

Re-mining of sulphide tailings

for critical-metal extraction and
improved environmental outcomes

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ASX: COB



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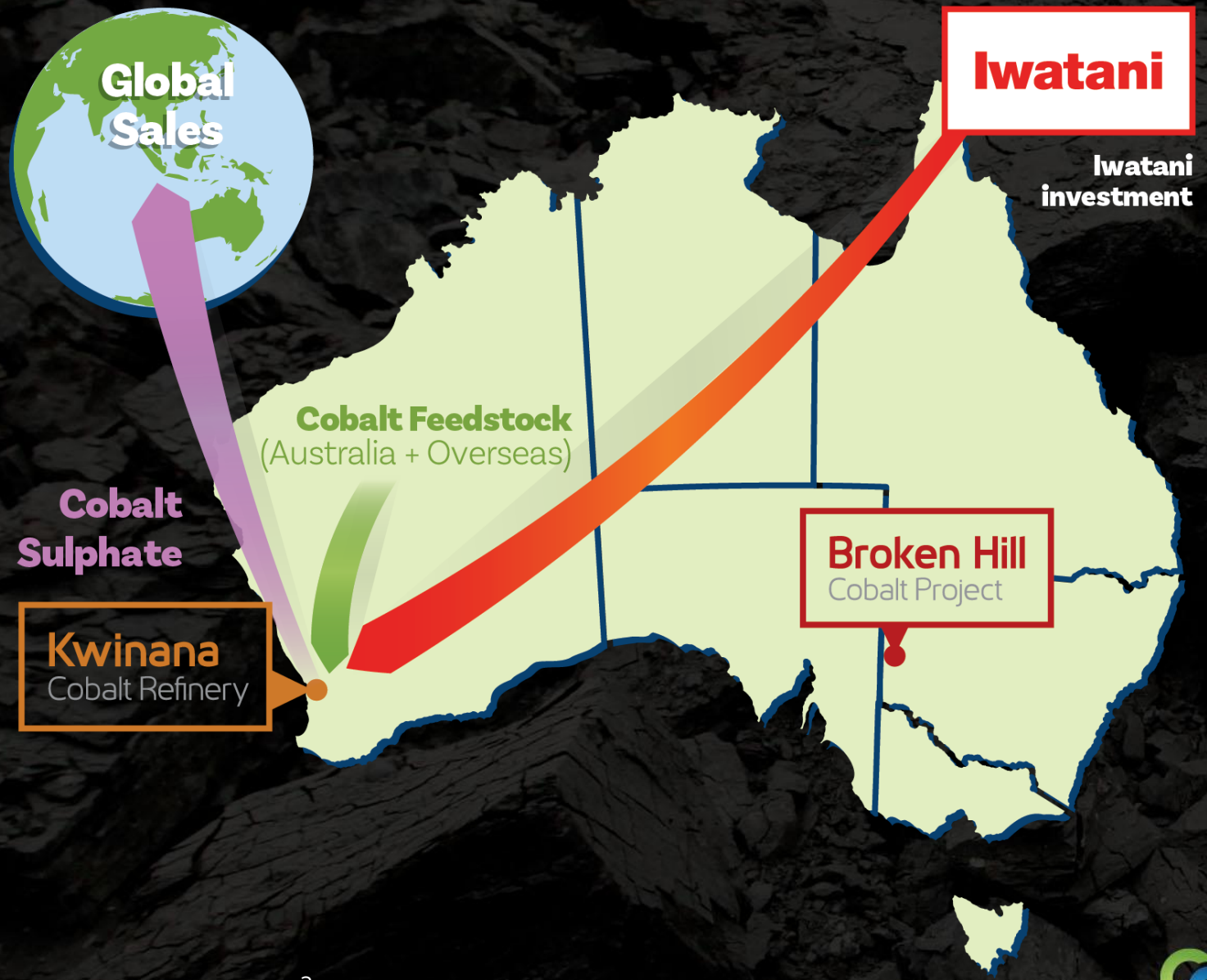
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Strategic Priorities

