

# ASX Announcement

15 February 2017



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ASX Code: VKA

## Reung Kiet Lithium Project – Update

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Viking Mines Limited (ASX: VKA, Viking or the Company) is pleased to provide the following update on exploration at the Reung Kiet Lithium Project (RK Project) in Southern Thailand (Figures 1 and 4). Viking has conducted orientation and reconnaissance soil sampling, rock chip sampling and mapping programs since announcing the transaction in November, 2016.

This work has identified a second parallel lepidolite pegmatite trend at the Reung Kiet Lithium Prospect, substantially increasing the prospectivity of the Project. Lepidolite is lithium rich mica, which occurs in some pegmatites.

### Highlights

- **Second 1km long lepidolite pegmatite trend identified at Reung Kiet Prospect.**
- **Surface exposures of several lepidolite pegmatite dykes, grades up to 1.9% Li<sub>2</sub>O.**
- **Drilling contract being finalised, drilling rigs to be deployed and scheduled to commence upon grant of license.**
- **Exploration application progressing very well, scheduled for presentation to the DPIM's Mineral Act Committee this month, the final step before Ministerial sign off.**
- **Material developments in several lithium micas processing technologies, strategy is to utilise quality and strategic positioning of assets and extend downstream into lithium carbonate manufacturing.**

### Pegmatite trends

Rock chip sampling, soil sampling, geological mapping and other observations have identified a new significant lepidolite pegmatite trend at the Reung Kiet Lithium Prospect.

The Main Trend extends southwest along strike and exhibits excellent exposures of several lepidolite pegmatite dykes in a swarm of ~30m wide. Previous rock chip and channel sampling returned results of up to 1.9% Li<sub>2</sub>O (see Figure 2).

The second, new Eastern Trend is ~65-75m east of the Main Trend, ~1km long and runs parallel to Main Trend. Minor historical workings are present with individual dykes up to 4m wide. Rock chip sampling indicates Li<sub>2</sub>O grades of 0.99% to 1.49% (see Figure 2).

Subtle lithium and rubidium anomalism suggest both lepidolite pegmatite trends are open to the North of the historical tin mine. The soil and rock chip sampling program, and using rubidium as a pathfinder for lithium, is discussed in Appendix 1 and Appendix 3 – Table 1.

### **Proposed Drilling**

A drilling program has been designed and further drill sites are being assessed. The 22 hole, ~2000m program will test near surface continuity, grade and widths of the parallel lepidolite pegmatites as well as the lepidolite pegmatite exposures to the south. Representative samples will be collected for metallurgical test work (see Figures 2 and 3). Priority targets lie beneath the historical open cut mine where lepidolite pegmatite widths >20m are indicated.

Viking is also advancing its rock chip sampling, soil sampling and geological mapping at the Bang I Tum Lithium Prospect to the north. Bang I Tum is considerably larger in strike extent; an update on initial orientation and reconnaissance sampling will be provided shortly. Once completed Viking will prioritise drilling programs.

Drilling is planned to commence as soon as practicable following the grant of the Reung Kiet exploration license. As previously advised Viking has been negotiating with several potential drilling contractors (VKA ASX 7February 2017 announcement). Drilling rigs will be deployed to Viking's nearby Khao Soon tungsten project, over which Viking has an option to acquire 75%, so as to ensure rigs are secured. Upon issuance of the lithium exploration licenses, drill rigs will be re-deployed to the RK Project.

### **Lithium Carbonate Strategy**

On 18 November, 2016, Viking announced that it had entered into a 3 month non-binding memorandum of understanding (MOU) with Lepidico Limited (LPD) to explore the option of establishing a joint venture to build a small scale lithium carbonate plant at or near Viking's RK Project. By mutual agreement Viking and LPD have agreed not to extend the non-binding MOU beyond 18 February 2017.

Viking has determined that it is too early in the RK Project's development to commit to any one process technology. LPD's technology remains an important potential option for the RK Project; Viking will continue to monitor developments over the coming year. Importantly, as LPD's strategy, in part, is to make its technology available for licensing, the technology will be accessible to Viking.

Viking's strategy remains to utilise its strategic resource and extend downstream into lithium carbonate production. Within the lithium peer group the RK Project exhibits unique characteristics. It is one of a very few projects situated in a low cost industrial economy with proximal access to all required infrastructure, all required inputs, and which is situated a short distance of key lithium carbonate end user markets in Asia, including the developing market in Thailand.

