

COLLERINA COBALT LTD (ASX:CLL)

HPA FIRST
PRE-FEASIBILITY STUDY

FAST TRACK TO HPA PRODUCTION

NOVEMBER 2018



Forward Looking and Cautionary Statements



Cautionary Statement

The Pre-Feasibility Study (PFS) referred to in this announcement has been undertaken to assess the technical and financial viability of the HPA First Project. Further evaluation work including a Definitive Feasibility Study (DFS) is required before the Company will be in a position to provide any assurance of an economic development case. The PFS is based on the material assumptions described in the body of this report and summarised in the Summary of Material Assumptions and Summary of Modifying Factors in **Appendix 5**. These include assumptions about the availability of funding and the pricing received for HPA. While the Company considers all of the material assumptions to be based on reasonable grounds, there is no certainty that they will prove to be correct or that the range of outcomes indicated by this PFS will be achieved. To achieve the range of outcomes indicated in the PFS, Pre-Production Capital funding in the order of A\$215 million plus working capital will likely be required. Investors should note that there is no certainty that the Company will be able to raise the amount of funding when needed. It is also possible that such funding may only be available on terms that may be dilutive to or otherwise affect the value of the Company's existing shares. It is also possible that the Company could pursue other "value realisation" strategies such as a sale, partial sale or joint venture of the Project. If it does, this could materially reduce the Company's proportionate ownership of the Project. Given the uncertainties involved, investors should not make any investment decisions based solely on the results of the PFS.

Forward Looking Statements

This PFS contains certain forward-looking statements with respect to the financial condition, results of operations, and business of the Company and certain plans and objectives of the management of the Company. These forward-looking statements involve known and unknown risks, uncertainties and other factors which are subject to change without notice, and may involve significant elements of subjective judgement and assumptions as to future events which may or may not occur. Forward-looking statements are provided as a general guide only and there can be no assurance that actual outcomes will not differ materially from these statements. Neither the Company, nor any other person, gives any representation, warranty, assurance or guarantee that the occurrence of the events expressed or implied in any forward-looking statement will actually occur. In particular, those forward-looking statements are subject to significant uncertainties and contingencies, many of which are outside the control of the Company. A number of important factors could cause actual results or performance to differ materially from the forward looking statements. Investors should consider the forward looking statements contained in this PFS in light of those disclosures.

‘HPA First’ – Pre-Feasibility Study

- **The ‘HPA First’ PFS has delivered a compelling business case, capable of delivering 10,200tpa of 4N (99.99% purity) High-Purity Alumina (HPA) into the burgeoning HPA market**
- **PFS Highlights include:**
 - **Production rate of 10,200tpa HPA**
 - **Unit cash costs of A\$8,538 (US\$6,403)/t HPA after by-product credits**
 - **Annual pre-tax free cash flow (FCF) of A\$247M (US\$185M)**
 - **Project CapEx of A\$214.6M (US\$161M)**
 - **Capital Intensity of A\$21,043 (US\$15,783) per tonne of HPA**
 - **Sensitivity Analysis shows a strongly profitable project at HPA prices as low at US\$10,000/t**
- **Compelling financials achievable by commercialising the Company’s innovative, proprietary process flow sheet**
- **The Company is now committed to immediately transitioning to a pilot plant and Definitive Feasibility Study (DFS) to position the Company to make a Final Investment Decision (FID)**

'HPA First' – Key Financial Metrics

	A\$	US\$
HPA Production (t/y)	10,200	
HPA Price Assumption (per/t HPA)	\$33,333	\$25,000
Annual Revenue (including by-products)	\$384 million	\$288 million
Annual Average Cash Operating Cost	\$131 million	\$98 million
Unit Cash Cost (per/t HPA)	\$12,852	\$9,639
Unit Cash Cost accounting for by-products (per/t HPA)	\$8,538	\$6,403
Annual Free Cash Flow (FCF)	\$247 million	\$185 million
Annual EBITDA	\$248 million	\$186 million
Aluminium Feedstock Processed (t/y)	65,753	
Capital Cost Estimate	\$215 million	\$161 million
Capital Intensity (CapEx\$ per tpa HPA)	\$21,043	\$15,783
Gross margin (Net Cash Flow/ Revenue)	64%	
Payback (years)	Less than 2 years	




























Financially Robust

- Sensitivity Analysis demonstrates a very robust project over a wider range of key sensitivities

Sensitivity to Financial Parameters	EBITDA (A\$ million/pa)
Pre-Feasibility Study Result	248
OPERATING COST	
Cost Increase (+15%)	233.2
Cost Decrease (-15%)	272.5
FOREIGN EXCHANGE	
A\$ to US\$ increases from 0.75 to 1.0	162.1
A\$ to US\$ decreases from 0.75 to 0.5	417.1
HPA PRICE	
HPA price decreases from US\$ 25,000/t to 10,000/t	47.1
HPA price increases from US\$ 25,000/t to 40,000/t	513.8

