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ASX Symbol

FGR, FGROB

December 2016 Quarterly Report

Company completes significant quarter of development

First Graphite (ASX: FGR) is pleased to report on what has been significant quarter of development on various fronts for technology and mining activities.

Highlights

- Acquisition of potentially disruptive technologies and intellectual property, including fire retardants and supercapacitors.
- Excellent results on the resistivity of the Company's graphene and third party results from the USA on Aluketiya graphite.
- Significant Sales Agreement with Kahatagaha Graphite Lanka Limited (KGLL) for the supply of graphite.
- Successful capital raising post-quarter end for \$3.52m.
- Completion of warehouse construction to provide central hub and storage facility.
- Continued progress toward mining at Company owned sites at Aluketiya and Pandeniya.

Intellectual Property and Technology Acquisitions

In January 2017 the Company advised it entered into a binding Heads of Agreement with Kremford Pty Ltd relating to a graphene oxide based thin film supercapacitor technology for high performance and low cost energy storage; the Bolt Electricity Storage Technology Battery (BEST Battery). This exciting, patent pending technology will overcome the energy density limitations with supercapacitors, achieving the following potential advantages;

- 10x better energy density than competing devices
- 10,000x faster charge/discharge rates
- 10,000 charge/discharge cycles
- ultra thin and ultra light in weight
- highly flexible and integratable
- environmentally friendly due to the absence of chemicals

In October 2016 the Company announced it had agreed a licence term sheet for a multipurpose graphene-based composite and Fire Retardant IP. Under the licence agreement FGR would pay a royalty and fee to the University of Adelaide. Expandable flake graphite has been used for some time in flame retardant resins. Their successful use is dependent on the purity of the graphite flake, particle size of flake and also on the expansion properties of expandable graphite. The use of graphene in these retardants will significantly improve their effectiveness.

The table below provides a simple comparison of what the parties believe the BEST Battery could achieve compared to the standard lithium-ion battery, based on laboratory test work undertaken to date.

Parameters	Supercapacitor (BEST Battery)	AA Rechargeable battery
Storage mechanism	Physical	Chemical
Charge time	1- 2 minutes	1 – 4 hours
Cycle life	Minimum 10,000 cycles	300 – 1,000 cycles
Cell voltage	1.5 to 2.3 V	1.25 – 1.5 V
Energy density (Wh/L)	7 (current state) 50- 60 (target for this project)	100 to 200
Power density (W/L)	Up to 10,000	35 to 300
Cost per Wh	\$20 (current state) \$0.30 (target for this project)	\$0.50 - \$1.00 (large system)
Service life	10 to 15 years	1 to 2 years
Disposal	No special requirement, environmentally friendly	Land fill, harmful to environment

Table 1: Overall comparison of existing supercapacitor with Lithium-ion battery

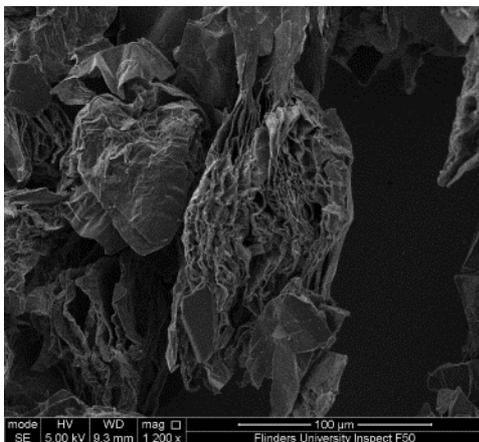
Graphene Property Improvements and Updates

In November 2016 Flinders University conducted tests on FGR graphene using its Turbo Thin Film (TTF) processing technology.

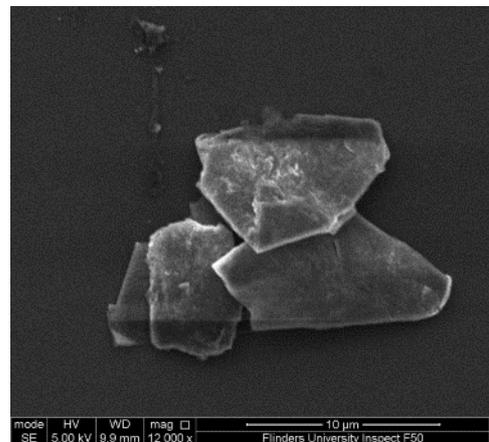
The initial results from the Turbo Thin Film device used FGR graphite in water and successfully produced few layer graphene as well as nano-sized needle structures (scrolls) which may have similar properties to carbon nanotubes.

TTF device has shown great promise to produce high quality, few layer graphene from FGR graphite feedstock and also create nanoparticles which can be beneficial in certain processes.

The process, when scalable will complement each other and FGR produced graphene to produce nanomaterial with precise control over physical properties including length, chirality and functionality.

