



# MARDIE SALT: POSITIVE PFS PROGRESS

- Positive PFS milestones achieved, with completion targeted in Q2 2018
- Industry experts forecast up to 60Mtpa salt demand growth over the next decade in Asian chlor-alkali and soda ash industry (equivalent to two Mardie sized projects every year for the next 10 years)
- Mardie environmental studies by reputable environmental experts (Stantec, Phoenix and RPS) delivered positive results
- Extensive geotechnical investigations completed by BCI and Land & Marine Geological Services confirm the suitability of a large area for construction of unlined ponds
- Cape Preston East Port designs progressed by Cardno to integrate covered salt stockpile and conveyors with iron ore facilities
- Contract being finalised with international firm for best practice design of a salt processing and purification plant
- Contract awarded to leading German engineering group, K-UTEC, for detailed investigations into the production of valuable by-products (including sulphate of potash)

BCI Minerals Limited (ASX:BCI) ("BCI" or the "Company") is pleased to provide an update on the Pre-Feasibility Study ("PFS") progress for its 100% owned Mardie Salt Project in the Pilbara region, Western Australia.

The Mardie Salt Project is favourably located in Australia's major salt producing region, where four operations owned by Dampier Salt (Rio Tinto, Marubeni and Sojitz) and Mitsui have a total production capacity of approximately 13 million tonnes per annum ("Mtpa"). The Mardie site presents the key prerequisites for production of salt from solar evaporation, being: (1) natural channels feeding a brine source (sea water) to the project area; (2) a hot dry and/or windy climate with a long and predictable dry season; and (3) a large area of flat land with low permeability that is suitable for the construction of evaporation ponds.

BCI completed a positive Scoping Study for the project in July 2017, demonstrating the potential technical and economic viability of a 3.0-3.5Mtpa operation producing high purity industrial-grade sodium chloride salt from seawater via solar evaporation, crystallisation and raw salt purification (refer to BCI ASX announcement dated 18 July 2017).

Over the past six months, BCI has made significant progress on the PFS, completing material environmental, heritage and geotechnical activities. The completed works provide further validation of the viability of the Mardie Salt Project and have informed the design and engineering work required to finalise the PFS in coming months.

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GPO Box 2811 West Perth WA 6872 Commenting on the PFS progress, BCI Managing Director, Alwyn Vorster, said: "The Mardie Salt Project has been created from point zero in 2012 by BCI's predecessor company, Iron Ore Holdings, and has now been progressed to be a focus project for BCI. During the next year, BCI plans to advance feasibility studies and consider partnerships ahead of a final investments decision. Mardie is another live example of the BCI business model of value creation through discovery, de-risking and transactions."

### Salt Market Commentary

BCI is planning to produce a high purity salt for use in industrial applications, specifically targeting the Asian market where there is excellent potential for the Mardie Salt Project to supply into a growing market. Industry expert, Roskill, is forecasting salt consumption in the Asian chlor-alkali and soda ash industries to grow by approximately 4.3% per annum from ~110Mtpa in 2016 to ~170Mtpa by 2026.<sup>1</sup> This total demand growth of ~60Mtpa over 10 years would require increased supply that is equivalent to approximately two new Mardie sized operations each year.

#### Environmental Studies

The environmental studies completed have greatly improved BCI's understanding of the local and regional environment. The studies are de-risking the development case by informing project optimisation work to be completed for the PFS that focusses on maintaining the biological diversity and ecological integrity of the local and regional environments, which is integral for securing necessary environmental approvals.

The studies completed to date include Benthic Communities and Habitats Assessment (algal mat and mangal communities), Potential Acid Sulphate Soils Assessment, Flora and Vegetation Reconnaissance and Desktop Assessment, Terrestrial Fauna Reconnaissance and Desktop Assessment, Hydrological Surface Water Assessment and Storm Surge Modelling. These studies have been conducted by reputable environmental experts including Stantec, Phoenix Environmental Sciences and RPS Group.<sup>2</sup>

BCI will initiate formal assessment of the project under Part IV of the *Environmental Protection Act* (1986) in February 2018, commencing with referral of the project to the Department of Water and Environmental Regulation ("DWER").

# Heritage Surveys and Traditional Owner Engagement:

BCI has long standing and strong relationships with the Yaburara Mardudhunera ("YM") and Kuruma Marthudunera ("KM") Native Title claim groups. Existing agreements are in place with both groups which cover the Mardie Salt Project.

In late 2017, BCI completed a heritage risk assessment of the project area which demonstrated that the project can be implemented with minimal impact to the heritage values in the area. BCI will continue to work with the YM and KM to ensure project design is sympathetic to the heritage values of both groups.

<sup>&</sup>lt;sup>1</sup> Source: Roskill's Global Industry, Markets & Outlook 2017 report for salt.

<sup>&</sup>lt;sup>2</sup> More information on BCI's consultants can be found at <u>www.stantec.com</u>, <u>www.phoenixenvironmentalsciences.com.au</u> and <u>www.rpsgroup.com</u>.