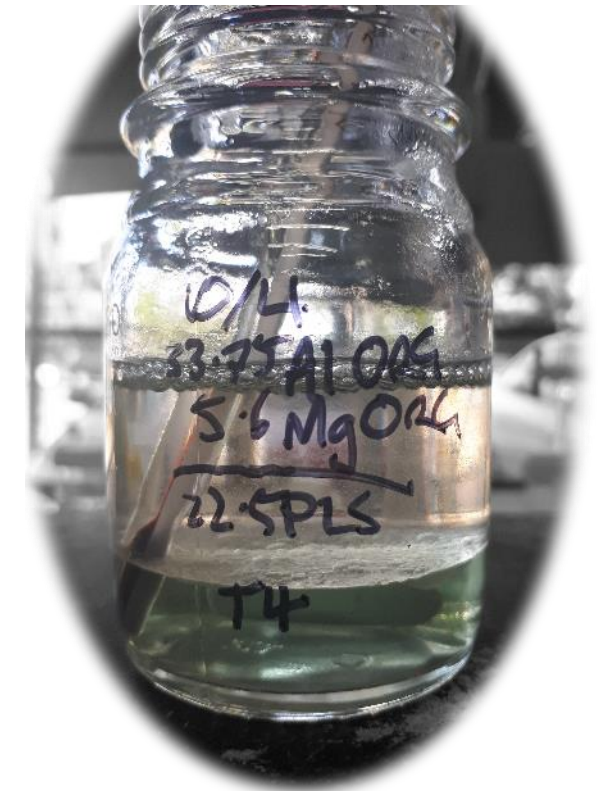
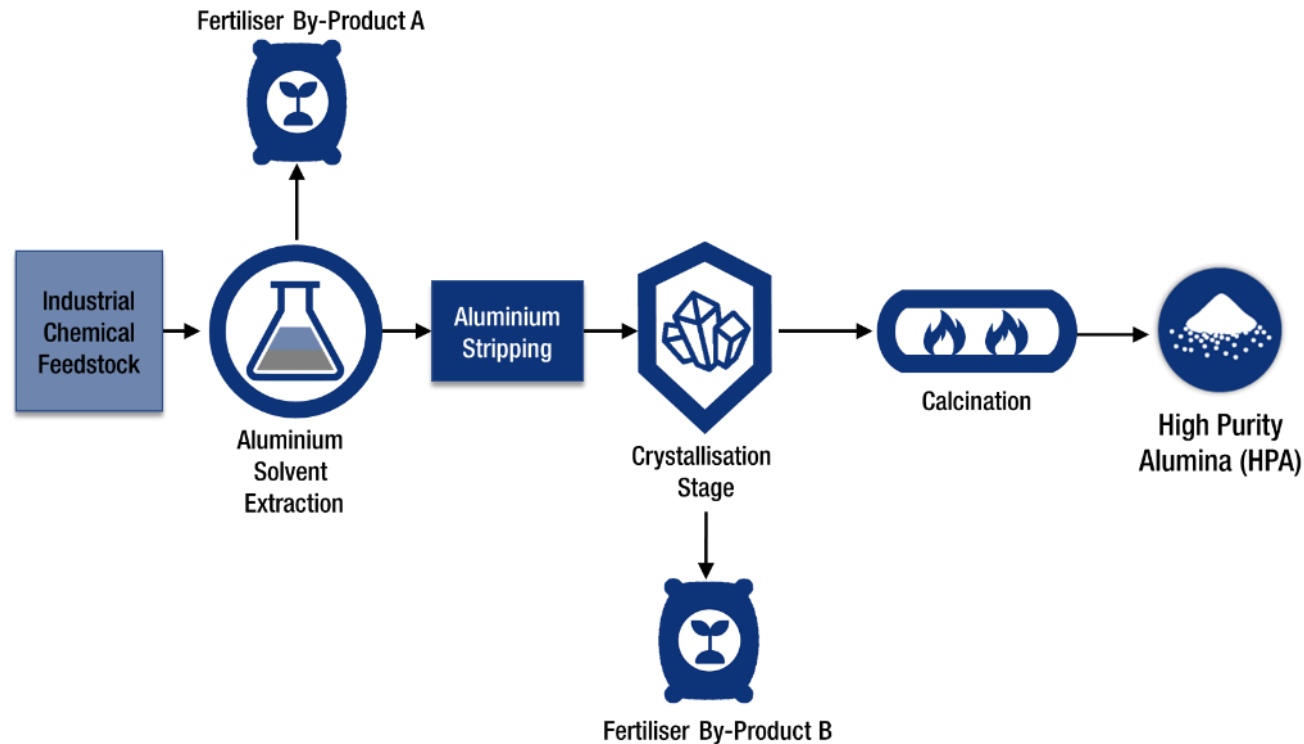
'HPA First' – Unique solvent extraction (SX) process route

Source: Company websites and exchange filings

					
Projects	CLL	FYI	PUA	Altech	Orbite
Project Stage	PFS Nov 2018	PFS Complete	PFS Complete	BFS 2015 FID Approved	Restarting Production
Feedstock	Bulk Industrial Chemicals	Kaolin	Kaolin	Kaolin	Kaolin
Project Units					
Mining	N/A				
Feedstock Calcining	N/A				
Hydrochloric (HCl) Acid leach	N/A				
High Temperature HCl recovery	N/A				
Solvent Extraction (SX)		N/A	N/A	N/A	N/A
HPA Refining					

Compelling financials based on SX process

- Proprietary, unique and innovative process approach to HPA production – including 2x by-product credits
- Based on well understood Solvent Extraction (SX) Process - SX accounts for ~25% of global copper production
- Highly selective process delivers HPA purity
- Atmospheric wet chemical process – no high-risk pressure vessels or acid leach



Newcastle Port - Strategically Compelling

- The 'HPA First' process allows for the discretionary location of an HPA Plant within an existing industrial zone offering highly favourable logistics
- Newcastle Port (NSW) offers industrial processing facilities, extensive infrastructure and an appropriately skilled workforce to construct and support the HPA Plant
- The area has large bulk and container port facilities to utilise for the import of feed materials, key equipment and export of HPA product
- The proposed plant site(s) are strategically located near likely suppliers of key reagents and by-product offtake partners



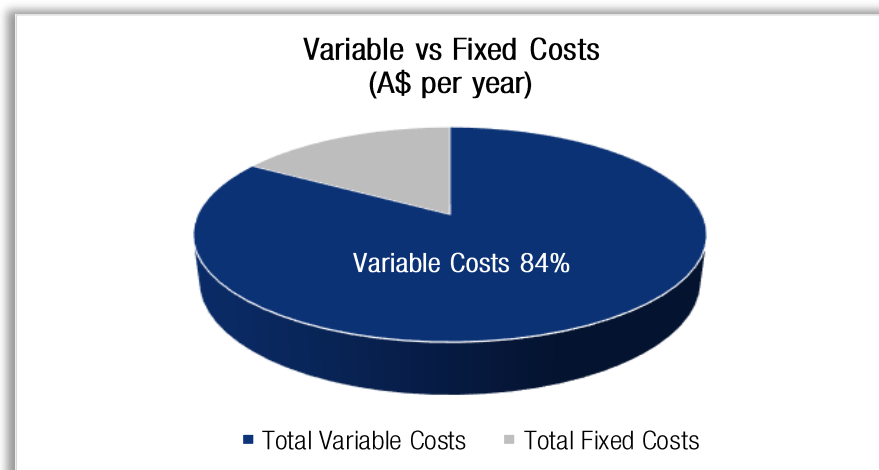
Newcastle Port - NSW

CapEx and Opex

- CapEx estimate accuracy -15% to +30% based off an Engineering, Procurement, Construction Management (EPCM) contracting strategy
- High % of variable OpEx indicates future scalability

Capital Cost Summary	A\$M	US\$M
Direct Cost	\$136.6	\$102.5
Indirect Costs	\$45.3	\$34.0
Contingency (18%)	\$32.7	\$24.5
Total Project Capital Cost	\$214.6	\$161.0

Operating Cost Summary	A\$M	US\$M
Variable Costs		
Aluminium Feedstock	\$26.3	\$19.7
Reagents	\$67.6	\$50.7
Utilities	\$12.8	\$9.6
Consumables	\$2.7	\$2.0
Total Variable Costs	\$109.5	\$82.1
Fixed Costs		
Labour	\$12.6	\$9.5
General Expenses	\$3.3	\$2.5
Maintenance	\$4.8	\$3.6
Contract Services	\$0.9	\$0.7
Total Fixed Costs	\$21.6	\$16.2
Annual Cash Operating Cost	\$131.1	\$98.3



Corporate Snapshot

TRADING INFORMATION

ASX CODE	CLL
Share Price (12-Nov-18)	13.0c
52 week trading range	6.0c – 18.0c
Issued Shares	567.1M

CAPITAL STRUCTURE

Issued Shares	567.1M
Unlisted options (@10c)	30.0M (expire 31 October 2019)
Unlisted options (@15c) ¹	2.0M (expire 31 October 2020)
Market Cap (fully diluted)	\$77.8M
Cash (31-Oct-18)	\$3.0M
Enterprise Value	\$74.8M

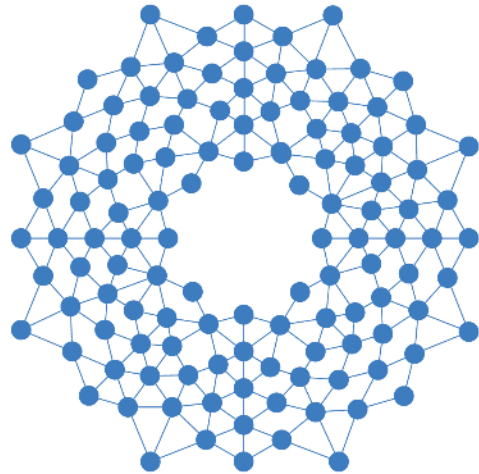
¹ It is proposed that Rimas Kairaitis be issued with 10M unlisted options at a strike price of 15c with a maturity date of 31 October 2020. The issuance of these options will be subject to shareholder approval.

