite concentrates from Targets 2, 5 and 6 is comparable to Target 1 based on the XRF analyses and should be upgradable to 99.9% purity (Appendix 1 – Table 6).

Technical Director, Dr Craig Rugless, noted "These studies form part of our ongoing commitment to fully realising the potential of the global McIntosh flake graphite resource. Importantly target areas - Targets 2, 5 and 6 contain coarser flake graphite and are achieving excellent metallurgical results."



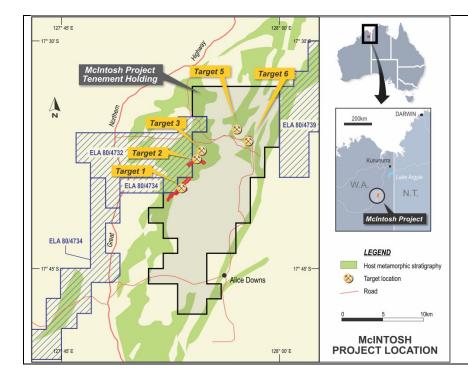


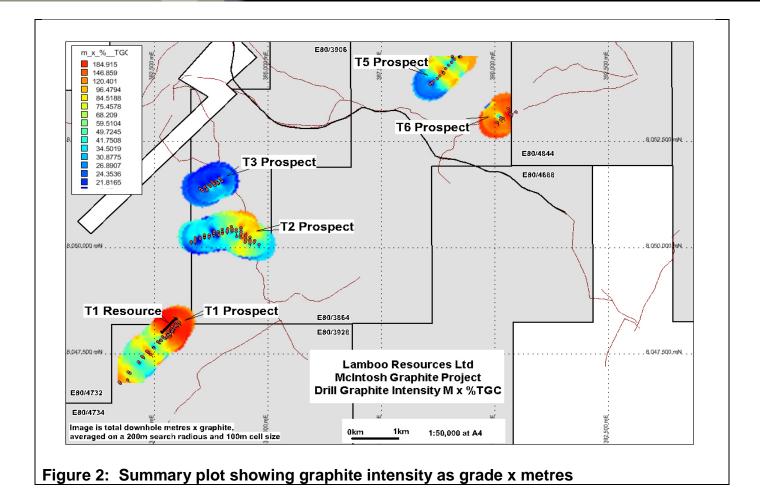
Figure 1: Location of flake graphite Target areas in the McIntosh Project that are currently subject to baseline environmental studies.
Lamboo ELA applications –hatched.

## **McIntosh Graphite Targets - Grade x Meter Summary**

Figure 2 represents a graphite intercept (m) x graphite grade (%TGC) image of the McIntosh targets based on RC and diamond drilling completed to date. The hot colours clearly outline the priority areas with Target 1 showing up as the main target although the eastern portion of Target 2, the northern portion of Target 5 and Target 6 are clearly developing as important areas requiring additional work. Targets 1, 5 and 6 remain open along strike and will potentially add to the global resource at McIntosh. The preliminary metallurgical testing of Targets 2, 5 and 6 has been very encouraging and has provided the impetus for planned resource drilling during the coming field season.

## McIntosh Targets 2, 5 and 6 - Metallurgical Flotation Studies

Metallurgical testwork by GZRINM has confirmed that the use of simple, cost-effective reagents such as lime and sodium silicate achieves good recoveries of flake graphite during the flotation process. Overall, the results of metallurgical testwork carried out at the Guangzhou Research Institute of Non-ferrous Metals (GZRINM) in southern China indicate that McIntosh Targets 2, 5 and 6 achieve higher preliminary flake graphite concentrates than were initially achieved for Target 1 (refer Table 1). The adoption of lime with the treatment of the McIntosh graphite was not only helpful in depressing sulphides but also accelerated the settlement of minerals making thickening easier. GZRINM concluded that the simple and stable beneficiation process they developed would be easily upgradable to the production scale.



Initial concentration including gravity separation and rougher and cleaner flotation for Target 6 has achieved 78% TGC (GZRINM, Table 2) at high recovery levels. The GZRINM studies have also confirmed that Targets 2 and 5 can achieve similar grades based on the same approach, albeit using improved reagents (Table 1). McIntosh flake graphite is amenable to caustic bake techniques (Nagrom) that will achieve the tenor and recoveries (93% TGC at 80% plus recoveries) of producing flake graphite mines in Central China. This tenor of graphite is currently being treated by hydrometallurgical techniques to achieve (lithium) battery grade graphite flake currently sold in China. Chemical leaching of the McIntosh graphite is realising grades up to 98% TGC (refer Table 2).

Table 1: The graphite flotation results (after GZRINM).

