

#### June 2016

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#### **Company Information**

ASX Code	WKT
Share Price (22 June 2016)	\$0.007
Ord Shares	1,971m
Options	0m
Market Cap (undiluted)	\$13.87m
Cash (estimated)	A\$1.50m
Total Debt	A\$0m
Enterprise Value	\$12.37m

#### **Board and Management**

Managing Director	Allan Mulligan
Non Exac Director	Andrew
NOII-EXEC. DITECTOR	Cunningham
Non-Exec. Director	Tom Murrell

#### **Substantial Share Holders**

Allan Mulligan	5.10%
Marcolongo Nominees	5.10%
Brywall	4.80%
Тор 20	51%
Directors and Management	7%

#### **Company Details**

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	Australia
Phone	+618 6298 7500
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#### **1 Year Price Chart**



# Walkabout Resources (WKT)

## High Quality Graphite

Recommendation: Speculative BUY

# Key Points

- Flagship Lindi Jumbo Graphite Project in Tanzania returning firstrate results
- High grade Inferred Resource of 11.7Mt @ 11.9% TGC, including 2.6Mt @ 20.6% TGC in a coherent domain, with the thickness and orientation amenable to low strip ratio open cut mining
- Outstanding results from metallurgical testwork, with concentrates containing up to 85.6% large flake or bigger, including up to 25.7% "super jumbo" flake
- Working towards a fast tracked development of a 25,000-40,000tpa concentrate operation
- Well served by infrastructure 200km by existing road from the port of Mtwara
- Exposure to lithium in exploration properties in Tanzania and Namibia
- Board and Management with extensive African experience and significant shareholdings

Walkabout Resources' focus is on fast tracking development of its Lindi Jumbo Graphite Project. Results to date indicate excellent potential to delineate a high quality resource, producing a high value concentrate. Preliminary metallurgical testwork has generated a concentrate that is comparable to, or better quality than, other African projects. The project is adjacent to Magnis' Nachu Project and is well served by infrastructure, which will significantly help to minimise capital and operating costs of any operation.

The Company has also brought lithium into the mix through two early stage exploration projects – Haneti in Tanzania and Strathmore in Namibia. Both of these are close to transport infrastructure and towns, and located in areas of known lithium bearing pegmatite occurrences.

We rate Walkabout as a SPECULATIVE BUY, with near term price movers being ongoing positive results from Lindi and the lithium properties – results will include those from the upcoming 1,500m drilling programme at Lindi.

## **Company Overview**

Walkabout Resources is an ASX-listed, African focussed mineral explorer and developer, with activities concentrating on the exploration and development of the key lithium ion battery raw materials of graphite and lithium.

The near term priority is on developing the Lindi Jumbo Graphite Project in Tanzania, with a strategy of a relatively modest start-up, followed by potential future expansions.

Other projects in the Company's portfolio include the 6.9Bt Takatokwane Coal Project in Botswana, which is currently subject to an advanced Pre-Feasibility study, and the Kigoma Copper Project in Eastern Tanzania, currently on hold given the focus on Lindi.



## **Quality Flagship Graphite Project**

In the flagship Lindi Jumbo Graphite Project ("Lindi" or "the Project") Walkabout Resources ("Walkabout" or "the Company") has a high quality project which the Company is looking to fast track into development. The Project is along strike from Magnis Resources' (ASX: MNS, "Magnis") Nachu Project ("Nachu"), with Magnis now enjoying a market capitalisation of some \$390 million.

## **Fast Track Development**

The strategy is for a fast tracked development for Lindi, with a relatively modest (25,000-40,000tpa concentrate) initial operation planned. The proposed size will allow for the Company to operate under a Mining Licence ("ML"), and not a Special Mining Licence ("SML") with the latter requiring a more involved application and approvals process, thus potentially cutting the approvals time. In addition, lesser initial capital requirements may reduce the time to obtain capital, although this will largely depend upon securing offtake.

## **Encouraging Drilling Results to Date...**

Drilling at Lindi has intersected good thicknesses of high grade graphite, with results of up to 29m @ 19.7% TGC (including 17m @ 27.1% TGC) in coherent, shallowly to moderately dipping, lithologically controlled domains.

## ... Used in High Grade Initial Resource

Very positive drilling results have delivered a high grade resource

Metallurgy to date has

been outstanding

Flagship Lindi Jumbo

Aiming for a fast track

development

Graphite Project in

Tanzania

The drilling has resulted in the calculation of an initial global JORC (2012)-compliant Inferred Mineral Resource of 15.3Mt @ 10.1% TGC in four domains, including 11.7Mt @ 11.9% TGC in Domains 1-3. This includes the coherent high grade Domain 2 of 2.6Mt @ 20.6% TGC – one of the highest grade resources amongst peers - with the mineralisation being open down dip and along strike. The current resource is significantly more than sufficient to supply a +15-year operation at planned initial throughputs.

## **Outstanding Metallurgical Results**

One key to the potential of the Project is the encouraging results from initial metallurgical testwork. Simple flotation of a 21% TGC head grade sample from Domain 2 has resulted in a concentrate with 85.8% of flakes being in the large to super jumbo size fractions; testing of a 9.1% head grade sample from the surrounding Domain 1 mineralisation resulted in a still impressive 71.1% reporting to the same fractions. In both cases concentrate purities were largely in the range of 94-97%, with ongoing work now directed at optimising purity and preparing samples for potential customers.

## **Ingredients for a Robust Project**

Our preliminary analysis indicates that Lindi could be developed into a robust project – the orientation and thickness of the mineralisation points towards a low strip ratio which, allied with an expected coarse grind, should result in relatively low operating costs. These costs and a potentially premium product are ingredients for a high operating margin.

## **Close to Infrastructure**

Another factor positively affecting costs (both capital and operating) is the proximity to transport and port infrastructure – the Project is within 200km (60km hard dirt and 140km sealed) road of the port of Mtwara, which reportedly has excess capacity.

## **Ongoing Activities**

A 1,500m diamond drilling campaign is due to commence, with both infill and extensional drilling planned to upgrade and expand the current resource. Parallel activities include ongoing metallurgical testwork, including bench scale and optimisation work, and community consultation and environmental studies.

Potential to deliver a robust project close to infrastructure



## Lithium as Well

Prospective lithium portfolio

Experienced personnel

operatina in minina-

friendly jurisdictions

Lithium has also been added to the mix, with projects in Tanzania and Namibia now in the portfolio. These early stage exploration projects are in areas of known lithiumbearing pegmatites, and provide an early stage entry into the second of the key lithiumion battery commodities.