Developments in lithium micas (Li-Mica) processing will provide Viking several low cost options to manufacture lithium carbonate. Viking has entered into discussions with a tier 1 mineral process engineering firm with experience in Li-Mica process development. This will position Viking to assess and utilise the leading Li-Mica processing technology available to it as and when required. This appointment will be announced when formalised.



## **Mineral Exploration Licenses**

The licensing process is proceeding well with positive results delivered after a critical meeting held earlier this week between Viking, the local arm of the Department of Primary Industry and Mines, and the Village Heads within the Reung Kiet license application area. Under review were Viking's exploration license applications for which Viking received unanimous support. The license applications are now ready to proceed to the DPIM's Mineral Act Committee for final review later this month, before Ministerial sign off.

Viking has been encouraged by the level of local support for its license applications and the results of the soil and rock chip programs outlined herein, which make for a larger project than anticipated.

## **Recent Shareholding Changes**

Viking would like to take this opportunity to advise that the crossing of Resolute Mining Limited's (Resolute) holding in Viking was acquired by sophisticated investors looking for exposure to lithium exploration and development. Due to a change in Viking's focus from gold to lithium, Viking was no longer a strategic fit for Resolute, which is a pure play gold mining company with activities in Australia and West Africa.

We look forward to keeping our shareholders updated as milestones are achieved.

**Jack Gardner**  
Executive Chairman

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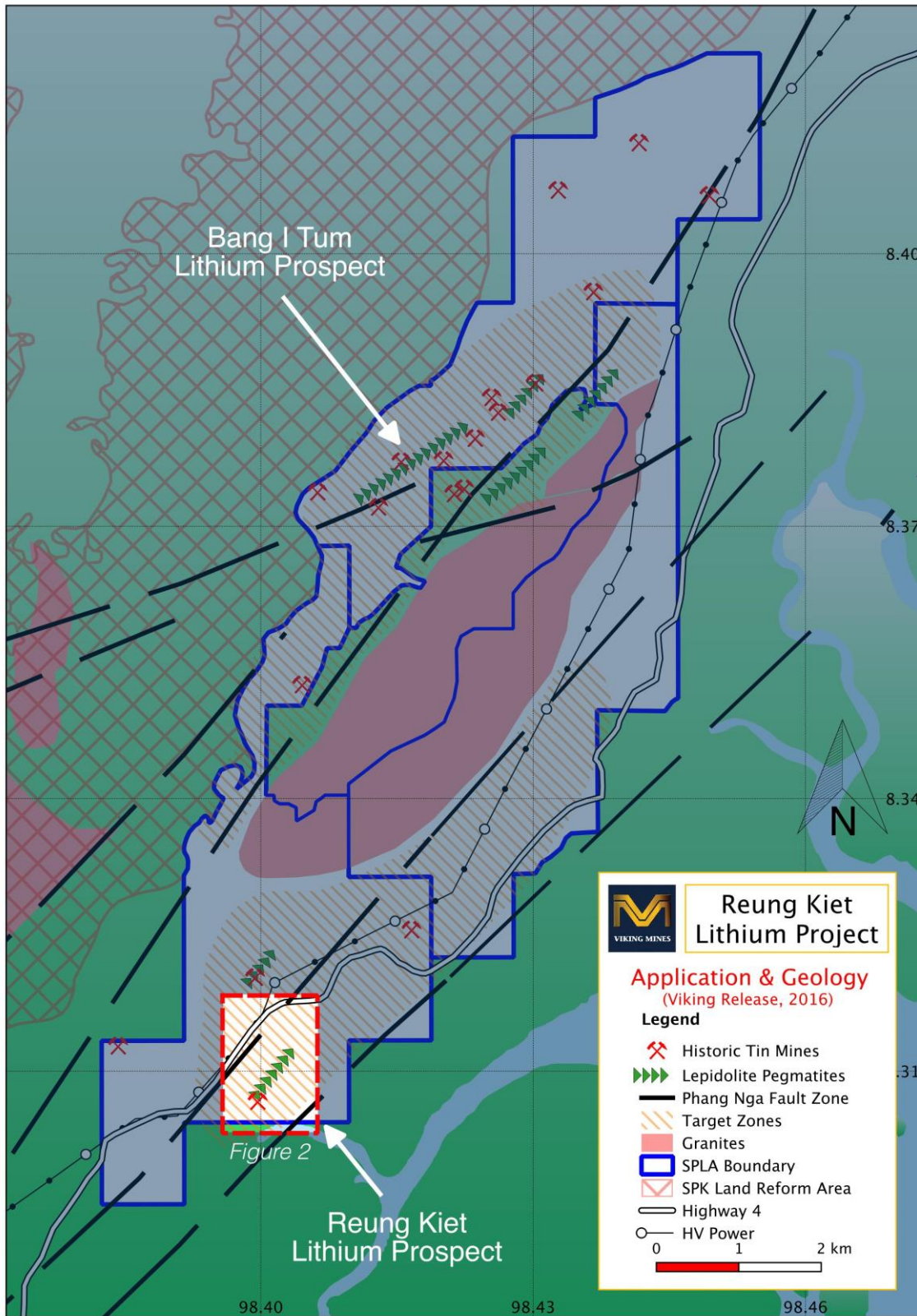


