

Alpha **HPA**

ASX: **A4N**
ASX Announcement
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The Manager Companies
ASX Limited
20 Bridge Street
Sydney NSW 2000

(8 pages by email)

REPORT ON ACTIVITIES FOR THE QUARTER ENDED 31 MARCH 2020

HIGHLIGHTS

MoU SIGNED WITH CHEMICAL COUNTERPARTY FOR THE HPA FIRST PROJECT

- MoU signed with Orica for reagent supply and by-product offtake for the HPA First Project
- Reagent supply and by-product delivery ex-Gladstone, QLD
- Joint project engineering working group established and working towards a definitive agreement
- HPA First Project location secured adjacent to Orica within the Gladstone State Development Area

HPA FIRST PROJECT DFS CONFIRMS A HIGH MARGIN, LARGE VOLUME PROJECT

- Definitive Feasibility Study (DFS) delivered for the HPA First Project
- Comprehensive technical and financial validation of the Company's HPA First Project
- Annual free cashflow increased to A\$280M* at 10,000tpa HPA
- Proven process capable of delivering >99.99% HPA purity
- Unit cash costs of A\$8,730 (US\$5,940)/t HPA after by-product credits
- Project CapEx of A\$308M (US\$209M)
- Financially robust project with high profitability at HPA prices as low as US\$10,000/t
- Immediate focus to project financing and completion of permitting and offtakes
- CRU Marketing confirms strong HPA pricing in a supply constrained 4N HPA market

SUCCESSFUL PRODUCTION AND DISTRIBUTION OF HIGH PURITY BOEHMITE

- The HPA First process confirmed as capable of producing crystalline high purity boehmite
- Boehmite purity levels reaching 99.997%, higher than any known commercial boehmite
- Boehmite samples despatched to end-users in Japan and South Korea for end-user testing

COLLABORATION WITH GERMAN RESEARCH LAB YIELDS NEW APPLICATIONS FOR HPA

- German research lab confirms benefits of the Company's HPA in Li-electrolyte dosing

HPA FIRST PROJECT PERMITTING ADVANCING

- Pre-lodgement documentation submitted to the Queensland Office of the Co-Ordinator General
- AECOM engaged as consultants to the GSDA permitting process

* Based on an HPA price of US\$25/kg and USD/AUD = 0.68
March 2019 PFS annual free cash flow = A\$265M

OPERATIONS

OVERVIEW

The March quarter included a number of highly significant milestones for the Company's HPA First Project, most notably the MoU with Orica Australia Pty Ltd (Orica), the completion of a very positive DFS and the demonstration that the HPA First process can be readily adapted to produce high-purity boehmite as well as high purity alumina (HPA) depending on end-user requirements.

With these key milestones in place, Alpha HPA is focused on completing customer offtake agreements, project permitting and project financing. Each of these key activities can be advanced with a lower capital expenditure profile relative to previous quarters, with the DFS and Pilot Plant process essentially complete.

CHEMICAL COUNTERPARTY TO THE HPA FIRST PROJECT

During the quarter, the Company announced the signing of a Memorandum of Understanding (MoU) with Orica setting out the volumes and pricing mechanisms for the supply of key process reagents and the offtake of by-product from the HPA First Project subject to the negotiation and finalisation of a more definitive Supply and Offtake Agreement (Agreement).

The MoU also set out the scope and commitment for the formation of an Engineering Co-operation Group (ECG), with representatives from each party to review and advise on the engineering requirements of supply, offtake and project interface.

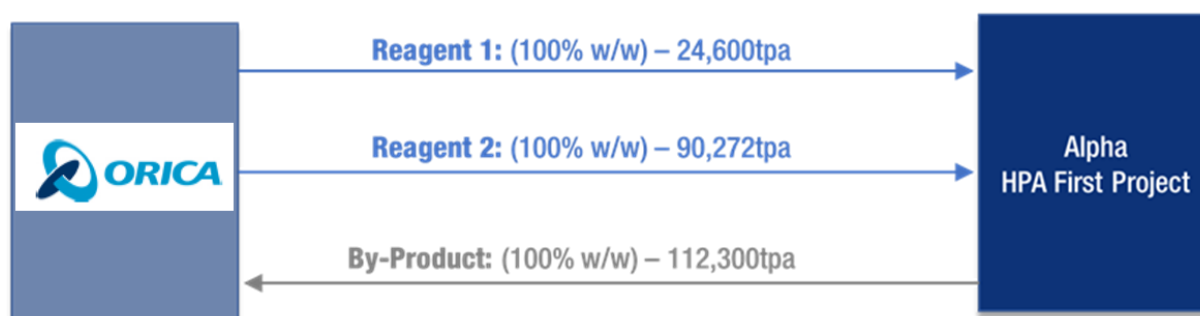
The signing of the MoU followed a period of initial technical and commercial due diligence by Orica.

