Locksley advances toward production of high purity antimony concentrate and next-generation materials

Rice University research driving development of vertically-integrated antimony processing and materials platform

KEY HIGHLIGHTS

- Locksley's research program with Rice University continues to advance, with optimisation underway to produce **defence-grade >99% purity antimony** using material sourced from LKY's Mojave Project in California, USA
- Successful upgrading of Mojave concentrate and direct ore processing pathways, supporting simplified flowsheet potential for Deep Eutectic Solvent (DES) technology
- DES research and testing progressing towards commercialisation as vertically integrated mine-to-market platform
- Locksley is advancing development of a vertically integrated processing-to-energy-materials platform, including:
    - Antimony impregnated carbon/graphite composites with potential high durability industrial applications
    - Antimony-coated metal substrates with potential battery anode and semiconductor applications
    - Novel flame-retardant antimony compound

Locksley Resources Limited (ASX: LKY, OTCQX: LKYRF, FSE: X5L) ("Locksley" or "the Company") is pleased to provide an update on the progress of its sponsored research program with Rice University in Texas, USA. Latest laboratory results from this demonstrate significant advancements across antimony extraction, materials fabrication and battery related applications.

High-Efficiency Antimony Extraction

Laboratory optimisation of deep eutectic system (DES) system processing has demonstrated **strong antimony extraction performance** using feedstocks from Locksley's Desert Antimony Mine (DAM), part of its Mojave Project, under controlled conditions. Both concentrate upgrading and direct ore processing pathways continue to advance, with ongoing optimisation targeting high-purity antimony suitable for downstream industrial and defense applications.

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Importantly, these results indicate the potential to process antimony-bearing material without conventional flotation pre-treatment, supporting simplified flowsheets and reduced processing complexity.

Downstream Materials Fabrication and Energy Applications

Locksley and Rice University have expanded the research scope to investigate innovative downstream antimony products for industrial and advanced technology markets.

Direct Ni–Sb Electrodeposition

Locksley and Rice University are advancing development of antimony-based composite materials for potential use in next-generation battery systems. Initial proof-of-concept work has demonstrated the formation of antimony-coated nickel substrates, representing a potential pathway toward high-performance anode materials used in AI energy infrastructure and robotics.

Antimony-Based Composite Anode Materials

The research team has successfully achieved preliminary synthesis of Sb_2S_3/graphite composites with up to 20% loading directly from sulfur-containing solvent leach solutions. Initial full-cell tests integrating $LiFePO_4$ cathode have provided early directional results, indicating an N/P ratio of approximately 1.19.

Unlike conventional graphite-silicon anodes, when incorporated into composite structures, such as Sb_2S_3/graphite, antimony can mitigate the effects of volume expansion during cycling, improving stability and lifespan. This could position antimony-based anodes more favourably for use in lithium-ion and sodium-ion batteries, with further optimisation and validation.

Electrolyte Safety Enhancements

Parallel work has identified potential for antimony-based additives to improve battery safety characteristics, including its flame-retardant properties. Research into antimony chloride ($SbCl_5$) as an electrolyte additive has indicated a reduction in Self-Extinguishing Time (SET), approaching non-flammable performance (<6 s/g).

While currently at an early stage, these findings suggest potential for enhanced fire-retardant performance in lithium-ion systems.

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Strategic Positioning

This program positions Locksley not only as a future producer of antimony, but as a developer of advanced materials and processing technologies aligned with U.S. strategic priorities through a vertically integrated research approach, spanning ore processing through to advanced energy materials development.

This work directly supports Locksley's mine-to-market strategy, which seeks to establish a secure, fully domestic U.S. supply chain for antimony, from extraction at the Mojave Project's Desert Antimony Mine (DAM) through to refined, high purity products and innovative downstream applications.

Recent metallurgical milestones, including production of high-purity antimony derivatives from Mojave sourced material, further validate the potential for 100% American-made outputs aligned with national priorities for critical materials independence.

Locksley considers this integrated research pathway a strategic platform, positioned to advance critical mineral processing while enabling downstream applications in high-performance energy materials. This approach highlights Locksley's potential as a versatile technology enabler spanning the entire value chain, from raw mineral extraction through to advanced downstream applications in critical materials and energy technologies.

Locksley Resources Managing Director and CEO Kerrie Matthews said:

"Our research partner Rice University continues to make important advancements in achieving production of high purity antimony concentrate as well as other uses for antimony across a range of high-tech defence and industrial applications, reinforcing just how valuable this critical mineral is and the opportunity that exists for Locksley through our advanced Mojave Project in California."

Next Steps

- Continued optimisation for antimony purification targeting >99% purity, followed by bench-scale validation and associated economic assessment.
- Further optimisation of Sb electrodeposition parameters and confirmation of Ni substrate stability.
- Expanded electrochemical testing of Sb_2S_3/graphite composite anode materials, accompanied by market assessment activities.
- Completion of electrolyte safety characterization, including half-cell electrochemical performance evaluation.
- Consultation with U.S Government on grant applications to further develop and commercialise

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This announcement has been authorised for release by the Board of Directors of Locksley Resources.