Figure 1: Reung Kiet Lithium Project Geology



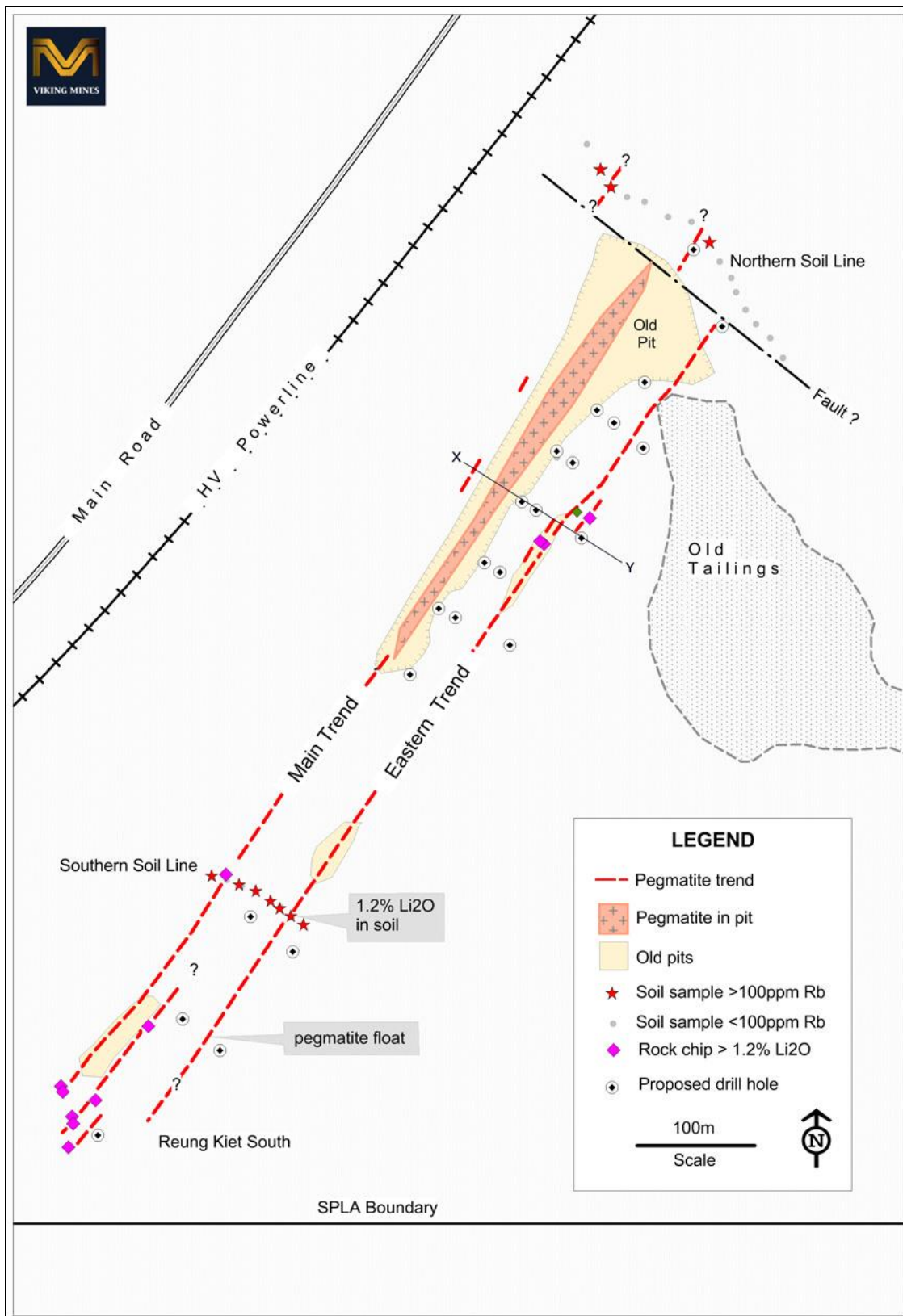


Figure 2: Reung Kiet Lithium Prospect Sampling and Planned Drilling

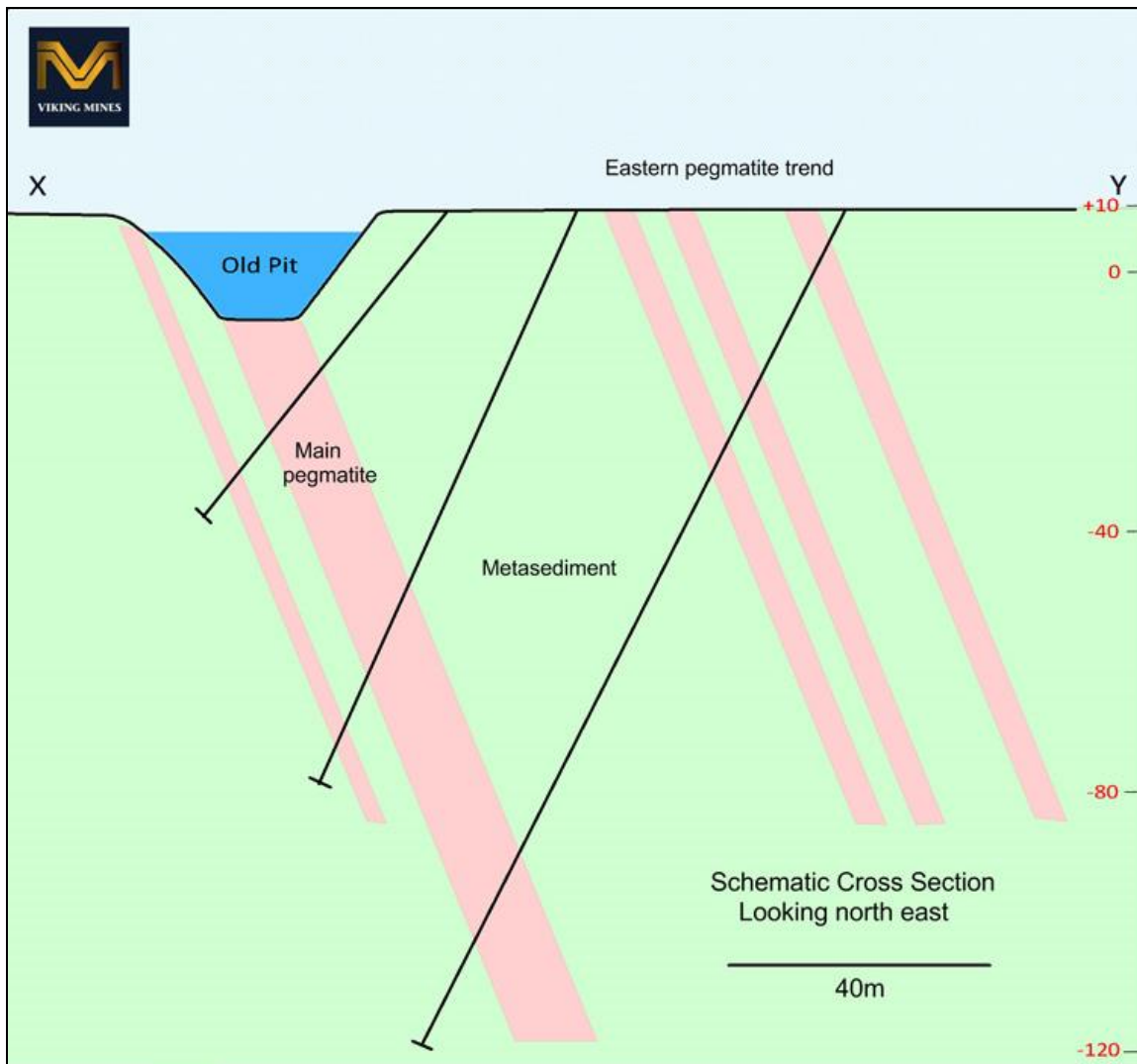


Figure 3: Reung Kiet Lithium Prospect - Cross Section of Planned Drilling

## **Appendix 1: Reung Kiet Lithium Prospect Soil Sampling and Rb Pathfinder Discussion**

Orientation soil sampling was undertaken to assess the efficacy of soil sampling at Reung Kiet and to help identify anomalous trends in support of rock chip sampling and geological mapping. The soil program comprised two lines, north and south of the open cut (see Figure 2). Samples were collected at approximately 10m spaced intervals along each line. A hand-auger was used to dig holes from 25-40cm deep. Samples were collected from the bottom ½ of each hole, this material representing mostly B-Horizon soil. Handheld XRF analysis was performed on the bagged soil sample.

The hhXRF results combined with laboratory data indicate the presence of elevated rubidium (Rb), tin (Sn) and other 'pathfinders' along trends to the north and south of the open cut as shown in Figure 2.

The southern soil line has identified a 70-80m wide zone of elevated Rb in soils. The peak Rb value was 0.38% Rb. This sample returned 1.2%  $\text{Li}_2\text{O}$  and is associated with lepidolite bearing pegmatite cobbles present in the soil. The other eight samples from this line yielded Rb levels from 320ppm to 617ppm. A rock sample of pegmatite float on the eastern end of the soil line returned 1.56%  $\text{Li}_2\text{O}$ .

