

29 April 2024

# QUARTERLY ACTIVITIES REPORT QUARTER ENDING 31 MARCH 2024

Sarytogan Graphite Limited (ASX: SGA, "the Company" or "Sarytogan") is pleased to present the Quarterly Activities Report for the Quarter Ending 31 March 2024.

### Highlights

- Five nines purity (up to 99.9992% C<sup>1</sup>, Figure 1) achieved in a single thermal purification step.
- Lithium-ion batteries manufactured with Sarytogan Graphite anodes and tested to outperform batteries with synthetic graphite anodes.
- Alkaline and Lithium primary batteries manufactured and tested with Sarytogan Graphite used as a cathode conductivity enhancer.
- Geotechnical drilling delivers more thick high grade drill intercepts.





Figure 1 - Sarytogan Graphite at 99.9992% C, prior to spheroidization. (Refer ASX Announcement 5 March 2024).

Sarytogan Managing Director, Sean Gregory commented:

"The March Quarter was another milestone quarter for the Company with 3 different types of batteries manufactured and successfully tested: lithium-ion, alkaline and lithium primary batteries. Five Nines Purity was achieved on Sarytogan Graphite for the first time, opening the prospect of application in many advanced industrial uses, including in the nuclear industry. These are all important inputs into the Pre-Feasibility Study which remains on track for completion in Q3 2024."

#### Sarytogan Product Mix

Sarytogan plans to produce three product types in approximately equal proportions (Figure 2).

The upstream beneficiation using grinding and flotation is planned to produce microcrystalline graphite at 80-85% C at the mine site (refer ASX Announcement 13 November 2023). Some of the micro-crystalline graphite will be diverted for sale into traditional industrial uses such as refractories, crucibles, foundries, friction parts, pencils, and lubricants.

The rest of the flotation concentrate will be processed downstream by thermal purification and spheroidization to Uncoated Spherical Purified Graphite (USPG) for lithium-ion battery anodes and Ultra High Purity Fines (UHPF) for advanced industrial uses.



Figure 2 - Sarytogan Proposed Schematic Flowsheet and Product Mix. Refer ASX Announcements: <sup>1</sup> 27/3/23, <sup>2</sup> 13/11/23, <sup>3</sup> 5/3/23, <sup>4</sup> 19/12/23.

### **Thermal Purification**

The bulk flotation concentrate produced in Australia (refer ASX Announcement 13 November 2023) was purified by our American Technology Partner at 2,850 degrees Celsius. The Carbon content was measured by LOI determination in a platinum crucible to be an average of **99.9991% C** over the 2.2kg purified (refer ASX Announcement 5 March 2024). One 570g sub-sample, purified with a specific set of process parameters, assayed **99.9992% C** (Figure 1). The remaining impurities were assayed for 17 elements by solid ICP, using one of only 2 machines in the USA with precision available at these low levels. The total contaminants of these 17 elements were less than **1.2 ppm**.

#### Lithium-Ion Battery Manufacture

Six lithium-ion coin-cell batteries were manufactured by our American technology partner (refer ASX Announcement 8 February 2024) using Sarytogan USPG previously produced (refer ASX Announcement 19 December 2023). The different sized spheres that made up the high spheroidization yield of 54% reported were recombined to make what we now know to be Active Anode Material (AAM) with high tap density measured at 1.05 g/cm<sup>3</sup>. The AAM was dispersed into slurry and coated onto copper foil using the drawdown technique. The electrode was dried under vacuum and weighed. It was welded to the bottom can of a stainless-steel test cell of standard size, CR2016, being 20mm diameter by 1.6mm thick.

#### **Battery Performance**

The batteries demonstrated reversible capacities ranging from 342 to 347 mAh/g across the six batteries tested. This is superior to many synthetic graphite products used in electric vehicle batteries which typically return specific capacities of 330 to 345 mAh/g (Figure 3). This is the first result and further optimisation is expected.

Furthermore, all six cells were measured as having remarkably repeatable and consistent results. No significant degradation in performance was observed after nine rounds of 10-hour charge and discharge cycles (Figure 3).



