Market Update

CobaltBlue
green energy technology

09 December 2022

Cobalt Blue Holdings Limited

A Green Energy Exploration Company

ASX Code: **COB**

Commodity Exposure:

Cobalt & **Sulphur**

Directors & Management:

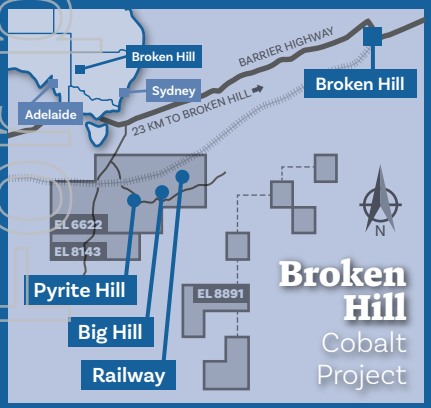
Robert Biancardi	Non-Exec Chairman
Hugh Keller	Non-Exec Director
Robert McDonald	Non-Exec Director
Joe Kaderavek	CEO & Exec Director
Danny Morgan	CFO & Company Secretary

Capital Structure:

Ordinary Shares at 09/12/2022:	**369.1m**
Unlisted options/rights:	**9.1m**
Market Cap (undiluted):	**$218m**

Share Price:

Share Price at 09/12/2022:	**0.59**



Cobalt Blue Holdings Limited

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Highlights

Demonstration Plant – High Grade Concentration Results

KEY POINTS

- Concentrator circuit has now completed processing 4200 t of ore, yielding 680 t of concentrate.
- Grades of gravity circuit concentrate consistently averaged 4400 ppm cobalt during operations.
- The combined recovery for the concentrator circuit was typically 95%, exceeding the recoveries obtained in the 2020 Project Update (PFS level study) of 90%.
- First large scale Mixed Hydroxide Precipitate (MHP) is expected in December, with continuous operation of the leach and MHP circuits planned from January.
- The Demonstration Plant operations are on track to deliver the initial 'process plant design criteria' for the Definitive Feasibility Study by the end of Q1 2023.

Commenting on recent achievements, Cobalt Blue's Chief Executive Officer, Joe Kaderavek said: *"This is large scale and technically substantial proof of our concentration operation. Converting over 4,000 tonnes of variable low to high grade ore to a consistent high-grade concentrate is a major project enabling step. Put another way, our refinery is 20% of the size of the mine and will see an average ~4,400 ppm concentrate for the life of operations. Concentrate recoveries of up to 95% well exceed our Pre Feasibility Study baseline.*

Concentrator Operations

The Concentrator Circuit has now completed operations supporting the Definitive Feasibility Study (DFS). A total of 4,200 t of ore has been processed to produce 680 t of wet concentrate (typical moisture 5–10%) concentrate. A further 800–1,000 t of ore remains for optimisation studies in the future. Operations were held over 65 days with the longest run of over 100 hours recorded. Mass recovery of ~17–20% was consist-ently achieved, with average concentrate grade of 4,434 ppm Co (see Figure 1).

Survey samples were obtained from the concentrator circuit, and independently assayed by a third-party accredited laboratory. A wide variety of ore grade was processed which confirmed regardless of ore grade, a consistent grade of concentrate was produced. Daily average ore grades varied from 600 ppm to 1300 ppm, with the concentrate consistently between 4,000–5,000 ppm (see Figure 2).

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Ore processed via the Concentrator Circuit was extracted from the Pyrite Hill deposit by means of underground development (as released on 1 September 2022 in the market announcement 'Demonstration Plant – Ore Extraction Completed'). The Pyrite Hill deposit extends over 1.2 km along strike, over 300 m down dip and varies in thickness from 10 to 100 m. Mineralisation is hosted by a quartz-albite gneiss and is characterised by the presence of disseminated pyrite concentrated parallel to primary foliation.Ore drive development extracted material between 257 mRL and 262 mRL, approximately 40 to 50 m below surface and 3 to 6 m below the interpreted top of fresh rock.