ReMine+

Unlocking Value
and Positive Impact
from **global** Mine Waste

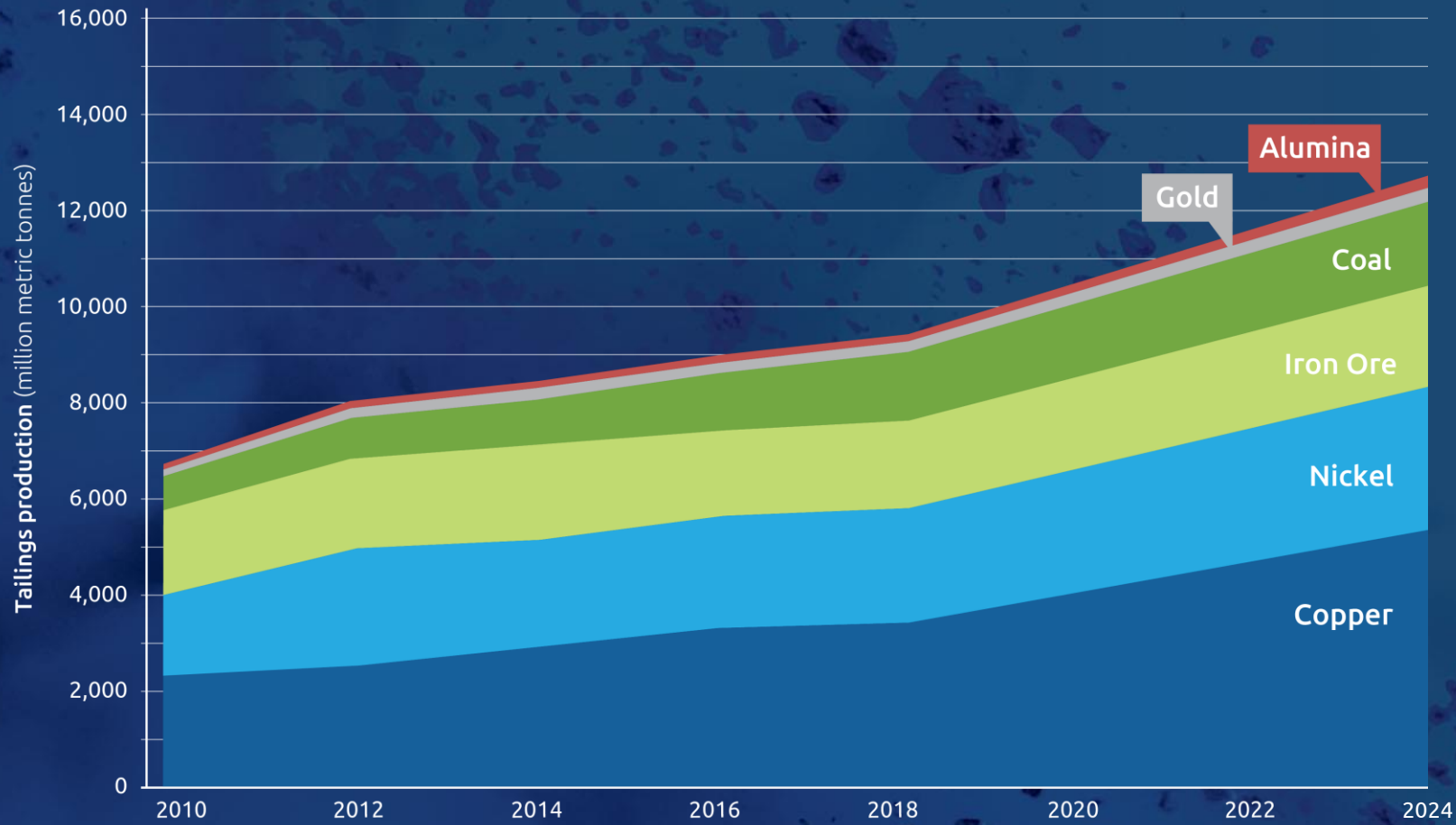


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Source: Cobalt Blue Holdings Limited