The northern soil line returned more subdued Rb levels. Of 15 samples taken 3 returned >100ppm Rb, the highest value being 239ppm Rb. This sample also returned 734ppm  $\text{Li}_2\text{O}$ . The anomalous zones are located just to the north of Reung Kiet pit, and appear to be offset to the west relative to their southern extensions. Additional work to the north is required to confirm this observation.

The results of the soil sampling and associated rock chip sampling indicate a very good correlation of Rb and  $\text{Li}_2\text{O}$ . This is not unexpected given the common association of Rb occurring with pegmatite hosted lithium mineralisation, especially lithium hosted in lepidolite. This now provides the company with a rapid assessment and screening tool that can be applied to broader exploration in the Reung Kiet project area.

## Appendix 2: About the Reung Kiet Lithium Project



Figure 4: Viking Mines Limited: Project Locations

The Reung Kiet Lithium Project (the 'RK Project') is located 60km north of Phuket in southern Thailand and comprises three contiguous prospecting licence applications in the final stages of approval, being SPLA1, SPLA2 and SPLA3 (the 'RK Applications'). The RK Applications cover an area of ~44km<sup>2</sup> and have been applied for by Siam Industrial Metals Co. Ltd. (SIM), a single purpose Thai entity in which Argo holds 75% of the issued shares and Argo's joint venture partner, Sydney based Thai Goldfields NL, holds 25%.