Figure 3 – Short-term galvanic cycling of six CR2016 lithium-ion batteries made with Sarytogan USPG

These results are highly significant and pioneering because of the unique microcrystalline nature of Sarytogan Graphite, which sets it apart from the normal classification of natural graphite categories such as vein, flake, and amorphous. Sarytogan Graphite offers all the benefits of high performance at lower costs due to its exceptionally high-grade, natural microcrystalline sizing, high spheroidization yield, simple flowsheet, and proximity to market.

#### **Alkaline Battery**

AA alkaline battery cells were manufactured by our American Technology Partner (refer ASX Announcement 11 April 2024). Sarytogan UHPF was blended with the manganese dioxide cathode and as a lining sprayed onto the inside of the metal can (Figure 4).



Figure 4 – Cross Section of an alkaline battery illustrating the use of Sarytogan UHPF.

The battery produced was measured as having higher capacity than uncoated control cells (Figure 5) and higher capacity than cells made from an existing graphite product sold for this use.



Figure 5 - Discharge curves for AA Alkaline Batteries with and without Sarytogan UHPF additives.

### Lithium CFx Battery

Li/CFx Batteries are primary (non-rechargeable) batteries made with a lithium (Li) metal anode and a cathode that is a blend of carbon (C) and fluoride (F) at variable ratios (x). The Li/CFx batteries have much higher specific discharge capacity compared to lithium-ion batteries, high energy density (light weight), long storage life, wide operating temperature range and are very rugged and reliable. They are therefore favoured in applications where charging infrastructure is not available, for example implantable medical devices, aviation, and military applications (Figure 6).



Figure 6 - Example applications of Li/CFx batteries.

Sarytogan UHPF was used in the manufacture of five Li/CFx cells (refer ASX Announcement 11 April 2024). Two cells were made using the Sarytogan UHPF grading 99.998% C (refer ASX Announcement 7 December 2023) and three using Sarytogan UHPF grading 99.9992% C (refer ASX Announcement 5 March 2024). Both grades produced higher voltage than a control Li/CFx cell made with existing commercial graphite (Figure 7). The results were sensitive to purity with the higher purity Sarytogan UHPF performing better, especially during the initial discharge. This initial discharge is a particularly important performance metric; consider the launch of drones for example.

Furthermore, the results were highly repeatable as shown by the coincident curves from different cells of the same graphite grade (Figure 7).



Figure 7 - Discharge curves for Sarytogan Li/CFx batteries.

#### **Nuclear Uses**

Graphite has always been an indispensable part of the nuclear fission reactor since its invention in the late 1930s. Its primary use is as the moderator surrounding the uranium fuel rods to bounce escaping neutrons back to the uranium to moderate the release of energy.

To be suitable for use as a moderator in nuclear reactors, graphite should be a fine powder at very high purity of  $\geq$ 99.999% C. Impurities of elements other than C may capture, rather than bounce, the escaping neutrons. The element Boron (B) has a particularly large neutron capture cross-section which is detrimental to the moderator's performance. The Sarytogan Five Nines Graphite assayed at **0.032 ppm B** well below the maximum nuclear specification of 2 ppm.

Another 26 elements can also have a lesser effect on the performance of the graphite moderator and assays of those elements are factored and totalled to give an Equivalent Boron Content (EBC), which has a specification of up to 3 ppm. The Sarytogan Five Nines Product has been assayed for 11 of these 26 elements to date and all have a negligible contribution to EBC. Earlier comprehensive assays of the Sarytogan flotation concentrate do not raise any concern for the other elements. The full suite of 26 elements will now be assayed to provide a certified EBC value.

High purity graphite is also used in the nuclear industry in applications other than the moderator including yarns, seals, lubricants, coatings, foils, and reflective materials.

The global market for nuclear graphite is currently about 60,000 tonnes per annum and is set to grow with the renewed worldwide investment in nuclear power. Graphite used as nuclear moderators sells at prices of higher than US\$25,000 per tonne, a significant premium to graphite used in lithium-ion batteries.

