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FAR EAST CAPITAL
The Mining Investment Experts

Company Review

21 August 2015

Analyst : Warwick Grigor

MRL Corporation Ltd (ASX:MRF)

"Strong earnings estimates on graphite become stunning when graphene is included"

Share Price	6.4¢	at 20/8/15
12 Mth High/Low	3-13¢	
Market Cap'n	$12.6m	undiluted
Issued Shares	196.725	mill. ordinary
Options - MRFOA	49.3	mill. 20¢, Oct 2016
Options - Unlisted	54.0	mill. 10¢, May 2017
Total Issued	300.0	mill. shares + options
Cash Balance	$1m	as at 30/6/15
Debt	Nil	
Largest Shareholders		
Citicorp Noms.	4.8%	
McGuckin Family	3.6%	(director)
Emerpus Asia	3.2%	(vendor)
Hallidaf Mgt	3.1%	(director)

Source: ASX

***Investment Perspective**: MRF is the most recent, genuine graphene stock to emerge. It can use the one step electrochemical exfoliation production method to produce high quality, low cost graphene.*

MRF sits in contrast with Talga due to its extremely high grade ore, with ROM grades of 90-99% Cg compared to Talga's expected grade of around 25%. The benefits of this super grade are compounded by the yield to graphene which has been demonstrated to be 50-80%, whereas Talga has released figures of 2-10%. Put simply, MRF has to move much less ore to achieve sizeable quantities of graphene. This minimises both capital expenditure outlays and operating costs. It also provides greater flexibility to transport ore to proposed graphene production facilities that can be located on the doorstep of the graphene consuming entities.

MRF will operate at a smaller scale than Talga due to the geometry of its orebody, but this is not an inhibiting factor at the early stage of the development of the graphene sector, as bulk applications are still being developed. The market is not yet able to absorb substantial quantities of graphene, though the availability of supply will rapidly stimulate demand.

The market has already re-rated Talga in recognition of its exciting potential but MRF has not yet seen its share price appreciate in the same way. It is time that it did so. Both companies have an exciting future but the spread between their market capitalisations is currently too great. Competition between the two companies will be to shareholder benefit as each company should be vying for investors' attention.

Directors

Peter Hepburn-Brown	Non-Exec Chairman
Craig McGuckin	Managing Director
Peter Youd	Exec. Director and CFO
Denis Geldard	Non-Exec Director
Chris Banasik	Non-Exec. Director

Company Description

MRF has acquired very high grade graphite projects in Sri Lanka that it is preparing for production. Historical records and economic assessments show sound profits are possible from long life small scale mining in the first instance, offering excellent returns on minimal capital outlays. The long term growth potential will come from the amenability to a very low cost graphene production method with the best yields to saleable graphene possible. Collaboration with leading scientific organisations and commercialising parties will give access to the entire value chain and an extended growth curve.

Compelling Points

- highest graphite grade possible at > 90% Cg
- rapid commissioning of brownfield sites
- low start-up capex of $5m
- low operating costs, high margins
- amenability to graphene & advanced graphite production
- strong board credentials
- 100% ownership of projects

EBIT Estimates

		Graphite Base Case	Base Case + Graphene
Production			
Graphite	tpa	5,000	4,000
Graphene	tpa	0	500
EBIT Margin		A$7.5m	A$33.4m
EBIT/share (undil.)		3.8¢	17¢

Table 1. EBIT estimates for Sri Lankan operations (see page 3)

Investment Highlights

Sri Lanka has the highest grade graphite mines in the world	"Grade is king". That is a universal maxim in mining. Sri Lanka is the home of the highest grade vein deposits of graphite in the world. These have been mined continuously since 1820, but more recently there have been only two operating mines. The grade is typically above 90% Cg, but can exceed 95%. This gives a competitive advantage in a world where 50% of mine production comes from grades of less than 6% Cg.
Narrow vein mining methods proposed	MRF plans to mine the orebodies using underground mining techniques with productive horizons commencing at 25-30m depth from the surface. Low cost airleg miners will be employed to selectively mine the best grade graphite.
Minimal processing required after mining	The selective mining will ensure highest quality graphite is delivered to the surface. Simple hand sorting will then remove any extraneous pieces before simple bagging for sale. You couldn't image a more simple, low cost process.
Low capital and operating costs	Each mine shaft is expected to cost $200,000 to rehabilitate and bring back into production. New mines will be a similar figure due to the ability to use concrete rather than steel when passing through oxidised ground. There is almost no capital cost for the above ground processing facilities.
Early start-up expected in 2015	MRF plans to open up its first shaft prior to the end of 2015. Production capacity will ramp up to 5,000 tpa from up to 20 shafts, on a single shift production schedule, over a two year period.
First mover advantage with 100% equity of Mining Licences	MRF holds one Industrial Mining Licence and a second is expected within a month or two. This places it well ahead of any other Australian companies seeking a foothold. It is the only Australian company with 100% ownership of its licences.
Graphene production from a single stage process	Recent test work by the Adelaide University has shown that MRF's graphene is perfectly suited to the electrochemical exfoliation method of extracting graphene due to the high grade, the crystalline nature of the graphite and minimal impurities. Further, the yield to graphene is very high at better than 50%. Thus it could be seen as a genuine graphene miner in due course.
No financing hurdle	The amount of money needed to achieve the planned production level is only $4-5m. Raising this should not be difficult given the quality of the product and the early payback of capital, giving a strong earnings profile.
Downstream processing to add more value	Apart from the potential to produce graphene, a spherical graphite product is possible. Further research is likely to find that other high value products can be made.