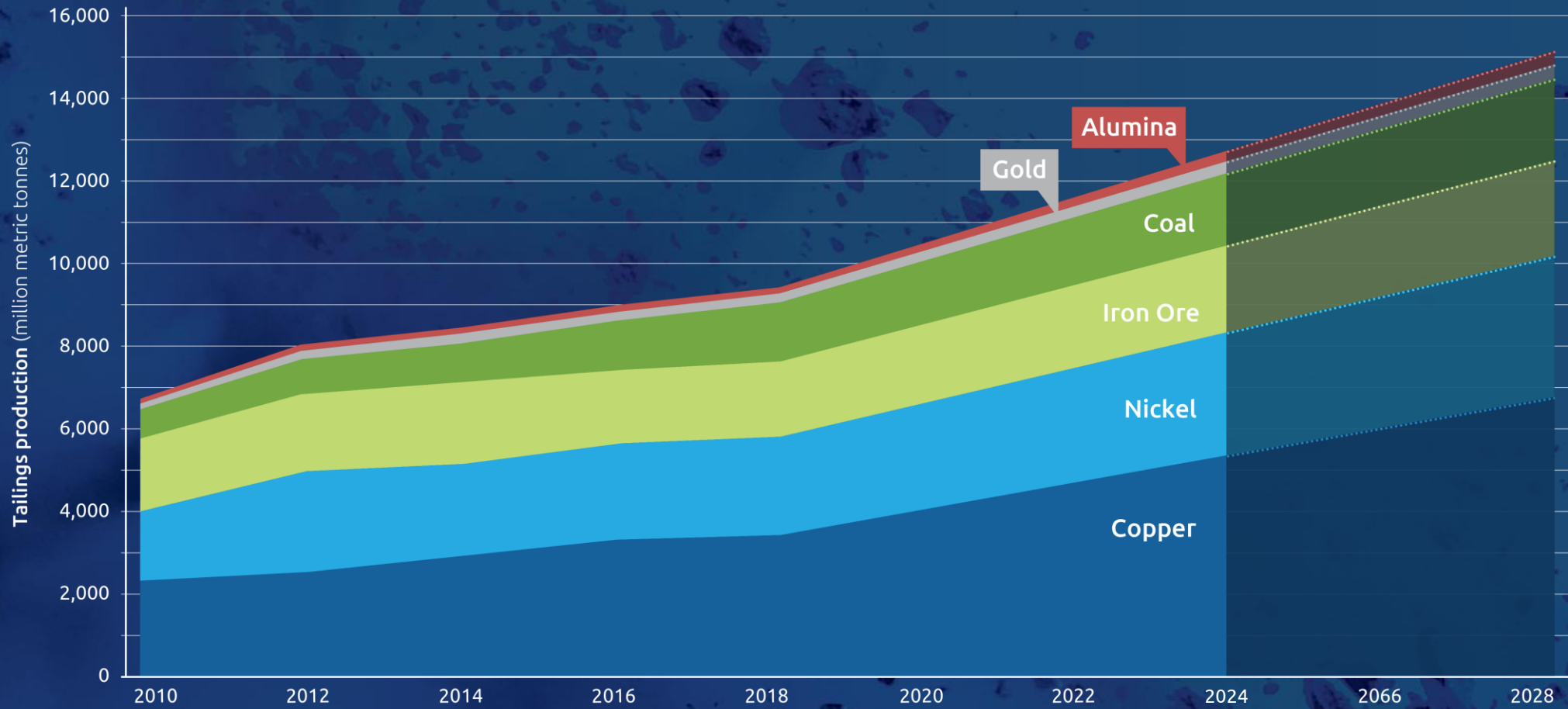
Global Mine Waste



Sources: International Council on Mining and Metals; Roadmap for Tailings Reduction, 2022; Global Mining Review, 2022; Valenta et al., 2023



Global Mine Waste

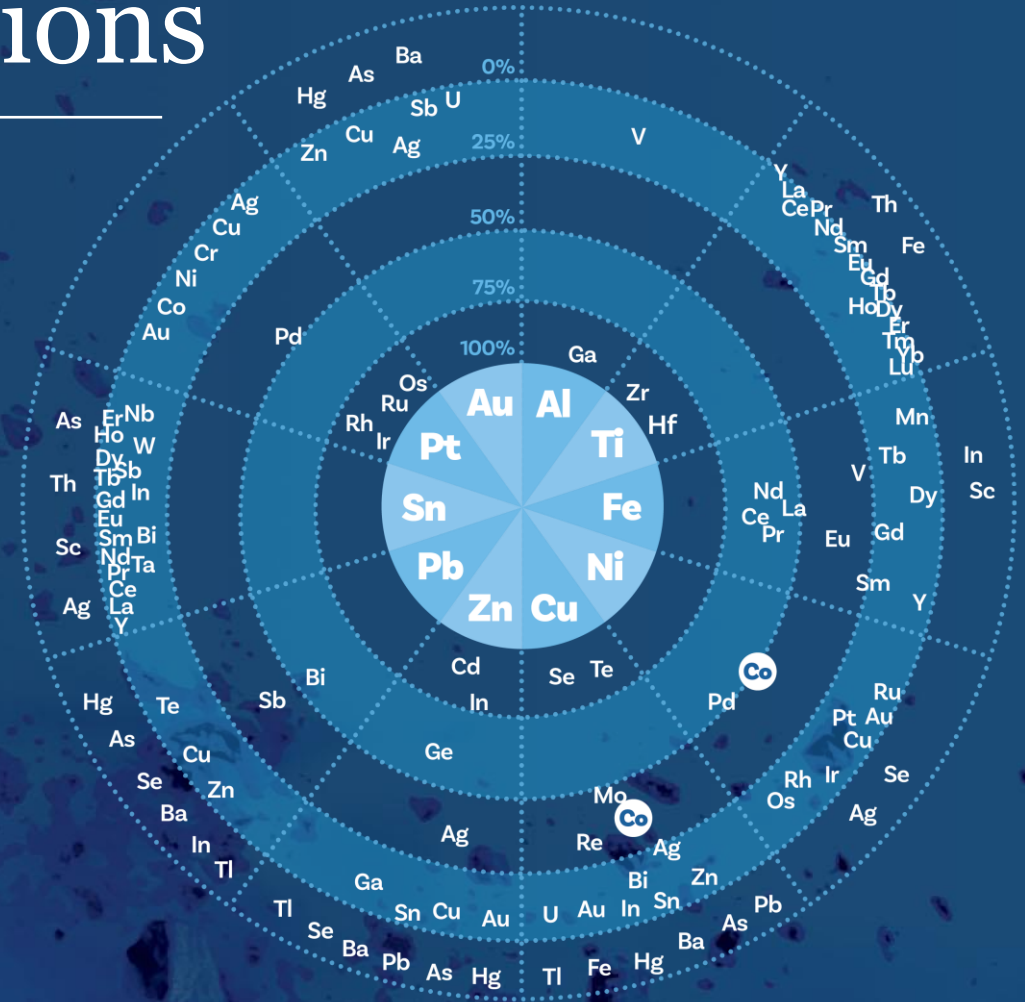


Sources: International Council on Mining and Metals; Roadmap for Tailings Reduction, 2022; Global Mining Review, 2022; Valenta et al., 2023



Predictive metal associations

- Natural ore deposits are a mix of commodities, though often with one dominant
- Mining operations focus on one or two commodities
 - The remaining metals are sent to waste
- Valuable secondary metals may be predicted to occur in mine waste based on their known ore associations