The addition of nuclear applications adds another layer to Sarytogan's product strategy to place as many units of carbon into as many markets as possible.

#### Geotechnical Drill Program

Eight HQ3 diamond drill holes for 471.3m were drilled from May to July 2023 (Figure 8). The holes were drilled to assess the strength of the rock and orientation of rock fractures. This data has been used to set appropriate pit wall angles used in the mining pit designs (Figure 8). Following the completion of geotechnical logging and sampling, which required uncut core, the drill core was cut and sampled for assay in December 2023 and January 2024 with assays now received and able to be reported (refer ASX Announcement 26 February 2024).



Figure 8 - Completed Diamond Drilling at the Sarytogan Graphite Deposit.

- High-grade graphite mineralisation in 92% of all meters drilled, including:
  - 60.1m @ 33.81% Total Graphitic Carbon (TGC) from surface to EOH in GT01
  - **50.0m @ 30.88%** TGC from surface to End of Hole (EOH) in GT02
  - **60.0m @ 30.46%** TGC from surface to EOH in GT05

Of the 471.3m drilled, 434.4m or 92% of the meters drilled are reported as mineralised intervals. Several significant intercepts of greater than 40% TGC have been reported and 2 individual assays higher than an extraordinary 50% TGC were recorded.

The significance of these results is that the initial pit walls will be constructed in high-grade mineralisation. This confirms that the selected initial mining areas have targeted only a very small proportion of the available Mineral Resource and has selected only the very highest grades at the lowest strip ratio.

#### Corporate

As at quarter end on 31 March 2024, the Company had A\$3.923M in cash.

The Company provides the following information pursuant to ASX Listing Rule requirements:

- 1. ASX Listing Rule 5.3.1: Exploration and Evaluation Expenditure spend during the quarter was \$606,000 materially comprising drilling, assay, metallurgical, and study expenses.
- 2. ASX Listing Rule 5.3.2: There were no substantive mining production and development activities during the quarter.
- 3. ASX Listing Rule 5.3.3:
  - a. The Sarytogan Graphite Deposit exploration licence 1139-R-TPI (1139-P-TПИ) was issued to Ushtogan LLP on 14/08/2018 and confirmed by 5406-TPI (5406-TПИ) contract on 26/10/2018. The contract was extended in June 2022 for a further 3 years to June 2025. The exploration concession covers 70 km<sup>2</sup>. There was no change to the Company's 100% interest in the licence since the last quarter.
  - b. The Kenesar Graphite Exploration Project exploration licence 1968-EL was issued to Ushtogan LLP on 28/02/2023 for a period of six years to February 2029. The exploration concession covers 150 graticular blocks or 309km<sup>2</sup>. There was no change to the Company's 100% interest in the licence since the last quarter.
- 4. ASX Listing Rule 5.3.4: the progress towards spending the funds relative to the proposed use of funds (ie. what is set out in Section 6(e) of the SGA supplementary prospectus) and any material variance between anticipated expenditure and actual expenditure is set out in Table 1.
- 5. ASX Listing Rule 5.3.5: Payment to related parties of the Company and their associates during the quarter as set out in Section 6.1 of the attached Appendix 5B relate to director salaries and fees in the quarter.

IPO allocation of funds	Projected	Actual
	Amount (A\$)	expenditure to
		31/3/24 (A\$)
Drilling	2,200,000	1,098,258
Assays	550,000	331,206
Metallurgical Testwork	500,000	964,931
Consulting Fees	550,000	256,955
Scoping, Pre-Feasibility Studies	450,000	378,321
Environmental Studies	150,000	21,210
Transportation	175,000	277,590
Equipment	150,000	213,173
Working Capital & Wages	1,354,627	2,261,955
Accommodation and Storage	250,000	311,931
Administration	450,000	1,574,896
New tenement	0	653,244
Taxes	300,000	134,873
Working Capital Loan Repayment	839,187	836,995
Brokerage	519,572	536,754
Accrued administration costs (unpaid director fees)	317,008	290,548
Expenses of the Offer	75,000	90,000
Total	8,830,394	10,232,839

Table 1 - Reconciliation of expenditure to date vs that projected in the Company's Supplementary Prospectus.