Figure 1. High grade graphite sample, probably > 95% Cg. Source: FEC

Project Economics with Graphene Considered

The Graphite Estimates are Simple

Earnings estimates for a simple, low tech graphite mining operation can be easily estimated, based on detailed engineering and costing undertaken by MRF. A capital outlay of $4-5m can be paid back within a two year period. Actual expenditure of this amount would be staggered over the first two years, as would the resulting cash flow from the ramp up.

An EBIT of A$7.5m has been estimated on the Base Case, increasing to A$15m in the Expanded scenario. The expansion could come from the development of new mines and/or the purchase of graphite from small local miners. As a graphite only producer, the Company is well placed with a low risk project.

The Speculation Comes with the Graphene

The speculative upside really kicks in for MRF if it can divert some of its graphite production to make low cost graphene. Here, we have assumed only 20% of the production is diverted to graphene, with there being a 50% yield. Our numbers have only looked at the Base Case scenario, which is 500 tpa of graphene. Additional capital expenditure would be required, but nothing prohibitive. It could probably be financed from cash flow.

There will also be higher value graphite products that can be made from the Sri Lankan ore, but we have not taken any of these into account.

Mining Parameters			**Base Case**	**Expanded**	
Vein Width		25-30 cm			
Carbon Grade	TCG	95%			
No. of Shafts			20	40	
Annual Graphite Production	tpa		5,000	10,000	
Time Frame			2 years	4 years	
Mine Life Est. (not on JORC)		> 10 yrs			
Capital Costs					
Per Shaft/Totals	A$	200,000	$4m	$8m	
Capex Payback	1-2 years				
Unit Costs/Revenue					
Graphite Price	US$/t	$1,750	*Simple sale price for graphite*		
Mine site costs	US$/t	$300			
Cash Operating Margin		$1,450			
All Other Costs		$350			
All-in-Costs	US$/t	$650	*Including all corporate overheads*		
Exchange Rate AUD/USD		0.73			
Earnings Measures			**Base Case**	**Expanded**	**Graphene Added**
EBIT Margin	US$/t	$1,100	A$7.5m	A$15.1m	A$33.4m
EBIT/share (undiluted)			3.8¢	7.7¢	17¢
EBIT/share (diluted)			2.5¢	5¢	11.1¢
Share Capital					
Issued Shares	mill.	196.725			
Issued Options (20¢, Nov '16)	mill.	49.300	20¢	$9.9m	*Cash If Exercised*
Issued Options (10¢, May '17)	mill.	54.000	10¢	$5.4m	*Cash If Exercised*
Graphene Figures			**Base Case**	**Expanded**	
% diverted to graphene	tpa	20.0%	1,000	2,000	
Graphene Yield		50.0%	*Based on the lower end of the range of test work*		
Graphene Production	tpa		500	1,000	
Graphene Price	US$/t	$55,000	*Based on the same price assumption as Talga's Scoping Study*		
Additional Processing Cost	US$/t	$15,000	*FEC estimate, including expensing of capital*		
Net Margin on Graphene	US$/t	$40,000			
Notes					
Finance	*There has been no attempt to dilute EPS for possible financing/share issues*				