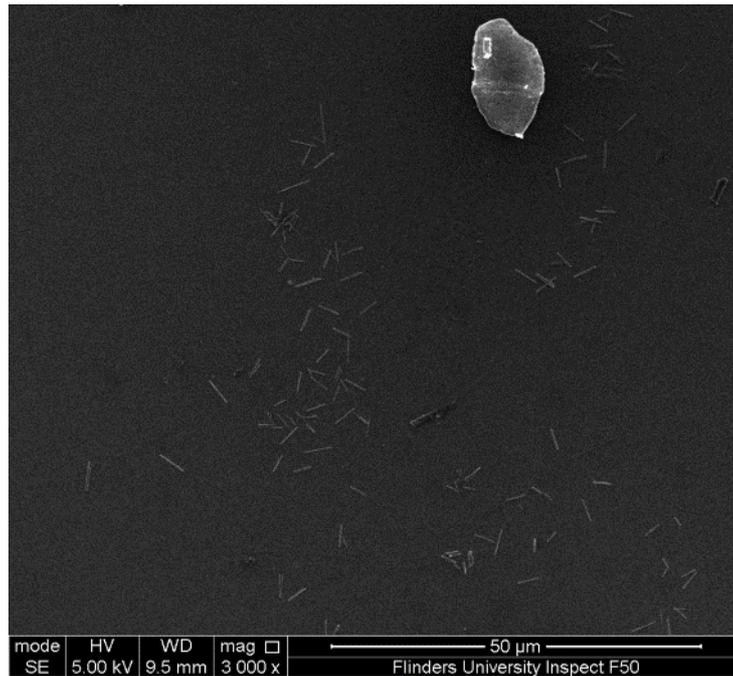


FGR provided feedstock



Graphene platelets from TTF process

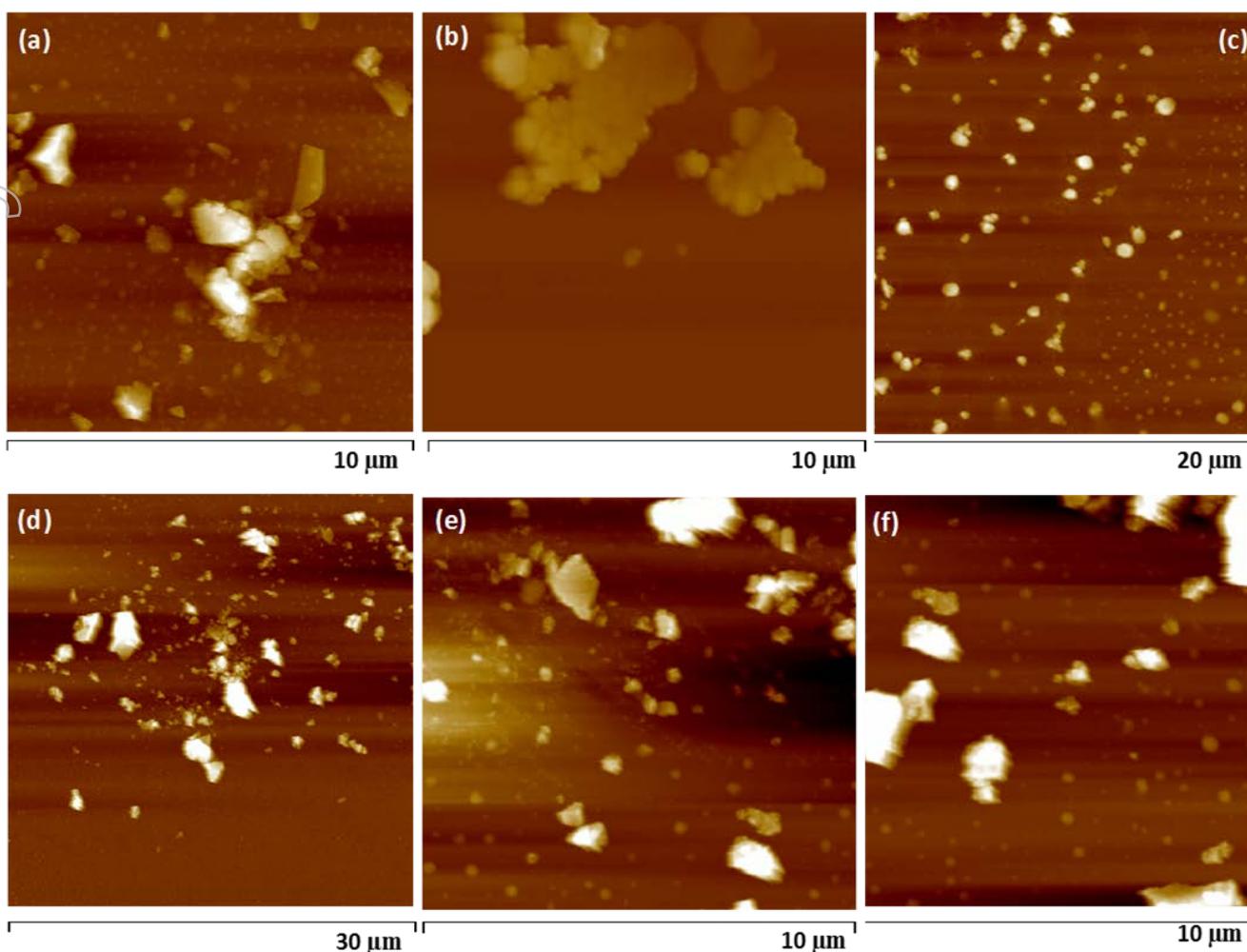
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Nano sized needle structures (scrolls)

In December 2016 the Company received the results from the tests conducted with the Flinders University Vortex Fluidic Device (VFD).