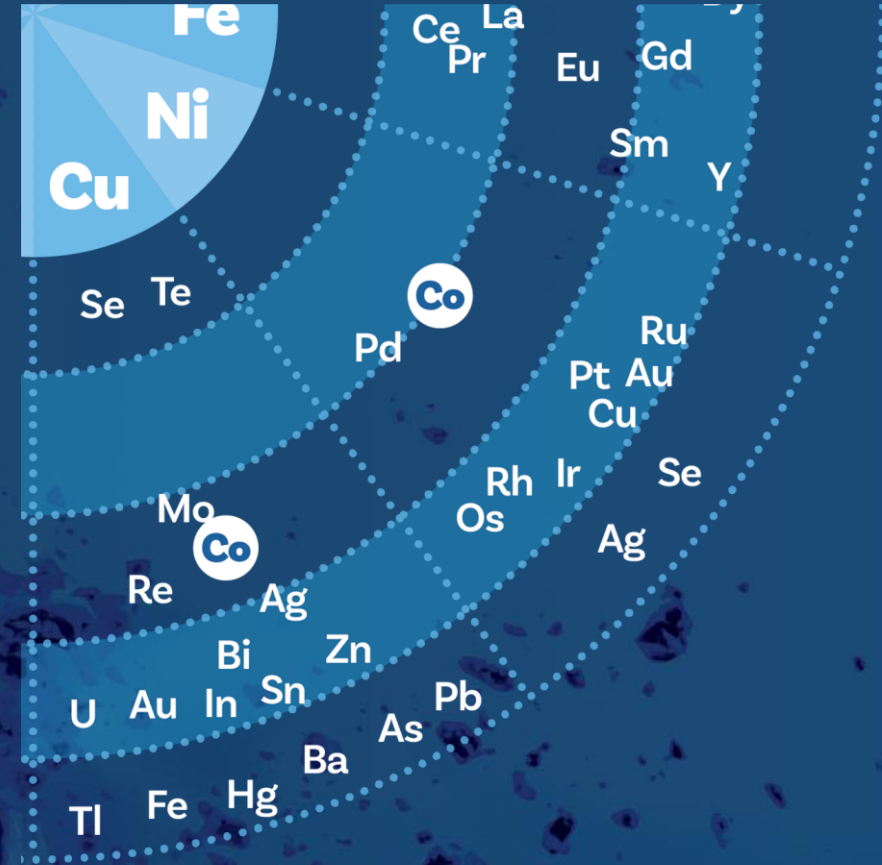


Source: <https://www.nordicinnovation.org/2021/nordic-supply-potential-critical-metals-and-minerals-green-energy-transition>



Predictive metal associations

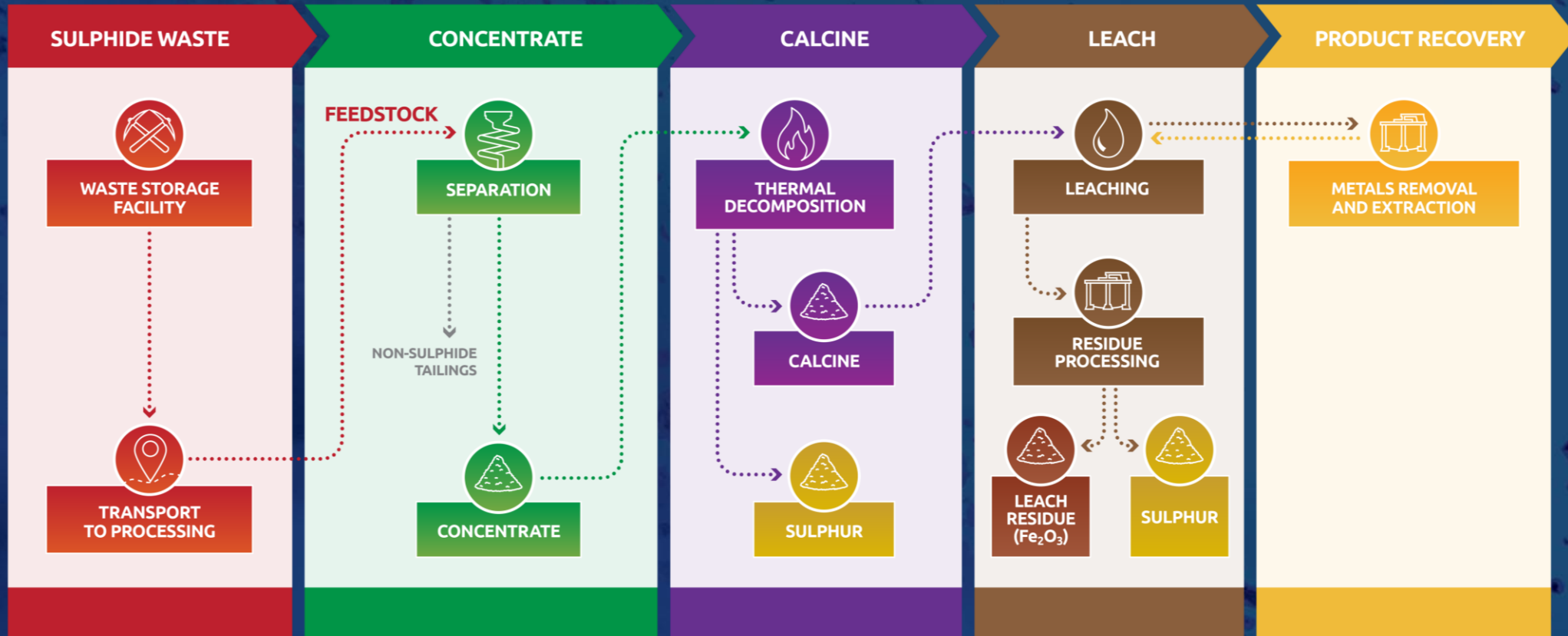
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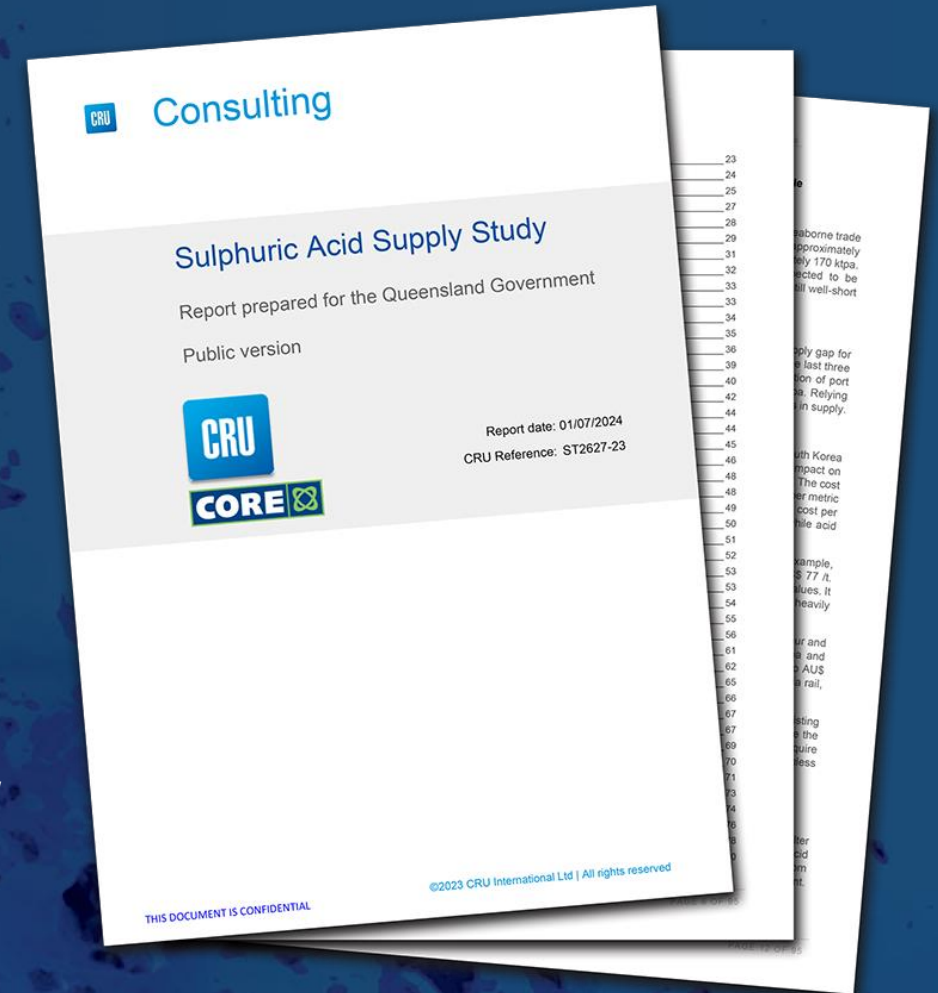
The Cobalt Blue flow sheet