Table 2. MRF Earnings Estimates. Source: FEC

Location Map of Sri Lankan Projects

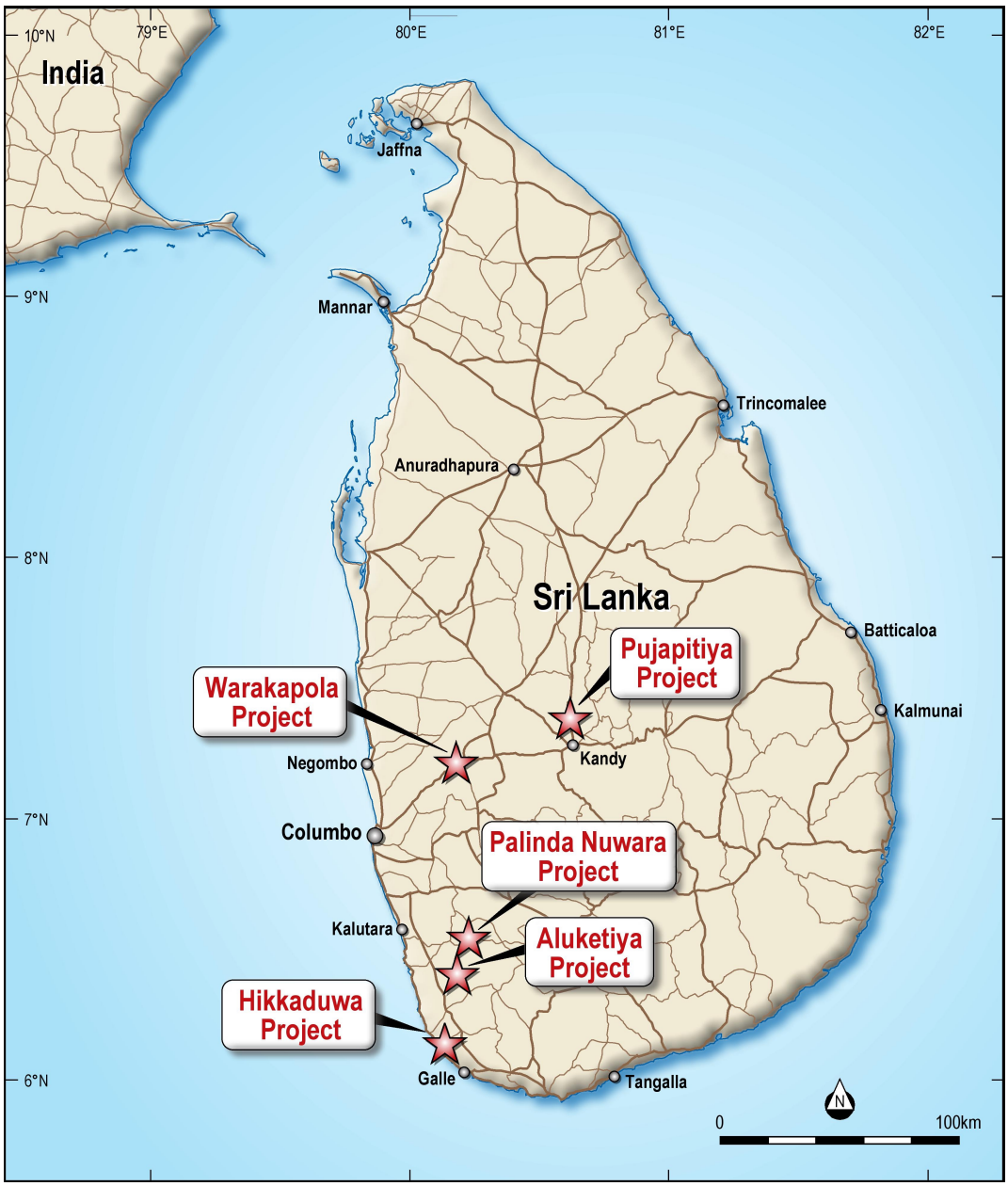

Figure 2. Project Location Map. Source MRF

Company History and Acquisition of Sri Lankan Assets

Company History and Background

MRF was previously a company named Mongolian Resources Ltd with coal exploration projects in Mongolia. It changed direction in April 2013, withdrawing from Mongolia in preference for high grade graphite in Sri Lanka. The shares underwent a suspension from April 2013, until December 2013, raising $1.2m in the process. A shareholder meeting was held in October 2013, to approve the change of direction and the name was changed to its current form at that time.

Graphite Mining in Sri Lanka

Graphite has been mined in Sri Lanka since 1820. Peak production occurred in the years 1900 to 1920, with exports reported to be 33,411 tonnes in 1916. That constituted 35% of global graphite production at the time. There were over 3,000 pits and shafts operating in Sri Lanka but all were small scale with the water table preventing deep mining.

Current production is 5-6,000 tpa from two mines; the privately owned Bogala mine (Graphit Kropfmuehl AG) and the government owned complex at Kahatagaha and Kolongaha.

Sri Lankan graphite is highly crystalline and very high grade, though orebodies are also very narrow. Selective mining and simple hand sorting and screening is sufficient to produce +95% Cg product. On either side of the high grade veins is another type of graphite, shown in Figure 2 below. Known as a needle graphite with grades of 75-85%, this is a secondary material which will require additional processing before marketing.