#### Geotechnical Investigations

Infill geotechnical investigations have been completed by BCI with support from Land & Marine Geological Services<sup>3</sup> utilising multiple methods to validate previous test work and increase the geotechnical understanding of the 100km<sup>2</sup> mudflat area. Test work completed includes Double Ring Infiltration tests, laboratory sizing analysis, Emerson classification, Atterberg Limits, particle size distribution, Dynamic Cone Penetrometer tests and Shear Vane tests. Regional photo interpretation of geology has also been completed to identify potential materials for construction.

These investigations confirm that the mudflats have a clay layer with low permeability which is suitable for the construction of solar evaporation ponds and crystallisers, without the costly requirement of lining the ponds.

#### Project Engineering

Designs of the solar evaporation ponds and crystallisers are being optimised based on outcomes of the completed geotechnical investigations, environmental studies and heritage studies. Other inputs into the design optimisation work include results from sea water samples collected from potential sea water pump station locations, data from survey control points that have now been established across the 120km<sup>2</sup> project area and the validated topographical data base.

Cape Preston East Port design work has been progressed by engineering consultant Cardno Limited, demonstrating that salt export facilities can be integrated into BCI's proposed iron ore export infrastructure for the Buckland Project. The design incorporates enclosed storage sheds and conveyers and a separate salt shiploader to maintain the integrity of the high purity salt product. More information on Cardno can be found at <a href="http://www.cardno.com">www.cardno.com</a>.

#### Award of Key Technical Contracts

A contract is being finalised with a reputable and experienced European firm for the design of a salt processing and purification plant which is capable of producing high purity salt for use in industrial applications, such as in chlor-alkali and soda ash production.

K-UTEC AG Salt Technologies ("K-UTEC") has been engaged to conduct detailed investigations into bitterns processing to create valuable by-products including sulphate of potash. The potential for additional products represents a material upside opportunity that was not factored into the Scoping Study and also has the potential to reduce the environmental impact of the project.

K-UTEC is a German-based engineering and research company engaged in the exploration of salt deposits, and extraction and treatment of salts and brines. In these fields, K-UTEC has been operating worldwide for 60 years. More information on K-UTEC can be found at <u>www.k-utec.de/en.html</u>.

<sup>&</sup>lt;sup>3</sup> More information on Land & Marine Geological Services can be found at <u>www.lmgspl.com.au</u>.

#### Potential Project Timeline

BCI is targeting completion of the PFS during Q2 2018. Subject to positive PFS results, BCI would then consider proceeding with a Feasibility Study, with completion targeted in the first half of 2019. This may allow construction to commence during the second half of 2019, with first export of salt product in 2022.

-ENDS-

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# APPENDIX

Figure 1: Mardie Salt Project Location



Figure 2: Salt Forming Naturally on the Mardie Salt Project Mudflats



Figure 3: Geotechnical Investigations (Double Ring Infiltration Tests)



Figure 4: Artist's Impression of the Cape Preston East Port Layout



# **ABOUT BCI MINERALS**

BCI Minerals Limited (ASX:BCI) ("BCI") is an Australian-based resources company that is creating value from its attractive portfolio of mineral interests through discovery, de-risking and transactions. BCI's portfolio currently includes interests in iron ore, salt, potash and gold projects.

Iron Valley is an operating iron ore mine located in the Central Pilbara region of Western Australia, which is operated by Mineral Resources Limited (ASX:MIN). Iron Valley is generating quarterly royalty earnings for BCI (A\$18.3M EBITDA in FY17).

BCI's is currently focused on advancing two 100% owned projects, Buckland Iron Ore and Mardie Salt, which are both planning to export product through BCI's proposed 20Mtpa Cape Preston East Port facility.

Buckland is an iron ore development project located in the West Pilbara region of Western Australia, comprising proposed mines at Bungaroo South, Kumina and other deposits. BCI is currently progressing an Integration Study on a 15Mtpa operation and plans to involve development and offtake partners in a joint venture structure.

Mardie is a salt project located on the West Pilbara coast in the center of Australia's salt production region. BCI has completed a positive Scoping Study on a solar evaporation operation producing 3.0-3.5Mtpa salt and a Pre-Feasibility Study is due for completion in the first half of 2018.

In addition to these focus projects, BCI is a joint venture partner of Kalium Lakes Limited (ASX:KLL) in the Carnegie Potash Project, which is currently at a Scoping Study stage.

BCI is progressing gold and base metals exploration on its 100% owned Marble Bar, Black Hills and Peak Hill tenements in Western Australia.

The Company's portfolio also includes potential royalties over the Nullagine, Koodaideri South and Extension tenements.

# **KEY STATISTICS**

Shares on issue:	395.0 million	
Cash and cash equivalents:	\$23.6 million	as at 30 September 2017
Board:	Brian O'Donnell	Non-Executive Chairman
	Alwyn Vorster	Managing Director
	Michael Blakiston	Non-Executive Director
	Jenny Bloom	Non-Executive Director
	Martin Bryant	Non-Executive Director
	Andy Haslam	Non-Executive Director
Major shareholders:	Wroxby Pty Ltd	27.7%
Website:	www.bciminerals.com.au	