#### Next Steps

The USPG lithium-ion cell performance (Refer ASX Announcement 8 February 2024) has continued to cycle through repeated charges and discharges to measure long-term performance. Results after 100 cycles will enable comparison with other existing graphite products. These long-term results will be available shortly.

Coated Spherical Purified Graphite (CSPG) is expected to provide even higher performance in the lithium-ion anode. CSPG has been manufactured by coating Sarytogan USPG with carbon. Battery testing of a coin cell with a Sarytogan CSPG anode is underway.

These tests are all important inputs into the Pre-Feasibility Study which is on-track to be completed in Q3 this year.

Sean Gregory

**Managing Director** 

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## About Sarytogan

The Sarytogan Graphite Deposit is in the Karaganda region of Central Kazakhstan. It is 190km by highway from the industrial city of Karaganda, the 4<sup>th</sup> largest city in Kazakhstan (Figure 9).



Figure 9 - Sarytogan Graphite Deposit and Kenesar Graphite Exploration Project locations.

The Sarytogan Graphite Deposit was first explored during the Soviet era in the 1980s with sampling by trenching and diamond drilling. Sarytogan's 100% owned subsidiary Ushtogan LLP resumed exploration in 2018. An Indicated and Inferred Mineral Resource has recently been estimated for the project by AMC Consultants totalling **229Mt @ 28.9%** TGC (Table 2), refer ASX Announcement 27 March 2023). Sarytogan has upgraded the mineralisation up to **99.9992% C** "five nines purity" by thermal purification, without any chemical pre-treatment (refer ASX Announcement 5 March 2024). Furthermore, spheres of graphite have been made at a high yield (refer ASX Announcement 19 December 2023) and performance lithium-ion batteries has been demonstrated (refer ASX Announcement 8 February 2024). A Pre-Feasibility Study as part of its strategy to supply high-quality anode pre-cursor material for the rapidly growing electric vehicle battery market is well advanced and scheduled for completion in Q3 2024.



Zone	Classification (JORC Code)	In-Situ Tonnage (Mt)	Total Gra phitic Carbon (TGC %)	Contained Graphite (Mt)
North	Indicated	87	29.1	25
	Inferred	81	29.6	24
	Total	168	29.3	49
Central	Indicated	39	28.1	11
	Inferred	21	26.9	6
	Total	60	27.7	17
Total	Indicated	126	28.8	36
	Inferred	103	29.1	30
	Total	229	28.9	66

Table 2 - Sarytogan Graphite Deposit Mineral Resource (> 15% TGC).

### **Compliance Statement**

The information in this report that relates to other Exploration Results is cross referenced to the relevant announcements in the text. These reports are available at www.asx.com.au. The information in this report that relates to Sarytogan Mineral Resources was first reported in ASX announcement dated 27 March 2023.

The Company confirms that it is not aware of any new information or data that materially affects the information included in relevant market announcements and, in the case of estimates of Mineral Resources, that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Persons' findings are presented have not been materially modified from the original market announcements.

## Appendix 5B

# Mining exploration entity or oil and gas exploration entity quarterly cash flow report

Name of entity			
Sarytogan Graphite Limited			
ABN Quarter ended ("current quarter")			
91 107 920 945	31 March 2024		

Consolidated statement of cash flows		Current quarter \$A'000	Year to date (9 months) \$A'000
1.	Cash flows from operating activities		
1.1	Receipts from customers	-	-
1.2	Payments for		
	(a) exploration & evaluation	-	-
	(b) development	-	-
	(c) production	-	-
	(d) staff costs	(232)	(384)
	(e) administration and corporate costs	(189)	(453)
1.3	Dividends received (see note 3)	-	-
1.4	Interest received	65	190
1.5	Interest and other costs of finance paid	-	-
1.6	Income taxes paid	-	-
1.7	Government grants and tax incentives	-	-
1.8	Other (provide details if material)	-	-
1.9	Net cash from / (used in) operating activities	(356)	(1,068)

