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# QUARTERLY REPORT TO 30 SEPTEMBER 2016

## HIGHLIGHTS

- Austpac continues to progress the draft licence and investment agreement with a company which has a significant heavy mineral resource in Asia to use the ERMS SR synrutile process. The company plans to beneficiate the heavy minerals and produce ilmenite, rutile and zircon. It also plans to add value to the ilmenite by producing high grade synrutile which it intends to sell as feedstock for the titanium sponge industry. Minor modifications were made to the agreement during the quarter and it is anticipated it will be signed once final approvals are obtained.

- The original Newcastle Iron Recovery Plant (NIRP) was designed to recycle iron oxide and iron chloride by-products from the steel industry (mill scale, furnace dust and spent pickle liquor) and recover iron and hydrochloric acid (HCl). An electric arc furnace (EAF), which smelts scrap iron to make steel, produces dusts (EAFD) which contain iron oxide and also have high levels of zinc. Recovery of the zinc has been problematic as EAFD is difficult to recycle. Over the past year, Austpac investigated the possibility of combining zinc recovery with the Company's iron and acid recovery processes and has developed a novel way to integrate the well-proven zinc electrolysis currently used in global zinc refineries into the Newcastle Zinc & Iron Recovery Plant (NZIRP).

- A mass balance of inputs and outputs for the integrated process has been developed and preliminary estimates of the capital and operating costs for an integrated flowsheet indicate this option will be viable. The use of proven technology will also lower the commercial risk.

- Detailed estimates of capital and operating costs are now being refined and potential sources of raw materials for the NZIRP are being reviewed to develop an economic model to fit the requirements of the current Australian steel industry. An option under consideration is to complete the iron and acid recovery plant, which would significantly reduce the initial capital requirement, and once the plant is cash flow positive, the zinc recovery circuit would be added.

- A patent application to cover Austpac's new recycling process to recover zinc, iron and hydrochloric acid is in the final stages of preparation and will be lodged in November 2016.

- Over 60% of the 87 million tonnes of steel produced in the USA each year is made using EAFs, so the potential for a process to recycle hundreds of thousands of tonnes of waste EAFD is significant. Austpac continues to advance discussions with a group of influential companies in the USA who recognise that Austpac's technologies create an immediate business opportunity and who are awaiting confirmation that Austpac's zinc recovery technology is viable. The group is in contact with a number of steel mills and has identified a number of suitable sites for a commercial zinc-iron-HCl recovery plant in North America. We are now jointly developing a preliminary economic model for plants sited in the steel-producing areas of the northeast of the country.

- Austpac continues to discuss alternative sources of project capital for the NZIRP with a number of Australian and US corporations and finance houses.

- In October 2016, Austpac received a $266,865 R+D tax concession refund.

## NEWCASTLE ZINC & IRON RECOVERY PLANT

Primary steel is produced from iron ore by using a blast furnace (BF) and a basic oxygen furnace (BOF). The fine dust emitted from these furnaces contains predominantly iron oxide with some minor contaminants, including zinc. Testwork by Austpac before 2010 indicated it was possible to produce marketable iron with very low levels of contaminants together with strong HCl, while zinc could be removed during the iron reduction stage and captured as zinc oxide. The NIRP was designed to incorporate this process.

Steel can also be produced by melting scrap iron in an electric arc furnace (EAF). Iron scrap generally contains other metals, including zinc derived from galvanised iron, and the dust from an arc furnace contains as much as 40% Zn in the dust, occurring as zinc oxides and other zinc minerals. EAF dust (EAFD) is a hazardous waste from which it is difficult to recover the zinc. Testwork on high-zinc EAFD in the pilot plant at Newcastle showed that while an acceptable iron pellet could be produced it was not possible at that time to produce marketable zinc oxide due contamination from carbon and other impurities.

Recognising that EAFD is a significant zinc resource, Austpac has investigated hydrometallurgical zinc recovery processes that potentially could be integrated with the Company's iron and hydrochloric acid process in the Newcastle plant. It was concluded this would be possible by using zinc sulphate electrolysis used by zinc refineries worldwide and the flowsheet was modified so that the NZIRP will be able to produce zinc metal, pig iron and strong hydrochloric acid. Preliminary capital and operating costs for the NZIRP indicate that the plant will be viable and the use of proven technology will reduce the commercial risk.

The current sources and amounts of raw materials for the NZIRP from the Australian steel industry are being reviewed to develop an economic model for the project. One option being considered is a two-stage development, whereby the iron and acid recovery section of the plant would be completed first to reduce the initial capital cost, and once the plant is generating a positive cash flow, the zinc recovery section would be added.

## ONGOING DEVELOPMENTS IN THE USA

During the first quarter of 2016, Austpac was approached by and commenced discussions with a group of influential companies in the USA who recognised that Austpac's technologies create an immediate opportunity to recycle EAFD in that country. The US steel industry produces 87 million tonnes of steel, over 60% of which comes from electric arc furnaces. The group has been waiting for Austpac to confirm that the new zinc recovery process was technically feasible, and has during the quarter been in contact with a number of mills and has identified a number of sites in the steel producing region in the northeast of the country.

The parties are now jointly developing a preliminary economic model for commercial zinc-iron-HCl recovery plants in North America.

## ERMS SR SYNRUTILE TECHNOLOGY LICENCE

During the first half of 2016, Austpac was approached by a company with a significant heavy mineral resource in Asia regarding a licence to use the Company's ERMS SR synrutile process. The company plans to develop a mine and a mineral separation plant to produce ilmenite, rutile and zircon, and is seeking technology to add value to the ilmenite. A draft licence and investment agreement has been negotiated under which the company can build a plant to beneficiate the ilmenite and produce high grade synrutile, which the company intends to sell as feedstock for the production of titanium sponge, an intermediate process in the manufacture of titanium metal. The company plans to undertake a scoping study followed by a bankable feasibility study, and it will establish an entity to manage the construction and operation of an ERMS SR Plant.

Minor modifications were made to the agreement during the quarter and the company now only awaits final approvals in order to sign the agreement.

## EL 5291 NHILL

In June 2016, Austpac executed a Grant Agreement with the State of Victoria as represented by its Department of Economic Development, Jobs, Transport and Resources. The grant is part of the Victorian Government's TARGET initiative to co-fund innovative exploration in the western part of the state. Austpac will be assisted financially to undertake a geophysical and drilling program within the Company's Exploration Licence 5291. Ground magnetic and gravity surveys have been completed and computer modelling is underway. This will be followed with a deep drill hole through over 100 metres of younger Murray Basin sediments to obtain core from deep within the basement to test for porphyry copper-gold and volcanic-hosted massive sulphide systems.

### Mining Exploration Entities:

EL 5291 (Nhill); Located between Nhill and Dimboola, Victoria; 100% Austpac Resources N.L.

## For further information please contact:

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*NOTE: This report is based on and accurately reflects information compiled by M.J. Turbott who is a Fellow of the Australasian Institute of Mining and Metallurgy and a Fellow of the Australian Institute of Geoscientists and is a competent person as defined in the Australian Code for Reporting of Identified Mineral Resources and Ore Reserves.*

### About Austpac Resources N.L. (ASX code: APG)

Austpac Resources N.L. [ www.austpacresources.com ] is a minerals technology company currently focused on recycling waste chloride solutions and iron oxides produced by steelmaking to recover hydrochloric acid and iron and zinc. Austpac's technologies also transform ilmenite into high grade synthetic rutile, a preferred feedstock for titanium metal and titanium dioxide pigment production. The Company has been listed on the Australian Stock Exchange since 1986.