

## ASX RELEASE

6 February 2017

ASX: ARU



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# BENEFICIATION PILOT PLANT DELIVERS EXCELLENT RESULTS

- **Piloting results confirmed by independent third party**
- **Data suitable for final design**
- **Preparations for next stage of flowsheet piloting underway**

**Arafura Resources Limited (ASX: ARU, “Arafura” or the “Company”)** is pleased to confirm the excellent results previously announced from piloting of its beneficiation flowsheet for its 100 per cent-owned Nolans Neodymium-Praseodymium (“NdPr”) Project in the Northern Territory (ASX: ARU 15/12/16; “Nolans Beneficiation Piloting Complete”).

Following a comprehensive review of the performance and results from the piloting operation by independent engineering firm SNC-Lavalin, Arafura can now confirm that sufficient process engineering data has been generated to support whole-of-ore flotation as the basis of design for the beneficiation plant in the Nolans Final Feasibility Study. The Company has demonstrated the metallurgical process and test methodology in a way that satisfies SNC-Lavalin.

The beneficiation pilot plant is the first stage of Arafura’s final piloting of the Nolans process flowsheet announced in mid-2016 (ASX: ARU 28/06/16; “Project Review Completed Delivering Significant Cost And Operational Benefits”). The pilot collected comprehensive and reliable operational and materials handling data for mass balancing and to build process design criteria, to enable final plant design and cost estimates for the beneficiation flowsheet.

Specialist equipment vendors also attended the pilot operation to test the thickening and filtration performance of the concentrate and tailings and assess applicability to the final design. Work is continuing with other process equipment vendors and data collected from this work will be incorporated into the detailed engineering study.

The piloting operation, which was hosted at ALS Metallurgy’s facility in Perth, successfully produced approximately 5 tonnes of a clean high-phosphate concentrate (“HPC”). Its characteristics are outlined in the table on the following page. The total rare earth oxide (“TREO”) and phosphate (“P<sub>2</sub>O<sub>5</sub>”) grade and recovery, together with rejection of iron (“Fe<sub>2</sub>O<sub>3</sub>”) and aluminium (“Al<sub>2</sub>O<sub>3</sub>”), confirm Arafura’s bench-scale test programs and validate the flowsheet changes announced in mid-2016. The design of the flowsheet leverages the resource’s endowment in phosphate-rich material types that feature enhanced concentrations of the key magnet-feed rare earths NdPr. Phosphoric acid is used as the prime leaching reagent for these material types and excess phosphoric acid is generated as a co-product.

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	Feed	HPC
<b>TREO Grade</b>	4.7%	<b>7.0%</b>
<b>TREO Recovery</b>	-	<b>&gt;80%</b>
<b>NdPr Oxide Grade</b>	1.2%	<b>1.8%</b>
<b>NdPr Oxide Recovery</b>	-	<b>&gt;82%</b>
<b>P<sub>2</sub>O<sub>5</sub> Grade</b>	17.4%	<b>29%</b>
<b>P<sub>2</sub>O<sub>5</sub> Recovery</b>	-	<b>&gt;90%</b>
<b>Al<sub>2</sub>O<sub>3</sub> Grade</b>	7.2%	<b>&lt;3.2%</b>
<b>Fe<sub>2</sub>O<sub>3</sub> Grade</b>	2.6%	<b>&lt;1.9%</b>
<b>Mass Pull</b>	-	<b>55%</b>

The concentrate quality comfortably meets the feed requirements for the next stage of final piloting, the pre-leach circuit. The Company has scoped the design for this next stage and has awarded a contract for the work which will commence at SGS Australia in the coming weeks, and is expected to be completed by mid-2017.

A link to a video of the beneficiation pilot plant in operation can be found on the Company's website [www.arultd.com](http://www.arultd.com).

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## **Technical Information**

### **Operation**

The flotation pilot operated continuously for approximately 84 hours during 29 November-3 December 2016.

A bulk composite of the resource's phosphate-rich material types representing the first ten years of mining at Nolans was crushed and ground in a closed loop mill to produce a p80 of 150µm. The circuit comprised four flotation banks with four 25-litre cells per bank used as the rougher scavenger circuit capable of feeding 150 kilograms of milled feed (at 25% solids) per hour. The circuit was equipped with heating tanks to pre-heat the feed to 40°C and conditioning tanks for dosing the key depressant and collector reagents.

The final tailings slurry and concentrate froth were collected in separate storage tanks and filtered using a plate and frame filter press.

### **Results**

XRF assays of control and survey samples acquired over the duration of the pilot program were well aligned and provided confidence in validating flotation process performance and providing data for engineering design.

The TREO and P<sub>2</sub>O<sub>5</sub> target grades and recoveries for the beneficiation pilot were based on confirmatory bench-scale testwork completed during 2016 forming the basis of process modelling and cost estimates for the 14,000 tpa TREO output phosphoric acid pre-leach flowsheet configuration. These targets were achieved for substantial periods of steady state operation of the pilot (see above table). P<sub>2</sub>O<sub>5</sub> recovery and grade for the duration of the pilot proved resilient to flotation kinetics, changes in reagent dosage and process disturbances. The Company is confident that process parameter and depressant/collector optimization would achieve even higher TREO grade and recovery without compromising the all-important rejection of impurities.

The depressant used in the pilot program proved to be highly effective at suppressing silicates, and aluminium and iron minerals. Consequently, the program produced a concentrate with very low impurities (i.e. around 3% Al<sub>2</sub>O<sub>3</sub> and 2% Fe<sub>2</sub>O<sub>3</sub>) that is highly suitable for downstream pre-leach and extraction piloting.