## Stable, Mining Friendly Jurisdiction

Tanzania, Botswana and Namibia are all stable, mining friendly jurisdictions, which all have a well-developed mining law, and host major mines operated by foreign companies.

## Experienced and Incentivised Board and Management

An important strength of Walkabout is the combined experience of its key personnel. This includes experience in all technical phases of the resources industry from exploration to operations, with extensive African experience, a key consideration when operating in the region. In addition, personnel have skin in the game, and thus will be motivated to achieve returns for shareholders.

#### Walkabout Peer Group

Walkabout is one of a number of ASX-listed graphite developers, with many also operating in Africa. In our peer group we have selected those companies operating in Africa with graphite as their primary target and looking at producing flake graphite from open pits for the battery and traditional industrial markets.

Of these Graphex, a spin-out from IMX Resources (ASX: IXR), is the most recent listing, commencing trading on June 13, 2016. This was listed at \$0.20/share, and is currently trading at around \$0.50/share.

Here we have included a number of relevant comparisons including EV/tonne TGC and indicative basket price.

#### Walkabout peer group - sorted on undiluted EV

Company	Location	Project/Area	EV Undiluted (\$m)	Global Resource (Mt)	Cg Grade (%)	Contained Cg Mt 100% basis	Basket Price (US)	EV/t TGC (Co share)	Project Stage
Syrah Resources	Mozambique	Balama	\$1,325	1,191.00	10.5%	125.40	\$752	\$10.6	Construction
Magnis Resources	Tanzania	Nachu	\$410	174.10	5.4%	9.34	\$2,290	\$43.9	DFS completed, debt finance term sheet, heading to development, permitted
Kibaran	Tanzania	Mahenge/Epanko, Merelani	\$54	39.90	8.4%	3.35	\$1,347	\$16.0	Securing finance for Mahenge Resource at Merelani. Offtake and sales agreements
Graphex	Tanzania	Chilalo	\$19	25.10	6.0%	1.50	\$1,211	\$12.5	Pre-Feasibility Complete
Triton Minerals	Mozambique	Balama	\$20	1,457.00	10.7%	155.75	\$1,421	\$0.1	In Administration
Metals of Africa	Mozambique	Montepuez Balama	\$16	78.00	10.3%	8.05	\$940	\$2	Feasibility
Black Rock Mining	Tanzania	Mahenge Area	\$14	131.10	7.9%	10.41	\$1,070	\$1.4	Scoping completed
Sovereign Metals	Malawi	CMGP - Duwi	\$12	85.90	7.1%	6.13	\$1,154	\$2.0	Scoping of Duwi Completed
Walkabout	Tanzania	Lindi	\$12	15.30	10.1%	1.55	\$2,250	\$11.4	Initial resource, scoping

Source: IRESS, Company reports, values as of close of business. June 22. 2016

Here the enterprise value is the enterprise value of the company as a whole and not of the graphite projects alone. 1. 2.

This does not take into account other significant projects

#### A number of points should be noted:

- The global resource includes all JORC-compliant resources held or partly held by the relevant company.
- The EV/tonne TGC is indicative only and is affected by a number of factors that need to be considered in any comparison.



- The basket price is indicative, and should be used for comparative purposes only

   it is based on published flake distribution figures and includes potentially unmarketable material such as amorphous graphite. Prices are largely based on flake size and do not take into account possible discounts/premiums for purity or other factors.
- The basket price is based on the 2020 Stormcrow forecasts (refer to metallurgical results tables later in this document), except that a price of US\$2,500/tonne has been used for jumbo flake these may not mirror figures provided in company releases where different pricing may be used.
- Where a company has published sizing results for two or more deposits (e.g. Kibaran with Mahenge and Epanko) or two zones in one deposit (e.g. Walkabout) the separate figures have been averaged.
- In the case of Walkabout, our basket price for the high grade Domain 2 concentrate is US\$2,806/tonne.

In terms of planned operations, we consider Kibaran's Mahenge Project (BFS Reserves of 10.9Mt @ 8.6% TGC, planned production of 40,000tpa concentrate), Graphex's Chilalo Project (PFS reserves of 4.7Mt @ 8.6% TGC, planned production of ~55,000tpa concentrate) and Blackrock's Epanko Project (Scoping Study inventory of 12.5Mt @ 10.5% TGC, estimated production of ~52,000tpa concentrate) as the closest analogues to Walkabout, assuming any operation for Walkabout is based on mining Domains 1-3, and not selectively mining Domain 2.

The development and financial studies for these three proposed operations have resulted in the following:

- Kibaran Mahenge BFS Pre-tax NPV<sub>10</sub> of US\$197m, initial capex of US\$78m
- Graphex Chilalo PFS Pre-tax NPV<sub>10</sub> of US\$200m, initial capex of US\$73.8m
- Blackrock Epanko Scoping Pre-tax NPV<sub>10</sub> of US\$286m, initial capex of US\$57m.

## Risks

As with any resource company there are a number of risks. Those pertinent to Walkabout are given below, which are mainly relevant to Lindi.

- Resource We see only minor to moderate resource risk at Lindi work to date has demonstrated the continuity of all resource domains between widely spaced drillholes, with only modest infill drilling requirements expected in order to upgrade the resource, plus the potential for significant resource expansions.
- Metallurgy This again is considered minor to moderate. Results to date indicate the likelihood of producing marketable products; however, this needs to be confirmed through testwork by potential offtakers.
- **Exploration** This is the key risk at the lithium and copper projects, which are all at an early stage of assessment. This is partially mitigated in the case of the lithium projects by them being in areas of known lithium occurrences.
- Funding This is an ongoing consideration for most explorers and developers, however Walkabout has recently raised ~\$1.3m in an oversubscribed placement to add to its existing ~\$0.5m, which will be used to fund the upcoming drilling programme.
- **Pricing** This will be uncertain in the case of graphite, given that it is an opaque market with prices set by contract between buyers and sellers, and pricing will not be known until offtake agreements are secured.
- Project Financing In our view this is the key determinant of the timing of any development at Lindi. This will be largely reliant upon securing offtake agreements, completion of a positive Feasibility Study and granting of an ML.



- Permitting Unless unforeseen circumstances arise, we can see no major obstacles to permitting at Lindi if the Company follows the required procedures. We note that Magnis has had an SML granted at their adjacent Nachu Project, and that Kibaran has had an ML granted at their Mahenge Graphite Project. One issue that could possibly arise with an ML is in the renegotiation of the Licence at the end of the initial 10-year period there is a possibility that the Government could play hardball in the renegotiation of the licence terms, however in our view this is unlikely.
- **Sovereign** Given the stability and attitudes to mining in the countries Walkabout is operating in, we consider this as a relatively minor risk. This is also mitigated by the operating experience that key personnel have in southern and eastern Africa.