Sri Lankan graphite was processed within dynamic thin films in the vortex fluidic device (VFD) at an inclination angle of 45° and rotational speed of 7,500 rpm. Two different solvent systems were employed namely (1) water and (2) a mixture of toluene and water at a 1:1 ratio. The resulting material was primarily characterised using atomic force microscopy (AFM) and Raman spectroscopy to confirm the thickness of the graphene sheets and to confirm integrity of the material. The ability to use water as the solvent will greatly reduce the introduction of contaminants into produced graphene.



AFM height images of the processed graphite flakes in water in the VFD – real time images

The Raman spectra of the graphene sheets show a typical graphitic spectrum, D band (1338.2 cm^{-1}), G band (1574.7 cm^{-1}) and a 2D band (2700.0 cm^{-1}). A significant increase in the averaged Raman ID/IG ratio (corresponding to the D-band and G-band intensities) of the sheets compared to the as received graphite flakes were observed, suggesting a significant increase in the density defects of the nanostructures which can well be attributed to the ripping of the graphene sheets due to intense shear in the VFD. The 2D band of the graphene sheets were narrower indicating the graphite flakes were indeed exfoliated to a certain extent.

The conclusions drawn by Flinders

- Water is the preferred solvent
- Conversion to multi-layer graphene sheets ~ 60% yield - AFM and Raman
- Requirement now for the use of peristaltic pumps
- System to be optimised

During the quarter tests at the University of Adelaide demonstrated the extremely low resistivity of FGR's high quality graphene. Conversely this means the electrical conductivity is extremely high and therefore suitable in a number of electrical based applications which require the transference of electrical energy.

FGR graphene had a resistance of less than 100 Ohm, which was between 17 and 50 times better than pristine graphene and reduced graphene oxide (RGO).

Furthermore, the spraying of FGR's graphene resulted in a homogenous distribution of overlapping graphene sheets on the interdigitated electrode while standard graphene made clusters (islands) and increased its resistivity (lowered conductivity). While not yet measured optically, visually FGR graphene appears to exhibit better transparency when compared with standard graphene.



FGR Large area graphene resistance <100 Ohm



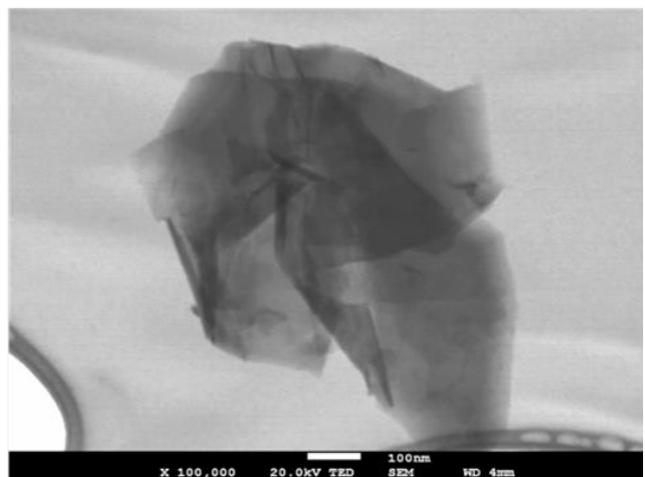
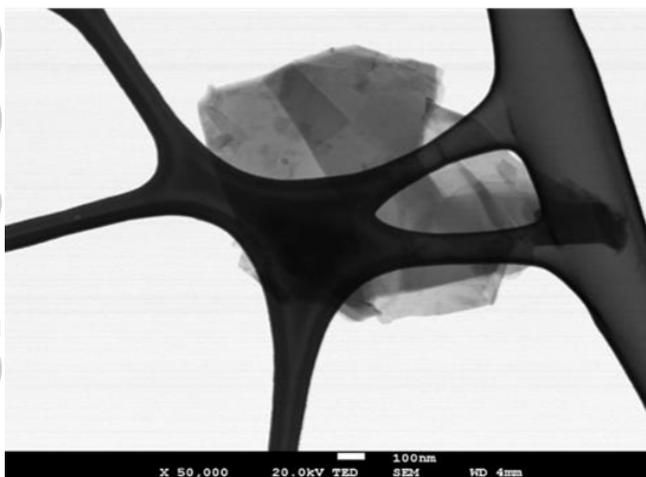
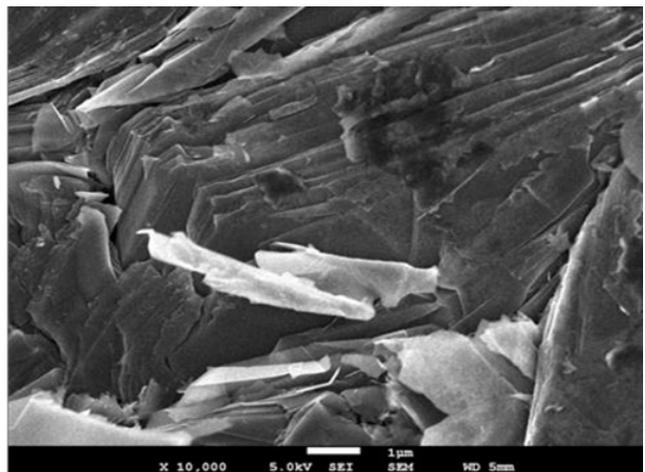
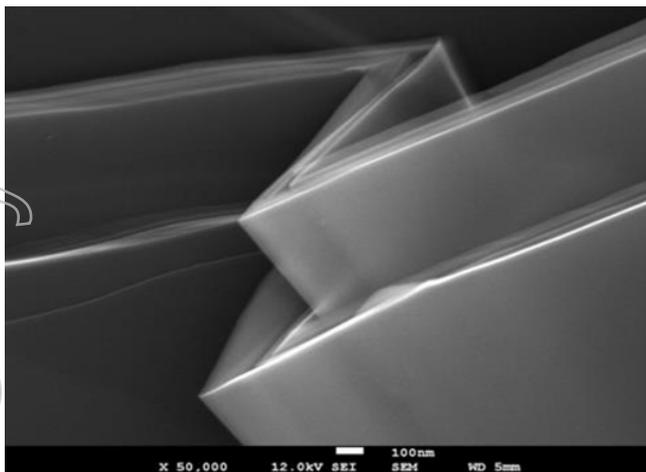
Pristine Graphene resistance 1,700 – 1,900 Ohm

