

2 September 2020

FYI VALIDATES CONTINUOUS CALCINATION PROCESS ON HPA PILOT PLANT PRODUCTS

Key points

- *FYI's Stage Two continuous pilot plant HPA product sent to USA for independent analysis*
- *Specialist laboratory in USA confirm analysis results for ultra-high purity alumina of > 99.99% from continuous calcination*
- *Specialist laboratory also confirms batch calcination results for HPA of 99.995% alumina*
- *Test results continue to meet FYI's pilot plant operational expectations*
- *Results further validate FYI's innovative process design for HPA production*
- *Customer commentary from previous trials states FYI HPA meets the reliability and quality requirements of its intended application*
- *Trial HPA product to be sent to potential customers for follow up product qualification*
- *Further stages of improvement currently being planned*



Figure 1: FYI Resources Continuous Furnace in Operation

FYI Resources Ltd (**ASX: FYI**) is pleased to announce the analytical results from the recently completed Stage Two continuous trial production of high purity alumina (HPA) from the Company's pilot plant (see ASX announcement 3 August 2020). The results received averaged > 99.99% Al₂O₃, meeting FYI's target grade expectations.

Following the successful Stage Two pilot plant production, HPA samples were submitted for high level Glow Discharge Mass Spectrometry (GDMS) analysis to EAG Laboratories in New York, USA.

Commenting on the pilot plant HPA analysis, FYI Managing Director, Roland Hill, said "The results from the Stage Two pilot plant trial are particularly pleasing as the purity has continued to meet our target expectations. The results reinforce the validation of our innovative flow sheet design and the sound technical principles upon which we have based our HPA strategy as demonstrated in our recently published DFS.



We are now freighting requested parcels of our HPA to selected potential customers for continued qualification. We look forward to working closely with the various groups through their individual assessment process".

Next Steps

The Stage Two trial product, having now passed FYI's internal quality control and quality assurance testing, will be packaged up to the various potential customer requested requirements and forwarded to them for further in-depth qualification.

Approximately half of the material will be retained by FYI for supplementary finishing work which was specifically requested by certain prospective customers. FYI will complete this work prior to forwarding to these parties. This additional work is viewed as "value-add" to the customers which will facilitate a more effective qualification pathway.

Further Process Improvements

Based upon the learnings from this recent continuous calcination run, further stages of improvement are being planned to potentially improve upon the excellent results achieved to date.

Independent EAG laboratories GDMS results are shown in the table below:

	GDMS Batch	GDMS Continuous (kinetic samples)
Sample #	Al ₂ O ₃ %	Al ₂ O ₃ %
1	99.995	99.988
2	99.997	99.989
3	99.994	99.989
4	99.993	99.991
5	-	99.991
6	-	99.992
7	-	99.992
8	-	99.991
9	-	99.991
10	-	99.988
Average	99.995	99.990

HPA Product Qualification

Product qualification is the process in which end users assess the performance, quality, purity and over-all suitability of our HPA to evaluate if the product meets certain performance criteria stipulated in contracts, regulations, or specifications.



The commentary received from potential customers regarding FYI's Stage One HPA trial production is that our material was very well accepted, exceeding the quality and purity requirements for the applications for which it was assessed. FYI is delivering sample product to potential customers specialising in several industries that utilise HPA – but are focusing on the sapphire glass, LED and electric vehicle (EV) battery segments.

Authorised for release by Managing Director, Roland Hill.

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About FYI Resources Limited

FYI is developing a long life, fully integrated, high quality, high purity alumina (HPA) production project for both general and traditional consumer markets. FYI's corporate objective is to position itself to be a significant producer of HPA within these rapidly developing markets which include applications in LED, electric vehicle batteries, smartphone and television screen as well as other associated high-tech product markets.

On the basis of its recently released DFS and the robust economic business case for production of HPA, FYI's Cadoux project, 220kms north-east of Perth in Western Australia, entails controlled production of a 100%-owned feedstock source, mined on a schedule to match supply requirements of a proposed refinery at Kwinana, south of Perth. FYI's ability to control the fully integrated process should ensure product quality, consistency and provenance – an increasingly important product selection criteria for customers who rely on knowing the origins and record of ownership in a product's supply chain.