# Introduction

Key focus on the Lindi Jumbo Graphite Project in Tanzania

Other African interests include lithium, coal and copper

Lindi comprises four

granted PL's, 200km

from the port of Mtwara

Walkabout's geographic focus is Africa, with its key project being the Lindi Jumbo Graphite Project in southeast Tanzania, in which the Company has earned 70%. Other projects include lithium exploration plays in Tanzania (granted tenements) and Namibia (applications) and the 6.8Bt Takatokwane Coal Project in southern Botswana.

In addition, the Company has majority interests in the 750km<sup>2</sup> Kigoma Copper Project, located adjacent to Lake Tanganyika in western Tanzania, where the target is sedimentary-hosted copper mineralisation, analogous to the Zambian Copper Belt.

The Company is concentrating activities on fast tracking a start-up at Lindi, with plans to produce between 25,000 and 40,000tpa of premium graphite concentrate from a high grade deposit.

# Lindi Jumbo Graphite Project (WKT 70%)

## **Introduction and Tenure**

Lindi comprises four granted Prospecting Licences ("PL") for 325km<sup>2</sup> in south-eastern Tanzania. The tenements are located some 75km west of the coastal town of Lindi, and around 200km by road to the Port of Mtwara. The westernmost tenement is contiguous with Magnis Resources' (ASX: MNS) Nachu Project, held under an SML.

#### Lindi location



Source: Walkabout Resources

The Company initially signed an option to Joint Venture the four tenements with a Tanzanian national in November 2014, with exercise of the option announced on May 13, 2015. Under the agreement Walkabout can earn 70% in each of the tenements through the estimation of a JORC (2012) compliant Inferred (or better) Mineral Resource; however, there is no obligation to accept all tenements.

The JV partners are free carried to a decision to buy them out at a pre-determined price of US\$1m per licence. The "Buy-Out" decision is severable, with all licences treated separately, and hence it is possible that the Company may only purchase one or two licences and release the rest.

# The Company holds 70% of the Project



The Company can exercise its "Buy Out" option of any tenement at any time, but until it does the agreement also specifies the following payments:

- US\$50,000 on signing of JV agreement.
- 1<sup>st</sup> year anniversary of signing US\$100,000 per licence that the Company decides to proceed with, payable 50% in cash and 50% in shares at a price equivalent to the 14 day VWAP prior to the payment date.
- 2<sup>nd</sup> year anniversary of signing US\$150,000 per licence that the Company decides to proceed with, payable 50% in cash and 50% in shares at a price equivalent to the 14 day VWAP prior to the payment date.
- 3<sup>rd</sup> year anniversary of signing US\$250,000 cash per licence that the Company decides to proceed with.

The Company has now earned 70% of the Project, with the transfer of the Licences now underway at the Ministry of Mines in Tanzania.

Negotiations are also underway with the holders of a number of Primary Mining Licences ("PML") that partly overlap the current resource.

## **Regional Geology**

The regional geology includes units of the Paleoproterozoic Usagaran Belt, with an age of between ~2,000 and 800Ma, which outcrops to the west of the Project area, occurring on the eastern side of the Tanzanian Craton. This was deformed by the Pan-African Orogeny, which has an age of between ~600 and ~500Ma, and occurred as a result of the closing of the Mozambique Ocean, with the orogenic areas termed the Mozambique Belt, over which the Project lies.

In addition to the reworked cratonic units, the Mozambique Belt also contains granites, rift margin sediments and passive margin metasediments from the early Neoproterozoic continental margin, with ages of between 1,000 and 541Ma.

Lithologies in the region are dominated by undifferentiated metasediments, graphitic schist and gneisses, amphibole and biotite gneisses and quartzites, all metamorphosed to amphibolite and granulite grade. Minor units include ultrabasic intrusives, pegmatites, marbles and limestones.

## **Work Completed and Mineralisation**

As far as the Company is aware, no previous exploration for graphite has been carried out in the Project area.

Initial work completed by Walkabout included geological mapping and geochemical sampling, which identified extensive areas of graphite mineralisation, from which two priority areas for follow up by ground VTEM surveying were selected, as shown in the figure below.

## Lindi Block 1 VTEM image



Source: Walkabout Resources

Located over the Mozambique Belt

Early work by Walkabout included mapping, geochemical sampling and ground VTEM surveying

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## Drilling

This work outlined two key areas, with one subsequently drill tested Of these, Block 1, situated immediately to the east of Magnis' Nachu Project, was selected for the initial drilling programme, which comprised 21 reverse ("RC") circulation holes for 1,256m and three diamond ("DD") holes for 215m.

The majority of the holes intersected graphite mineralisation associated with graphitic schists and graphite-biotite gneisses, largely in an antiform referred to as the "Gilbert Arc", which is now the focus for ongoing activities. Other units include biotite schists and gneisses, garnet gneisses and some dolomites.

Mineralisation in the western limb of the anticline includes three main domains:

- An upper domain (D3), averaging 9.5m thick, and
  - a lower domain (D1), averaging 24.5m thick, which
- contains a high grade core (D2), averaging 11.2m thick.

#### Lindi drilling with selected assays



Drilling has returned thick intersections of high grade graphite hosted in schists and gneisses

Source: Walkabout Resources

#### Cross-section – north-western limb



Units are moderately dipping

Source: Walkabout Resources



Drilling on the eastern side of the anticline also intersected a lower grade domain (D4), with an average thickness of 17.2m, which is interpreted as representing a different lithological unit to those hosting the mineralisation on the western limb.

Mineralisation has been intersected for a strike length of ~1,000m, and down dip for ~200m, equivalent to a vertical depth of ~100m. Mineralisation has an average dip of 25°, and is open along strike and down dip. The orientation and thickness of the mineralisation is conducive to low strip ration open pit mining.

Selected results of drilling include:

- LJDD001- 20m @ 20.5% TGC from 50.1m (D1), including:
   11.0m at 26.8% TGC from 59.1m (D2)
- LJRC010- 29m @ 19.7% TGC from 31.0m (D1), including:
   17.0m at 27.1% TGC from 36.0m (D2)

Given the respective orientations of the drilling and mineralisation, down hole intercepts are very close to true widths of mineralisation.

The drilling has also confirmed the correlation between VTEM anomalies and graphite mineralisation – this highlights the potential for significant additional mineralisation to be delineated with future testing of other VTEM anomalies in the tenement package.

## **Mineral Resources**

Initial Inferred Mineral Resources of 15.3Mt grading at 10.1% TGC for Lindi were released to the market on January 16, 2016, as shown in the table below.