Sample	Assay of head (%TGC)	Graphite Concentrate (%TGC)	Recoveries (%)	
Target 1	8.35	55.90	80.73	
Target 2	4.43	80.22	88.30	
Target 5	8.52	80.61	80.59	
Target 6	4.83	78.43	95.82	



Table 2: Flotation concentrate after chemical leaching

Sample	Chemical Leaching (HF + HCI) Results (%TGC)
Target 1	95.04
Target 2	98.03
Target 5	96.26
Target 6	97.43

Petrographic studies (Table 4) have shown that Targets 2 and 5 contain medium to coarse flake graphite up to 500 µm or 35 mesh (refer photomicrographs, Figures 3 and 4) and are typically coarser grained than Target 1 (refer Tables 4 and 5, Figure 5). The samples analysed by the metallurgical laboratories represent RC pulps that have already been subject to grinding within the RC drill hole that has resulted in the reduction of the coarser flake sizes. Ongoing metallurgical work will be conducted on bulk samples either from drill core or from pit/costean sampling providing the opportunity to fully assess graphite flake size.

Table 4: Flake size (short diameter) distribution based on microscope studies of RC pulps (after GZRINM)

Size (ųm)	Target 1	Target 2	Target 5	Target 6	
-640+320	-	3.15%	0.9%		
-320+160	3.05%	3.93%	3.12%	0.98%	
-160+80	8.95%	16.91%	9.82%	15.28%	
-80+40	14.0%	25.22%	18.3%	25.46%	
-40+20	30.75%	28.73%	38.44%	36.43%	
-20+10	32.58%	19.23%	25.67%	18.67%	
-10	10.67%	2.83%	3.75%	3.18%	

Table 5: Flake size distribution based on sieved concentrates from Target 1 (after Nagrom)

Size (ųm)	Mesh size (A.S.T.M)	Target 1 (cumulative flake size distribution after sieving)
-500	- 35#	98.17%
-425	- 40#	95.68%
-355	- 45#	92.46%
-250	- 60#	85.03%
-180	- 80#	77.65%
-125	- 120#	67.21%
-106	- 140#	62.76%
-90	- 170#	58.21%
-75	- 200#	53.53%
-53	- 270#	43.73%
-38	- 400#	37.49%



#### The following is a summary of the data provided by GZRINM:

**Targets 1 and 2:** The circuit for graphite flotation was conducted with one rougher, one scavenger (the froth of the scavenger was reground first, then the froth of rougher and scavenger combined for cleaning). Six cleaners (cleaner 2 to cleaner 5) were conducted after regrinding. Lime and sodium silicate were adopted as regulators and kerosene and pine oil were used as collector and frothing agents respectively.

**Target 5:** The circuit for graphite flotation was conducted with one rougher, one scavenger (the froth of the rougher and the scavenger were combined for cleaning) Six cleaners (cleaner 2 to cleaner 5) were conducted after regrinding. The middling 1 and middling 2 phases were conducted with flotation after regrinding (with one rougher and one scavenger). Like Targets 1 and 2, lime and sodium silicate were adopted as regulators and kerosene and pine oil were used as collector and frothing agents respectively.

**Target 6:** The circuit employed for the Target 6 sample was essentially the same as Target 5 tests with one rougher, one scavenger (the froth of the rougher and the scavenger were combined for cleaning). Ten cleaners (cleaner 2 to cleaner 10) were conducted after regrinding for graphite flotation and have achieved a grade of 78.43% TGC and 96% recovery (Table 1). The initial beneficiation properties of the sample in the roughing stage of flotation was superior to Targets 2 and 5.

The methodologies employed to assess Targets 2, 5 and 6 will be mirrored at Nagrom Laboratories in Perth to produce flake graphite concentrate for assessment by potential end users.

## Bulk Sample - China Sciences Hengda Graphite Co., Ltd.

A 60 tonne bulk graphite schist sample (2 containers) from McIntosh will be sent to the Hengda processing plant at Yiajiaping in Central China to assess the graphite for commercial production. The exercise represents a vital part of the scoping study to assess flake graphite grades and recoveries at a production level as well as the logistics of eventually sending graphite concentrate to China. The results will help to facilitate an off-take agreement for the McIntosh flake graphite.

Craig Rugless

**Technical Director** 

Competent Persons Statement

Information in this "ASX Announcement" relating to Exploration Results and geological data has been compiled by the Technical Director of Lamboo Resources Ltd, Dr Craig S. Rugless who is a Member of the Australian Institute of Mining and Metallurgy and a Member of the Australian Institute Geoscientists. He has sufficient experience that is relevant to the types of deposits being explored for and qualifies as a Competent Person as defined in the 2012 Edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves" (JORC Code 2012 Edition). He consents to the inclusion of this information in the form and context in which it appears in this report.