Sulphuric acid in demand

- Mt Isa Copper smelter closing ~2030
- NiWest smelter moving to C & M
- Sulphuric acid required by
 - IPL's Phosphate Hill operation
 - Rare Earth producers
 - Cu heap leach operations
 - Soft rock vanadium operations
 - And more...
- Significant economic impacts related to acid supply (Qld)
- Qld State Development commissioned Sulphuric Acid Supply Study in 2023:

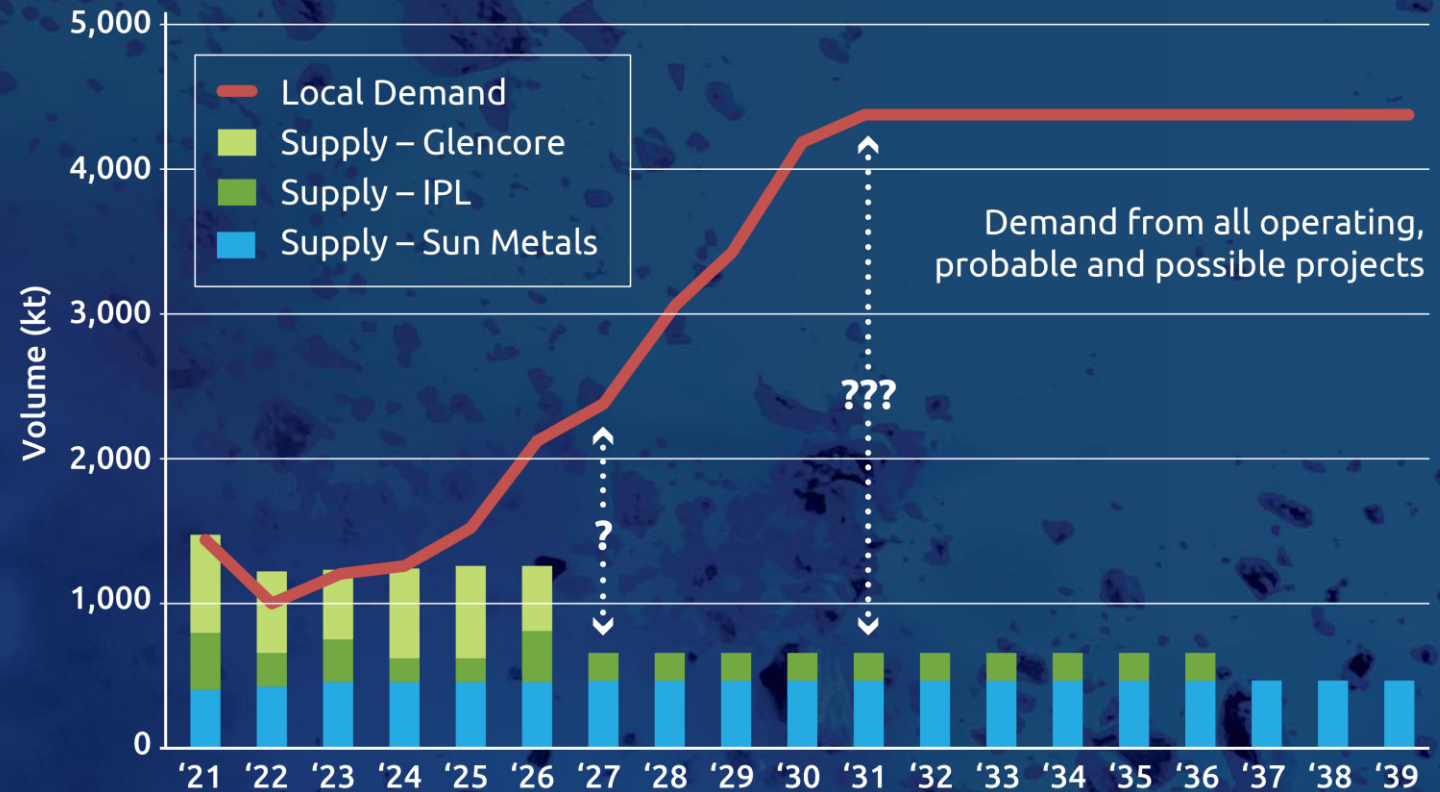
<https://www.statedevelopment.qld.gov.au/regions/regional-priorities/a-strong-and-prosperous-north-west-queensland/achievements-and-deliverables>