#### Lindi Mineral Resource

Category	Domain	Tonnes (Mt)	TGC (%)	V2O5 (%)	Contained TGC (t)	Contained V2O5 (%)
Inferred	1	6.9	8.9	0.19	611,000	13,000
Inferred	<b>2</b> <sup>1</sup>	2.6	20.6	0.20	526,000	5,200
Inferred	3	2.2	11.7	0.19	258,500	4,300
Inferred	4 <sup>2</sup>	3.7	3.9	0.04	146,000	1,600
Inferred	ALL	15.3	10.1	0.16	1,542,000	24,100
Inferred	Excluding D4	11.7	11.9	0.19	1,396,000	22,500

Source: Walkabout Resources

1: High grade zone enveloped by Domain 1

2: Low grade zone – eastern limb of the Gilbert Arc

# Lindi - orthogonal view looking north



Source: Walkabout Resources

An initial mineral resource of 15.3Mt @ 10.1% TGC has been defined

This includes a higher grade zone of 2.6Mt @ 20.6% TGC



The estimation also excludes those parts of the modelled domains located within the PML's that are not held by Walkabout.

## Metallurgy

Metallurgical characterisation and optimisation testwork has been ongoing at NAGROM Laboratories in Perth, with this largely concentrated on optimising flake size characteristics, whilst also delivering purity levels that are required for potentially marketable concentrates and achieving acceptable recoveries. This work has also been undertaken to prepare samples to send to potential customers. This work is now being augmented by bench scale and optimisation work to be undertaken in Harare, with a one tonne sample recently being despatched.

The testwork for the latest work has included a simple  $P_{100}$  850µm coarse crush and grind, followed by a rougher flotation and two cleaner flotation stages.

This work, on Domains 1 and 2, has produced excellent results as shown in the following tables, with a high proportion of flake being larger than 180 $\mu$ m, including high percentages of the premium super jumbo material.

In addition, the work has achieved grades of between 95.6% to 97.1% TGC for the super jumbo fraction without the use of chemical upgrading – the purity of the Domain 1 concentrate is generally higher than that of Domain 2, however the Domain 2 products generally exceeded the Company's target of 94% TGC, with potential for these to be increased with further testwork – the testwork is still at a relatively early stage.

What also needs to be noted is that the vanadium does not report to the graphite concentrate – it is most likely in the micas that report to tails.

The tables below include forecast pricing from Stormcrow; however other forecasters see super jumbo pricing of  $\sim$ US\$4,000/tonne and that for jumbo of US\$2,500/tonne.

#### Metallurgical testwork results – Domain 2, 21% TGC head grade

0		,		0	
Flake Size (with generally accepted purity)	Sieve Size (μm)	% Mass Distribution	% TGC	Stormcrow Forecast Price 2020 (US\$/t)	Basket Price (US\$/t)
Super Jumbo	>500	25.7	95.6	6,175	1,587
Jumbo	300-500	33.6	94.4	?2,000	672
Large	180-300	26.5	92.8	1,165	308
Summary	+180	85.8	94.3		1,997
The Rest	-75-180	14.2	89.9	493	70
Total		100	93.6		2,567

Source: Walkabout Resources

#### Metallurgical testwork results – Domain 1, 9.1% TGC head grade

Flake Size	Sieve Size (μm)	% Mass Distribution	% TGC	Stormcrow Forecast Price 2020 (US\$/t)	Basket Price (US\$/t)
Super Jumbo	>500	5.6	97.1	6,175	346
Jumbo	300-500	33.2	96.6	?2,000	664
Large	180-300	32.3	96.4	1,165	376
Summary	+180	71.1	96.6		1,386
The Rest	-75-180	28.9	94.8	493	143
Total		100	96.1		1,529

Source: Walkabout Resources

Metallurgical testwork has been very positive, returning high proportions of large and bigger flake, including high percentages of "super Jumbo" material

Concentrate purities are

also encouraging



## **Strategy and Ongoing Activities**

The strategy is the rapid development of a 25,000-40,000tpa concentrate operation

Further drilling will commence shortly

As stated earlier, the Company's strategy is to fast track development of an initial early, relatively modest 25,000-40,000tpa graphite concentrate start up at Lindi, requiring the granting of an ML, as opposed to the more involved SML. The differentiation is partly in capital cost – an ML can be used for a project with a capital investment of <US\$100 million, however the licence is only granted for an initial period of 10 years and is open for renegotiation at the end of that period.

A 1,500m drilling programme is planned to start in late June, with the following aims:

- Resource upgrade and expansion, with infill and extensional drilling.
- Providing hydrological and geotechnical information.
- Providing further samples for ongoing metallurgical testwork and process design.

The results of this work will be included in a Feasibility Study which is expected to be completed by December 2016. Elements of this study are required to be submitted as part of the ML application, which is planned to occur earlier, in addition to project financing purposes. Another key objective will be securing offtake agreements which are also vital in obtaining project funding.

At the same time the Company will also progress non-technical activities required for the granting of an ML, including community consultation, socio-economic programmes and environmental studies.

Future work will include testing of other VTEM anomalies to enlarge the resource base, to allow for future expansions of the planned operation.

## **Project Economics**

Given the current regulatory restrictions, the Company has not released any figures relating to the potential economics of Lindi. Our analysis (which is to be considered as indicative only) of results of work to date however shows the potential for a relatively low cost and robust operation. Planned similar scale operations include Kibaran's Mahenge Project, which is now in the financing stage.

In our view, current resources, on the western flank of the Gilbert Arc, at 11.7Mt @ 11.9% TGC, assuming a reserve to resource conversion of 80% (assuming all current Inferred Resources are upgraded to Indicated or Measured), dilution of 5% and losses of 5% could conceivably yield a reserve in the order of ~10Mt @ 11% TGC, for 1.1Mt of contained graphite. This is more than sufficient for a 20-year operation at a mining rate of between 250,000 and 400,000tpa, assuming a metallurgical recovery of 90%.

This does not consider the operating economics of selectively mining the high grade Domain 2, which by itself could conceivably support a 10-year operation without any resource expansions of this zone.

Any such operation should have relatively low operating costs, with the orientation and thickness of the mineralisation pointing towards a life of mine strip ratio of less than 1.5:1 being feasible. Also, the results of the metallurgical testwork to date indicate that only a coarse grind is required, again leading to relatively low processing costs.

A number of factors will also help contain capital costs. These include access to existing road networks and the port at Mtwara, with the proximity of the port (200km) also helping operating costs. In addition, the relatively small size of any proposed operation and the coarse grind size will be a positive on the capital side.