The RK Project is a brownfields project and exhibits several outcropping lepidolite rich pegmatites located along strike from historical open cut mines. The two key prospective trends are over 4km long. The historical mines sit within two +1.0km long lepidolite pegmatite trends. These are the Reung Kiet and Bang I Tum pegmatites. Mapping suggests that these pegmatites extend by 1-2km. Both the lepidolite pegmatites and the trend in which they sit are amongst the longest in the lithium peer group. Rock-chip samples collected by Argo and Viking averaged 1.46% Li<sub>2</sub>O, with a peak of 1.98% Li<sub>2</sub>O, these grades sit at the higher end of the Li<sub>2</sub>O peer group. Significant levels of Ta<sub>2</sub>O<sub>5</sub> (average 238ppm) and Sn (average 0.08%) were also present in the above samples. Historical metallurgy yielded a 3.5% Li<sub>2</sub>O concentrate with 80% recoveries.

A major British/Thai joint study of the area in the late 1960's observed that "the pegmatites at Reung Kiet and Bang I Tum may well be the largest unzoned lepidolite pegmatites yet recorded" and that the "lepidolite is fairly evenly distributed both along the length of the pegmatite and from wall to wall. In places there is local enrichment of massive lepidolite". The Reung Kiet pit is ~450m long, up to 120m wide, estimated to be 30m deep and sits on a +1km trend. The Bang I Tum prospect comprises



several old pits along a 2km trend, the main pit itself is ~650m long, up to 130m wide, and is also estimated to be 30m deep. In both cases the main pegmatite dykes are up to 25m wide with ancillary dyke swarms up to 7m wide.