### Photomicrographs of flake graphite from Targets 5 and 6 under the polarising microscope

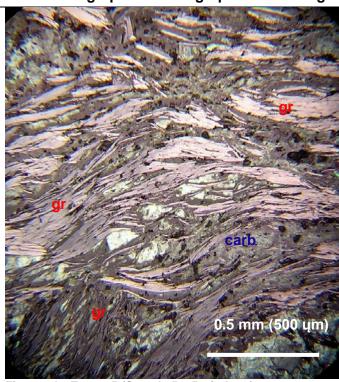


Figure 3A: Target 5 (Sample 508507) showing coarse flake graphite (gr) aggregates or "clumps" paralleling an anastomosing schistosity. Crossed polars under reflected and transmitted light. Field of view – 1.5 mm.

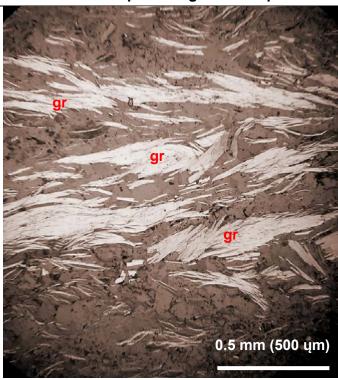


Figure 3B: Target 5 (Sample 508511) – detail of coarse flake graphite. Plane polarised reflected light. Field of view – 1.5 mm.

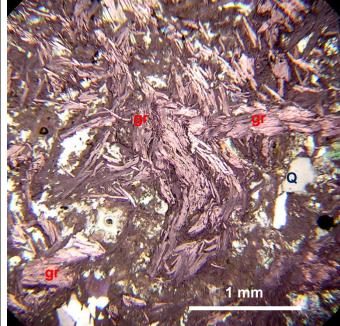


Figure 4A: Target 6 (Sample 508455 - strong flake graphite (gr) aggregates or "clumps" associated with minor quartz in the graphitic schist host. Plane polarised reflected light. Field of view – 3 mm.

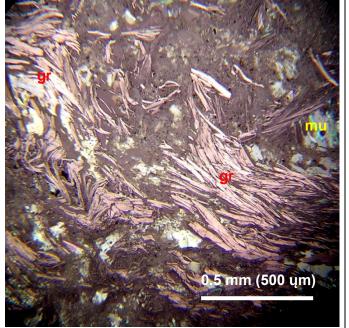


Figure 4B: Target 6 (Sample 508455) – detail of flake graphite aggregates associated with platy muscovite (mu) in the graphitic schist host. Note the flake size relative to the bar scale. Plane polarised reflected light. Field of view – 1.5 mm.

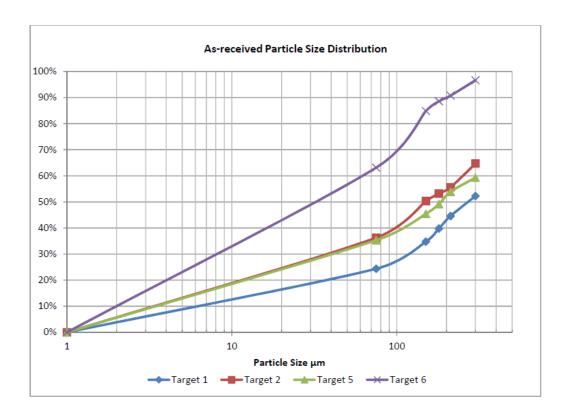


Figure 5: Particle size versus distribution graph showing the relative flake graphite sizes in the samples examined from Target 1, 2, 5 and 6. It is worth noting that the samples represent RC pulps that have undergone grinding during the sample collection.



# Appendix 1

Table 6 XRF analysis of flake graphite concentrates (GZRINM)

Sample	TGC%	SiO <sub>2</sub> %	Al <sub>2</sub> O <sub>3%</sub>	MgO%	K <sub>2</sub> O%	Fe <sub>2</sub> O <sub>3%</sub>	CaO%	Na <sub>2</sub> O%	TiO <sub>2</sub> %	P <sub>2</sub> O <sub>5</sub> %	ZrO <sub>2</sub> %	LOI%
Target 1	95.04	0.05	0.03	0.01	BLD	0.42	0.01	BLD	0.07	BLD	BLD	97.6
Target 2	96.65	1.76	0.02	BLD	0.01	0.08	0.03	0.03	0.01	BLD	BLD	97.96
Target 5	95.86	0.03	0.02	0.01	BLD	0.77	0.01	0.03	0.02	BLD	BLD	97.67
Target 6	97.432	0.21	0.4	BLD	BLD	0.03	0.014	0.02	0.03	BLD	BLD	97.67

BLD - Below limit of detection