# Haneti Lithium Project, Tanzania (WKT 100%)

**Introduction and Tenure** 

Walkabout has recently been granted three PL's totalling some 475km<sup>2</sup> in the Haneti area of central Tanzania, some 40km northeast of the major regional centre of Dodoma and adjacent to Liontown Resources (ASX: LTR) Mohanga Lithium Tantalum Project.

Our view is that there is the potential for a robust, relatively low cost operation at Lindi

The 100% held Haneti Lithium Project includes 475km2 of recently granted PL's



## **Geology and Mineralisation**

Haneti is located over Meso-Neoarchaean gneiss-granite-migmatite complexes of the Dodoman and Isangan Groups within the Tanzanian Craton. Part of the tenement package is reportedly located over the same lithium-tantalum corridor that includes Liontown's Mohanga project.

Work in the vicinity of Walkabout's tenements has indicated that pegmatites are more widespread than originally thought – large areas are masked by younger cover, and there has been no modern exploration, including drilling in the region.

Liontown has mapped pegmatites up to 700m in strike length with widths of up to 100m. Rock chip sampling has returned assays of up to 5.12% Li and 0.07% Ta.

#### Haneti Lithium Project location



Haneti is located in an area of know lithium bearing pegmatite occurrences in the Tanzanian Craton, however it has seen no modern exploration

Source: Walkabout Resources

#### **Planned Activities**

Given the recent granting of the PL's, the Company has now finalised a programme of reconnaissance geological mapping and sampling with interpretations and results pending. This has utilised in-country contract personnel not involved with Lindi.

# Strathmore Lithium Project, Namibia (WKT 100%)

## **Introduction and Tenure**

Walkabout has recently applied for three Exclusive Prospecting Licences ("EPL"), centred approximately 20km north of Henties Bay in Namibia. The tenements cover 304km<sup>2</sup>, and are readily accessible by formed roads and tracks from Henties Bay.

Parts of the tenements are located over the West Coast Recreational Area, which is regarded as an environmentally sensitive area, however Namibian Law allows for exploration and mining in such areas provided certain conditions are met.

## **Geology and Exploration History**

The regional geology comprises the Cape Cross-Uis Pegmatite Field, which includes Neoproterozoic granites and Damara metasediments of the Swakop Group that have been intruded by pegmatites and alkaline ring complexes, arguably of Cretaceous age. The pegmatite field extends for some 120km is a NE direction with an average width of around 20km.

The complex was also historically referred to as the "Northern Tin Field", with historical activities including prospecting (and some sporadic mining) for tin, niobium, tantalum, lithium, beryllium and rare earth elements since the early 1900's, however the main

The Strathmore Lithium Project is located in a region of known lithium occurrences, with some historic mining of lithium and other pegmatite associated elements focus was not on lithium, and there has been limited modern exploration for the metal. Pegmatites of up to 460m in length with spodumene masses of up to 1m have been noted in the field.

The Strathmore pegmatites, at the southwestern end of the field, and around which Walkabout has made its applications, include both unzoned cassiterite pegmatites and zoned Sn-Nb-Ta pegmatites, with lithium bearing minerals including spodumene and zinnwaldite amongst others. Individual bodies have strikes up to 120m and widths of up to 40m. A significant portion of Walkabout's applications are masked by younger cover, and hence there is the potential for the discovery of blind pegmatites. The Company also considers that there is potential for brine hosted lithium mineralisation.

The Erongo region, in which the Project is situated, is host to the Rossing Uranium Mine some 100km to the southeast, and also saw lithium mining from the Karibib pegmatite belt some 150km southeast of the application area.



Strathmore Lithium Project location map

Source: Walkabout Resources

## **Planned Activities**

Field activities, which will include reconnaissance mapping and sampling, are planned once the tenements are granted, which is expected sometime after the June 2016 Ministry meeting.

## Takatokwane Coal Project, Botswana (WKT 70%, 40%)

## **Introduction and Tenure**

Takatokwane comprises three tenements located in southeast Botswana, some 200km WNW of Gaborone and accessible by fully sealed road. These include the 500km<sup>2</sup> Takatokwane tenement PL035/2007, held by local company Wizard Investments (Pty) Ltd, with Walkabout having earned 70% to date. The adjacent Takatokwane South Project includes PL157/2009 and PL160/2009, currently held 40% by Walkabout, with the right to earn 65% from Triprop Energy Pty Ltd; a Botswana based private exploration company, on completion of a Pre-Feasibility Study.

## **Geology and Resources**

Coal at Takatokwane is within the Permian age Ecca Group, part of the widely developed Karoo Supergroup. Coals of equivalent age are widely distributed through southern Africa.

Within the tenements, four gently west dipping seams (Seams 1 to 4) have been recognised, with Seam 2 being the thickest. An additional two seams have been recognised in some drillholes. The indicated resource estimation in the southeast of



Takatokwane returned an average thickness for Seam 2 of 14m in PL159/2009 and 19m in PL035/2007 and depths to the top of the seam of 66m and 70m respectively. Other seams are thinner ( $^{2}$ m).





Source: Walkabout Resources

Three separate resource estimations have been completed at Takatokwane, as illustrated in the figure below. Inferred resources were estimated from initial Stage 1 drilling, with closer spaced Stage 2 drilling used to define areas of shallower coal that could be used for the initial operation, and formed the basis for a Scoping Study/PFS.





Source: Walkabout Resources

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The Takatokwane Coal Project in Botswana has Inferred Resources of 7.8Bt, including Indicated Resources of 748Mt

This includes Seam 2, with an average thickness of between 14m and 19m, and a depth to the top of ~70m in the indicated portion



#### **Inferred Mineral Resource - Takatokwane**

			Raw Coal			
Seam	Inferred Resource (Mt)	Density (t/m3)	Ash (%)	S (%)	CV (MJ/kg)	Moisture %)
Total	6,884	1.71	34.9	2.48	16.7	8.0
			Washed			
Tenement	Float	Yield (%)	Inferred (Mt)	Ash (%)	S (%)	CV (MJ/kg)
PL 35/2007	1.6	57.0	2,395	16.5	1.69	23.0
PL159/2009	1.7	46.1	1,223	20.5	1.59	21.2
Source: Walkabou	t Resources					

Washability testwork indicates the potential to produce products suitable for both the regional and Asian thermal coal markets

#### Indicated Mineral Resource – Takatokwane (inclusive in Inferred Resources)

			Raw Coal			
Seam	Indicated Resource (Mt)	Density (t/m3)	Ash (%)	S (%)	CV (MJ/kg)	Moisture %)
Total	748	1.67	37.1	1.7	17.0	7.7
			Washed			
	Float	Yield (%)	Indicated (Mt)	S (%)	CV (MJ/kg)	CV (kcal/kg)
Total	1.7	42.6	318	1.0	22.2	5,287
Source: Walkabo	out Resources					

#### **Development Strategy**

The Company originally completed an advanced Scoping Study/PFS in 2014, with this undergoing subsequent optimisation work.