Current/Future Acid Demand – NW Qld



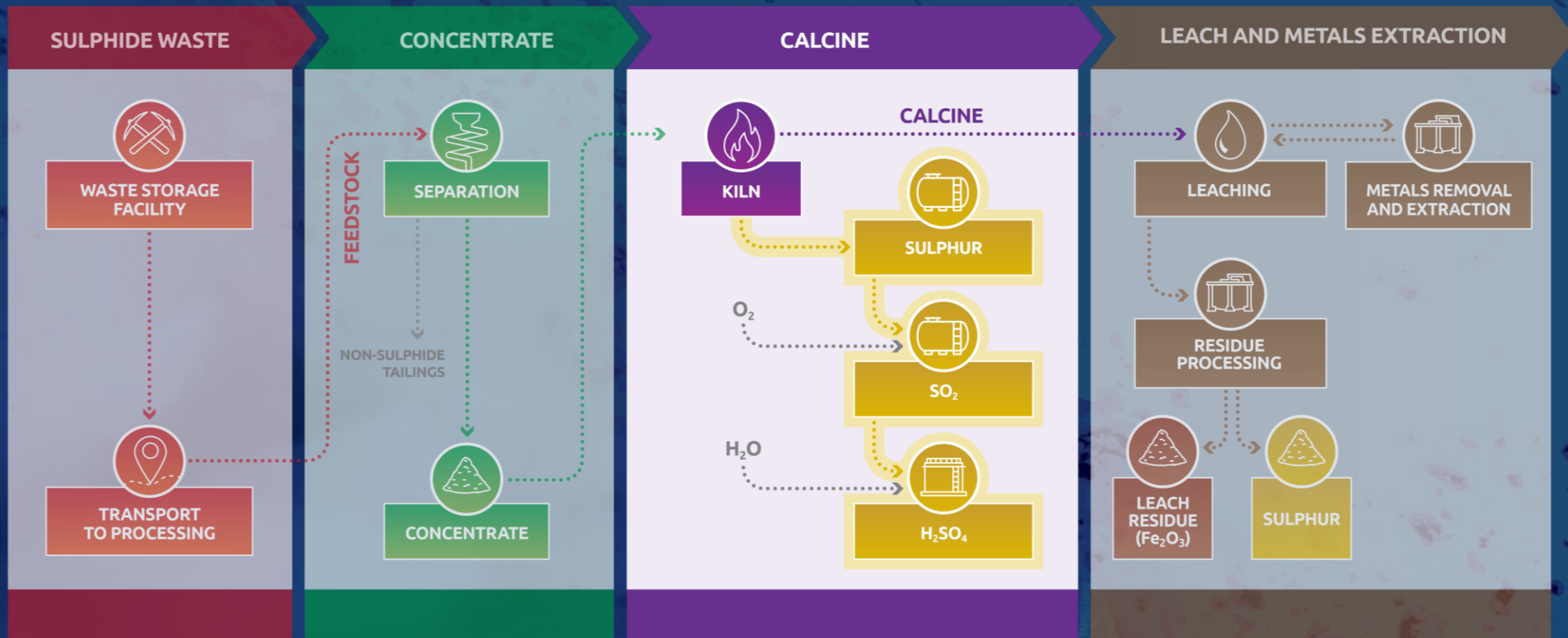
Local supply and demand of sulphuric acid