SHARE PRICE PERFORMANCE



Name Change

- The Company is seeking shareholder approval at its upcoming Annual General Meeting for a name change to 'Alpha HPA Limited' to reflect the immediate business focus on the production of High Purity Alumina



alpha **HPA**

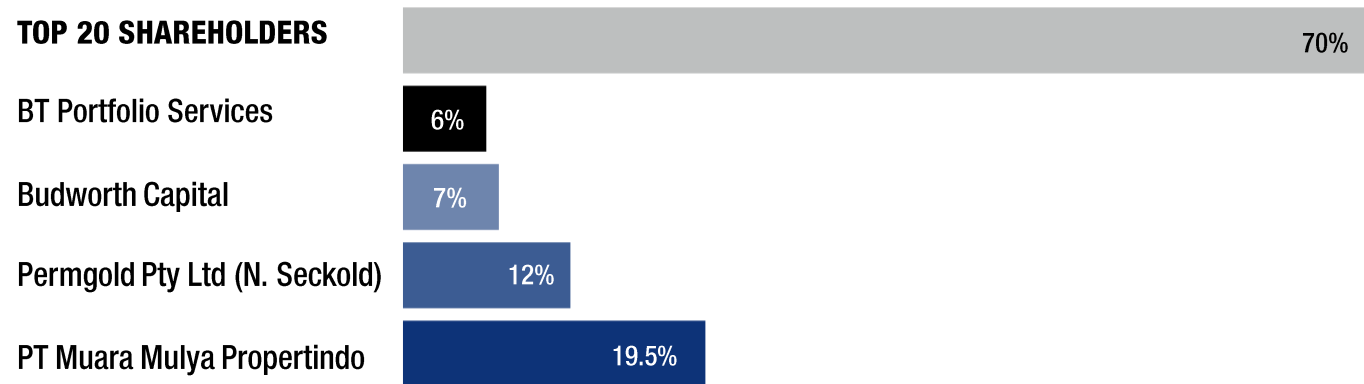


alpha **HPA**

Corporate Snapshot

SHAREHOLDERS

TOP 20 SHAREHOLDERS



RECENT HIGHLIGHTS

2017/2018

99.99% HPA

4N (99.99%) purity achieved in HPA testwork program

HPA FIRST

Adoption of the HPA First process

\$4.0M

\$4.0M underwritten Rights Issue (July 2018)



First HPA production using the HPA First process

PFS

HPA First process completed by July 2018



Board & Management



Norman Seckold
Chairman

30+ years in the full time management of natural resource companies. Past Chairman and Director of listed companies including Bolnisi Gold NL, Timberline Minerals Inc., Perseverance Corporation Limited, Valdora Minerals NL, Palmarejo Silver and Gold Corp. and Cockatoo Coal Limited. Currently Chairman of Santana Minerals Limited and Planet Gas Limited and Deputy Chairman of ASX listed Nickel Mines Limited.



Rimantas Kairaitis
Managing Director

20+ years experience in minerals exploration and resource development in gold, base metals and industrial minerals. Led the geological field teams to the discovery of the Tomingley and McPhillamy's gold deposits in NSW and steered the Hera gold-lead-zinc Project from discovery through to successful commissioning and commercial production. Previously founding Managing Director and CEO of ASX-listed Aurelia Metals.



Peter Nightingale
Director and CFO

20+ years as a Director or Company Secretary for a range of resource companies including Pangea Resources Limited, Timberline Minerals Inc., Perseverance Corporation Limited, Valdora Minerals NL, Mogul Mining NL, Bolnisi Gold NL and Cockatoo Coal Limited. Currently a Director Planet Gas Limited, Nickel Mines Limited and Prospech Limited.



Justin Werner
Non-Executive Director

20+ years' mining and management experience. Previously consulted to a number of blue chip mining companies including BHP, Rio Tinto and Freeport McMoran. Successful track record of mine discovery and development. Currently Managing Director of ASX listed Nickel Mines Limited.



Tony Sgro
Non-Executive Director

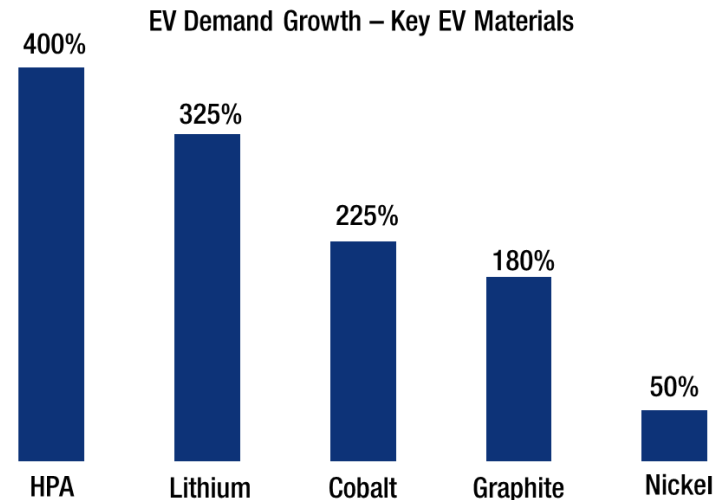
Chemical Engineer with 45+ years' senior management experience in the supply of specialised equipment to the process industries with an emphasis on mining and oil & gas. Co-founder, Director and General Manager of Kelair Pumps for 36 years.

About High Purity Alumina (HPA)



- HPA is the pure form of aluminium oxide (Al_2O_3) HPA is the pre-cursor material for the manufacture of **sapphire glass** and **ceramic coated Lithium-Ion-Battery (Li-B) separators**
- Its value derives from its physical properties of extreme hardness and chemical stability
- Purity is determined by the concentration of trace elements in the alumina compound e.g. iron, magnesium, sodium
- Price and performance of HPA varies upon product density, crystal structure, particle size and distribution and degree of purity

4N HPA is the largest sector of the HPA market and is seen by Collierina Cobalt as the most logical sector of the market in which to focus in terms of demand volumes and margin optimisation