The studies have been based on four long term 6mtpa strip mines, targeting Seam 2, supplying both regional and export markets. Regional markets include existing power generators in southern Africa, with export operations dependent upon execution of planned major rail projects, including the Trans Kalahari Rail ("TKR") to Namibia, with the planned route passing close to the Project.

The economic viability of Takatokwane is dependent upon both improvements in international coal prices and the construction of the TKR, and as such only limited activities are being undertaken at the current time.

## Kigoma Copper Project – Tanzania (WKT 100%, earning 75%)

The Kigoma Copper Project "Kigoma" or "the Project" comprises 4 PL's and 15 PML's, covering some 775km<sup>2</sup> in western Tanzania, near the port town of Kigoma on Lake Tanganyika. The Company is earning a 75% interest in the PML's and three of the PL's, and has a 100% interest in one PL.

PML's are small scale licences with a maximum area of 10 ha; however contiguous licences can be grouped and converted to an ML upon application and submission of a suitable environmental study. The Kigoma PML's are located in an area reserved for artisanal mining, and unavailable for granting of PL's.

## **Geology, Mineralisation and Exploration**

The Project is located over clastic and chemical sediments and basaltic lavas of the Mesoproterozoic to Cambrian Nyomori Supergroup, part of the Bukoban system to the west of the Tanzanian Craton. The Bukoban System represents a shallow marine basin developed on the flanks of the Tanzanian Craton, and is generally un-metamorphosed and only locally intensely deformed.

Lithologies within the Project include basalt, oxidised red bed sandstones and carbonates.

The Company considers the Project prospective for sedimentary hosted copper deposits, similar to those found in the Zambian/Katangan Copperbelt, with mineralisation formed by the post sedimentation introduction, through copper bearing brines, of copper into the host sediments.

The Kigoma Copper Project is located in western Tanzania

Kigoma, located over the shallow marine Bukoban System, was originally considered prospective for sedimentary hosted copper mineralisation



**Kigoma Copper Project location** 



Source: Walkabout Resources

The western part of the Project ("Copper Oxide Project" in the above figure) is marked by a large number of artisanal mines, where oxide copper is mined, bagged and shipped to Dar-as-Salaam for smelting. Other metals produced include lead and silver. The oxide mineralisation is generally associated with shear zones where they intersect reactive units.

Drilling by the Company has indicated that mineralisation in the artisanal workings includes:

- Flat lying interflow or flow top shears at the contact between the Gagwe basalts and overlying llagala dolomites, with mineralisation also permeating a few metres into the basalts, and
- vertical shears with mineralisation associated with carbonate and later silica work by the Company indicates that these have extensive strike extent, and in the region are largely controlled by or related to the northwest trending Malagaras Shear Zone ("MSZ").

This drilling included 1,800m of RC drilling in 38 holes, all carried out within the Oxide Project. Best intersections included 3m grading at 1.27% Cu and 39g/t Ag in WRC031, which tested steeply dipping structures in an area of abundant quartz/sulphide float associated with soil copper anomalism.

This work, completed in late 2013, is the most recent field work completed at Kigoma. Other work, all during the 2013 field season and which largely concentrated on the Oxide Project, included geological mapping, and soil/rock chip geochemical sampling. Three short scout holes were also completed at the Sulphide Project testing the Rusuni Shear Zone, where anomalous copper was intersected.

## **Planned Activities**

Given the focus on Lindi, and currently depressed copper prices, no immediate work is planned at Kigoma. Should this change, the focus will move to the Sulphide Project, where historic geophysics has outlined a large magnetic anomaly, interpreted as an intrusive, within PL9328/2013 with coincident Ni and Cu anomalies.

There are a number of artisanal mines in the area, mining oxide copper from generally structurally controlled zones – drilling has shown these to be discontinuous

Any future work will be concentrated on the underexplored eastern "Sulphide Project" - with an intrusive target being identified by previous explorers



# Breakaway's View

In Lindi, Walkabout has a very promising graphite project, with drilling and metallurgical results to date indicating the possibility of producing a high quality, large flake, high purity product from a relatively low cost operation.

The relatively limited metallurgical work completed to date indicates size and purity characteristics potentially superior to other east and southern African developers, and ongoing optimisation testwork has the potential to increase the purity of the concentrate – we note that from our analysis of other companies that ongoing work generally increased the quality of products.

The Company is in our view taking a measured and prudent approach to development, looking initially for a relatively low cost 25,000-40,000tpa concentrate start-up operation, with the possibility of expansion down the track. This may allow for easier funding, partly through lower capex requirements and also the need to only secure relatively small offtake agreements, with these a critical part of any project financing and eventual development.

The development timetable, in our view, will largely be determined by securing offtake agreements and financing, critical issues in any development, and we have seen significant time taken to achieve these milestones in other projects.

We see relatively low risk in the technical aspects – the mineralisation should be able to be upgraded and expanded with a moderate amount of drilling (which is due to commence), with the completion of the required environmental studies being the time constraint in the technical aspects for the application for the ML.

Some may have concerns about the apparently modest size of the current resource, however this is more than sufficient, assuming a high resource to reserve conversion ratio, to supply a long term operation at initially planned throughputs, similar to other planned African graphite developments. Given the orientation and thickness of the mineralisation we cannot see any obvious reasons why a high conversion ratio shouldn't be expected.

The current resource should also allow for some expansion of the proposed operation down the track should markets allow, and there is also significant resource upside potential within the tenements, with a number of VTEM anomalies yet to be drill tested that are associated with encouraging surface geology and geochemistry.

The projected operation at Lindi is similar to that of a number of other Tanzanian developers, where development studies have returned NPV's of >US\$200m, and initial capex estimates in the order of US\$60-80m.

The lithium projects both provide prospective, albeit very early stage exposure to the commodity. Both projects are located in areas of known lithium-bearing pegmatites; these areas are under-explored, and are in part masked by younger cover. Given the geology, there is a fair possibility for discoveries of lithium-bearing pegmatites in these projects.

Given the current markets and other considerations, Takatokwane and Kigoma are both on hold; however, they provide good option value should conditions improve.

The African experience of key personnel and their holdings in the Company are also important positives.

At some stage it may be prudent to look at a consolidation of the capital structure, and potentially a mop-up of unmarketable parcels to strengthen the register.