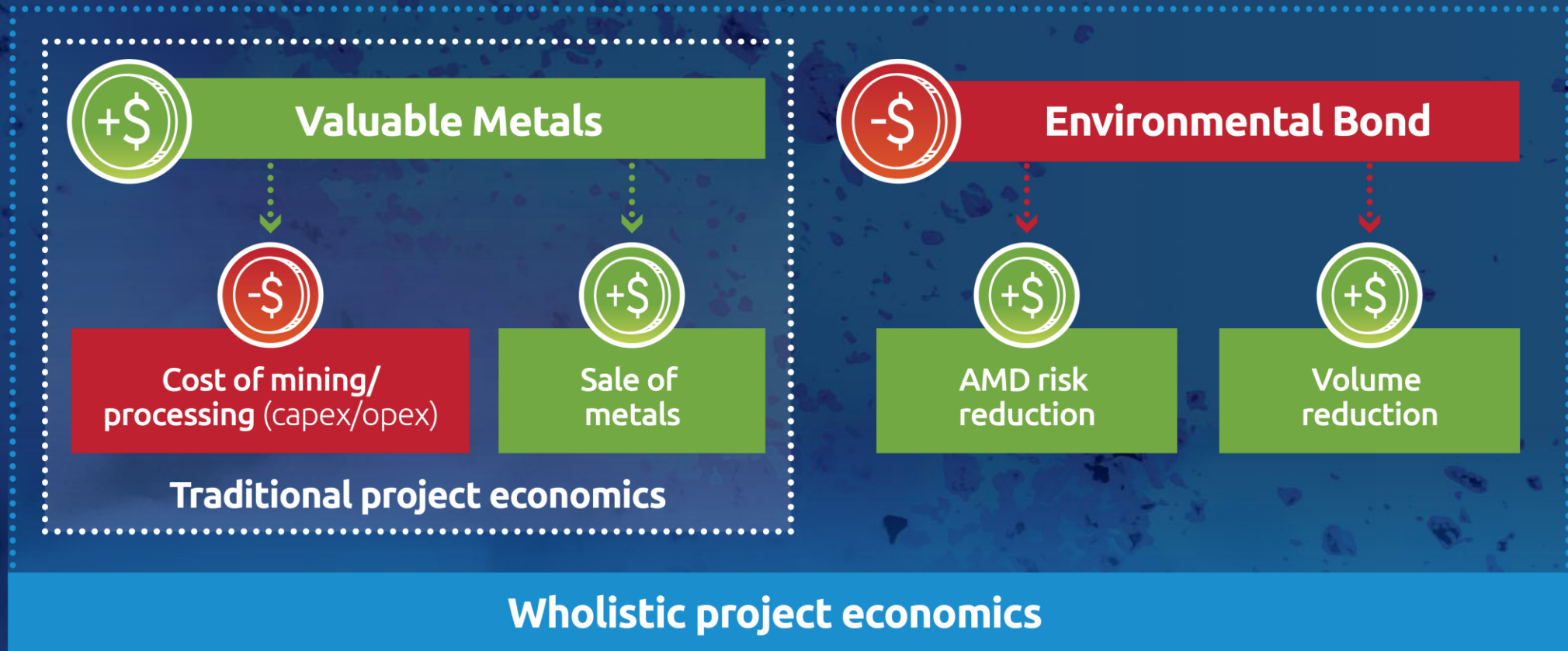
Adapted from CRU presentation; Sulphuric Acid Supply Study, 1st August 2024



The Cobalt Blue flow sheet – sulphuric acid



The Case for Tailings Re-Processing



Flin Flon Tailings Project

Site: Flin Flon TSF **Location:** Manitoba, Canada
Commodities: Zn-Cu-Ag
Status: initial testwork completed. Confirms >90% conversion of pyrite to pyrrhotite from tailings sample, with capture/removal of elemental sulphur



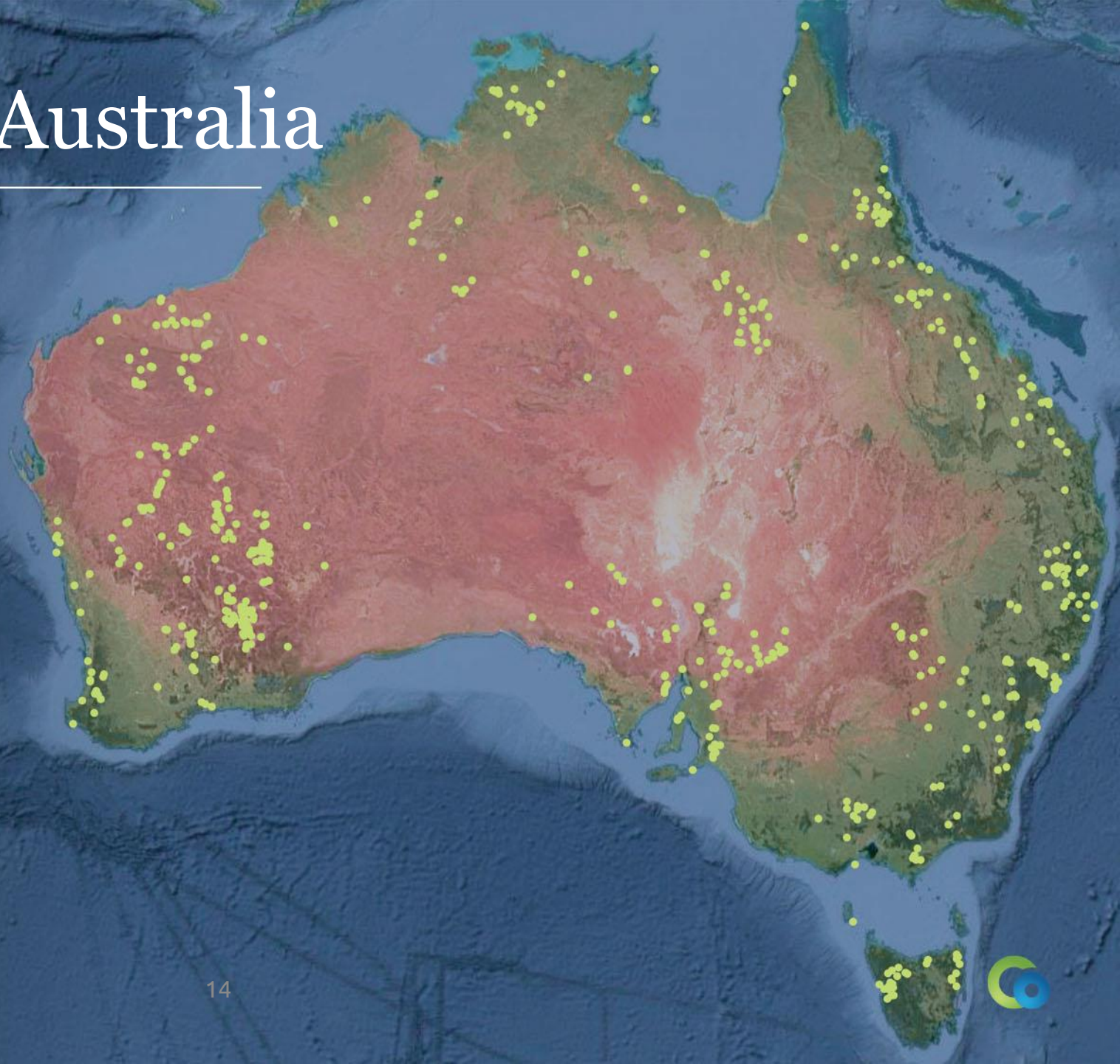
Estimated >100 million tonnes contained in tailings dam at Flin Flon. Tailings contains Zn, Cu, Ag and Au.