SEM and STEM Microscopies Evaluation of First Graphite Vein Graphite

Test were conducted in the USA on graphite samples provided from Aluketiya core samples and the results were exceptional and provided further evidence of the very high grade of material.

A Scanning Electron Microscope (SEM) and Scanning Transmission Electron Microscope (STEM) were first used to evaluate the morphology and structural features of the graphite.

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High magnification SEM (top) and STEM (bottom) images demonstrate the surface morphology and the structural features of graphite

Further work was then undertaken with Energy Dispersion X-Ray Spectroscopy (EDS SEM) and the data showed 100% Carbon (C). X-Ray Fluorescence Wavelength Dispersive Spectrometry (XRF WDS) confirmed the material is a high grade with about 99.87 % C, no impurity elements were detected in the amounts > 50 ppm.

	Compound Name	Concentration (%)	Absolute Error (%)
1	C	99.87	
2	Mg	0.01	0.003
3	Al	0.01	0.003
4	Si	0.04	0.006
5	Cl	0.02	0.004
6	Ca	0.00	0.002
7	Fe	0.04	0.006

Results of XRF WDS Analysis

Raman Spectroscopy exhibited C sp² graphitic G-band and an overtone 2D band; no C sp³ defect D-band is detected. The Raman data proves the high quality of this material.

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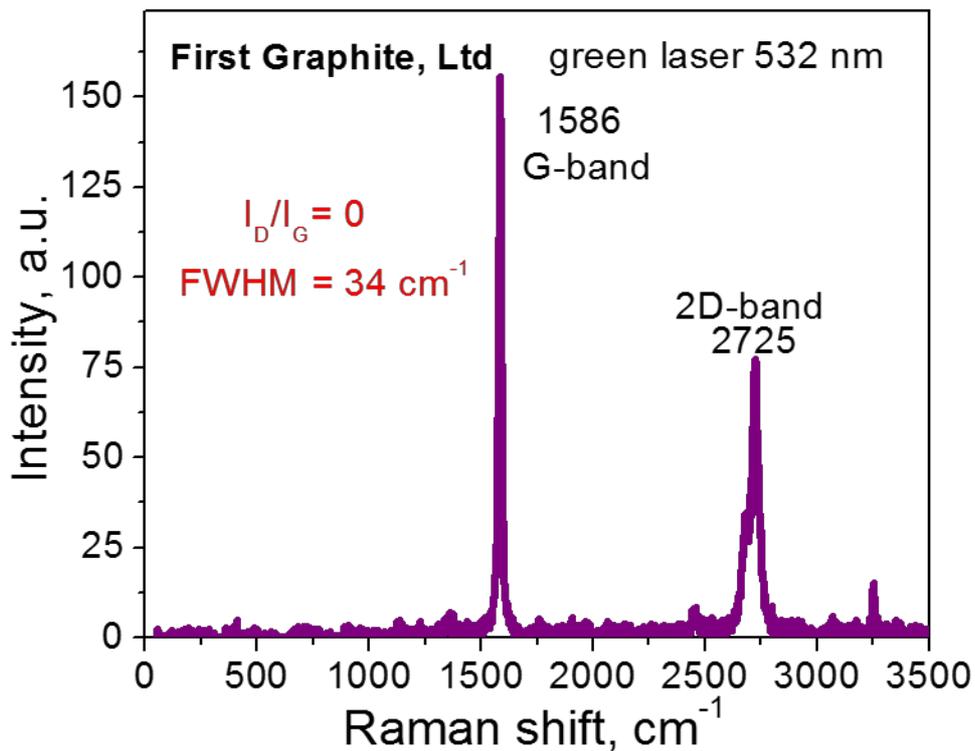


Figure 4: Raman Spectroscopy of FGR Vein Graphite

A summary of these results is;

- A combination of microscopic and spectroscopic techniques was used to evaluate the structural, morphological, and chemical quality of the material.
- 99.87 % of Carbon detected with no impurities >50 ppm level.
- Raman shows no D-peak evidencing high quality of material.