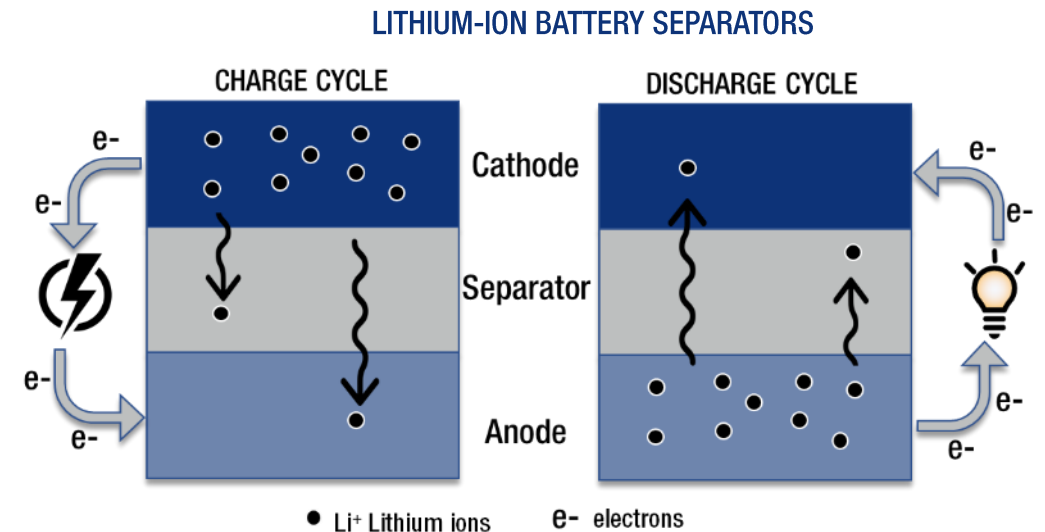
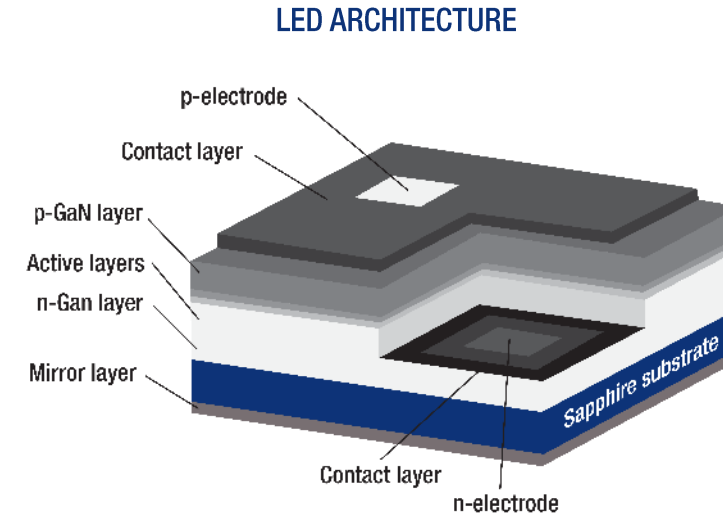
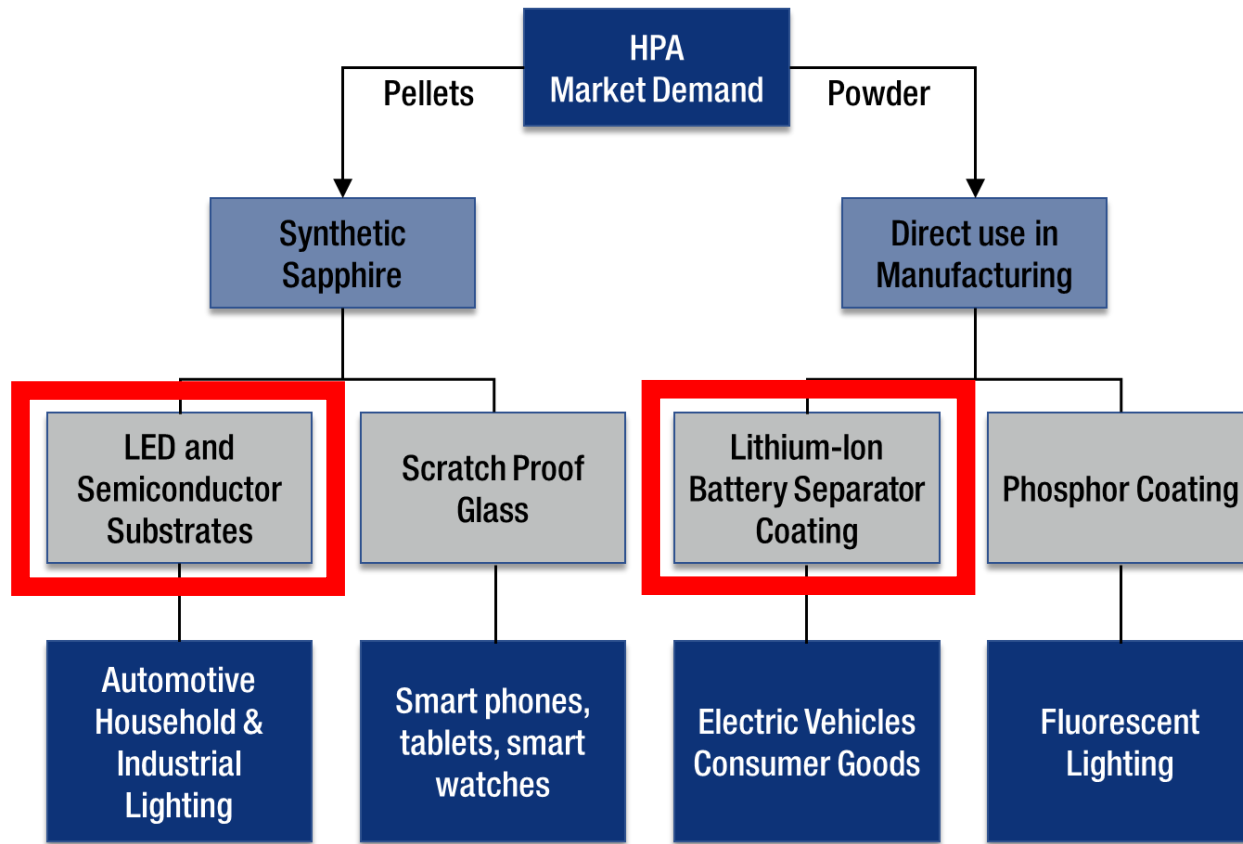
Source: Various Industry Sources & Research

PRICE FOR PURITY

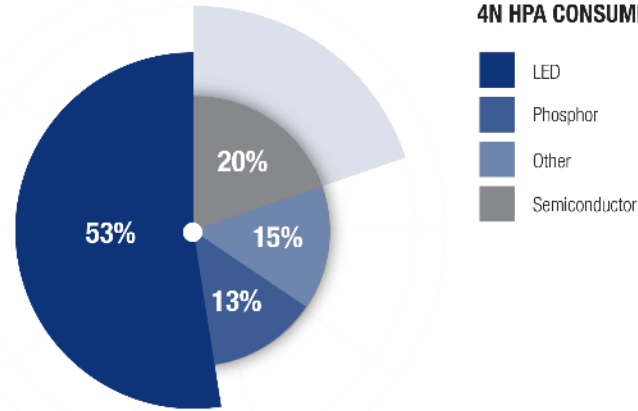
SGA	99.5% purity	~US\$400/t
3N HPA	99.9% purity	~US\$10,000-25,000/t
4N HPA	99.99% purity	~US\$25,000-40,000/t
5N HPA	99.999% purity	~US\$50,000-100,000/t
6N HPA	99.9999% purity	By negotiation in a very limited market.