Cobalt Blue and Hubbay Minerals collaborating to apply Cobalt Blue's processing technology to the Flin Flon tailings facility, Manitoba. Testwork results to date have achieved >90% conversion of pyrite to pyrrhotite + sulphur. An overall flowsheet is now being designed for the final step of testwork.

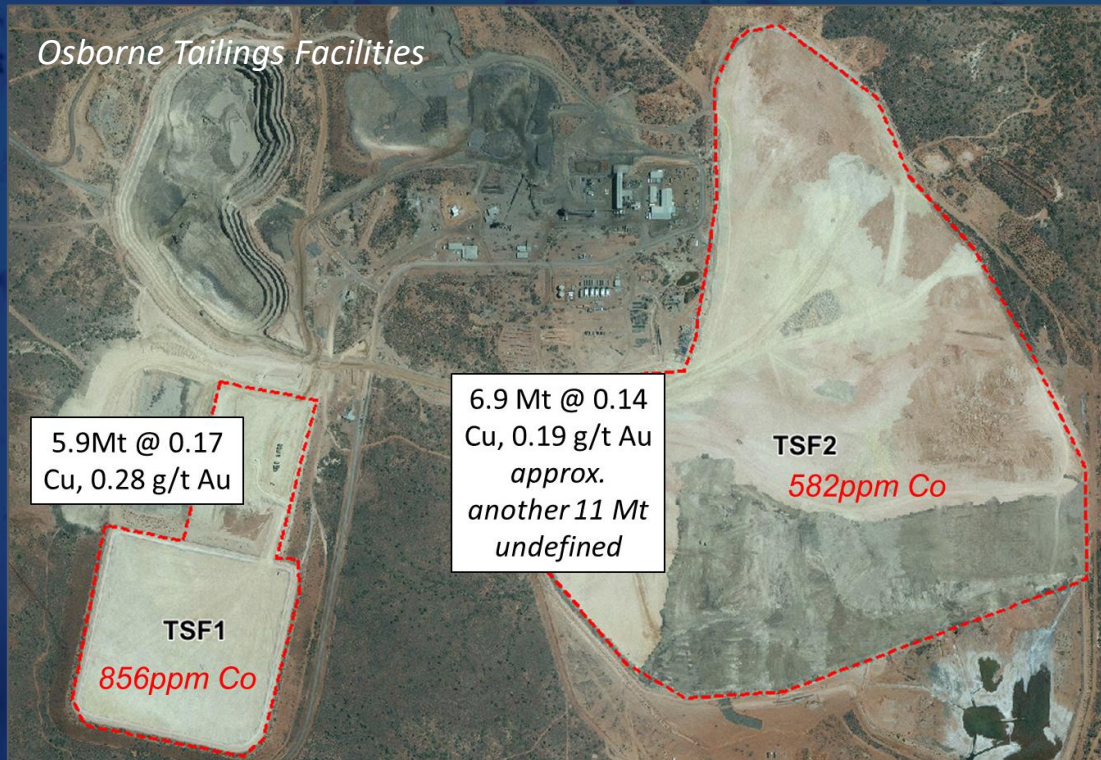


Mine Waste in Australia

- Long history of mining
- >5,000 active and inactive sites
- Most will have associated waste
- Potential for valuable raw materials in the waste



Case Study: Osborne Testwork



Two flowsheets tested:

Tails → float → POX

Tails → kiln → POX (COB Process)

	Float	POX	TOTAL recovery
Cobalt	90%	46%	41.4%
Copper	74%	98%	72.5%

	Kiln	POX	TOTAL recovery
Cobalt	99%	90%	89.1%
Copper	99%	90%	89.1%

Further recovery of cobalt and copper required from leach solutions.



Challenges to re-mining

- Scale of liability for environmental bonds prohibitive for junior companies
- Regulatory frameworks have not kept up with modern desire to re-mine waste, especially at abandoned sites
- Low grades mean traditional economic models don't work (green premiums)
- Challenging metallurgy



Positive Impact Re-Mining





ReMine+
Positive impact
from mine waste

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