

ASX Announcement

Nolans Pilot Program Update

19 October 2017



- **Successful conclusion of first stage of Phase 4 piloting**
- **Phase 4 pilot scope expanded to de-risk future commissioning and operations**

Arafura Resources Limited (ASX: ARU) (“Arafura” or “the Company”) is pleased to provide an update on recent progress on flowsheet piloting for its 100 per cent-owned Nolans Neodymium-Praseodymium (NdPr) project in the Northern Territory.

The Nolans pilot plant program is being completed in seven phases, with each phase typically run over several days on a continuous basis. Metallurgical recovery, process control, equipment performance, materials handling and other data acquired during the conduct of individual pilot plants are being used by Arafura for full-scale plant design and in the project’s definitive feasibility study (DFS). Independent expert advice and oversight of all phases conducted to date has been provided by organisations such as SNC-Lavalin, Prayon Technologies (Prayon), and ANDRITZ Gouda.

The Company is pleased to report that the first stage of the Phase 4 pilot (Acid Bake) has been successfully concluded. Arafura’s extraction plant flowsheet achieves optimal hydrometallurgical performance using a low temperature bake (< 300°C). The tests were undertaken at a small scale to evaluate the applicability of Gouda paddle dryer equipment for Arafura’s acid bake process. This contrasts with kiln-based equipment used by other rare earth projects for their high temperature acid bake processes.

A representative of ANDRITZ Gouda attended the tests and concluded the Gouda paddle dryer would be appropriate to meet Arafura’s piloting objectives.

Phase 4 – Acid Bake Trials

Initial trials (see photos from page 3) were conducted at SGS Australia’s Perth facilities over a three-week period in October, aimed at demonstrating the capacity of the Gouda paddle dryer technology to deliver on the operational requirements of the next stage of rare earth piloting: sulfuric acid bake. A batch Gouda paddle dryer unit was used for this purpose and a representative of ANDRITZ Gouda was present during the initial period of testing to observe the unit’s performance and to de-risk the testing process. Tests were conducted to evaluate a range of operating parameters, with multiple samples collected to assess metallurgical performance and materials handling with progression

Nolans Pilot Program Update

through the baking process. Based on the operational performance of the unit, ANDRITZ Gouda has expressed confidence that the Gouda paddle dryer technology in that particular configuration is appropriate for demonstrating the acid bake function.

These trials consumed around 100 kilograms of NdPr-rich pre-leach residue (PLR) generated during the Phase 2 pilot program.

Whilst confident in the success of the acid bake trials, the Company believes it to be prudent to expand the scope of Phase 4 piloting to:

- Gather further operational and design data;
- Provide the opportunity to test alternative equipment to diversify supplier reliance; and
- De-risk future commissioning and operation of the extraction plant flowsheet.

The Company now intends to demonstrate this process at a larger scale which will consume all of the PLR (two tonnes) that was produced in the Phase 3 pilot (Bulk Pre-Leach). Phase 4 piloting is now expected to be completed in the first quarter of next year. A final investment decision (FID) on the Nolans project is anticipated by the end of 2018 (Figure 1).

Figure 1: Nolans Pilot Program Timeline

	2016	2017	2018
Final Piloting			
1) Beneficiation	COMPLETED		
2) Phosphoric Acid		COMPLETED	
3) Bulk Pre-Leach		COMPLETED	
4) Acid Bake			
5 & 6) Rare Earth Extraction			
7) Rare Earth Separation			
Definition Stage Engineering			
Final Investment Decision			

Confirmatory Test for Phases 2 and 3 (Phosphate Extraction and Bulk Pre-Leach)

On completion of the Phase 2 pilot plant (Phosphate Extraction), a sample of dilute phosphoric acid was shipped to Prayon in Belgium to pilot the final step in producing merchant grade phosphoric acid (MGA). This pilot resulted in a good quality MGA product that is suitable for the production of higher grade fertilizers such as diammonium phosphate (DAP).

In addition, a small pilot of the phosphoric acid regeneration circuit (Phase 3) was conducted at SGS Australia's Perth facilities to revisit the deportment of rare earths to gypsum waste. This pilot work was successful in demonstrating a 24% reduction in the overall TREO (total rare earth oxide) losses to gypsum relative to the previous guidance of 4% (refer to ASX announcement 10 July 2017).

Nolans Pilot Program Update

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Gouda Paddle Dryer Setup



Paddle Dryer Internals



Pre-Leach Residue (PLR) Feed to Acid Mix



Nolans Pilot Program Update

Acid Mix



Acid Mix to Acid Bake



Mixing During Acid Bake Showing Visible Paddles