We rate Walkabout as aWe rate Walkabout as a Speculative Buy. We expect short term price movers to be<br/>positive results from both the graphite and lithium projects.

## What is Graphite and What is it Used For?

Graphite (chemical symbol 'C') was named by Abraham Gottlob Werner in 1789 from ancient Greek "to write/draw". The key properties of graphite include; an excellent conductor of heat and electricity, the highest natural strength and stiffness of any material, maintaining its strength and stability to temperatures in excess of 3,600°C and high resistance to chemical attack. It is also one of the lightest of all reinforcing agents and has high natural lubricating properties.

If you took a very close look at a graphite pencil lead you will see layer upon layer of carbon atoms, multiple two dimensional planes that are loosely bonded to their neighbours. The reason graphite works so well as a writing material, and industrial lubricant, is because the layers of atoms slip easily over one another. The layered structure facilitates easy cleavage along the planes. Each of these single layers of atoms is known as graphene. Separating the individual layers of graphite sets the electrons free and allows carbon to behave differently.

Natural graphite is generally found in three forms, amorphous, flake and vein. In all cases graphite generally forms platy, hexagonal crystals, giving graphite its flaky appearance.

#### Amorphous Graphite

Amorphous graphite is the lowest quality material, and occurs generally as microcrystalline (<75 $\mu$ m crystal size) masses. It is commonly formed by the metamorphism of coal or carbon rich rocks, and is the most abundant form of graphite. Graphite commonly occurs as seams, with grades commonly in the range of 30-90% Cg, and purities in the order of 60-90% C.

#### Flake Graphite

Flake is the most abundant crystalline form of graphite, and is generally associated with metamorphosed graphitic and carbonaceous sediments. Generally, grades are in the range of 1-12% Cg, however higher grades are also found in a number of cases. Graphite quality is commonly determined by flake size and concentrate TGC grades, with the coarser flake (>150 micron) products generally more sought after due to their commonly higher TGC grades.

#### Vein Graphite

This style of mineralisation is uncommon, and poorly understood. The best known (and only mined) examples are in Sri Lanka, which are high grade veins (+90% Cg) producing high purity (+98% carbon) concentrates. Flake size can be variable in this style, as can grade and purity, but are generally very coarse.

## **Graphite Demand and Production**

Traditional demand for graphite is largely tied to the steel industry where it is used as a refractory, including as liners for ladles and crucibles, and as a component in bricks which line furnaces. The second major use in the steel industry is as an additive in steel, where it is used to increase the carbon content. In the automotive industry it is largely used in brake linings, gaskets (for which expanded graphite is an important component) and clutch materials. Graphite also has a numerous other uses, including in lubricants, fire retardants, and reinforcements in plastics. However, it is the use in batteries (including automotive) that will outstrip industrial uses by many times in the near future.

Other potential uses currently being researched include the use of graphite and graphene in 3D printing, and a number of other potential uses for graphene particularly in electronics.

The current market is dominated by refractories, which comprise ~40% of the total market, with metallurgical applications next at ~25%. Batteries currently comprise ~8% of the market.

According to the USGS worldwide production of natural graphite (as opposed to

Traditional demand is driven by the steel industry, where it is used as a refractory, and also as a steel additive

Graphite, a form of

carbon, is an excellent

conductor of heat and

electricity, and has the

Major graphite forms are

amorphous, flake and

Graphite pricing is

and purity

determined by flake size

highest strength and stiffness of any natural

material

vein

synthetic graphite, but which has a similar sized market) was 1.17Mt in 2012, which is a similar scale to the nickel market (~1.3Mtpa). Of this production, flake accounted for 60% and amorphous 40% and some production from vein. China is the dominant world producer (yet is still a net importer); accounting for ~70% of total world output, however, the graphite is primarily amorphous and low grade flake. Concerns about the long term reliability of high quality graphite supply out of China are driving consumers to look for other sources.



China is the dominant world producer, supplying some 70% of world output

Industrial demand has been growing at around 5%, and significant further growth is expected, driven largely by future demand for lithium-ion batteries

The lithium-ion battery market is forecast to be driven by increasing demand for electric vehicles, each of which requires in the order of 40kg of spherical graphite, requiring 100kg of flake to produce due to production losses Industrial demand for graphite has been steadily growing at around 5% p.a. and significant further growth in the industry is expected from the incremental demand created by numerous green initiatives including lithium-ion batteries, fuel cells, solar energy, semi-conductors, and nuclear energy. Many of these applications have the potential to consume more graphite than all the current uses combined. Importantly, only flake graphite that can be upgraded to 99.95% purity is suitable for making lithium-ion batteries.

#### Lithium-ion Batteries

Many commentators see the lithium-ion battery market, with the growing demand for electric vehicles and home / commercial energy storage as the key graphite demand driver going forward. In a lithium-ion battery, lithium is the cathode and flake graphite the anode, however, 10 - 30 times more graphite is required in these batteries than lithium. Approximately 60% of the battery market is supplied by natural flake and 40% by the more expensive and less conductive synthetic graphite.

Electric vehicles on average each require in the order of 40kg of spherical graphite ('SPG") for their batteries, with the production of 40kg of SPG requiring 100kg of high grade, high purity (>99.95%) flake graphite due to losses in the production process. The key requirements for spherical graphite are at least a 94% TGC, and ideally a size of minus 150µm to optimise the costs of milling and upgrading. Traditionally larger flake has been used due to higher concentrate grades, with the extra cost of milling the larger flake being offset by the significantly cheaper thermal or chemical upgrade costs.

Some commentators have estimated that up to 6 million electric vehicles could be manufactured in 2020. This equates to a ~10% market penetration, and assuming 60% of demand is met by flake would require an estimated extra 360,000tpa of flake graphite, or approximately 60% additional to current supply of ~600,000tpa.

China previously announced that it has mandated that 30% of Government vehicle



purchases to be electric, fuel cell or hybrid by 2016, with the ratio to be raised in following years, with provincial governments being required to follow suit. Other measures reportedly being taken by China include waiving a 10% purchase tax for new-energy vehicles.

Tesla, the US electric vehicle manufacturer has recently commenced construction of a battery manufacturing facility in Sparks, Nevada, with first battery production planned for 2017, in what will be the world's largest single battery manufacturing facility. Tesla estimates demand for 126,000tpa of flake graphite (50,000t of SPG) on a best case basis, and 83,000tpa on a conservative basis to supply the plant.

Tesla is also developing its domestic battery production, with these being recently introduced into Australia.

The lithium-ion battery industry is currently growing at a rate of 30 - 40% annually and it is estimated that Lithium-ion batteries are also crucial to the consumer electronics industry for applications as varied as power tools, cell telephones, laptops, tablets and media players.

