



16 October 2025

CASTILE BEGINS BISMUTH PRODUCTION ANALYSIS FOR ROVER 1 BFS

Castile Resources Limited (“Castile” or the “Company”) is pleased to announce that it is conducting analysis to establish a downstream production pathway aimed at bismuth contained in the Rover 1 Project for the Rover 1 Bankable Feasibility Study.

Highlights

- **Preliminary analysis first round testing completed for a pathway to produce 99% pure bismuth from Castile’s concentrate**
- **Researchers at Peking University in China have announced the development of a bismuth microchip that is 40% faster while consuming 10% less power than current technology¹**

Castile is developing the Rover 1 Project near Tennant Creek in the Northern Territory. The Project contains key metals gold and copper, which have both experienced strong price gains in recent times. The Project has extremely high leverage to the gold and copper price which accounted for approximately 80% of the revenues in the 2022 Pre-Feasibility Study using 2022 metal prices. Castile is using significantly higher gold and copper metal prices in the Bankable Feasibility Study to better reflect the sustained rise in the market prices of these commodities.

The Rover 1 Project also contains critical minerals bismuth and cobalt as well as magnetite. The Company has a fully designed downstream pathway with mining and concentration at the Rover 1 site which is then railed to the refining plant at the Middle Arm Sustainable Development Precinct (MASDP) in Darwin. The gold, copper and cobalt are refined to end products at MASDP and the Company is currently working through a Bankable Feasibility Study to further optimise this pathway for those metals. The magnetite will be processed on site via concentration to a high-grade product on site at Rover 1 which is railed directly to the Port of Darwin.

The Company is now considering options for a downstream pathway for the bismuth which currently presents in a concentrate at the MASDP facility in Darwin after all other metals have been extracted. Castile believes processing the concentrate with a partner who has existing production is the most profitable outcome. There were no revenues assumed from bismuth in the Rover 1 2022 Pre-Feasibility Study as the bismuth price was subdued, but now Castile anticipates a significant contribution from bismuth to the Bankable Feasibility Study given the remarkable price volatility in the metal.

Bismuth has experienced unprecedented supply disruption and phenomenal price volatility since China placed export restrictions on global supply in February 2025. China produces 83% of the worlds refined bismuth, and consequently in March 2025 the bismuth price in the US market traded from US\$6.00/lb to US\$55.00/lb².

¹ <https://www.zmescience.com/science/news-science/china-just-made-the-worlds-fastest-transistor-and-it-is-not-made-of-silicon/>

² Reuters 19 March 2025 “European bismuth prices rocket to record highs on China export curbs”
<https://www.reuters.com/markets/commodities/european-bismuth-prices-rocket-record-highs-china-export-curbs-2025-03-19/>





Castile is one of the very few ASX listed companies offering exposure to a development pathway for bismuth resources in Australia.

Preliminary analysis including the first round of testing has been completed for a pathway to produce 99% pure bismuth from the Castile concentrate. The Company will seek a downstream pathway – not just sell the bismuth concentrate – but retain exposure and participate in the sale proceeds of the final downstream bismuth product.

The Pentagon has recently announced that it has begun procuring critical minerals for stockpiles to counter the Chinese dominance of critical mineral production.

China uses bismuth in its guided missile program to utilise its strong anti-magnetic properties placing further pressure on supply global supply chains (see ASX:CST 30 April 2025).

Castile has previously announced that it is seeking offtake and/or prepayment agreements for our by-products, such as the bismuth, to assist in the financing of the Rover 1 Project.

CHINA ANNOUNCES DEVELOPMENT OF BISMUTH MICROCHIP 40% FASTER AND USING 10% LESS ENERGY THAN CURRENT TECHNOLOGY

Researchers at Peking University have announced the development of transistors using bismuth that are 40% faster while consuming 10% less power than the latest silicon-based offerings from industry leaders like Intel and TSMC. This advancement represents a potential paradigm shift in processor technology using bismuth that could redefine performance limitations long accepted with silicon.

The most striking advantage of bismuth-based microchips is their remarkable switching speed. These new transistors can theoretically operate at frequencies around 500GHz - nearly 100 times faster than today's best silicon chips, which typically peak at 5-6GHz. Real-world implementations already demonstrate speeds of 7-10GHz, effectively reviving the processor clock speed race that has largely stalled with silicon technology.

Beyond raw speed, bismuth-based transistors demonstrate significantly improved power efficiency. Testing shows they're approximately three times more energy efficient than comparable silicon transistors. This efficiency gain could dramatically extend battery life in mobile devices or reduce cooling requirements in data centres.

These bismuth microchips are not currently commercial production, but development continues to advance this remarkable breakthrough in technology using bismuth. If commercial production begins it may place further constraints on global bismuth supplies.



Mark Hepburn, the **Managing Director** of Castile commented:

"The addition of bismuth to our Bankable Feasibility Study along with the extraordinary price gains in gold and copper since the 2022 PFS are a huge bonus showcasing the unique properties of the Rover 1 Project. Castile has one of the only bismuth resources available for commercialisation in Australia.

"After a considerable amount of inbound interest in our bismuth concentrate since the Chinese export ban earlier this year, we have moved to develop a downstream pathway to produce pure bismuth with an established producer at a time of unprecedented uncertainty in the global market.

"Whilst the gold, copper and cobalt downstream processing will remain in Australia, we see enormous opportunity to team up with an established offshore producer of bismuth with a proven global customer network to undertake this analysis. Castile will only do a deal that allows us to participate in the majority of the sale proceeds of the final pure product.

"The global supply of bismuth is already very tight with China dominating production and enforcing export bans. If the bismuth microchip developed at Peking University goes into commercial production, there could well be a quantum shift in demand for pure bismuth produced outside of China and Castile is planning accordingly."

OTHER USES OF BISMUTH

Bismuth is the strongest anti-magnetic (diamagnetic) material in the world and has a low melting point making it highly functional in numerous industries including:

- electronics
- automotive
- aerospace
- defense
- energy
- pharmaceuticals

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Authorised for release by the Board of Castile Resources Limited