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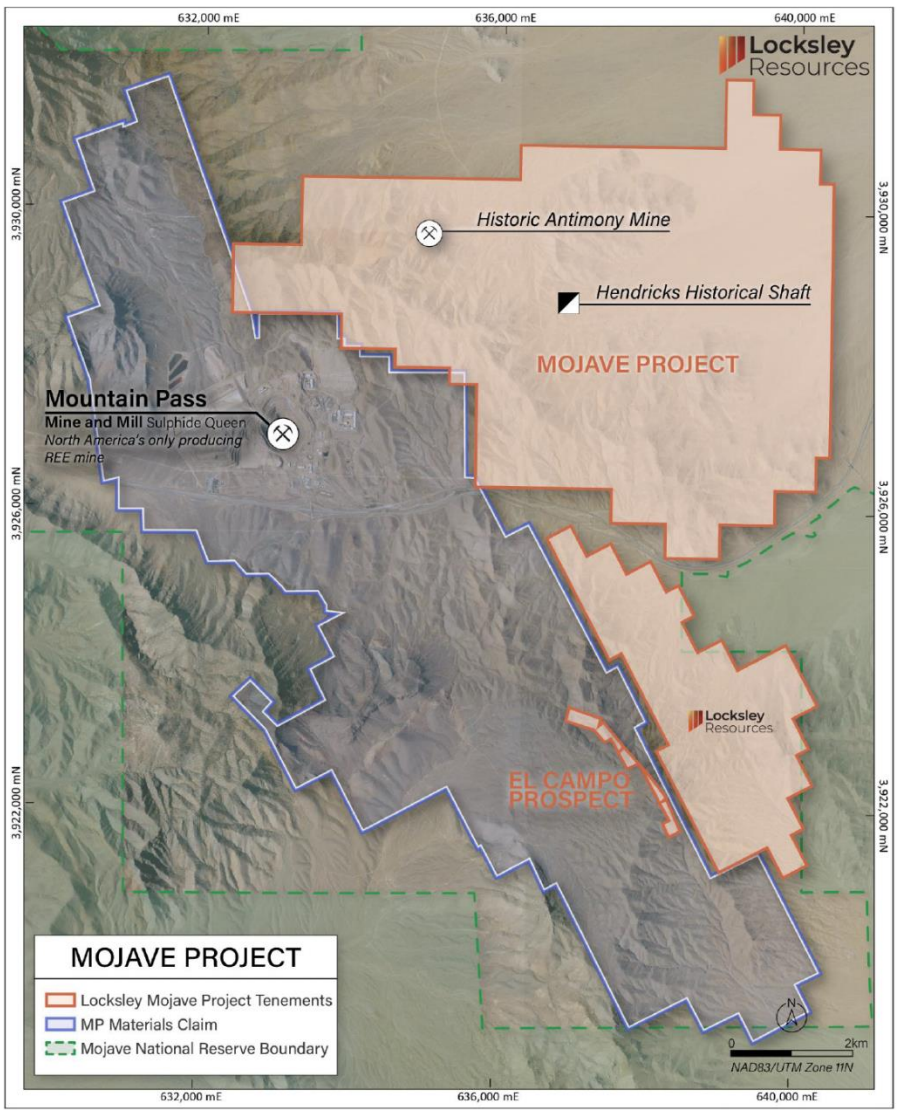
ABOUT LOCKSLEY RESOURCES LIMITED

Locksley Resources Limited is focused on critical minerals in the United States of America. The Company is actively advancing the Mojave Project in California, targeting rare earth elements (REEs) and antimony. Locksley is executing a mine-to-market strategy for antimony, aimed at re-establishing domestic supply chains for critical materials, underpinned by strategic downstream technology partnerships with leading U.S. research institutions and industry partners. This integrated approach combines resource development with innovative processing and separation technologies, positioning Locksley to play a key role in advancing U.S. critical minerals independence.



Location of the Mojave Project Blocks in south-eastern California, USA

Forward-Looking Statements

This document may include forward-looking statements. Forward-looking statements include, but are not limited to, statements concerning Locksley Resources planned activities and other statements that are not historical facts. When used in this document, the words such as "could," "plan," "estimate," "expect," "intend," "may", "potential," "should," and similar expressions are forward-looking statements. Although Locksley Resources 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.

Cautionary Statement

This announcement may contain visual exploration results in respect of the Mojave Project. Visual estimates of mineral abundance should never be considered a proxy or substitute for laboratory analyses where concentrations or grades are the factor of principal economic interest. Visual estimates also potentially provide no information regarding impurities or deleterious physical properties relevant to valuations.

Competent Persons Statement

Information in this document that relates to metallurgical test work is based on, and fairly represents, information and supporting documentation reviewed by Mr Peter Adamini, BSc (Mineral Science and Chemistry), who is a Member of The Australasian Institute of Mining and Metallurgy (AusIMM). Mr Adamini is a full-time employee of SGS Australia owned Independent Metallurgical Operations Pty Ltd, a wholly owned subsidiary of SGS Australia Holdings Pty Ltd. Mr. Adamini is an independent consultant engaged by Locksley Resources Limited for metallurgical representation and has sufficient experience relevant to metallurgy to act as a Competent Person in relation to the technical content reported. Mr. Adamini consents to the inclusion in this announcement of the matters based on his information and in the form and context in which it appears.

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