2.	Cas	h flows from investing activities		
2.1	Payn	nents to acquire or for:		
	(a) e	entities	-	-
	(b) t	tenements	-	-
	(c) p	property, plant and equipment	-	-
	(d) e	exploration & evaluation	(606)	(2,849)
	(e) i	investments	-	-
	(f) (	other non-current assets	_	-

Cons	solidated statement of cash flows	Current quarter \$A'000	Year to date (9 months) \$A'000
2.2	Proceeds from the disposal of:		
	(a) entities	-	-
	(b) tenements	-	-
	(c) property, plant and equipment	-	-
	(d) investments	-	-
	(e) other non-current assets	-	-
2.3	Cash flows from loans to other entities	-	-
2.4	Dividends received (see note 3)	-	-
2.5	Other (provide details if material)	-	-
2.6	Net cash from / (used in) investing activities	(606)	(2,849)

3.	Cash flows from financing activities		
3.1	Proceeds from issues of equity securities (excluding convertible debt securities)	-	-
3.2	Proceeds from issue of convertible debt securities	-	-
3.3	Proceeds from exercise of options	-	-
3.4	Transaction costs related to issues of equity securities or convertible debt securities	-	
3.5	Proceeds from borrowings	-	-
3.6	Repayment of borrowings	-	-
3.7	Transaction costs related to loans and borrowings	-	-
3.8	Dividends paid	-	-
3.9	Other (provide details if material)		
3.10	Net cash from / (used in) financing activities	-	-

4.	Net increase / (decrease) in cash and cash equivalents for the period		
4.1	Cash and cash equivalents at beginning of period	4,852	7,773
4.2	Net cash from / (used in) operating activities (item 1.9 above)	(356)	(1,068)
4.3	Net cash from / (used in) investing activities (item 2.6 above)	(606)	(2,849)
4.4	Net cash from / (used in) financing activities (item 3.10 above)	-	-

Cons	colidated statement of cash flows	Current quarter \$A'000	Year to date (9 months) \$A'000
4.5	Effect of movement in exchange rates on cash held	33	67
4.6	Cash and cash equivalents at end of period	3,923	3,923

5.	Reconciliation of cash and cash equivalents at the end of the quarter (as shown in the consolidated statement of cash flows) to the related items in the accounts	Current quarter \$A'000	Previous quarter \$A'000
5.1	Bank balances	1,923	852
5.2	Call deposits	2,000	4,000
5.3	Bank overdrafts	-	-
5.4	Other (provide details)	-	-
5.5	Cash and cash equivalents at end of quarter (should equal item 4.6 above)	3,923	4,852

6.	Payments to related parties of the entity and their associates	Current quarter \$A'000
6.1	Aggregate amount of payments to related parties and their associates included in item 1	205
6.2	Aggregate amount of payments to related parties and their associates included in item 2	-
Note: if any amounts are shown in items 6.1 or 6.2, your quarterly activity report must include a description of, and an explanation for, such payments.		

7.	<b>Financing facilities</b> Note: the term "facility' includes all forms of financing arrangements available to the entity. Add notes as necessary for an understanding of the sources of finance available to the entity.	Total facility amount at quarter end \$A'000	Amount drawn at quarter end \$A'000
7.1	Loan facilities	-	-
7.2	Credit standby arrangements	-	-
7.3	Other (please specify)	-	-
7.4	Total financing facilities	-	-
7.5	Unused financing facilities available at qu	arter end	-
7.6	Include in the box below a description of each facility above, including the lender, interest rate, maturity date and whether it is secured or unsecured. If any additional financing facilities have been entered into or are proposed to be entered into after quarter end, include a note providing details of those facilities as well.		the lender, interest tional financing ter quarter end,