The foundation of FYI's HPA strategy is the innovative and integrated processing flowsheet utilising moderate temperature and atmospheric pressure technologies. These factors combine resulting in world class HPA project potential.

Competent Persons Statements

Metallurgy

The information in this report that relates to metallurgy and metallurgical test work is based on information reviewed and compiled by Mr Daryl Evans, a Competent Person who is a Fellow of the Australian Institute of Mining and Metallurgy (AusIMM). Mr Evans is an employee of Independent Metallurgical Operations Pty Ltd, and is a contractor to FYI. Mr Evans has sufficient experience that is relevant to this style of processing and type of deposit under consideration, and to the activity that he has undertaken to qualify as a Competent Person as defined in the 2012 Edition of the "Australasian Code for the Reporting of Exploration Results, Mineral Resources and Ore Reserves". Announcements in respect to previous metallurgical results are available to view on the Company's website at www.fyiresources.com.au.



JORC Code, 2012 Edition – Table 1

Section 1 Sampling Techniques and Data

Criteria	Commentary
Sampling techniques	<p>Drilling sampling was previously reported (ASX: 9.7.2018).</p> <p>Metallurgical test work applied to the recovered drilling samples is intended to determine aluminium leach and precipitation characteristics of the kaolin. Sample preparation and metallurgical test work was performed by Independent Metallurgical Operations Pty Ltd (IMO) in Perth, Western Australia.</p>
Drilling techniques	Previously reported (ASX: 9.7.2018).
Drill sample recovery	Previously reported (ASX: 9.7.2018).
Logging	Previously reported (ASX: 9.7.2018).
Sub-sampling techniques and sample preparation	<p>Drilling sampling was previously reported (ASX: 13.3.2019).</p> <p>The sampling techniques for the metallurgical test work was in line with industry standards in determining composite samples representative of the resource. This included drying and splitting of individual samples and then compositing into representative samples.</p> <p>The sampling procedures were under the control of qualified and experienced IMO employees and considered adequate for the intended metallurgical test work.</p> <p>Master composite samples were prepared representing the Cadoux resource with alumina feed grades ranging from 21.5% to 21.2% but with variable deleterious materials to test the upper limits of the flowsheet design.</p> <p>The composites underwent a stage of attritioning with the products screened to generate fine and coarse size fractions.</p> <p>The fine attritioned product underwent one stage of calcination to convert kaolin clay to metakaolin. The calcined product was leached with hydrochloric acid at temperature.</p> <p>The leach liquor underwent a series of precipitation stages, involving hydrogen chloride gas being sparged through the leach liquor allowing the precipitation of solid aluminium chloride.</p> <p>Conversion of the final solid aluminium chloride to alumina involved a two-stage calcination process with the final product achieving ranges from 99.9971% to 99.9981 % Al₂O₃ purity.</p> <p>Sizes and representative nature of the samples is considered appropriate.</p> <p>All procedural work and preparation was conducted under strict controls and supervision. All testwork was conducted under test conditions by qualified and experienced technicians and overseen by qualified managers including Mr Alex Borger and Mr Daryl Evans (Independent Metallurgical Operations Competent Person).</p>
Quality of assay data and laboratory tests	Analysis for the leach test work was deemed appropriate for the detailed test work as it was undertaken in laboratory environment with precision equipment and included worldwide accepted controls.