The RK Project offers excellent exploration potential along strike from known lepidolite pegmatites and beneath historic mining activities. Almost all exploration targets have been identified through surface exposures of lepidolite pegmatites, with strong potential for new targets under shallow cover.

The RK Project offers exceptional strike and thickness and provides VKA a pathway to target low cost mining and lithium carbonate production. The RK Project is a walk up drill ready and, subject to licensing and landholder access agreements, offer immediate targets to be tested.

The RK Project has excellent regional and local infrastructure, is accessible all year, including during the wet season, and has support from all levels of Government.

Readers are advised to refer to the 18 November 2016 ASX announcement “Viking Acquires Lithium and Tungsten Projects in Thailand” for further information.



Lepidolite-pegmatite cutting mudstone of the Phuket Group, Reung Kiet Mine, 11 km south-west of Takua Thung. The light-coloured pegmatite in the lowest part of the excavation contrasts vividly with the darker coloured mudstones forming the steep slopes.

*Enhancement of original photo by M. S. Garson.*

*Source: Garson, M. S., Bradshaw, N., and Rattawong, S., 1969. Lepidolite pegmatites in the Phang Nga area of peninsular Thailand: International Tin Council, 2nd Technical Conference, Bangkok. Page 330, Chapter 17.*



**Competent Persons Statement:** The information in this Public Report that relates to technology metals Exploration Results, Mineral Resources or Ore Reserves is based on information compiled by Mr David Hobby, who is a Member of the Australasian Institute of Mining and Metallurgy. Mr Hobby is a full time employee of Argo Metals Group Limited. Mr Hobby has sufficient experience that is relevant to the style of mineralization and type of deposit under consideration and to the activity that he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Mr Hobby consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

**Forward Looking Statements:** This document may include forward looking statements. Forward looking statements may include, but are not limited to statements concerning Viking Mines Limited's planned exploration programs and other statements that are not historical facts. When used in this document, words such as "could", "plan", "estimate", "expect", "intend", "may", "potential", "should", and similar expressions are forward looking statements. Although Viking Mines Limited believes that its expectations reflected in these forward looking statements are reasonable, such statements involve risks and uncertainties and no assurance can be given that actual results will be consistent with these forward looking statements.

## Appendix 3: JORC Code, 2012 Edition – Table 1

### Reung Kiet Lithium Project

#### Section 1 Sampling Techniques and Data

Criteria	JORC Code explanation	Commentary
Sampling techniques	<p>Nature and quality of sampling (eg cut channels, random chips, downhole gamma sondes, handheld XRF instruments, etc).</p> <p>Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.</p> <p>Aspects of determination of mineralisation that are Material to the Report (eg 'RC drilling used to obtain 1m samples from which 3kg was pulverised to produce a 30g charge for fire assay'; or where there is coarse gold that has inherent sampling problems).</p>	<p>Rock-chip, channel and float samples. Samples collected were around 1- 3kg of pegmatite occurring as outcrops and subcrops.</p> <p>Soil samples were collected using a 2" hand auger. The lower half/third of the hole was retained for analysis. Typical weights around 1kg.</p> <p>Samples were selected in order to ascertain the degree of lithium enrichment in the different pegmatites and enable geochemical characterisation of individual pegmatites. As such, the samples are representative of the lithium mineralisation within the pegmatites but do not necessarily represent the composition of the entire pegmatite.</p> <p>A total of 23 soil samples were collected by Viking's experienced field geologists and sent to either ALS Chemex in Brisbane or SGS in Perth for analyses.</p> <p>Laboratory QAQC duplicates and blanks were inserted.</p>
Drilling techniques	Drill type (eg core, reverse circulation, etc) and details (eg core diameter, triple tube, depth of diamond tails, face-sampling bit, whether core is oriented; if so, by what method, etc).	No drilling undertaken
Drill sample recovery	<p>Method of recording and assessing core and chip sample recoveries and results assessed.</p> <p>Measures taken to maximise sample recovery, ensuring representative nature of samples.</p> <p>Is sample recovery and grade related; has sample bias occurred due to preferential loss/gain of fine/coarse material?</p>	No drilling undertaken
Logging	<p>Have core/chip samples been geologically/geotechnically logged to a level of detail to support appropriate resource estimation, mining studies and metallurgical studies.</p> <p>Is logging qualitative or quantitative in nature. Core (or costean, channel, etc) photography.</p> <p>The total length and percentage of the relevant intersections logged.</p>	<p>Rock-chip samples are not logged, however sample type and geological details are recorded.</p> <p>Soil samples are described and the site characteristics recorded.</p>
Sub-sampling techniques and sample preparation	<p>If core, cut or sawn and whether quarter, half or all core taken.</p> <p>If non-core, riffled, tube sampled etc and sampled wet or dry?</p> <p>For all sample types, nature, quality and appropriateness of sample preparation technique.</p> <p>QAQC procedures for all sub-sampling stages to maximise</p>	<p>No drilling undertaken.</p> <p>All samples were dry. No duplicate samples collected.</p> <p>Laboratory standards, splits and repeats were used for quality control.</p> <p>The sample type, size, preparation and method is of acceptable industry standard and practice for this stage of</p>