Sales Agreement with Kahatagaha Graphite Lanka Limited (KGLL)

In December 2016 the Company advised it was engaging in a long term supply agreement and in January 2017 was pleased to announce it had signed a twenty four month Sales Agreement with the Sri Lankan government owned Kahatagaha Graphite Lanka Limited (KGLL) to purchase premium quality graphite.

The Sales Agreement between the Company and KGLL is for a twenty four month period and specifies the quantity, quality and pricing of the material to be purchased by FGR. KGLL selected FGR as its exclusive partner for this agreement after approaches from a number of other parties. It was a reflection of the strong relationship which has been built with the Sri Lankan Government, based on FGR's commitment to advancing Sri Lankan production.

As part of the agreement FGR will work with the Government-owned mine to provide assistance for value adding downstream opportunities for KGLL's graphite.

The sales agreement with KGLL will ensure that there is a good supply of graphite through the commissioning and ramp up period without any interruption to the graphene initiative, FGR's primary source of growth going forward.

Capital Raising

On 27 January 2017 FGR was able to announce it had received firm commitments for a placement of shares at \$0.11 raising \$3.52 million. Far East Capital Limited, the Lead Manager, had advised the placement was strongly supported by institutional and high net worth individuals. The placement means FGR is well-positioned to continue with the development of its graphene technology strategies, including the recently announced BEST Battery project, and production from its own mines which are currently being developed.

Sri Lankan Development Work

FGR has found the development of its 100%-own graphite mines in Sri Lanka has been more challenging than anticipated, mostly due to ground conditions in the initial excavation of the shafts. However, these issues are being overcome and a change in personnel has resulted in progress accelerating in January.

Aluketiya

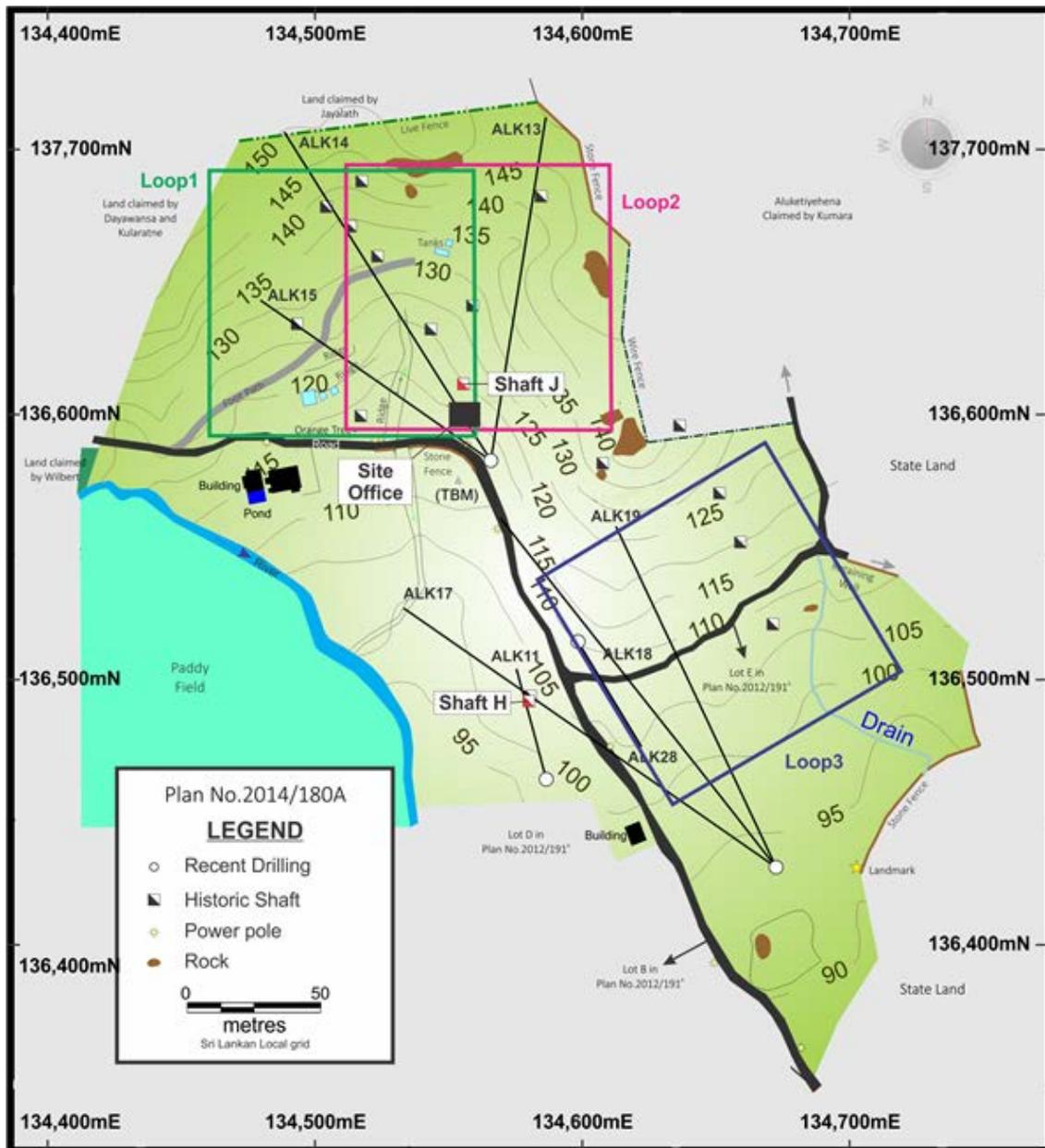
During the quarter Aluketiya Shaft H was progress a further 8 metres to 30 metres and is on the transition to hard material. Ground conditions, including the ingress of mud from previously mined stop areas has been eliminated during the quarter. The implementation of a new pressure grouting system together with improved speed and efficiency on the installation of shaft liners has resulted in this issue being overcome. The mine plans to transition from weathered and fresh rock interface at between 30 and 37 metres depth. When the transition is completed production drives will be constructed to access the three main production targets from Shaft H, including the high grade intersection previously reported in ALK18.