Source: CRU

High Purity Alumina (HPA) Market



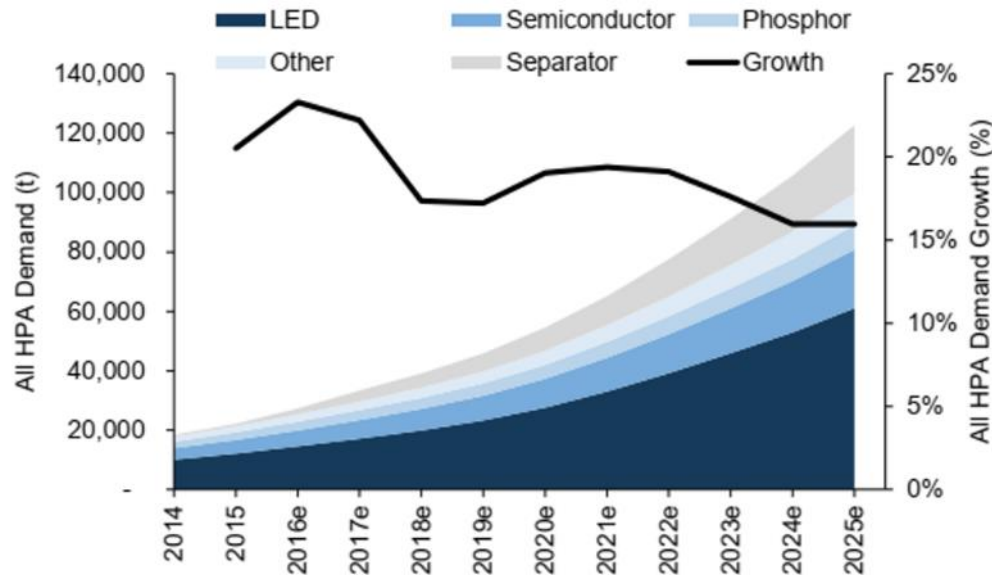
High Purity Alumina (HPA) Demand – A Battery ‘Metal’



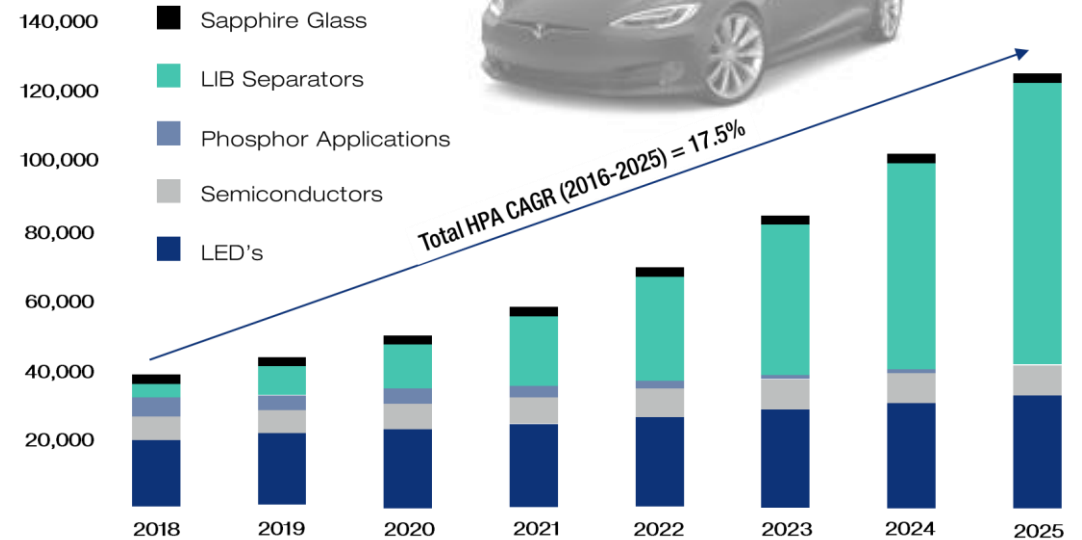
Consensus market agreement on strong demand growth for HPA to 2025. Market analysts divided on growth driver being either the increasing adoption of LED (Light Emitting Diode) products and/or separator coatings in lithium ion batteries (Li-B's).

Projected Li-B separator demand overwhelmingly driven by projected Electronic Vehicle (EV) demand.

HPA Demand Outlook (2018-2025)