Criteria	JORC Code explanation	Commentary
	<p>representivity of samples.</p> <p>Measures taken to ensure sampling is representative of the material collected, e.g. results for field duplicate/second-half sampling.</p> <p>Whether sample sizes are appropriate to the grain size of the material being sampled.</p>	<p>investigation and style of mineralization.</p>
Quality of assay data and laboratory tests	<p>Nature, quality and appropriateness of the assaying and laboratory procedures used; whether the technique is considered partial or total.</p> <p>For geophysical tools, spectrometers, handheld XRF instruments etc, parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied, their derivation, etc.</p> <p>Nature of QAQC procedures adopted (eg standards, blanks, duplicates, external laboratory checks); whether acceptable accuracy levels (ie lack of bias) / precision established.</p>	<p>Sample preparation is integral to the analysis process as it ensures a representative sample is presented for assay. The preparation process includes sorting, drying, crushing, splitting and pulverising. For MMM, the samples were dried, crushed and sub-sample pulverized to 90% passing 75 microns using in-house facilities in Thailand. For Viking samples were dried, crushed and sub-sample pulverized to 90% passing 75 microns by SGS in Bangkok. Pulps were then air freighted to Australia for analysis.</p> <p>All soil samples "as collected" were analysed using a hand held Olympus Delta 400 Premium in Geochem mode, with dual beam analysis for 30 seconds each. Three soil samples were analysed by SGS. Comparison of Rb assays show very good correlation. Most other elements of interest also exhibit good correlation with lab results.</p> <p>Rock samples were assayed for MMM by mixed acid digest or sodium peroxide with ICP finish by ALS Chemex in Brisbane for Li, Sn and Ta</p> <p>Viking rock and soil samples were analysed by sodium peroxide fusion digest with ICP-MS finish at SGS in Perth for Li, Sn, Ta.</p> <p>Laboratory standards, splits and repeats were used for quality control.</p>
Verification of sampling and assaying	<p>Verification of significant intersections by independent / alternative company personnel.</p> <p>The use of twinned holes.</p> <p>Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.</p> <p>Discuss any adjustment to assay data.</p>	<p>Sample results have been checked by company Senior Geologist.</p> <p>Assays reported as Excel xls files and secure pdf files.</p> <p>Data entry carried out digitally by field personnel to minimize transcription errors. Field documentation procedures and database validation conducted to ensure that field and assay data are merged accurately.</p> <p>Following factor adjustments applied to assay data for reporting purposes:  Li to Li<sub>2</sub>O 2.153  Ta to Ta<sub>2</sub>O<sub>5</sub> 1.22</p>
Location of data points	<p>Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings etc used in estimation.</p> <p>Specification of grid system used.</p> <p>Quality and adequacy of topographic control.</p>	<p>Sample locations picked up with hand held Garmin GPS, with approximately 3-7m accuracy, sufficient for first pass pegmatite mapping.</p> <p>All locations recorded in lat/long or UTM WGS84 Zone 47N.</p> <p>Topographic locations interpreted from Thai base topography.</p>
Data spacing and distribution	<p>Data spacing for reporting of Exploration Results.</p> <p>Is data spacing and distribution sufficient to establish degree of geological and grade continuity appropriate for Resource /</p>	<p>All samples were selected by the geologist to assist with identification of the nature of the mineralisation present at each location. No set sample spacing was used and samples were taken based upon geological variation at the location.</p>



