

## **HAWKSTONE ENGAGES HAZEN RESEARCH TO EVALUATE THE PRODUCTION OF BATTERY-GRADE LITHIUM $\text{Li}_2\text{CO}_3$ FROM BIG SANDY SEDIMENTARY LITHIUM DEPOSIT**

### **Highlights**

- **US President-elect Joe Biden has a “Plan for a Clean Energy Revolution”, which aims for America to become the world’s clean energy superpower, by boosting domestic production of battery metals.**
- **Hawkstone is well placed to capitalise on this dynamic shift in Federal policy, with its Big Sandy Lithium Project in Arizona.**
- **Hawkstone has appointed Hazen Research Inc, of Colorado to complete metallurgical test work on the lithium-mineralised material from the Big Sandy Project, with the object of producing battery-grade 99.8%  $\text{Li}_2\text{CO}_3$ .**

USA focused Gold and Lithium Explorer, Hawkstone Mining Limited (**ASX:HWK**) (“**Hawkstone**”, the “**Company**”) is pleased to announce that the Company has appointed Hazen Research Inc to perform metallurgical test-work on the lithium-mineralised sedimentary material from the Big Sandy Lithium Project (“**Big Sandy**”, “**Project**”), with the aim of producing battery-grade 99.8%  $\text{Li}_2\text{CO}_3$ .

The environmentally-compliant hydrometallurgical process that Hazen will evaluate involves sulphuric acid leaching, purification and production of 99.8%  $\text{Li}_2\text{CO}_3$  for lithium-ion batteries used in electric vehicles and generation-scale storage to backup renewable energy production. Initial outcomes should be available within two-three months.

Joe Biden has a “Plan for a Clean Energy Revolution” which places America on the road to becoming the world’s clean energy superpower. With a vision of a 100% clean energy economy, stated not only as an obligation, but as an opportunity for the USA to achieve a 100% clean energy economy, with net-zero carbon emissions by 2050. Biden’s campaign has privately stated to US miners that he will support boosting domestic production of critical metals used to make electric vehicles, solar panels and other products crucial to this climate plan<sup>1</sup>.

Hawkstone is well placed to capitalise on this dynamic shift in US Federal policy, with its Big Sandy Lithium Project strategically located halfway between Phoenix, Arizona and Las Vegas, Nevada straddling US Route 93 and Interstate 11, the newest link to the Pan-American corridor, in the southwest “Sun Belt,” which is a rapidly growing centre for renewable energy.

- To advance the Project, Hawkstone has appointed Hazen Research Inc to complete metallurgical test work on the lithium mineralised material from the Big Sandy Project, with the object of producing battery grade 99.8%  $\text{Li}_2\text{CO}_3$ .
- This testwork will be used to develop a feasible and economic processing route leading to pilot scale testing.

<sup>1</sup> <https://www.reuters.com/article/usa-election-mining/exclusive-biden-campaign-tells-miners-it-supports-domestic-production-of-ev-metals-idINKBN27808B>

- Previous testwork completed by Kappes, Cassidy and Assoc. (KCA) of Reno, Nevada established<sup>2</sup>:
  - Lithium recoveries from 85% to 95% in a simple sulphuric acid leach
  - Leach times ranged from 1 to 7 hours at ambient temperatures.
  - No grinding and minimal crushing required.
- A drill program in 2019 successfully defined an estimated JORC inferred resource of 32.5 Million tonnes grading 1,850 ppm Li for 320,800 tonnes  $\text{Li}_2\text{CO}_3$ <sup>3</sup>.
- This represents 4% of the project area that contains an estimated geological potential of between 271.1Mt to 483.15Mt at 1,000 - >2,000ppm  $\text{Li}^4$ .

*Note that the potential quantity and grade of the estimated geological potential (Exploration Target) is conceptual in nature. There has been insufficient exploration to estimate a mineral resource and it is uncertain whether future exploration will result in the definition of a mineral resource. It has been estimated using a range of thicknesses for the mineralised sediments calculated from drill intercepts, surface sampling and geological mapping. The grade estimates a range of values demonstrated from drilling and surface sampling.*

Initial metallurgical testwork completed by KCA demonstrated the lithium-bearing sedimentary material to be readily recoverable via a simple acid leaching and hydrometallurgical chemical process that has minimal air emissions.

Preliminary engineering studies have commenced and the Company's Phoenix-based engineer will evaluate process routes, supply chain optimisation, possible mining and processing scenarios, as well as establishing contacts within the local, State and Federal governments.

Baseline environmental and cultural surveys forming part of the Plan of Exploration (POE) process have been completed, and the POE will enable further drilling to extend the known resource to the north and south.