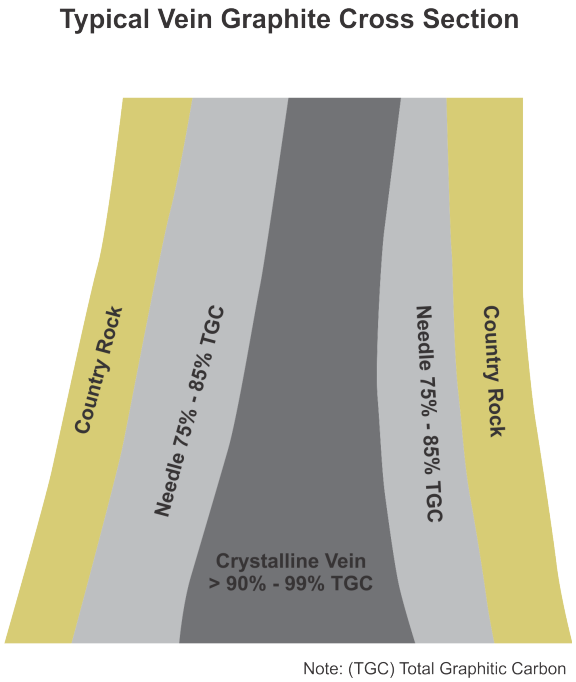

Figure 3. Typical Vein Cross Section. Source: MRL

Licence Acquisitions

In April 2013, MRF announced an agreement to acquire 45 km^2 of exploration licences prospective for graphite. Vendor payments to The Supreme Group were;

- a US$100,000 deposit
- US$400,000 on settlement
- 5 million vendor shares
- an additional 5 million vendor shares on conversion to a mining licence, and
- payment of US$500,000 on the commencement of commercial mining activities

The transaction was settled in October 2013, following shareholder approval being granted in a meeting.

The licences were aggregated into three projects;

- Warakopola (25 km^2) in Gampaha & Kegalle Districts
- Palinda Nuwara (10 km^2) in Kalutara District, and
- Hikkaduwa (10 km^2) in Galle District

In January 2014, MRF announced the granting of an additional 18 km^2 in the Pujapitiya Project area (the fourth one), south of the Kahatagaha/Kolongaha mining operations.

In October 2014, MRF announced the completion of the acquisition of the Aluketiya mining licence with an historical graphite mine, located at Meegahatenna, within the Walallawita District, 85 km from Colombo. The vendor was a private individual who is also the landowner.

MRF has applied for an Industrial Mining License at Pandeniya, where it intends to commence mining prior to the end of 2015.

MRF is continuing to assess other licence opportunities in Sri Lanka. In December 2014, MRF announced another transaction that could effectively double its tenement size, but that is subject to due diligence. Other opportunities are being assessed.

Licences Currently Held

The Sri Lankan mining law is loosely based on both Western Australian and Canadian law, though there is significantly less underlying regulation.

As at August 2015, MRF held;

- one granted Industrial Mining Licence at Aluketiya
- one application for a conversion to an Industrial Mining Licence at Pandeniya
- four exploration licences at Warakapola, Pujapitiya, Hikkadua and Palinda Nuwarra.

Expenditure to Date

MRF has spent approximately $1.8m on the Sri Lankan projects to date, in addition to the acquisition costs.

Aluketiya Mining Proposal

MRF proposes to commence mining operations at Aluketiya, where there is plenty of evidence of historical mining activities. A number of shafts (8-10) were developed to maximum depths of 70-80m, with graphite producing drives extending 10-15m either side of the shafts, but there are no historical records of production volumes. The last recorded mining activity was in the period of 1995-2000. Recent diamond drilling has confirmed that the orebodies extend beyond historical workings.

Local Geology

The geology in the Aluketiya licence area is dominated by two main rock types; garnet – sillimanite-biotite granitic gneiss (garnet granitic gneiss) and charnockite. Four major well developed fracture systems have been identified with the most prominent having a NEE-SWW orientation. The deep seated graphite veins are understood to follow this orientation but shallow veins may follow discrete, alternative patterns of direction.

The graphite comes from Proterozoic sediments and has been remobilised by volcanic events, depositing in fault zones and in pressure shadows around fault noses. Veins become diffused near surface and are not economic until depths of 25-30m where they combine into larger widths. At depths of 50-70m they can achieve widths of up to 30-50 cm. Either side of the 90%+ graphite is usually a halo of “needle” graphite that runs at 75-85% Cg. This can be treated via a simple flotation circuit to lift the grade to 97%. MRL intends to stockpile this material in the first instance.

Diamond Core Drilling

MRL has completed six diamond core holes at Aluketiya following a fixed loop EM survey. All but one hole intersected a large number of graphite veins (7 - 37) ranging in thickness from a few centimetres to greater than 30cm. In the top 25-30m of the system the veins splinter into narrower fingers, suggesting that commercial mining widths are not expected until development extends beneath a depth of 30m. The main veins vary in strike lengths of 30-100m.

Resource Potential

Chemical analysis of two main veins has returned carbon content as high as 95-99 % Cg. Potential resources blocks in the order of 1,000-2,000 tonnes can be estimated in the vicinity of the drill holes, with expectations that these figures can be extrapolated throughout the vein system. A figure of 5,000 tonnes would support a 250 tpa per shaft of saleable product mine for more than 10 years.

Proposed Mining Dimensions and Methods

Underground drive openings vary in size but generally will be designed on a nominal 1.5m width and 2.0m height with a two compartment winze on either end or in the middle of the vein strike. Working lifts will be designed nominally on 1.2m x 1.8m. The historical entrance to these shafts and tunnels were timbered to provide support and prevent the surrounding rock from falling down and now must be bolted as the timber has rotted away.

