Spark Energy Minerals Validates Priority Lithium and Gallium-REE Drill Targets at Arapaima Project in Brazil's Lithium Valley

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Vancouver, September 17, 2025 - Spark Energy Minerals Inc. (CSE: SPRK) (OTCID: SPARF) (FSE: 8PC) ("Spark" or the "Company") is pleased to report significant progress at its flagship Arapaima Project in Brazil's Lithium Valley. Recent exploration work - including mapping, geochemical analysis, and sampling - has confirmed high-priority lithium and gallium -rare earth element (REE) drill targets.

The Company is now advancing logistics, surface access agreements, and permitting in preparation for an aggressive diamond drilling at Cruzeta, Água Branca, and Grota do Maquém lithium targets, as well as air-core and/or reverse circulation drilling at its rapidly emerging gallium-REE Caladão Target.

Figure 1. Location of Spark Energy Minerals' Arapaima Project in Brazil's Lithium Valley, highlighting the priority lithium and gallium-REE targets (right), relative to competitor areas (left).

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Eugene Hodgson, CEO of Spark Energy Minerals, emphasized:

"Our thorough exploration efforts, which include mapping, sampling, and geochemical assaying, have clearly defined our primary drill targets for both lithium and gallium-rare earth elements (REE). The strong correlation between lithium and essential pathfinder elements, along with the unique fractionated pegmatite signatures, especially noted at the Cruzeta and Grota do Maquém targets, highlights the significant potential of our tenements.

"Additionally, we are excited to push forward with our Caladão Rare Earths Target, located near a recently announced resource and displaying notably high gallium and REE values. We are committed to moving ahead with the necessary permitting and logistics to start drilling as soon as possible, unlocking the full potential of our projects."

Spark Arapaima Exploration

Exploration activities to date have resulted in:

- 123 pegmatite occurrences mapped across 31 km of strike.
- Reconnaissance and stream sediment sampling completed across approximately 55% of 65 drainage basins.
- 75% of surveyed basins have reported Lithium and pathfinder elements, including niobium, rubidium, tantalum, cesium, tin, and rare earth anomalies requiring detailed follow-up.
- Surface sampling has outlined an extensive 4,500-hectare zone over the Caladão Granite with anomalous gallium and rare earth element (REE) values - a compelling development given that Spark's tenements lie directly contiguous to Axel REE's recently reported Gallium-REE discovery (see Axel REE news release: https://wcsecure.weblink.com.au/pdf/AXL/02982179.pdf).

Priority Lithium Targets

Three high-priority lithium targets - Cruzeta, Água Branca, and Grota do Maquém - have been identified, where lithium is strongly correlated with pathfinder elements (Cs, Sn, Rb). This geochemical association is typical of fertile lithium-cesium-tantalum pegmatites (LCT) and spodumene-rich pegmatites (SRP). These targets represent the most advanced lithium prospects within Spark's 91,900-hectare Arapaima Project.

Contour maps (see Figure 2) show lithium closely associated with manganese, a relationship further supported by the field identification of the mineral lithiophorite. This indicates that lithium has been naturally remobilized from primary sources, such as spodumene - a common process in deep tropical weathering environments like Arapaima - reinforcing the potential for lithium mineralization at depth below surface weathering in the area.

Figure 2. Geochemical maps showing lithium (left) and cesium, niobium, tin, and rubidium (clockwise) responses from rock chip samples over Spark's three priority drill targets. Warm colours indicate anomalous values; cooler areas may reflect limited sampling rather than low values.

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In lithium-rich pegmatites (LCT-SRP), lithium is strongly linked with rubidium, since both are commonly hosted in potassium-bearing minerals alongside spodumene and other lithium minerals.

Lithium also shows a notable association with thallium, which behaves similarly in geological systems and is often concentrated in the minerals spodumene and lepidolite. These correlations are classic markers of fertile pegmatites and further strengthen the case for lithium potential at Arapaima.

Figure 3. Geochemical maps for lithium and key pathfinder elements (thallium, manganese, and scandium) across Spark's three priority drill targets. Areas shown in warmer colours represent higher concentrations, highlighting zones of strong anomalism. Cooler colours should not be interpreted as barren ground, but rather as areas where additional sampling is required.

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Principal Component Analysis (PCA), a statistical tool used to confirm multi-element correlations, shows that lithium consistently occurs alongside key pathfinder elements, including rubidium, thallium, manganese, tin, cesium, niobium, and tantalum.

At Arapaima, lithium also shows an association with scandium, though this is considered less significant. These correlations are classic indicators of fertile, lithium-bearing pegmatites and provide a strong foundation for drill targeting.

Figure 4. A combined anomaly map (PC1), where warmer colours highlight areas with higher concentrations of lithium and associated pathfinder elements. Cooler colours do not necessarily indicate a lack of mineralization but often reflect areas with limited sampling.