All infrastructure for Shaft J has been completed and commissioned including water treatment and shaft sinking has commenced and is approximately 3 metres from the collar. The transition zone for Shaft J is considerably shallower than Shaft H. Shaft J is using 2.5m engineered concrete liners for the first time.

Amended mine plans will enable a longer term sustainable production and maximise the extraction of the ultra high grade (99.27% TGC) vein intersections as intersected in ALK18. As previously reported ALK18 intersected three zones of mineralisation comprising a total of 1.72metres of graphite within a 2.8m interval of core. With the additional prospectivity shown from the DHTM it would have been unwise and short sighted not to have amended the initial plans.

These delays, whilst unfortunate, will not impact on the Company's growth plans for its graphene production as adequate quantities of third party material have been sourced while the Company transforms towards being a vertically integrated supplier of high grade graphite and large volume high specification quality graphene.

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Aluketiya project site plan with Shafts H and J and exploration drill hole traces and transmitter loop locations

Pandeniya

Further drilling in the area is being undertaken to provide guidance to the mining engineers, targeting the down hole EM plates to provide information to assist in the development and stoping plan of the area.

Central Hub Construction

FGR's 600m² warehouse located at Warakapola to provide processing, maintenance and field office support for its surrounding mining and exploration activities was completed during the quarter. This Hub is a major step to ensure a cohesive approach for field and engineering support as production commences.

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Warehouse at the Warakapola hub



Warehouse interior

FGR's Managing Director Craig McGuckin said he was pleased with the quarter's progress for the Company.

Mr McGuckin said First Graphite was making progress towards its goal of becoming a substantial supplier of high quality-graphene in 2017.

"The Company has made steady progress on a number of fronts during the December quarter," Mr McGuckin said, "A revision of personnel and procedures in Sri Lanka has improved our operational efficiency in mining. While work continues on developing our own sources of high grade graphite we are able to source third party material for graphene production."

The March Quarter Program

FGR has made a positive start to the March Quarter, which includes:

- Working with potential industry partners on graphene sales.
- Undertaking further development work on the methodologies for screening, washing and drying of the graphene being produced
- Commence BEST battery development.
- Finalise agreement with Flinders University on the VFD and TFF and begin the optimisation program.
- Expanding technical collaboration and customer negotiations.
- Increase graphene labour including a senior graphene specialist to drive full commercialisation.
- Progressing Shaft's H and J at Aluketiya.
- Finalising drilling at Pandeniya based on the targets identified in the downhole electromagnetic survey.

About First Graphite Ltd (ASX: FGR)

First Graphite produces high quality graphene from high grade Sri Lankan vein graphite.

First Graphite seeks to develop graphene production methods and acquire graphene related intellectual property which can provide further revenue related opportunities.

About Graphene

Graphene, the well-publicised and now famous two-dimensional carbon allotrope, is as versatile a material as any discovered on Earth. Its amazing properties as the lightest and strongest material, compared with its ability to conduct heat and electricity better than anything else, mean it can be integrated into a huge number of applications. Initially this will mean graphene is used to help improve the performance and efficiency of current materials and substances, but in the future it will also be developed in conjunction with other two-dimensional (2D) crystals to create some even more amazing compounds to suit an even wider range of applications.

One area of research which is being very highly studied is energy storage. Currently, scientists are working on enhancing the capabilities of lithium ion batteries (by incorporating graphene as an anode) to offer much higher storage capacities with much better longevity and charge rate. Also, graphene is being studied and developed to be used in the manufacture of supercapacitors which are able to be charged very quickly, yet also be able to store a large amount of electricity.