The proposed mining method to be used at the Aluketiya Mine is hand-held, selective airleg and machine pick powered by compressed air. Stope areas will be divided into production blocks, nominally the lesser of length of vein strike or 30m and 50m vertical along dip. Stope areas will be divided into production blocks, nominally the lesser of length of vein strike or 30m and 50m vertical along dip. A crown pillar will be left in place at the top of each mining block to ensure final support is in place for the last production lift of each. On any level, there will be hand-held stope mining. This will involve mining the ore zones, by a method of mining a slot nominally of 0.6m advance or whatever is practical. Where required ground support including rock bolts will be used.

The veins are expected to be commonly 25-30cm wide. Thinner veins will be not be pursued while larger veins will be most useful. The intention is to leave about 1cm of graphite on the host rock to ensure minimum dilution of grade. The traditional Sri Lankan method is to remove the graphite by hammer and stone chisel, but there may be better methods available.

Resuing Mining Method

The multiple veins at Aluketiya vary in width and range from a few cm to in excess of 0.5m. A special variation of the cut and fill method known as Resuing can be used. It requires the identification of the vein and country rock to be readily possible. The method relies on the shrinkage or expansion of the rock when it is blasted.

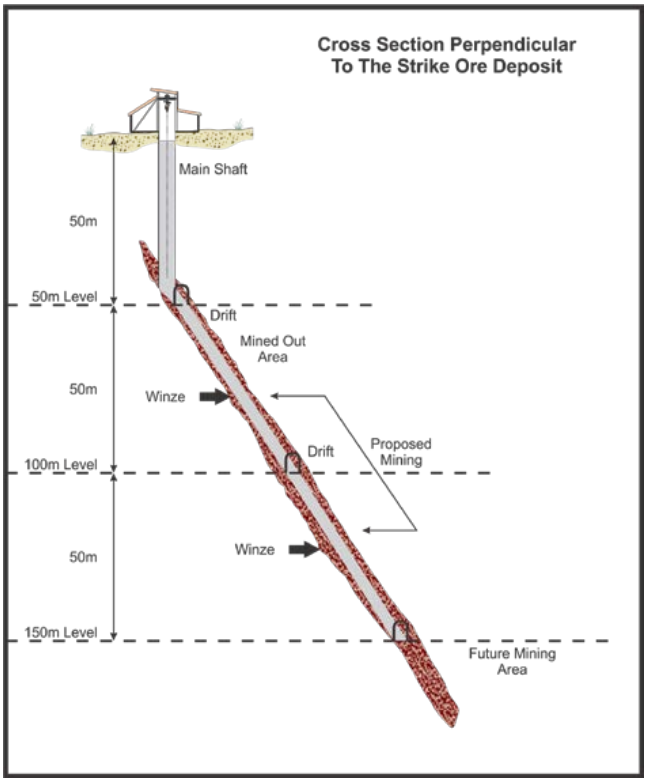

Figure 4. Schematic of underground mine. Source MRL

The principal of resuing is cut and fill stoping in which the country rock, usually the hanging wall, is blasted down as fill. All other aspects of resuing method are similar to cut and fill. This method is almost imperative if vein material runs as little as 150mm to 300mm.

Each operating shaft will employ 6-7 experienced miners working on a 12 day on, 4 day off roster, working 8 hour shifts.

Lower Mining Costs

Sri Lanka is recognised as a much lower cost country in which to operate. Not only will airleg miners be much cheaper than in Australia, but all other labour and material inputs for an operation will be cheaper. This will a major factor in MRL being able to operate small scale mines with there being no real economies of scale.

Rehabilitation of historical shafts

Typical Rehabilitation of the historical shaft and the method of re-entry will be undertaken with the following procedural steps:

- clear all vegetation from around the old shaft using safety lanyards where required to provide clear access to the historical workings;
- level the immediate area around the shaft collar to the engineered design and cap with suitable compacted building material;
- place a structural steel frame over the old mine opening creating the new shaft dimensions;
- place structural reinforced steel and concrete over and around the steel frame to establish a new shaft collar and safe working area and cover opening with steel plate;
- erect engineered modular headframe over the shaft opening, with a hoisting system for men and materials;
- lower structural boxed steel sections down the shaft until solid rock in reached;
- anchor in steel box sections to solid rock and fill gap between steel box and historical shaft with concrete;
- at shaft locations 1 and 2 new shafts will be sunk using onsite formed concrete liners to line the unconsolidated material areas. The method varies slightly from the rehabilitation model whereas the concrete liners will gradually lower into the excavated shaft area as the waste is removed. All other equipment used is the same. The concrete liners will stop once the basement rock is encountered.