Source: Petra Capital

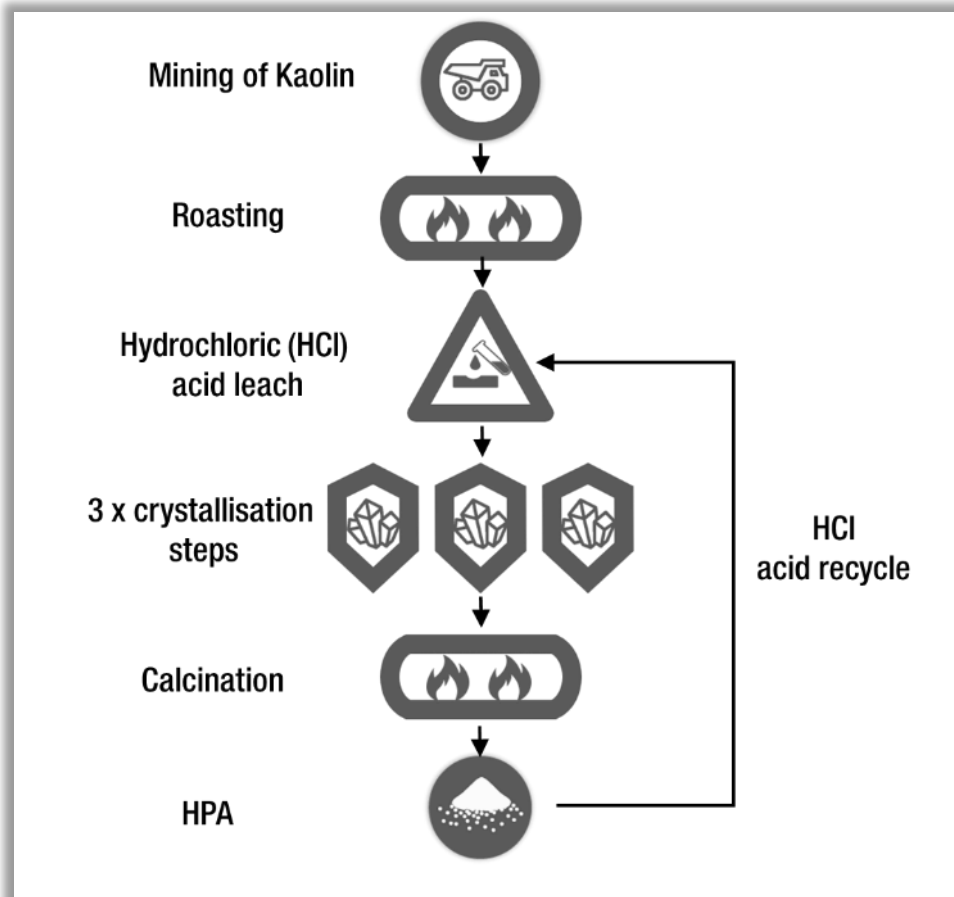


Source: CRU

Existing HPA Market Production Processes

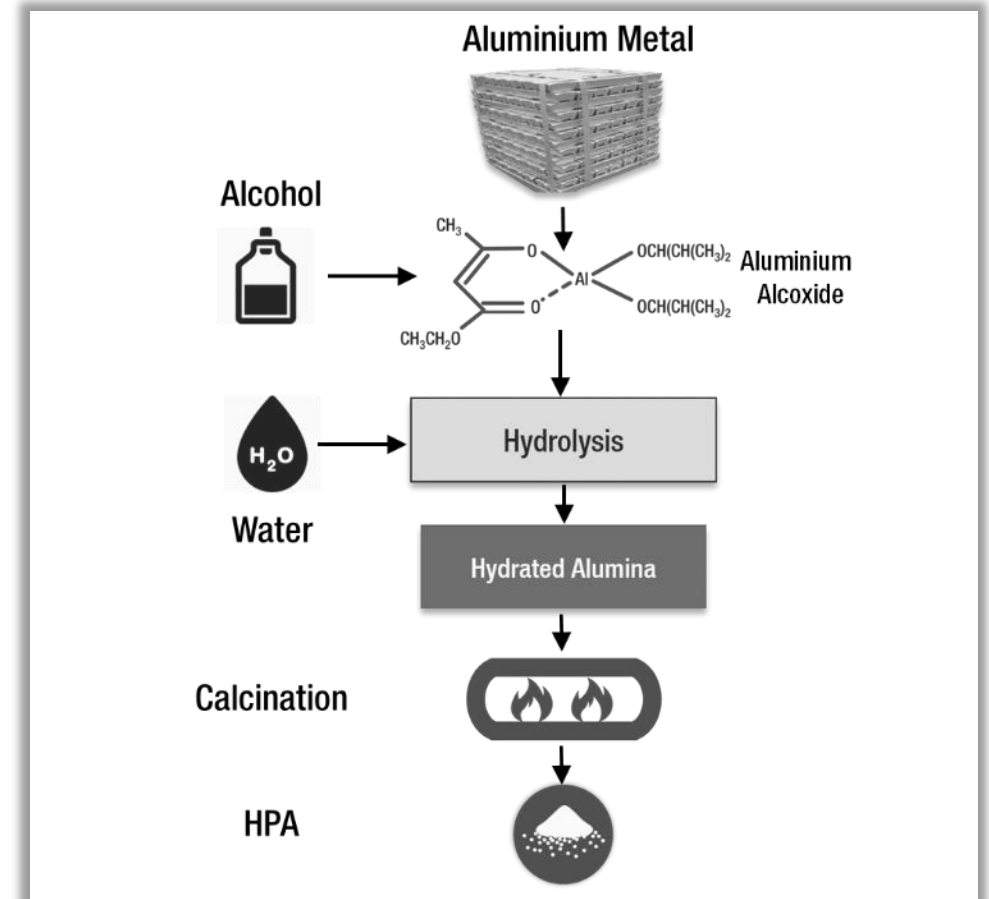
Existing HPA production is synthesised from Aluminium metal feedstock or produced from hydrochloric acid leach of kaolin clay.

HPA from kaolin – schematic flow sheet



Source: various company and technical presentations

HPA from Al metal – schematic flow sheet



Source: Sumitomo Chemicals

Indicative Project Delivery Timetable

- The Company has committed to an immediate transition to pilot-plant construction and DFS

Task	From	To	2018	2019				2020				2021				2022			
			DecQ	MarQ	JunQ	SepQ	DecQ	MarQ	JunQ	SepQ	DecQ	MarQ	JunQ	SepQ	DecQ	MarQ	JunQ	SepQ	DecQ
PRE-CONSTRUCTION																			
Pilot Plant + DFS	1/03/19	30/11/19		█															
EIS	1/11/18	30/10/19	█	█															
Regulatory Approvals	1/11/18	29/11/19	█	█															
Marketing and Offtake	1/11/18	26/06/19	█	█															
Financing	10/06/19	6/12/19		█															
PROCESS PLANT																			
Establishment	30/09/19	31/12/19					█												
Detailed Engineering	9/12/19	17/07/20					█	█											
Procurement	6/01/20	4/06/21						█				█							
Construction	30/09/19	8/10/21					█	█				█				█			
Commissioning	11/10/21	18/02/22														█	█		
Production Ramp-Up	21/02/22	9/02/24																█	

'HPA FIRST' - FAST TRACK PATH TO HPA PRODUCTION

The HPA First process uses the Company's proprietary licenced solvent extraction (SX) and refining technology and a feedstock blend of readily available industrial products rather than an acid leach solution generated from the Collerina Project ore

SIMPLER



Does not require a mining operation

- Simplified flow sheets with no acid plant, leach vessels, filtration plant, neutralisation circuits or tailings
- Single site industrial location

BETTER



Dramatically improved business case:

- Dominant HPA revenue fast tracked
- Higher aluminium feed tenor
- Significant CapEx reductions
- Significant OpEx reductions

FASTER



Fast track to cashflow:

- Faster DFS – simpler pilot plant
- Faster Permitting - single site industrial zoning
- Faster track to financing and construction to operational cash-flow

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Chairman

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THANK YOU

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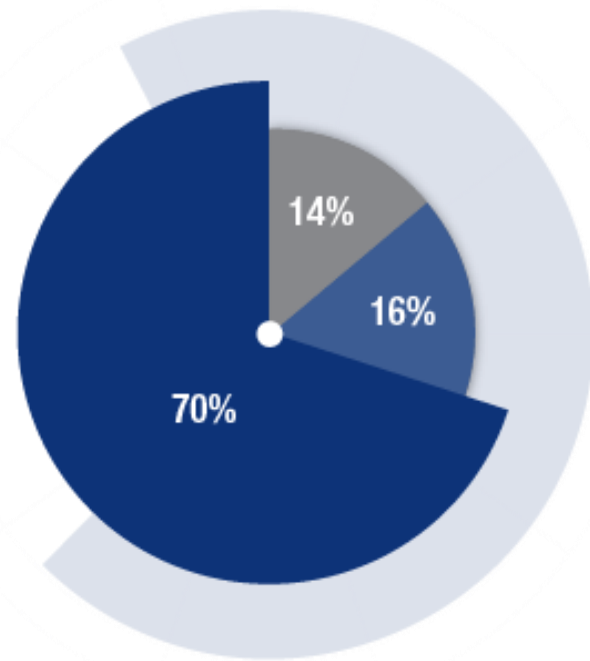
COLLERINA COBALT LTD (ASX:CLL)

Appendices

Appendix 1

Demand for HPA – Regions

Demand for HPA is primarily being driven by the increasing adoption of LED (Light Emitting Diode) products, separators in lithium ion batteries (Li-B's) and scratch resistant artificial sapphire glass for smartphone screens and watches



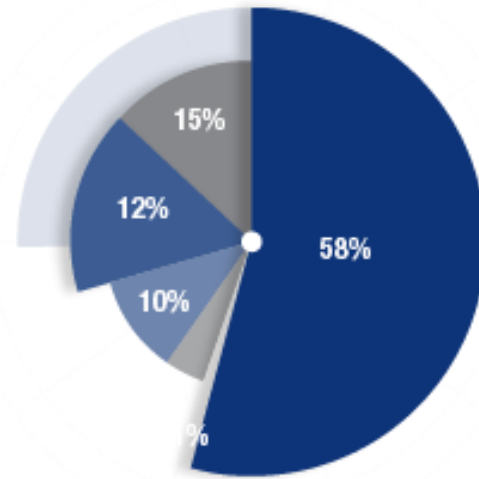
HPA DEMAND BY GEOGRAPHIC REGION (2016)