Figure 1 – **Grade of ore and concentrate for operations.**

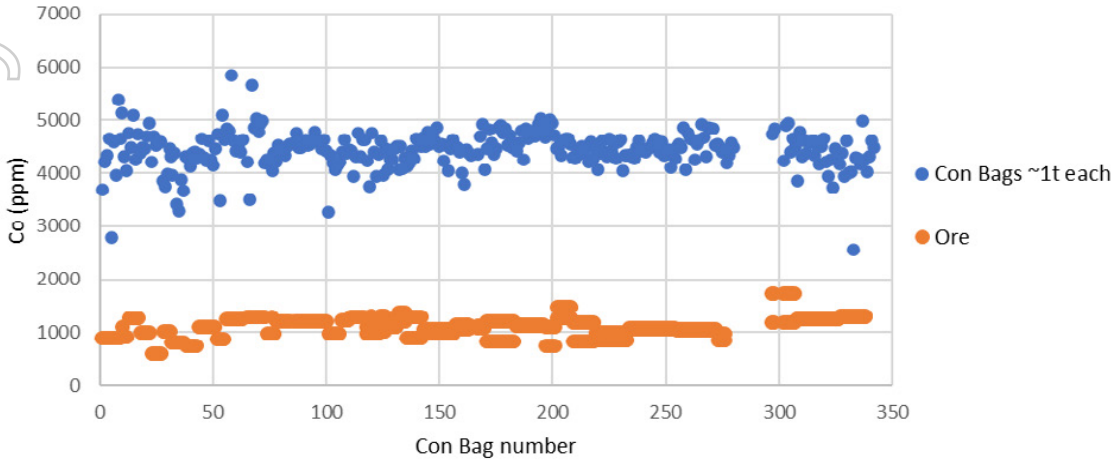

Figure 2 – **Grade of concentrate versus incoming ore feed grade to circuit.**

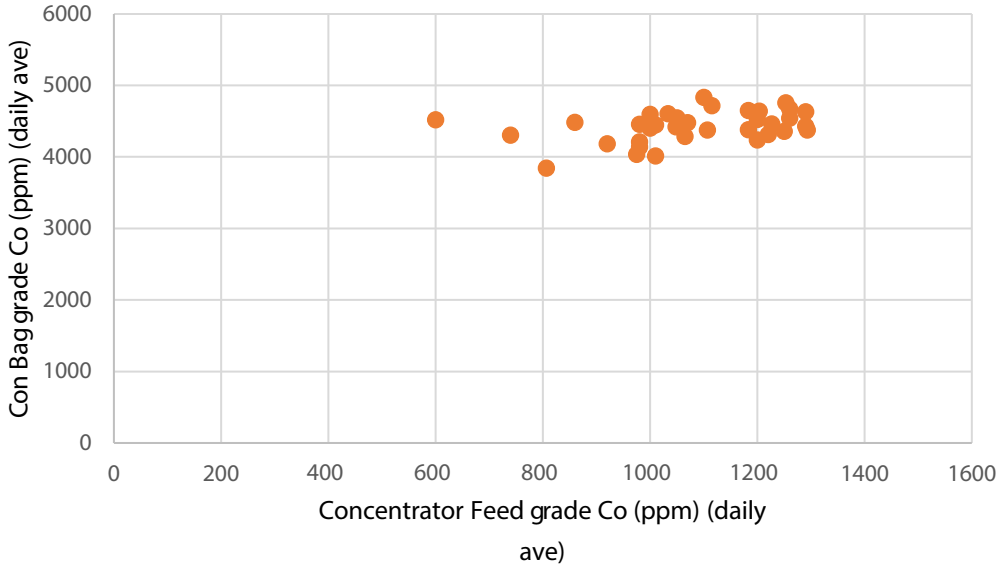

Figure 3 – **Collection of concentrate into 1 tonne bulka bags with float concentrate on the left, and gravity concentrate in the** centre.

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Figure 4 – **Operating spiral with separation of pyrite on the inner spiral and cutter gap, and gangue to outer edge of the spiral.**

Figure 5 – **Feed ore milled to <4 mm on left hand, and gravity concentrate on right hand.**

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Concentrate Treatment

The treatment of cobalt-pyrite involves two key steps. The first is conversion of pyrite into pyrrhotite and elemental sulphur, followed by leaching of the pyrrhotite. The solubilised cobalt is then recovered by precipitation as a mixed hydroxide with grades of 30% cobalt and 7% nickel (typical Pilot Plant results from 2021).

Following initial commissioning in September 2022, kiln operating parameters continue to be optimised to maximise pyrite to pyrrhotite conversion. The kiln is now in continuous operation with feed rates between 150–200 kg/hr. The kiln will initially focus on production of calcine for leaching, with clean sulphur recovered once a specialised heat-exchange condenser is operational and sulphur prilling equipment installed in Q1 2023.

The leaching autoclave has been commissioned with the first 2 t of kiln product. Ahead of leaching, the kiln calcine was upgraded to 75–85% pyrrhotite and 0.6% cobalt, with residual gangue to be recycled to the float cell to recovery unreacted pyrite. This upgrade step reduces the load of inert material progressing into the leach.

First MHP is expected later this month, with continuous operation of the leach and MHP circuits planned from January 2023.

Figure 6 – **Kiln product separated into pyrrhotite for leaching (left hand side) and gangue (right hand side) for recycle to the float cell for recovery of unreacted pyrite.**

The Demonstration Plant operations are on track to deliver the initial 'process plant design criteria' for the Definitive Feasibility Study. The Plant will continue to run through 1H 2023, to obtain large samples of cobalt and sulphur products for market acceptance, and to obtain reliability data for the DFS.

Overall Process Cobalt Recovery

The concentrator circuit recovers cobalt-pyrite from the gravity spirals and the float cell. The deportment of cobalt-pyrite between the two methods depends on the particle size, with coarse particles recovered on the gravity spiral, and fine particles recovered in the float cell.