Rehabilitation of each historic shaft is expected to take 4-6 months, with full production rates to be achieved after 9-10 months. Each shaft is expected to produce 250 tpa of saleable graphite

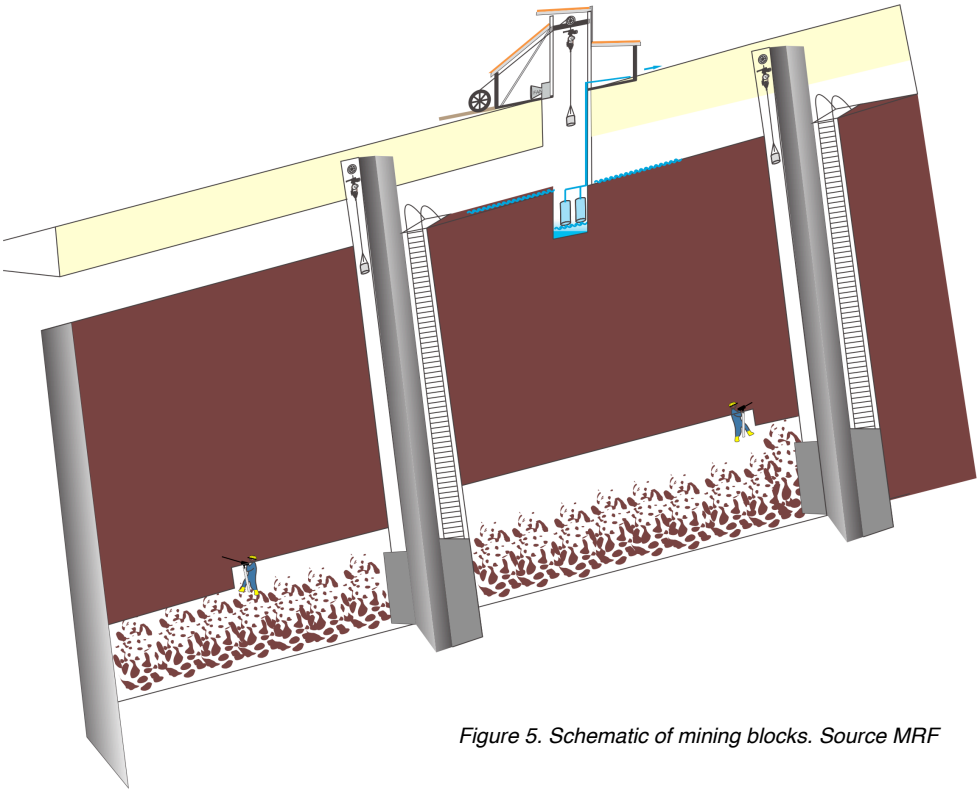

Figure 5. Schematic of mining blocks. Source MRF

Pandeniya Mining Proposal

It is possible that mining may first commence at Pandeniya where there has already been a head frame and shaft facilities installed, but that is dependent upon the granting of an IML. The conversion application was lodged in January 2015. MRF expects that it should be granted by October 2015.

As of last week the shaft had been dewatered to a depth of 8m, with the total depth believed to be in the order of 50m. The next step is to install steel frames and casing to a depth of approximately 30m, at which point the hard fresh rock ground conditions are encountered.

Local Geology

The lithological and structural geological setting in the area is considered to be significantly favourable for the deposition of graphite deposits with a large number of old workings being observed. Pandeniya is itself a good candidate for deep seated reserves beneath historical mining levels.

Diamond core drilling

MRF has completed three diamond core holes at Pandeniya. Two of these intersected graphite veins below the main Pandeniya shaft workings. The Company is purchasing its own diamond drilling rig to improve the quality of the work being undertaken, with the flexibility that this will also provide. Downhole EM surveys on a 50-100m loop are very effective in identifying where the graphite veins lie. These will allow MRF to economise on the drilling as it moves to identify mineable resources.

Resource potential

Detailed estimates will require a dewatering of the shaft and access to historical workings, but taking a 40m radius around hole DH 01 intercept could support an estimate of 3-4,000 tonnes of graphite. This would support a mine life exceeding 10 years at 250 tpa.

Proposed Mining Dimensions and Methods

It is expected that Pandeniya will provide similar mining conditions as Aluketiya. Similar mining methods will be employed.

Figure 6. Pandeniya Headframe. Source FEC

Figure 7. Rehabilitated Shaft Opening. Source FEC

The Uniqueness of the Sri Lankan Graphite Deposits

Sri Lanka is the home of a unique style of ultra high grade graphite vein deposits. Their narrow widths preclude bulking mining methods and constrain mining rates but selective mining methods can achieve extraordinarily high grades.

Very High Grades

Due to the natural fluid-to-solid deposition process, vein graphite deposits are typically above 90% pure with some vein graphite reaching 99.5% graphitic carbon in-situ. This level of purity is possible because the deposition of carbon occurs as a precipitation of solid carbon from a geologic fluid that is traversing emplaced rock. There is no intimate mixing or association of the graphite with country rock as in conventional flake graphite deposits where the non-carbon and carbon phases may be deposited contemporaneously.