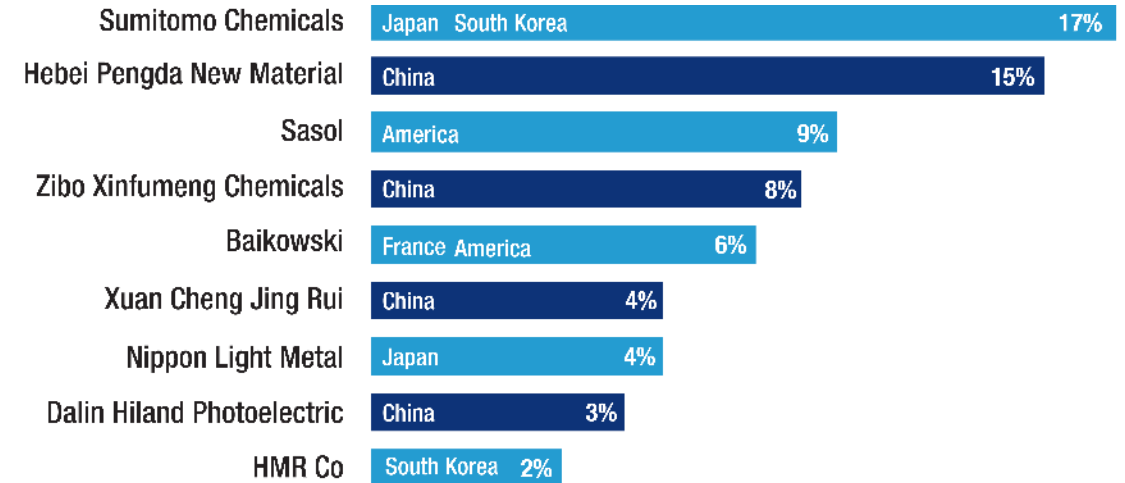
Growth demand is dominated by the APAC Region (~70% in 2016) primarily China, Japan and South Korea

As a would-be Australian based HPA producer, Collierina Cobalt is ideally placed to service the most dominant region of global HPA demand

Appendix 2 Supply of HPA



GLOBAL HPA SUPPLY DISTRIBUTION - 2016E



% EXPECTED 2016 OUTPUT

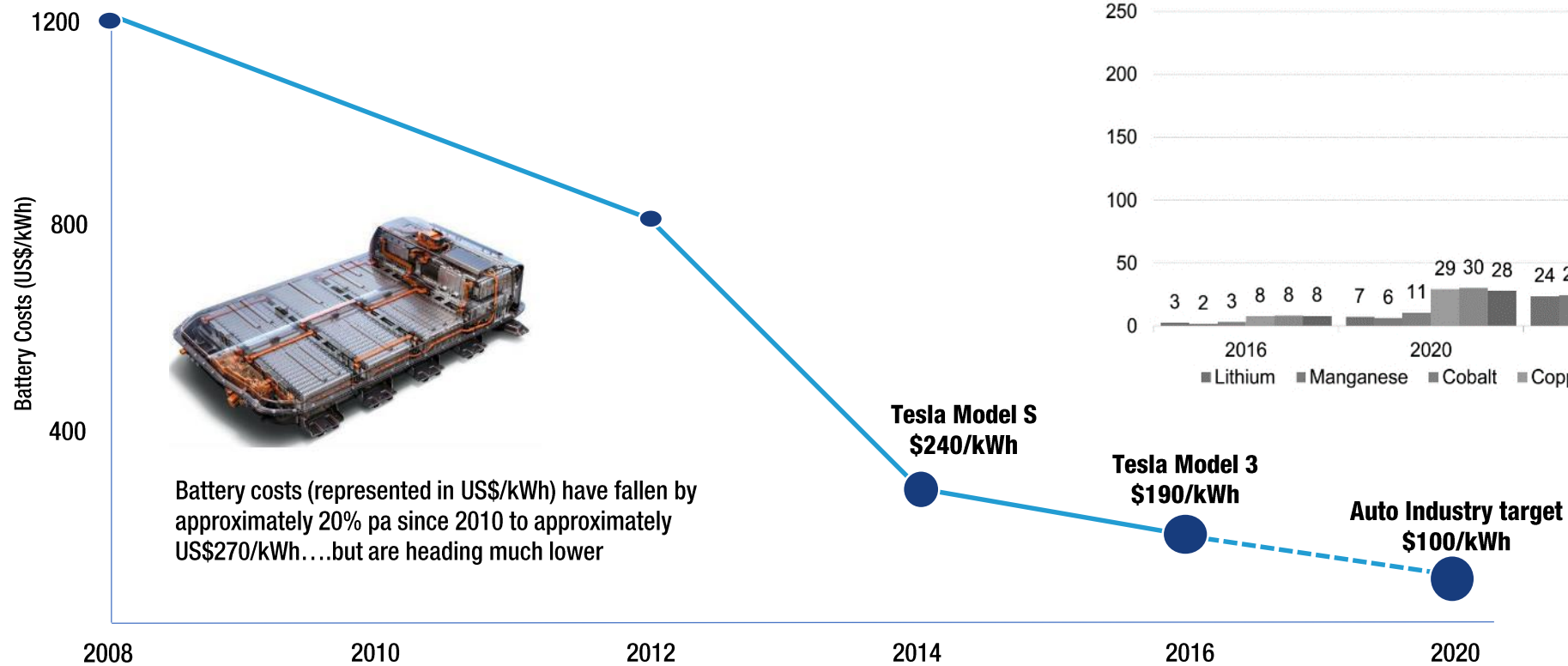
SOURCE: PERSISTENCE MARKET RESEARCH

- Current HPA supply is concentrated in the Asia Pacific region (~83%) with China the most prolific producer
- Current production is dominated by large diversified chemical companies where HPA is a non-core product and an immaterial percentage of revenue (< 5% for Sumitomo Chemicals)
- Cobalt sees enormous opportunity as a focused HPA producer to:
 - Become a genuine alternative supply source to the existing dominant APAC producing countries, and more importantly
 - Fill an expected supply shortage as forecast HPA demand escalates over the next decade
- Collerina Cobalt stands to become an extremely low-cost HPA producer
- Strong potential exists for long-term offtake agreements prior to commercial production