Background

The HPA First Project requires the supply of two key chemical reagents which are recycled inside the HPA production process as a by-product for sale back to the reagent supplier. The volume and nature of the reagents and by-product require the HPA First Project to be ideally located within 2 kilometres of a chemical counterparty, to allow for the reagents and by-product to be delivered by pipeline in liquid form. The terms of the MoU have been negotiated on the basis of pipeline supply and delivery from/to a project site within the Gladstone State Development Area (GSDA) (see Project Location).

Reagent Supply and Offtake

The reagent and by-product volumes in consideration (expressed at 100% concentrations) are set out below:



The MoU sets out a pricing mechanism for both the key reagents as well as the by-product over an indicative 20-year term. The pricing mechanism compares favourably with the reagent and by-product pricing assumptions used in the updated PFS (ASX announcement: 7 March 2019). The MoU also sets out indicative quality specifications for the supply and delivery of the reagents and by-product.

Project Location

The MoU has been negotiated on the basis of reagents supply and by-product offtake delivered from/to Orica's facility in Gladstone, QLD, within the GSDA.

On this basis, Alpha HPA has secured an option with Economic Development Queensland (EDQ) on a suitable 10 hectare land parcel within the GSDA, being Lot 12/SP239343 (see map below). Alpha HPA has now negotiated final purchase terms for land with the EDQ and has commenced a full-scale project permitting process.



The GSDA is located north-west of Gladstone and is a defined area of land dedicated for industrial development and materials transportation infrastructure. Comprising of 27,194 hectares of land adjacent to the Port of Gladstone, with connections to major rail networks and Australia's national highway, the GSDA also provides suitable access to mains power, LNG and a diversely skilled local workforce. The GSDA already hosts a number of major industrial chemical projects, including:

- Rio Tinto alumina refinery;
- Orica chemical manufacturing complex;
- Transpacific Industries waste management and recycling facility;
- Australia Pacific LNG;
- Santos Gladstone LNG; and
- Queensland Curtis LNG.

Engineering Co-Operation Group

The MoU includes a binding commitment on each party to establish an Engineering Co-Operation Group (ECG) to work on the on-engineering requirements for the interface between the Orica and the Alpha HPA projects, including safety, reliability, operability and schedule. The ECG scope will include design elements for pipeline routes, tie-in connection points, transfer rates, pressure, temperature, pump designs, process controls, instrumentation, materials of construction, hazard studies, engineering controls, trips, procedures, training and quantity mass measurement.

The ECG includes a minimum cost commitment of \$200,000 per party up to 31 July 2020.

Since executing the MoU, Alpha HPA and Orica, have begun progressing the engineering tasks associated with the Orica-Alpha HPA Project interface in the GSDA. Key activities include:

- Gladstone site visit to inspect key reagent take-off and by-product delivery points between each site and site utilities;
- piping and electrical specifications for Orica-Alpha HPA interface;
- reagent and by-product quality specifications and concentrations; and
- engineering scope for by-product concentration.

Conditionality

The definitive Product Supply and Offtake Agreement contemplated in the MoU is subject to the following Conditions Precedent:

- Alpha HPA securing land suitable for pipeline transfer of products;
- Alpha HPA securing funding to execute the Project;
- Alpha HPA securing all necessary statutory approvals;
- each party completing its due diligence activities to its satisfaction and the negotiation and finalisation of all required agreements including the Product Supply and Offtake Agreement, and
- internal approvals of each party.

Exclusivity

The MoU includes the grant of exclusivity to Orica to 31 July 2020.

DEFINITIVE FEASIBILITY STUDY (DFS)

On 17 March 2020 the Company released the results of the HPA First Definitive Feasibility Study (DFS) based on the construction and operation of the HPA First Project within the GSDA. The DFS was the result of an intensive 12 month program of Pilot Plant operation and detailed engineering, with the DFS confirming the HPA First Project as both technically robust and financially compelling.

The Alpha HPA Board has now committed to a full project financing process, in parallel with completion of project permitting, in the expectation of a successful market outreach program and securing HPA offtake agreements.