#### Graphene

Another potential demand driver is graphene, although our view is that significant commercial utilisation is some way off. Graphene is a single atom thick layer of graphite, and is the strongest material in nature, at approximately 200 times the strength of structural steel.

Graphene was first formed in the laboratory 10 years ago, and is now a hot topic of research in the scientific community and R & D laboratories. The material has a number of potential applications including, amongst others:

- Used in electronic applications, transmitting electrons faster than silica
- Included in composite materials that are potentially ten times tougher than Kevlar
- Used as an anti-corrosion coating which would be the world's thinnest
- Allows plastics to conduct electricity
- Used in low cost display screens that could be flexible

## **Outlook for Graphite**

During 2010 the European Commission included flake graphite amongst 14 materials it considered high in both economic importance and supply risk while the British Geological Survey listed flake graphite as one of the materials to most likely be in short supply globally. The US government has also declared flake graphite a critical material.

Concerns come from the dominance of the industry by China; however, there is also the view that China is rationalising its domestic industry to lower costs of production and in response to environmental concerns. Over the long term this may end up decreasing Chinese supply.

The following graph shows Industrial Minerals' forecast short term trends in natural graphite end usage. This shows general 6% CAGR growth in all except batteries, with batteries being the largest growth area at 24% CAGR from 2012 to 2016. Extrapolating these figures through to 2020 results in battery demand of ~460,000t, and non-battery demand of ~1,500,000t, for a total demand approaching 2,000,000t.

Other forecasts indicate a much more aggressive growth due to the battery market, as shown below – the extrapolated Industrial Minerals forecast falls between the two cases presented below.

Tesla has commenced construction of its battery manufacturing facility in the USA, that will require up to 126,00tpa of flake graphite

Graphene, a single atom thick layer of graphite, is another potential demand driver, although significant commercial production may be some way off

The British Geological Survey has listed flake graphite as a material most likely to be in short supply globally



#### Anticipated demand for graphite with and without the battery market

There is the potential for graphite demand to grow to 2-2.5mtpa by 2020, up from current levels of 1.2mtpa



## **Graphite Quality and Associated Pricing**

Product pricing is dependent upon a number of parameters, including flake size and purity. In general, the larger the flake size and higher the purity the higher the price – this is largely due to the lower cost of treating the concentrate to achieve desired specifications for end uses, and the common increase in grade with flake size. The most common quality parameters that prices are quoted on are large flake (>177 $\mu$ m) and high purity (94-97% carbon). Specifications higher than either of these will command premium prices.

There is a wide range of price forecasts for the different graphite products. Industrial Minerals has forecast large flake (+177 $\mu$ m) prices of around US\$1,800/t and medium flake (150-177 $\mu$ m) prices of around US\$1,200/tonne from 2017. This variability in forecasting can be seen when the above is compared with forecast prices from Stormcrow Capital Ltd., an independent Toronto based research firm, as shown below. We note that the jumbo flake pricing is based on very high purity material that is a potential substitute for the high cost synthetic graphite.

One of the key points to be noted are the expected price falls in the lower quality material – this will be largely due to, should a number of the planned large operations come on stream, a glut of this material. Therefore, size and quality will more and more be a discriminant on whether a project will go ahead.

## **Graphite Specifications and Indicative Pricing**

Graphite Product	Carbon Content (%)	Mesh Size	Graphite Size	2014 Price (US\$/t)	Forecast 2020 Price (US\$/t)
Jumbo Flake	99-99.9%	+48	>300µm	\$2,300	\$6,175
Large Flake	94-97%	+80-48	177 - 300μm	\$1,300	\$1,165
Medium Flake	94-97%	+150-80	106 - 177μm	\$950	\$517
Small Flake	94-97%	+200-150	74 - 106μm	\$750	\$493
Fine Flake	80-85%	-200	<74µm	\$550	\$359
Synthetic	99.95%			\$7,000 - \$20,000	

High purity jumbo flake graphite has been forecast at US\$6,175/t

Source: Various, Inc. Stormcrow Capital

It needs to be noted that graphite is not transparently traded – prices are set between customers and suppliers, and prices received for similar products in the future will vary between the different producer/customer agreements.

The chart below shows a price chart for the commonly quoted large flake/high purity graphite and illustrates a generally upward price trend over the period 2002 to 2015 due to increasing demand. The emergence of electric vehicles and the potential boom in



lithium-ion battery demand into the foreseeable future is likely to continue to buoy the graphite price, with an upward trend again commencing in 2014.

## Historical Graphite Price Chart



Source: Lincoln Minerals based on Industrial Minerals data





**Allan Mulligan** is a mining engineer with 30 years of mine management and production experience.

Managing DirectorAllan MulliganAllan has specialised in technical assessment and production economics, feasibilities,<br/>project design and costing of underground mines and prospects. He has worked<br/>extensively in exploration, mine development and operations across Africa and Australia<br/>and understands the value of Australian expertise and African opportunity.

Allan was a founding director of Walkabout Resources Pty Ltd. He has previously been on the board of several West Australian explorers.

**Andrew** has a BSc Hons in Geology from the University of Stellenbosch in South Africa and is a member of the Australian Institute of Geosciences.

Andrew Cunningham Andrew has extensive cross discipline technical and management experience in the minerals industry predominantly in Africa and Australia and has worked in a range of commodities and geological styles including uranium, iron ore, graphite, diamonds, gold and base metals.

During the last 15 years he has managed all facets of exploration and development projects in Africa from project generation to the completion of feasibility studies. He has held senior geology and exploration positions with major international mining companies as well as various ASX and TSX listed companies. Andrew has been working with Walkabout Resources since 2013 and brings a wide range of exploration, resource development, mine geology and management experience to the company.

Non-Executive Director Tom Murrell is recognised as an authority on investor and financial relations and has been the Managing Director of his own company, 8M Media and Communications for the past 18 years.

He has provided counsel to an elite group of companies listed on the Australian Stock Exchange ranging from Top 500 companies through to start-up biotechnology, medical and exploration companies.

He has been a Director of Investor Central, a Singapore-based financial news service since 2002.

A graduate of three Australian Universities, he gained his MBA from the University of Western Australia and is the immediate past President of the Business School's Graduate Management Association (GMA) representing UWA MBA alumni.

Non-Executive Director



#### **Analyst Verification**

We, Grant Craighead and Mark Gordon, as the Research Analysts, hereby certify that the views expressed in this research accurately reflect our personal views about the subject securities or issuers and no part of analyst compensation is directly or indirectly related to the inclusion of specific recommendations or views in this research.

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