Estimated cash available for future operating activities	\$A'000
Net cash from / (used in) operating activities (item 1.9)	(356)
(Payments for exploration & evaluation classified as investing activities) (item 2.1(d))	(606)
Total relevant outgoings (item 8.1 + item 8.2)	(962)
Cash and cash equivalents at quarter end (item 4.6)	3,923
Unused finance facilities available at quarter end (item 7.5)	-
Total available funding (item 8.4 + item 8.5)	3,923
Estimated quarters of funding available (item 8.6 divided by item 8.3)	4.1
Note: if the entity has reported positive relevant outgoings (ie a net cash inflow) in iten Otherwise, a figure for the estimated quarters of funding available must be included i	n 8.3, answer item 8.7 as "N/A". n item 8.7.
If item 8.7 is less than 2 quarters, please provide answers to the following questions:	
8.8.1 Does the entity expect that it will continue to have the currer cash flows for the time being and, if not, why not?	t level of net operating
Answer: N/A	
8.8.2 Has the entity taken any steps, or does it propose to take ar cash to fund its operations and, if so, what are those steps a believe that they will be successful?	y steps, to raise further and how likely does it
Answer: N/A	
	Estimated cash available for future operating activities Net cash from / (used in) operating activities (item 1.9) (Payments for exploration & evaluation classified as investing activities) (item 2.1(d)) Total relevant outgoings (item 8.1 + item 8.2) Cash and cash equivalents at quarter end (item 4.6) Unused finance facilities available at quarter end (item 7.5) Total available funding (item 8.4 + item 8.5) Estimated quarters of funding available (item 8.6 divided by item 8.3) Note: if the entity has reported positive relevant outgoings (ie a net cash inflow) in item Otherwise, a figure for the estimated quarters of funding available must be included in If item 8.7 is less than 2 quarters, please provide answers to the follo 8.8.1 Does the entity expect that it will continue to have the currer cash flows for the time being and, if not, why not? Answer: N/A 8.8.2 Has the entity taken any steps, or does it propose to take an cash to fund its operations and, if so, what are those steps a believe that they will be successful?

8.8.3	Does the entity expect to be able to continue its operations and to meet its business
	objectives and, if so, on what basis?

Answer: N/A

Note: where item 8.7 is less than 2 quarters, all of questions 8.8.1, 8.8.2 and 8.8.3 above must be answered.

#### **Compliance statement**

- 1 This statement has been prepared in accordance with accounting standards and policies which comply with Listing Rule 19.11A.
- 2 This statement gives a true and fair view of the matters disclosed.

Date: 29 April 2024

Authorised by: The Board of Directors (Name of body or officer authorising release – see note 4)

#### Notes

- 1. This quarterly cash flow report and the accompanying activity report provide a basis for informing the market about the entity's activities for the past quarter, how they have been financed and the effect this has had on its cash position. An entity that wishes to disclose additional information over and above the minimum required under the Listing Rules is encouraged to do so.
- 2. If this quarterly cash flow report has been prepared in accordance with Australian Accounting Standards, the definitions in, and provisions of, AASB 6: Exploration for and Evaluation of Mineral Resources and AASB 107: Statement of Cash Flows apply to this report. If this quarterly cash flow report has been prepared in accordance with other accounting standards agreed by ASX pursuant to Listing Rule 19.11A, the corresponding equivalent standards apply to this report.
- 3. Dividends received may be classified either as cash flows from operating activities or cash flows from investing activities, depending on the accounting policy of the entity.
- 4. If this report has been authorised for release to the market by your board of directors, you can insert here: "By the board". If it has been authorised for release to the market by a committee of your board of directors, you can insert here: "By the [name of board committee – eg Audit and Risk Committee]". If it has been authorised for release to the market by a disclosure committee, you can insert here: "By the Disclosure Committee".
- 5. If this report has been authorised for release to the market by your board of directors and you wish to hold yourself out as complying with recommendation 4.2 of the ASX Corporate Governance Council's Corporate Governance Principles and Recommendations, the board should have received a declaration from its CEO and CFO that, in their opinion, the financial records of the entity have been properly maintained, that this report complies with the appropriate accounting standards and gives a true and fair view of the cash flows of the entity, and that their opinion has been formed on the basis of a sound system of risk management and internal control which is operating effectively.