Figure 8. Needle graphite on gneiss contact

Typical veins measure from centimetres to nearly two meters in thickness with the highest purity material being located toward the centre of the vein away from contact with the wall rock. Vein graphite is mined using conventional shaft or surface methods typically used to mine vein-type deposits.

Vein graphite is available in sizes ranging from 8 cm lumps to powder as fine as 5-micrometers. Products covering the range of purity from 94% graphitic carbon to 99% graphitic carbon are commonly available. In many applications vein graphite may offer superior performance since it has higher thermal and electrical conductivity, which result from its high degree of crystalline perfection. Vein graphite also has the highest degree of cohesive integrity of all natural graphite materials. High cohesive "energy" means that vein graphite is easy to mould and can be formed into solid shapes without the aid of a binder addition.

Figure 9. Near surface expression of vein

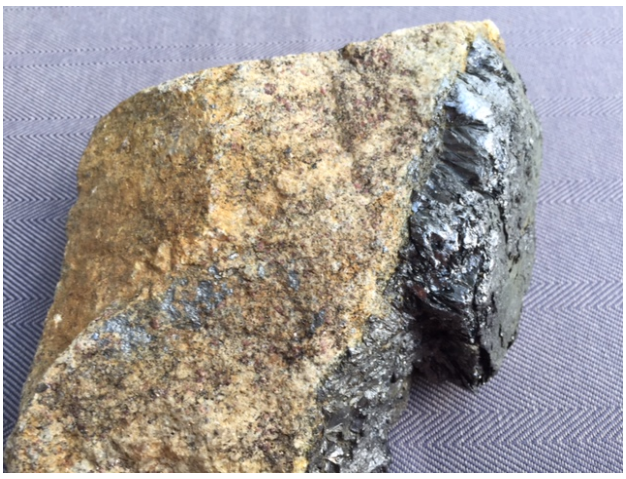

Figure 10. Contact of graphite on gneiss

Figure 11. Aluketiya Licence area

Figure 12. Aluketiya Licence area - surface installations

Corporate Information

Directors and Management

MRL has a particularly strong, mining-oriented board given its status as a prospective developer.

Peter Hepburn-Brown - *Non-Exec. Chairman*

- 30 years of experience as a mining engineer in both open pit and underground mining
- Extensive background in narrow vein mining
- Director of several private & public companies

Craig McGuckin - *Managing Director*

- Qualified mining professional with in excess of 30 years experience in the mining, drilling and petroleum industries
- Held senior positions in private and publicly listed companies
- Founding director of Rheochem Plc

Peter Youd – *Exec.Director, CFO & Co. Secretary*

- Chartered Accountant and has extensive experience within the resources, oil and gas services, and mining
- For over 35 years has held senior management positions and directorships for publicly listed and private companies in Australia and overseas
- Bachelor of Business from the W.A Institute of Technology (now Curtin University).

Denis Geldard - *Non-Executive Director*

- 40 years of technical and operational experience in exploration and project development in Australia and internationally
- Mining graduate from the Kalgoorlie School of Mines in Western Australia
- Director in a number of Australian listed mining and exploration companies

Chris Banasik - *Non-Executive Director*

- Master's Degree in Mineral Economics from University of WA and Bachelor's Degree in Applied Physics from Curtin University
- Director of Exploration and Geology of Silver Lake Resources
- Held senior geological management positions over 12 years with organisations including WMC Resources Ltd, Reliance Mining Ltd, Goldfields Mine Management and Consolidated Minerals Ltd.

Recent ASX Announcements

19/8/15 ***Ceasing to be a substantial shareholder***
Interests associated with Jason Peterson sold 2.9 mill. shares, taking him below 5%

11/8/15 ***Tests show very high graphene yields***
Very positive news on the productivity of the vein graphite's ability to convert to graphene

3/8/15 ***HoA to pursue graphene commercialisation***
Evidence of MRF working to identify outlets for graphene production

27/7/15 ***Quarterly Reports***

13/7/15 Response to price query
Referred to ASX release of 13 May, 2015, covering graphene tests

1/7/15 ***Change of director's interest notice***
Denis Geldard purchased shares on market

30/6/15 ***Section 708A(5)(e) notice***
pursuant to recent placement

29/6/15 ***Appendix 3B***
Following General Meeting to ratify placement

Recent Share Issues - Capital Raisings

Date	Shares Issued	Issue Price	Amount Raised
Oct 2013	6m	20¢	$1.2m
May 2014	56m	2.5¢	$1.4m
Sept. 2014	15.7m	7¢	$1.1m
May 2015	25m	4¢	$1m

Table 3. Recent Share Issues. Source. ASX

Further Information

Further information can be obtained from accessing ASX released announcements at the ASX website, www.asx.com.au or the MRL Corporation Limited website. www.mrltd.com.au

Far East Capital Ltd has released a booklet on graphene titled "*The Investors Guide to Graphene*", available on request. Contact wgrigor@fareastcapital.com.au.