Criteria	JORC Code explanation	Commentary
	Reserve estimation procedure(s) and classifications applied? Whether sample compositing has been applied.	Sample compositing was not applied
Orientation of data in relation to geological structure	Does the orientation of sampling achieve unbiased sampling of possible structures; extent to which this is known/understood.  If relationship between drilling orientation and orientation of mineralised structures has introduced a sampling bias, this should be assessed and reported if material.	Channel samples collected off exposed faces, which do not provide orientation, or true width information. Associated structural measurements and interpretation by geologist can assist in understanding geological context.  All other samples point samples. Soil samples were collected on lines oriented normal to known pegmatite trends.
Sample security	The measures taken to ensure sample security.	Samples were either securely packaged when transported by independent carrier or transported by company personnel to ensure safe arrival at assay preparation and analysis facility.
Audits or reviews	The results of any audits or reviews of sampling techniques and data.	None conducted at this stage of the exploration program.

## Section 2 Reporting of Exploration Results

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.  The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.	Three contiguous prospecting licence applications (SPLA1-3) covering an area of 44 sq km have been applied for by Thai company Siam Industrial Metals Co. Ltd. (SIM). ). Mandalay Mining and Metals (MMM) holds 75% of SIM, with Sydney based Thai Goldfields NL holding the remaining 25%. Project is located 60km north of Phuket in southern Thailand.
Exploration done by other parties	Acknowledgment and appraisal of exploration by other parties.	The Institute of Geological Sciences, a precursor of the British Geological Survey (BGS) in the late 1960's. This work consisted of geological mapping, documenting old workings, some surface sampling and metallurgical test work. The pegmatite in the Main pit was mapped.
Geology	Deposit type, geological setting and style of mineralisation.	The project area sits adjacent and sub-parallel to the regionally extensive northeast trending Phangnga fault. The Cretaceous age Khao Po granite intrudes into Palaeozoic age Phuket Group sediments along the fault zone, and is thought to be the source of the pegmatite dykes and the associated Li-Sn-Ta mineralization. The pegmatites are located proximal to the granite in northeast trending fault zones, and are fine grained, aplitic in places, showing no evidence of zoning.
Drillhole Information	A summary of information material to the understanding of the exploration results including a tabulation for all Material drill holes of: <ul style="list-style-type: none"><li>• easting and northing of the drill hole collar</li><li>• elevation or RL (Reduced Level – elevation above sea level in meters) of the drill hole collar</li><li>• dip and azimuth of the hole</li><li>• downhole length and interception depth</li><li>• hole length.</li></ul>	No drilling undertaken



Criteria	JORC Code explanation	Commentary
	If exclusion of this information is not Material, the Competent Person should clearly explain why this is the case.	
Data aggregation methods	<p>Weighting averaging techniques, maximum/ minimum grade cutting and cut-off grades are Material and should be stated.</p> <p>Where compositing short lengths of high grade results and longer lengths of low grade results, compositing procedure to be stated; typical examples of such aggregations to be shown in detail.</p> <p>Assumptions for metal equivalent values to be clearly stated.</p>	No drilling undertaken, Sample results reported as individual surface samples.
Relationship between mineralisation widths and intercept lengths	<p>These relationships are particularly important in the reporting of Exploration Results.</p> <p>If mineralisation geometry with respect to the drillhole angle is known, its nature should be reported.</p> <p>If it is not known and only down hole lengths are reported, a clear statement to this effect is required (eg 'down hole length, true width not known').</p>	No drilling undertaken. Rock chip sample results reported as individual surface samples collected off subcrop or exposed faces. For channel samples relationship between sample width and true width not known.
Diagrams	Appropriate maps and sections (with scales) and tabulations of intercepts to be included for any significant discovery. These to include (not be limited to) plan view of collar locations and appropriate sectional views.	No drilling undertaken
Balanced reporting	Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.	Results of assays for Li and Rb of all samples collected by MMM and Viking reported above or previously reported.
Other substantive exploration data	Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.	All meaningful and material exploration data relevant to the deposit style sought has been reported
Further work	<p>The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling).</p> <p>Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas (if not commercially sensitive).</p>	It is envisaged that further mapping and sampling is warranted to investigate potential additional lithium pegmatites, together with drilling to test extensions at depth.