Appendix 3

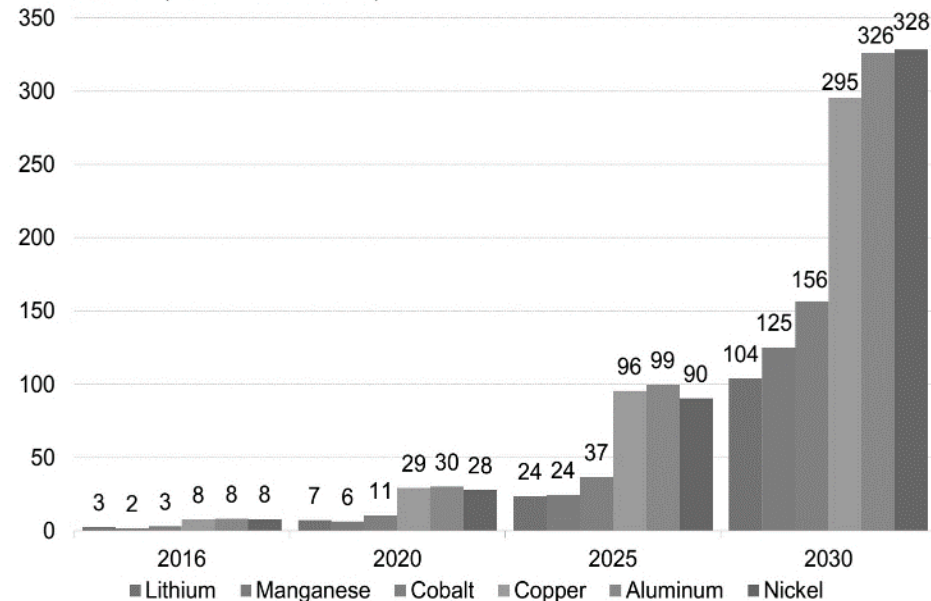
Battery Costs Will Underpin EV Penetration

Batteries with lower cost structures and greater energy densities will drive EV penetration and demand for battery metals



Forecast demand for key battery materials

Metal demand (thousand metric tons)



Source: Bloomberg New Energy Finance

Appendix 4

Statement of Compliance

Competent Persons Statement (Process Development Testwork)

Information in this announcement that relates to metallurgical results is based on information compiled by or under the supervision of Dr Stuart Leary, an Independent Consultant trading as Delta Consulting Group. Dr Leary is a Member of The Australasian Institute of Mining and Metallurgy (AusIMM). Dr Leary has sufficient experience to the activity which he is undertaking to qualify as a Competent Persons under the 2012 Edition of the 'Australasian Code for reporting of Exploration Results, Mineral Resources and Ore Reserves'. Dr Leary consents to the inclusion of the technical data in the form and context in which it appears.

For further information on testwork results and processes see ASX announcements dated 20 November 2018, 6 September 2018, 6 August 2018, 9 July 2018, 30 April 2018, 26 April 2018, 21 March 2018, 6 March 2018, 21 February 2018, 8 December 2017, 30 November 2017, 29 November 2017, 24 November 2017 and 13 November 2017.

Appendix 5

Modifying Factors

Criteria	Commentary
Study Status	<p>The 'HPA First' Pre-Feasibility Study (PFS) indicates the project is technically and financially viable. The Study was completed by Prudentia Process Consulting, with input from the Company and other specialist consultants. The activities and findings of all other disciplines are summarised in the PFS document, and detail derivation of other modifying factors such as processing recoveries, costs, revenues, government and permitting.</p> <p>Overall the results of the PFS demonstrate that the HPA project is technically and financially robust.</p>
Mining factors or assumptions	The HPA First PFS does not assume any material sourced from a mining operation
Processing (including Metallurgical factors or assumptions)	<p>The production of HPA using a Solvent Extraction (SX) based process is a novel process flow sheet.</p> <p>The process plant design can be summarised by the following sequential activities:</p> <ul style="list-style-type: none"> • The preparation of the industrial feedstock blend • Solvent extraction of the feedstock solution to produce an aluminium strip liquor and aqueous solution of dilute fertiliser by-product (raffinate). • Production of fertiliser by-product A from the raffinate involving evaporative crystallisation, dewatering, drying and packaging. • Crystallisation of the aluminium salt from aluminium strip liquor. • Production of HPA pre-cursor. • Calcining of HPA pre-cursor to HPA, micronizing and packaging. • Evaporation circuit to produce fertiliser by-product B <p>The process flow sheet has been validated for the purposes of the PFS through the following testwork:</p> <ul style="list-style-type: none"> • Bench scale SX and batch HPA refining • 2 x continuous SX mini-rig campaigns to produce aluminium strip liquors • 1 x processing of SX aluminium strip liquors to HPA assaying 99.99% purity <p>The process testwork was conducted on a blend of industrial aluminium chemicals from 2 x different vendors. Some minor feedstock variability between vendors was noted.</p>
Environmental and Permitting	<p>Collerina has engaged AECOM Consultants to assist with the Environmental and Regulatory Approvals process required for the preferred Project Site at Newcastle Port, NSW.</p> <p>At the time of this report, AECOM are preparing a Preliminary Environmental Assessment (PEA), being the first stage of the NSW Approvals process for a State Significant Development (SSD)</p>

Appendix 5

Modifying Factors

Criteria	Commentary
Financial	<p>Project costs have been estimated by Prudentia Process Consultants on the basis below.</p> <p>CapEx: The capital cost estimate is provided at an accuracy level of +30% to -15%. The capital cost estimate has been based on the implementation of an Engineering, Procurement, Construction Management (EPCM) contracting strategy.</p> <ul style="list-style-type: none"> • Pricing for mechanical equipment and packages are based on budget quotes sourced from reputable vendors or internal database information and scaled accordingly • Contingency of 18% has been added to the total reflecting the status of engineering, maturity of the process technology and data contained within this pre-feasibility study • No allowance for taxes, import duties, value added tax (VAT), goods and services tax (GST) and the like was made <p>The total capital cost is based on the direct cost of mechanical equipment delivered and installed at site. The cost of the mechanical equipment is based on the process flow diagrams, stream table, design criteria and equipment list. Over 75% of mechanical pricing is based on vendor budget quotes with the remainder a mix of in-house (Prudentia) database, internal estimates, factored estimates, internet sourced data and allowances.</p> <p>OpEx: The operating cost estimate has been calculated based on a first principle build-up including reagents, utilities, consumables, labour, general expenses, maintenance and contract services to operate the plant. The operating costs were apportioned into fixed costs and variable costs with adjustments made to variable costs in the financial model for annual tonnage with ramp-up. Labour costs have been built up from an organisational chart typical of a processing facility of this scale. The annual operating costs at year 3 (full ramp-up) are summarised in Table 6, above, and are considered accurate to +/- 25%.</p> <p>Sensitivities: Sensitivity cases were considered by flexing key model inputs including sale price, operating costs and foreign exchange. The sensitivity analysis has been reported in EBITDA as there is no mine setting the project life. As expected with the operating margin the project is most sensitive to changes in the HPA product price in comparison to the other sensitivity factors modelled. Foreign exchange has the next biggest impact on the Project's EBITDA because the HPA price is traded in USD. The Project is fairly resilient to changes in operating cost.</p>
Marketing	<p>Collerina commissioned the independent research group CRU to complete an HPA market study. The key conclusions of the study included:</p> <ul style="list-style-type: none"> • The HPA global market is expected to increase from around 35kt in 2017 to 125kt in 2025, and 4N HPA produced by established suppliers in Japan, South Korea, USA and Europe is trading within the range of US\$25-50/kg • A strong demand outlook and rising cost inputs are expected to place upwards pressure on prices. The main downside risk is increased competition from Chinese producers and changes to technology which reduce HPA intensity in manufacturing processes.
Social, legal and Governmental	<p>The final Project Location has yet to be determined, however the Company is investigating a number of sites within the Industrial Port area of Newcastle, NSW. The Company is advised by AECOM consultants with respect to Government Permitting and Environmental Studies</p>