Appendix - Overview of Graphene

The nanomaterial that is set to change the world of materials and manufacturing

A generational change in technology	Graphene presents us with a generational change in technology, taking the field of nano-science (which has been operational for 40 years) one step further. It is nano-science that has given us the capability of identifying and separating graphene to achieve a product that can be combined with so many other materials to achieve performance levels not otherwise considered possible. Graphene is the facilitator.
When graphene is added to other materials it delivers extraordinary improvements in performance	Graphene is a natural material that is the basic building block of graphite. While it was "discovered" in the 1940s, it took until 2004 before scientists figured out how to isolate it from graphite particles, using the simple "scotch tape" exfoliation method. Since then there has been a tremendous explosion of interest in graphene with research scientists demonstrating its suitability for combination with a vast range of other materials to greatly enhance the performance of those materials. There has also been an explosion in the number of patents being taken out as industry has been preparing for the start of the new and deeply disruptive "graphene age".
Scaleability has been a stumbling block, but Talga can solve this issue	Almost all graphene production to date has come from high-tech expensive processes in laboratories that have not been able to satisfy demand due to lack of scaleability. This has been a constricting factor. Industry is looking for a solution to this problem. The most likely company to be able to address this issue is Talga with its one-step direct from ore process.
Reliability of quality and supply has been holding back commercialisation	Consistency of quality will continue to be a concern for industries that seek bulk supplies for applications. Companies that can achieve consistency will be able to develop brand names that are synonymous with standards of reliability. Customers will learn to trust these brands, making it more difficult for subsequent entrants to the market. Thus they will be important intangible assets for leaders in the sector.
Apparent cost is a red-herring when quantity and performance are considered	With quoted prices of $300/gm, graphene appears expensive at first glance. However, the amount of graphene you need to add to materials is frequently less than 1% of the mass and therefore only a minor cost in the total process. The improvements it provides are more often measured in terms of multiples, not mere percentage gains. Graphene frequently makes such a serious material difference that results outweigh any cost implications.
The superlatives just keep coming	• 200x stronger than steel, making it the strongest material known to man • light, stretchable and flexible • the perfect thermal conductor • highest electrical density (one million times that of copper) • transmits electricity almost at the speed of light with virtually no resistance (the lowest resistivity of any material) • the most reactive form of carbon and largest surface area of any material on earth • self repairing - it can self repair holes in its sheets when exposed to free molecules containing carbon
A wide range of applications, and growing	The range of actual and potential applications is growing strongly, seemingly only limited at this stage by research capability and testing. The applications already identified include; • conductive inks for printing, packaging and electrical conductivity in plastics and glass • composite materials such as carbon fibres, plastics, geofabrics, PET and food packaging • coatings and paints using impermeable and hydrophobic qualities, anti-corrosion • water purification technology, offering 90% costs savings over desalination plants • energy storage in batteries and solar power technology • body armour and armaments, fuel cells, membrane technology, medical and biomedical devices, electronics, lubricants and oilfield chemicals.
Implications for other materials and metals	The ability to greatly enhance efficiency of materials with which it is combined will lead to cost saving in many areas. Demand for materials such as metals could be impacted if, for example, the amount of copper needed in electric motors is reduced by 80% with the addition of 1% graphene. Similarly, addition of small amounts of graphene to steel and aluminium could lead to lower demand for the underlying metal. Zinc is in danger of becoming obsolete due to graphene based paints and galvanic coatings significantly outperforming zinc oxide paints and galvanising.

Interesting Graphene Links

Graphene Paint	https://www.youtube.com/watch?v=E_uZZrY3zLc
Manchester	https://www.youtube.com/watch?v=ZMJnBx117-E
Mesograf	https://www.youtube.com/watch?v=-x4v8cKWFFQ
Conductive ink	https://vimeo.com/121878247
Graphene 3D Printing *(company promo)*	https://youtu.be/zvMqLayQXv4
Lomiko Metals (Energy Storage) *(company promo)*	https://youtu.be/oE55teMMrjY
Angstron Materials *(company promo)*	https://youtu.be/XHb75p7JN3I
Graphene (good overview)	https://youtu.be/jFryFQoWP0M
Graphene Documentary	https://youtu.be/IUrqyuw-6Iw
Graphene Revolution	https://youtu.be/sugmA-pll4k
Graphene: Energy Storage	https://youtu.be/DzLiaJsric4
Quest for New Metals *(UCLA lecture on superhard metals conducting polymers and graphene)*	**https://youtu.be/du6H990Z9yA**
Extreme Technology *(advanced materials documentary)*	https://youtu.be/g_4NMdQfqvc
From Atoms to Applications *(Mikael Fogelstrom lecture)*	https://youtu.be/675eM-V8t08
Graphene Synthesis and Applications *(Institute for Energy Efficiency – Lecture by Richard Kaner)*	https://youtu.be/a6QirDH3NtQ
Graphene: The Material of Tomorrow *(Time Magazine clip)*	http://ti.me/1CJA1y3