The combined recovery for the demonstration plant concentrator circuit was typically 95%. This exceeds the previous recoveries obtained in the 2020 Project Update (PFS level study) of 90%.

	Project Update 2020	Demonstration Plant 2022
Mass of Ore	45 t	4,200 t
Feed type	RC drilling chips, screened at 1,180 µm	Fresh ore, crushed, ball mill
Co recovery to concentrate	90%	95%

Further work is ongoing to validate the recovery of cobalt from the concentrate through the remaining downstream processing circuits.

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COB Timeline

The expected development schedule for the Broken Hill Cobalt Project ('**BHCP**') is shown below.

Figure 8 – **Expected development schedule.**

	PRE-2021	2021	2022	2023	2024	2025
Broken Hill Cobalt Project						
Business Achievements	100% Project Ownership CRC-P Grant	Global Cobalt Sample Program	Offtake Cobalt Qualification Program – 2022 Major Project Status and CMAI grant	Final Investment Decision	Construction Period Mine Development EPC Renewable Power Contracts	Refinery Commissioning First Commercial Production
Technical Studies	Project Update 2020 PFS 2018	Feasibility Study	Feasibility Study	Definitive Feasibility Study and Approvals		
Process Testing	Pilot Scale Testwork	Pilot Plant – 30 Tier 1 Partners Offtake Contract Negotiations (begin)	Larger scale (24/7) Operations Commercial Qualification Samples Bulk Sample			First On Specification Production
Environmental Approvals		EIS Field Studies	EIS Field Studies	EIS Submission SSD Determination	ESG/CO_2 Reporting	ESG/CO_2 Reporting Operating Permits (approved)
	PRE-2022		MILESTONES			

Cobalt Blue Background

Cobalt Blue (ASX:COB) is a mining and mineral processing company focussed on the development of the Broken Hill Cobalt Project in New South Wales, Australia. The portfolio of three granted tenements in a total area of 49 km^2 containing large-tonnage cobalt-bearing pyrite deposits are located 23 km west of Broken Hill. COB has developed a patented minerals processing technology for treating pyrite feedstocks targeting 85–95% recovery of cobalt from ore to product (as Mixed Hydroxide Precipitate or Cobalt Sulphate). The Broken Hill Cobalt Project has a targeted project life of +20 years and will be a significant employer in Regional NSW with around 400 full-time jobs generated. COB will become a global top 10 producer of cobalt, a critical mineral that is integral in the global journey to decarbonize via electrification.

The expected timeline for the BHCP is subject to various risks, some of which are outside the control of the Company, and which include successful and timely completion of project milestones, funding availability, government and other third-party approvals.

Looking forward, we would like our shareholders to keep in touch with COB updates and related news items, which we will post on our website, the ASX announcements platform, as well as social media such as Facebook (f) and LinkedIn (in). Please don't hesitate to join the 'COB friends' on social media and to join our newsletter mailing list at our website.

Joe Kaderavek

Chief Executive Officer

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This announcement was approved by the Board of Directors.

Released Information

This ASX announcement refers to information extracted from the following reports, which are available for viewing on COB's website http://www.cobaltblueholdings.com

- 06 October 2022: Demonstration Plant – Ore Processing Update
- 01 September 2022: Demonstration Plant – Ore Extraction Completed
- 26 July 2020: Broken Hill Cobalt Project Update 2020

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

Competent Person Statement

The information in this announcement that relates to metallurgy and metallurgical testwork has been reviewed by Dr Andrew Tong. Dr Tong is not an employee of the Company but is employed by Minerals and Residues Pty Ltd and provides services as a contract consultant. Dr Tong is a member of AusIMM and has sufficient experience with the style of processing response and type of deposit under consideration, and to the activities undertaken, to qualify as a competent person as defined in the 2012 edition of the "Australian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves" (the JORC code). Dr Tong consents to the inclusion in this report of the contained technical information in the form and context as it appears.

Forward Looking Statement

This ASX announcement contains forward-looking statements which are identified by words such as 'may', 'could', 'believes', 'estimates', 'targets', 'expects', or 'intends' and other similar words that involve risks and uncertainties.
These statements are based on an assessment of present economic and operating conditions, and on a number of assumptions regarding future events and actions that, as at the date of this Announcement are expected to take place.
Such forward-looking statements are not guarantees of future performance and involve known and unknown risks, uncertainties, assumptions, and other important factors, many of which are beyond the control of the Company, the Directors and management.

We cannot and do not give any assurance that the results, performance, or achievements expressed or implied by the forward-looking statements contained in this ASX Announcement will actually occur and recipients are cautioned not to place undue reliance on these forward-looking statements.
We have no intention to update or revise forward-looking statements in the future, regardless of whether new information, future events or any other factors affect the information contained in this announcement except where required under applicable law or the ASX Listing Rules.

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