**Hawkstone Mining Managing Director, Paul Lloyd, commented:** *"The Big Sandy Lithium Project was the initial focus of Hawkstone and, with softening of lithium demand and price, work on the project has been focused on baseline engineering studies, establishing local contacts and obtaining the required permits for further drilling and bulk sampling while awaiting the awakening of the lithium market. We feel that lithium's time has arrived with a dynamic shift in US Federal policies, Tesla building a new Gigafactory at Austin Texas and announcing its intent to develop US sedimentary resources, VW shifting the majority of its production to EV's including an entire production line in Chattanooga, Tennessee, and battery storage coupled with wind and solar displacing coal and gas generation with countries around the world mandating the end of the ICE (internal combustion engine) age. With this paradigm shift in the energy / transport sectors, the Company is pleased to announce the engagement of Hazen Research to commence bench scale testing of the Big Sandy lithium mineralisation, with the aim of producing battery-grade 99.8%  $\text{Li}_2\text{CO}_3$  and, in the process, developing a preliminary process flow sheet."*

<sup>2</sup> Hawkstone Announcement, Nov 29, 2018, Preliminary Met Test Work Proves Highly Successful

<sup>3</sup> Hawkstone Announcement Sept 26, 2019, Big Sandy Lithium Project, Maiden Mineral Resource

<sup>4</sup> Hawkstone Announcement Nov 7, 2019, Big Sandy Lithium Project, Exploration Target Update



**Image 1 – Big Sandy, Extensive Lithium Mineralised Sediments**

## Metallurgical Test Work

Tenders were called from R&D companies with proven experience in lithium processing to undertake metallurgical test work on lithium-mineralised sediments from the Big Sandy Project and establish a viable process route for the production of battery grade 99.8%  $\text{Li}_2\text{CO}_3$ . Hazen Research, Inc. was chosen to complete the test work, having previously completed test work for Lithium Americas, Ioneer Ltd, Lake Resources and Cypress Development Corp. A 50kg sample of mineralised drill core from the 2019 drill campaign has been dispatched with results expected in the 1<sup>st</sup> quarter of 2021.

## Preliminary Engineering, Logistic, Assessment and Development Planning

Preliminary studies have commenced which have been managed by Hawkstone's Phoenix, Arizona based engineer, Doug Pitts, a board member of the Arizona Mining Association (AMA) and representative on the Government Relations committee. Hawkstone became a member of the AMA in 2019 joining companies including Freeport Mining, Resolution Copper, Asarco/Grupo Mexico, Excelsior Minerals, Florence Copper, and various suppliers to the mining industry.

In a Conceptual Feasibility Assessment and Development Plan, Mr Pitts has examined all aspects of the Project and has identified and highlighted numerous competitive advantages of the Big Sandy Lithium Project. Key points from his report are as follows:

- **Large Resource:** potentially one of the largest mineable lithium resources in North America, with a potentially low strip ratio exploitable by free dig, open pit mining methods.
- **Sustainable:** opportunity for an environmentally-complaint hydrometallurgical/chemical process with a zero-discharge approach, the possibility of a buried slurry pipeline to transport ore to a nearby industrialised processing location on a large east-west rail link, and dry-stacked tailings disposal to maximize water reclamation, and, if required, a compliant sulphuric acid plant design that can serve other industries in the area..
- **Good Infrastructure and Labour Market:** located just off US Highway 93 and the new Interstate 11/Pan-American Highway that connects with interstate routes crossing the USA, making the Project

an easy access location for consumables supply and products transport, with a skilled workforce for construction, operation and maintenance.

- **Government Support:** Arizona is a fast-growing mining friendly state (world's 4<sup>th</sup> largest copper producer) open to development and is willing to provide development incentives.
- **Growing Market:** the USA and Arizona, in particular, have one of the highest solar footprints in the world. Utilities are rapidly switching to new lower cost wind and solar power production, employing battery-based energy storage.
- **Battery Supply Chain:** prominent companies are completing the lithium supply chain with manufacturer/energy storage producers located or in development in Arizona, Nevada, Texas and Tennessee.
- **Critical Mineral:** lithium became a US strategic mineral in 2018 with recently introduced Federal permitting incentives.

## Cultural and Biological Surveys

Phoenix, Arizona based consulting group ERM have completed field work consisting of cultural and biological surveys constituting the environmental assessment of drill hole locations and access for the proposed Phase 3 drill program in Blocks B and C in the Northern Mineralised Zone and Block 1 in the Southern Mineralised Zone. The survey meets BLM, Arizona State Historic Preservation Office and Arizona State Museum (ASM) standards. The final reports on these surveys has been submitted to the BLM as part of the POE process. A Draft POE has been circulated with finalisation expected in this quarter.

This announcement has been authorised for release by the Board of Hawkstone.

### FOR FURTHER INFORMATION PLEASE CONTACT:

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### Competent Persons Statement

The information in this announcement that relates to the Big Sandy Sedimentary Lithium Project (including the information provided pursuant to ASX Listing Rules 5.12.2 to 5.12.7 (inclusive)) is based on, and fairly represents information compiled by Gregory L Smith who is a Member of the Australasian Institute of Mining and Metallurgy (AusIMM) and has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity to which 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. Smith is a Director of the Company and holds shares in the Company. Mr. Smith consents to the inclusion in this announcement of the matters based on this information in the form and context in which it appears. The Company confirms that the material assumptions and technical parameters underpinning the Resource estimate have not materially changed.