DFS Highlights:

- **Production rate of 10,000tpa HPA**
- **Annual free cashflow increased to A\$280M***
- **Unit cash costs of A\$8,730 (US\$5,940)/t HPA after by-product credits**
- **Project CapEx of A\$308M (US\$209M)**
- **Capital intensity of A\$30,800 (US\$20,900)/tpa HPA**
- **Financially robust project with high profitability at HPA prices as low as US\$10,000/t**

* Based on an HPA price of US\$25/kg and USD/AUD = 0.68
March 2019 PFS annual free cash flow = A\$265M

Technical

The DFS validated the HPA process flow sheet through the construction and operation of the HPA First Pilot Plant facility in Brisbane, QLD. The Pilot Plant recorded over 600 hours of operating time and generated over 40kg of high purity alpha-phase alumina of >99.99% purity for end-user qualification and vendor testwork. The Pilot Plant was the first time the flowsheet has been operated on a fully integrated basis. Pilot Plant operations finalised the detailed mass and energy balance allowing for calculation of the material flowrates through equipment, reagent use, impurity deportment, by-product quantities and utilities demand. Equipment selection was based on detailed engineering design, and selection of construction materials based on detailed materials testwork.

The DFS process and outcomes have also been subject to technical review by Orica, as chemical counterparty to the project under the Orica-Alpha HPA MoU (ASX announcement: 10 February 2020).

Financial

Consistent with outcomes of the Pre-Feasibility Study (PFS): (ASX announcement 7 March 2019) the HPA First Project presents a compelling financial business case, generating an estimated annual free cashflow of A\$280M* at full production. Headline financial metrics of the DFS are presented in the tables below:

HPA First Project		
Key Project Parameters	A\$	US\$
A\$/US\$ Exchange Rate	0.68	
HPA Production (t/y)	10,000	
Annual Average Cash Operating Cost	\$127million	\$86million
Unit Cash Cost (\$/t HPA)	\$12,750	\$8,670
Unit Cash Cost accounting for by-products (\$/t HPA)**	\$8,730	\$5,940
Aluminium Feedstock Processed (t/y)	18,592	
Pre-Production Capital Cost	\$308 million	\$209 million
Capital Intensity (CapEx\$/ per tpa HPA)	\$30,800	\$20,900

Alpha HPA engaged independent market research firm, the CRU group, to conduct a detailed analysis of the global HPA market, including a breakdown of the existing market supply, demand and cost structure, as well as a detailed forward projection of HPA supply demand and pricing. Based on this detailed analysis, CRU advise a realistic pricing of US\$25/kg for 4N HPA represents current pricing of 4N HPA, with forecast pricing of US\$25/kg over the first 5 years of the project life. In addition to the CRU analysis, the Company has also commenced an international market outreach program with a view to securing direct offtake relationships with end-users. Based on both CRU and the Company's own market outreach, and to accommodate scenarios of potential price discounting to penetrate supply chains, revenue metrics are presented below across a range of HPA price points in the table below.

Key Project Parameters	HPA Pricing Scenarios					
	USD \$25/kg		USD \$20/kg		USD \$15/kg	
	AUD	USD	AUD	USD	AUD	USD
Annual Revenue @ 10,000tpa	\$368 million	\$250 million	\$294 million	\$200 million	\$221 million	\$150 million
Annual Pre-Tax Cashflow	\$280 million	\$191 million	\$207 million	\$141 million	\$133 million	\$91 million
Payback	< 2 years		<3 years		<4 years	

* Based on an HPA price of US\$25/kg and USD/AUD = 0.68

As the HPA First Project is not constrained by mine life, there is no fixed project life, and therefore a discounted cash flow (DCF) analysis was not performed. Rather, the financial analysis is presented on an EBITDA basis.

Subject to the assumptions made, Alpha HPA expects the projected earnings to be maintained over the long term, providing an extremely attractive investment proposition.

DFS Opportunities

The Company was delighted with the DFS completion and current findings. In addition, some further significant technical and commercial opportunities for the project will be investigated in the coming months:

- The CapEx estimate includes \$25.3M (\$30.0M including Indirects) associated with the by-product concentration area. The location and capital expenditure for this area remains subject to final engineering and evaluation with Orica, which may result in a CapEx adjustment and an attendant time-dated OpEx amortisation adjustment.
- The HPA Pilot Plant has recently successfully produced an alternative ceramic coating product, being high purity (4N) boehmite (Al-O-OH). The Company is in active discussions with end-users in the lithium-ion battery supply chain regarding boehmite and will be shortly sending boehmite samples to these end-users for qualification testing. The addition of boehmite to the HPA First process provides excellent flexibility to produce alternative products based on end-user demand.

The full DFS release (ASX Announcement: 17 March 2020) can be found on the Company's website - www.alpha-hpa.com.au.