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Cesium Analysis

Recent discoveries in Brazil's Lithium Valley have shown that cesium can occur at potentially economic grades within lithium-rich pegmatites. Typically, cesium values above 10 ppm are considered anomalous, with values exceeding 50 ppm strongly indicative of advanced fractionation and favourable conditions for

lithium mineralization.

At Arapaima, rock-chip samples from Grota do Maquém and especially the Cruzeta target have returned cesium values above 50 ppm, reaching 267 ppm. These results reinforce Spark's priority focus on drill testing these highly prospective targets.

Figure 5. The distribution of anomalous cesium across Spark's Arapaima tenements. Rock-chip samples returned values above 50 ppm - clear evidence of strong fractionation - highlighted at Grota do Maquém and most prominently at Cruzeta (up to 267 ppm). These results further support Spark's decision to prioritize drilling at these targets.

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Spark's assays show that when cesium values exceed 50 ppm, they are strongly associated with elevated levels of other key pathfinder elements - including rubidium (up to 5,000 ppm), lithium (up to 1,500 ppm), tantalum (up to 90 ppm), and thallium (up to 20 ppm). This geochemical signature is characteristic of highly fractionated, lithium-fertile pegmatites and again, reinforces the potential at Arapaima.

Figure 6. Illustrating the strong association between cesium and other pathfinder elements. Samples with cesium above 50 ppm also returned high values of rubidium (up to 5,000 ppm), lithium (up to 1,500 ppm), tantalum (up to 90 ppm), and thallium (up to 20 ppm). This geochemical pattern is typical of highly fractionated, lithium-fertile pegmatites and further supports drill targeting at Arapaima.

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Spark's data also shows that higher cesium values (>50 ppm) are associated with elevated niobium (up to 550 ppm) and tin (up to 300 ppm). Both elements are typically enriched in the later stages of lithium-rich pegmatites. Together with lithium, rubidium, tantalum, and thallium, these pathfinder elements form a strong geochemical signature that points to zones with high lithium mineralization potential.

Potassium / Rubidium (K/Rb) Ratio Analysis

K/Rb ratios are a proven exploration tool, with values below 150 indicating strong fractionation and higher lithium potential. The lower the ratio, the greater the likelihood of spodumene-rich pegmatites.

At Arapaima, all three of Spark's priority targets returned K/Rb ratios under 150, with Cruzeta standing out at below 20 - a clear signal of highly fractionated pegmatites and strong lithium prospectivity. These results provide valuable vectors to guide detailed mapping and future drilling.

Figure 7. Highlighting K/Rb ratios across Spark's tenements. All three priority targets show ratios below 150, while Cruzeta stands out with ultra-low ratios below 20. These results are a strong indicator of highly fractionated, lithium-fertile pegmatites and reinforce Cruzeta's potential as a high-priority drill target.

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Spark's Caladão Gallium and Rare Earths Target

Axel REE has recently reported a maiden JORC-compliant gallium resource and noted that a rare earth resource estimate for the same area is expected to be released in the coming weeks (see Axel REE news release dated August 22, 2025: https://wcsecure.weblink.com.au/pdf/AXL/02982179.pdf).

Spark controls more than 4,500 hectares of contiguous ground within the fertile Caladão Granite Complex - directly adjacent to Axel's discovery. Surface sampling across Spark's ground has already returned anomalous gallium and REE values. In anticipation of Axel's forthcoming REE resource, Spark is preparing an air-core / reverse circulation drilling program to follow up on these anomalies to test the potential extension of Axel's mineralization onto Spark's licenses.

Figure 8. The location of Spark's Caladão REE Project, which covers more than 4,500 hectares directly adjacent to Axel REE's tenements. Axel recently published a JORC-compliant gallium resource in this area. Spark's contiguous ground has returned anomalous REE and gallium values, and upcoming drilling will test whether Axel's mineralization extends onto Spark's licenses.

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Exploration Plan

Spark's exploration team is preparing logistics and permitting to begin drilling at its priority lithium and rare earth targets. With priority targets confirmed and groundwork well advanced, the Company is on track to launch its first significant drill program in Brazil's Lithium Valley - a transformative step toward unlocking the full potential of Arapaima.

Qualified Person:

The scientific and technical information disclosed in this document has been reviewed and approved by Jonathan Victor Hill, BSc Hons, FAUSIMM, a Qualified Person consistent with NI 43-101 and a director of Spark Energy Minerals Inc.

About Spark Energy Minerals Inc.

Spark Energy Minerals, Inc. is a Canadian company focused on the acquisition, exploration, and development of battery metals and mineral assets, with a particular emphasis on its substantial interests in Brazil. The Company's flagship project is the Arapaima Lithium & Gallium-REE project spanning a combined 91,900 hectares in Brazil's renowned Lithium Valley, one of the most prolific mining regions in the world. This region is rapidly gaining global recognition for its vast deposits of lithium and rare earth minerals, positioning Brazil as a critical player in the global energy transition.

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FOR ADDITIONAL INFORMATION, SEE THE COMPANY'S WEBSITE AT:

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