Nature of vein graphite

Sri Lankan graphite deposition model is best described from the 'bottom up': tension fractures formed in the metamorphic sediments, caused by the folding of the sediments, creating 'conduits' for the hydrothermal deposition of high quality vein graphite. Historically, mining of these veins has found the veins generally increase in thickness and grade quality with increasing depth.

For further information:

Craig McGuckin

Managing Director

First Graphite Ltd

Peter R. Youd

Executive Director

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Information in this report relating to Metallurgical interpretation, analysis, mineral distribution and recommendations has been compiled by Mr Chris Banasik, MAusIMM in consultation with Dr Slobodanka Vukcevic, Senior Metallurgist at Nagrom the Mineral Processors. Dr Slobodanka Vukcevic has sufficient experience and expertise relevant to this type of test work through her job experience and expertise and qualifies as a competent person in the field of metallurgy.

Information in this report relating to Exploration Results is based on information compiled by Mr Chris Banasik, MAusIMM working in consultation with MRL's Senior Sri Lankan Geologist who has 35 years of vein graphite experience in Sri Lanka. Their experience is relevant to the type of deposit under consideration. Mr Banasik is signing as competent person as defined in the 2012 Edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Mr Banasik consents to the inclusion in the report of the matters based on the information in the form and context in which it appears.

JORC TABLE 1 Report for Exploration Locations

Section 1 Sampling Techniques and Data

<i>Criteria</i>	<i>Explanation</i>
Sampling techniques	<ul style="list-style-type: none"> Diamond core is collected and stored in core trays of 4m per tray. Vein graphite is readily identified visually (black in colour) and intersections recorded accordingly. Selected intersections will then be cut under the supervision of MRL's Senior Sri Lankan Geologist and prepared for transport to Nagrom (Australia) for analysis.
Drilling techniques	<ul style="list-style-type: none"> All future drilling will be undertaken utilising HQ Triple Tube (HQTT) drilling.
Drill sample recovery	<ul style="list-style-type: none"> Diamond core recovery is recorded between core runs by the geological crew in the Core Logging Record. The unconsolidated surface material will be drilled using rotary wash method until competent material is intersected
Logging	<ul style="list-style-type: none"> All holes are logged on site by MRL geological personnel under the supervision of MRL's Senior Sri Lankan Geologist, using MRL's Core Logging Procedure Manual. Logging will record geological and geotechnical observations, and is undertaken on a continual basis throughout the entire drill hole.
Sub-sampling techniques and sample preparation	<ul style="list-style-type: none"> Selected-core intersections of Vein Graphite will be submitted for analysis to Nagrom laboratories in Perth Western Australia. The remaining half-core is stored in the core boxes. Core & bulk samples may be provided to potential off-take parties.
Quality of assay data and laboratory tests	<ul style="list-style-type: none"> Selected Vein Graphite core intersections will be analysed by Nagrom the Mineral Processors in Perth Western Australia. Nagrom will follow industry practice QA/QC procedures to ensure high quality sample assurance. Certified Sample Standards will be inserted routinely into sample analysis.
Verification of sampling and assaying	<ul style="list-style-type: none"> All diamond core will be logged and photographed by MRL geologists under the supervision of MRL's Senior Sri Lankan Geologist. Independent consulting geologist will visit the MRL operation sites on a regular basis to oversee QA.
Location of data points	<ul style="list-style-type: none"> All drill locations have been positioned using hand-held Garmin GPS systems or survey. MRL has completed a full topographical survey of the Pandeniya – Bopitiya & Aluketiya areas. All drill collars will be geo-referenced to the Sri Lankan Transverse Mercator Projection.
Data spacing and distribution	<ul style="list-style-type: none"> Drill holes have been orientated in a position to intersect the expected vein mineralisation (based on historical shafts / adits and geophysical information) at the optimal angle for evaluation, whilst minimising surface land disturbance.
Orientation of data in relation to geological structure	<ul style="list-style-type: none"> Diamond Core Drill holes are designed to intersect potential graphite vein mineralisation perpendicular to strike, wherever possible, whilst taking into account expected deviation in dip and azimuth.
Sample security	<ul style="list-style-type: none"> Core Samples are collected and stored in core trays under the supervision of MRL geological crews and then transported at the end of each day, and secured in a locked container at the MRL site facility for further detailed logging. Security is managed by MRL's Senior Sri Lankan Geologist and the MRL country General Manager.

Criteria	Explanation
Audits or reviews	<ul style="list-style-type: none"> A review was undertaken by the consulting Geologist of all procedures, including retrieving of core samples from the core tube, through to logging and storage of core samples, during drilling activities. Consulting Geologist will undertake further reviews into the future.