SUCCESSFUL PRODUCTION AND DISTRIBUTION OF HIGH PURITY BOEHMITE

During the March quarter, the Company continued its discussions and collaboration with a Japanese lithium-ion battery separator manufacturer with regard to the manufacture and testing of boehmite using the HPA First process. Boehmite is a hydrated aluminium oxide (Al-O-OH), and is the alternative coating material used in ceramic coated separators for lithium-ion batteries. High purity boehmite represents a potential additional revenue product for the HPA First Project.

During the quarter, four x 1kg boehmite samples were produced at the Company's HPA First Pilot Plant in Brisbane. Purity assays, by the GDMS assay method confirmed:

- an average boehmite purity of 99.995%, and
- peak boehmite purity of 99.997%.

Based on the Company's market research, Alpha HPA is not aware of any commercial boehmite products of equivalent purity. X-ray diffraction (XRD) analysis and scanning electron microscope (SEM) analysis confirmed 100% crystalline boehmite.



Boehmite spray dryer



High purity boehmite in production

High Purity Boehmite Samples Despatched to End Users

Alpha HPA has despatched two x 2kg samples of high-purity boehmite to Japan and South Korea following requests from end-users. The Company has worked closely with the Japanese end-user in the boehmite development process.

COLLABORATION WITH GERMAN RESEARCH LAB YIELDS NEW APPLICATIONS FOR HPA

Alpha HPA has achieved success in improving lithium-ion batteries with a German electrolyte developer and manufacturer (E-Lyte innovations GmbH) and together completed a study on battery performance on the dosing of Li-based electrolyte with HPA generated from the Alpha HPA Pilot Plant. The study conclusively determined that electrolyte for lithium-ion batteries dosed with Alpha's HPA delivered:

- markedly increased battery rate performance, and;
- markedly improved cycle life of batteries operated at low temperatures.

Alpha HPA now plans to leverage this research and extend its market outreach work to include electrolyte manufacturers as potentially significant HPA end-users.

HPA FIRST PROJECT PERMITTING ACTIVITIES ADVANCED

Subsequent to the execution of its MoU with Orica and the release of its DFS for the HPA First Project, Alpha HPA has now submitted its pre-lodgement documentation with the Queensland Office of the Co-ordinator General. Working with consultants AECOM, the Company is now preparing its Application for Material Change of Use with respect to the Gladstone State Development Area.

COLLERINA PROJECT – NSW (100% Alpha HPA and subject to commodity split agreement)

In line with the Company's plans to focus on advancing the HPA First Project, no exploration activities were undertaken at the Collerina project during the quarter.

WONOGIRI PROJECT – INDONESIA (45% Alpha HPA)

No exploration activities were undertaken at the Wonogiri Project during the quarter.

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About the HPA First Project

The Company's HPA First Project represents the evaluation and intended commercialisation of the production of ~10,000tpa of high purity alumina (HPA) using the Company's proprietary licenced solvent extraction and HPA refining technology. The technology provides for the extraction and purification of aluminium from an industrial feedstock to produce 4N (>99.99% purity) alumina for the intended use within the lithium ion battery and LED lighting industry. Following a successful testwork program and completion of a Pre-Feasibility Study, updated in March 2019, Alpha HPA has now completed Definitive Feasibility Study based on the successful completion of its Pilot Plant program at its dedicated laboratory facility in Brisbane.

The Company has commenced full permitting, market outreach and project financing processes, with the expectation of positioning the HPA First Project to Final investment Decision.

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: 23 April 2020, 25 March 2020, 17 March 2020, 10 March 2020, 23 December 2019, 10 December 2019, 10 October 2019, 23 September 2019, 28 August 2019, 5 August 2019, 25 July 2019, 2 July 2019, 1 July 2019, 3 June 2019, 17 April 2019, 7 March 2019, 4 December 2018, 20 November 2018, 6 September 2018, 31 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.

Cautionary Statement

The Definitive Feasibility Study (DFS) referred to in this announcement has been undertaken to assess the technical and financial viability of the HPA First project. The DFS is based on the material 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 outcomes indicated by this DFS will be achieved. To achieve the range of outcomes indicated in the DFS, additional funding will 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 HPA First project. If it does, this could materially reduce the Company's proportionate ownership of the HPA First project. Given the uncertainties involved, investors should not make any investment decisions based solely on the results of the DFS.

Forward Looking Statements

The DFS contains certain forward-looking statements with respect to the financial condition, results of operations, 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 give 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 the DFS in light of those disclosures.