Criteria	Commentary
	Metallurgical reviews and testwork has been overseen and approved by Mr Alex Borger – Metallurgical Project Manager and Metallurgical Competent Person – Mr Daryl Evans.
Verification of sampling and assaying	<p>The metallurgical test work was supervised by suitably qualified personnel under laboratory conditions.</p> <p>Primary data is captured on paper in the laboratory and then re-entered into spreadsheet format by the supervising metallurgist, to then be loaded into the company's database.</p> <p>No adjustments are made to any assay data.</p>
Location of data points	All samples used in the metallurgical test work have been accurately recorded by the laboratory technician and checked by the supervising metallurgist.
Data spacing and distribution	Industry standard sample distribution and source material representation methodology has been applied.
Orientation of data in relation to geological structure	Industry standard sample distribution and source material representation methodology has been applied. The risk of sample bias is considered to be low.
Sample security	All samples were under supervision at the laboratory. All residual sample material is stored securely in sealed bags.
Audits or reviews	Mr Evans has reviewed QAQC results and found these to be acceptable.

Section 2 Reporting of Exploration Results

Criteria	Commentary
Mineral tenement and land tenure status	Previously reported (ASX: 9.7.2018).
Exploration done by other parties	Previously reported (ASX: 9.7.2018).
Geology	<p>The project area is underlain by weathered granitoid Archaean rock of the Yilgarn Granites is the likely parent material for the kaolin. Here, deep weathering of the feldspathic and ferromagnesian minerals within the metamorphosed granitic has resulted in the formation of kaolinite. There is no outcrop but recognizable granitoid fragmental rocks are sometimes present just below surface. The crust of the overburden comprises gravel and sands over reddish to off white clay. White kaolin underlies the overburden followed by weathered, partial oxidised and then fresh granitoids at depth. The recent drilling at the property has revealed a weathering profile which is very common in Western Australia with the granitoid rocks, deeply weathered forming a leached, kaolinized zone under a lateritic crust. Analysis at the Laboratory shows particle size distributions are typical of "primary style" kaolins produced from weathered granites. The crust of overburden comprises gravel and sands over reddish to off-white clay to an average depth of 5m. White kaolin then averages approximately 16 m before orange to yellow sandy and mottled clays are intersected which are followed by recognizable rounded granitoid material. The thickness of the kaolin profile varies from less than 1m to a maximum of 28m. Fresh granitoids are found at depths of between 10 and 30m. All kaolin resources are within 4 to 11 metres of the surface. All holes are drilled vertically. Intersected kaolin thickness ranges from 4-28m.</p>
Drill hole Information	Sample and drill hole coordinates are provided in market announcements.



Criteria	Commentary
Data aggregation methods	The nature of the metallurgical testwork did not require data aggregation, however all data points were noted and recorded in the appropriate data base to be used in continued test work and product development.
Relationship between mineralisation widths and intercept lengths	Previously reported in detail (ASX: 9.7.2018).
Diagrams	Project related diagrams are presented in various previous ASX announcements released to the market at the relevant time.
Balanced reporting	The reporting is considered to be balanced.
Other substantive exploration data	<p>Metallurgical test-work is being conducted on composite kaolin samples by IMO. IMO are following a standard diagnostic flowsheet template to determine aluminium leaching and precipitation characteristics of the kaolin.</p> <p>The test work involves the following procedure of composited kaolin samples of the latest drilling program (see FYI ASX announcement dated 9th June 2018)</p> <p>The sample was calcined at for one hour to convert the Kaolin to an acid soluble species. The sample was then leached in 26% (w/w) Hydrochloric acid at 20% solids and 100°C for 180 minutes with samples being collected to provide kinetic leach recoveries.</p> <p>Leach testing was conducted in a glass leach vessel containing concentrated feed sample scalped at 106 µm and concentrated industrial grade hydrochloric acid.</p> <p>The high grade variable Al₂O₃ samples was generated by combining phase 1 precipitate solids from previous testing to determine the aluminium chloride hexahydrate crystal size.</p> <p>The solids underwent additional stages of precipitation testing with intermediate Distilled Water leaches to resolubilise the aluminium chloride hexahydrate.</p> <p>The HPA assays were conducted by GDMS analysis at EAG Laboratories in New York, USA.</p>
Further work	As a result of the successful definitive feasibility (DFS) outcomes (released March 2020) continued metallurgical test work will be undertaken to optimise FYI's HPA flowsheet design, materials of construction and handling etc to be incorporated into the project final engineering design (FEED) and will be announced to the market as required.