Section 2 Reporting of Exploration Results

Criteria	Explanation																																																																
Mineral tenement and land tenure status	<p>The Warakapola / Bopitiya / Pandeniya project exploration license areas are 100% owned by MRL Graphite (Pvt) Ltd. The exploration Licenses when granted have a two-year term which can be renewed prior to the two-year anniversary.</p> <table border="1" data-bbox="528 622 1399 725"> <thead> <tr> <th>License No.</th> <th>MRL Interest</th> <th>Status</th> <th>General Location</th> </tr> </thead> <tbody> <tr> <td>IML/A/HO/8416/LR2</td> <td>100%</td> <td>Granted</td> <td>Western</td> </tr> <tr> <td>IML/A/HO/9405</td> <td>100%</td> <td>Granted</td> <td>Central</td> </tr> </tbody> </table> <table border="1" data-bbox="528 775 1399 1216"> <tbody> <tr><td>EL/225</td><td>100%</td><td>Granted</td><td>Central</td></tr> <tr><td>EL/226</td><td>100%</td><td>Granted</td><td>Central</td></tr> <tr><td>EL/228</td><td>100%</td><td>Granted</td><td>Central</td></tr> <tr><td>EL/243</td><td>100%</td><td>Granted</td><td>Central</td></tr> <tr><td>EL/262</td><td>100%</td><td>Granted</td><td>Central</td></tr> <tr><td>EL/318</td><td>100%</td><td>Granted</td><td>Central</td></tr> <tr><td>EL/321</td><td>100%</td><td>Granted</td><td>Central</td></tr> <tr><td>EL/325</td><td>100%</td><td>Granted</td><td>Central</td></tr> <tr><td>EL/326</td><td>100%</td><td>Granted</td><td>Central</td></tr> <tr><td>EL/227</td><td>100%</td><td>Granted</td><td>South Central</td></tr> <tr><td>EL/322</td><td>100%</td><td>Granted</td><td>South Central</td></tr> <tr><td>EL231</td><td>100%</td><td>Granted</td><td>South West</td></tr> <tr><td>EL/244</td><td>100%</td><td>Granted</td><td>South West</td></tr> </tbody> </table> <ul style="list-style-type: none"> First Graphite Ltd has informed the Consulting Geologist all granted licenses are in good standing and comply with the reporting requirements of the exploration licence. 	License No.	MRL Interest	Status	General Location	IML/A/HO/8416/LR2	100%	Granted	Western	IML/A/HO/9405	100%	Granted	Central	EL/225	100%	Granted	Central	EL/226	100%	Granted	Central	EL/228	100%	Granted	Central	EL/243	100%	Granted	Central	EL/262	100%	Granted	Central	EL/318	100%	Granted	Central	EL/321	100%	Granted	Central	EL/325	100%	Granted	Central	EL/326	100%	Granted	Central	EL/227	100%	Granted	South Central	EL/322	100%	Granted	South Central	EL231	100%	Granted	South West	EL/244	100%	Granted	South West
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Exploration done by other parties	<ul style="list-style-type: none"> Initial Exploration and Review of the Warakapola / Bopitiya / Pandeniya project was carried out by Geological Survey and Mines Bureau (GSMB) Technical Services (Pvt) Ltd with reports provided to MRL. MRL has established a regional office in the EL228 area to support the company geologists and underground exploration crews. Historical mining has taken place with several shafts and adits evident. MRL continues exploration in all license areas 																																																																
Geology	<ul style="list-style-type: none"> Warakapola / Bopitiya / Pandeniya / Aluketiya Geologically, the area covered by the selected grid units belong to the Wannu Complex of Sri Lanka. The Wannu Complex is mainly characterised by thick sequences of orthogneisses, comprising amphibolite, migmatitic, granitic and granodioritic gneisses. These rocks represent a series of antiformal and synformal structures. A characteristic feature of the exploration area is the alignment of identified abandoned graphite mines / pits within a NNW-SSE trending corridor. (GSMB 2013) 																																																																
Drill hole Information	<ul style="list-style-type: none"> All Diamond Core Drill holes are accurately surveyed for dip and azimuth using a GlobalTech Pathfinder multi-shot, electronic, down-hole survey tool. 																																																																
Data aggregation methods	<ul style="list-style-type: none"> Intersections of diamond core containing vein graphite will be visually selected for analytical testing with accurate lengths recorded to ensure 100% of mineralisation is analysed and reported. 																																																																
Relationship between mineralisation widths and intercept lengths	<ul style="list-style-type: none"> Planned Drill hole orientation is based on observations from historical shafts / adits and geophysics, and planned to intersect any vein graphite mineralisation as close to perpendicular as practical. 																																																																

<i>Criteria</i>	<i>Explanation</i>
Diagrams	<ul style="list-style-type: none"> • NA
Balanced reporting	<ul style="list-style-type: none"> • First Graphite Ltd will endeavour to produce balanced reports accurately detailing the results from any exploration activities.
Other substantive exploration data	<ul style="list-style-type: none"> • No other substantive exploration data is available at this time.
Further work	<ul style="list-style-type: none"> • First Graphite Ltd continues to complete further site investigations on all licenses. Following the completion of progressive site investigations and evaluation the next phase of exploration for each location will be undertaken and reported. • Land access agreements continue at Pujapitiya, Dedigama and Hikkaduwa • Further drilling is planned at Pandeniya, Pujapitiya and other license areas as land access is obtained.

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