



# Razorback

a newsletter for Royal's shareholders & stakeholders

## Icebergs South of Yunta

**Even as a geologist, sometimes it's hard to picture icebergs south of Yunta, especially on a 45°C summer's day in the field, but such were the environmental conditions under which the sediments were laid down and iron introduced into Razorback.** The time was the Neoproterozoic, 700 - 750 million years ago, and the world was not a particularly nice place to live.



*Modern day Iceberg with boulder on top*

The Adelaide Geosyncline, within which the Razorback Deposit and the spectacular Flinders Ranges are situated, is a good place to see evidence of ancient rocks deposited during a period of major glaciation. These key glacial events, which are believed to be global in nature, are often referred to as the "Snowball Earth" era, where nearly the entire earth ("Slushball") was frozen. In fact, it was University of Adelaide geologist and Antarctic explorer, Sir Douglas Mawson, who first identified the glacial sediments in South Australia and was the first to come up with the idea. The "Snowball Earth" theory is hotly debated in the geological world, but what is clear is that there are large successions of rocks worldwide from the Neoproterozoic which show clear evidence of glaciation.

How do we know the rocks at Razorback were glacial in origin? One clue is the erratically placed boulders present in the siltstones referred to as "diamictites". When glaciers advance, they do so with great force and take anything in their way, which can include large boulders the size of Toyota utes. During periods of glacial retreat and sea level rises, the ice begins to break up and icebergs float out to sea. As the icebergs melt, the rocks contained within the ice drop to the sea floor. In geology, these are known as "dropstones".



*Razorback Tillite with dropstones*

How does this fit in with iron at Razorback? Well, during periods of glaciation there was an accumulation of iron in the seawater, derived from volcanic activity in the ocean, similar to what you see in today's oceans. The iron stayed in solution because the ocean was anoxic due to the cold conditions and lack of circulation. When glaciers were in periods of melt and sea levels rose, this reduced Fe-rich seawater mixed with continental oxygen-rich sediment near the coast and precipitated out the iron into sediments on the sea floor. It is those sediments that now make up the spectacular Braemar Iron Formation!



ROYAL  
RESOURCES LIMITED

### Important Dates

**31 January: First Quarter Activities Report**

### Royal in the spotlight

**Royal AGM, 28 November, 2013**

**Royal Resources teams up with Braemar Infrastructure on South Australian iron ore export solution, Adelaide Advertiser, 25 September, 2013**

**Premier's Community Excellence Awards: Excellence in Supporting Community Participation, May 2013**

**Farmers and explorers working together SA Mines and Energy Journal, Issue 27**

**Healthy Mind Calendar: The Mid North Broadcaster 6 Feb, 2013**

**Royal Resources' Razorback project on track, Adelaide Now, 30 January, 2013**

**Next Top Mining Shares, A.Trench and D.Packey, 2012**

**Australian Mining Prospect Awards "Explorer of the Year, 2011"**

**Diggers & dealers Industry Awards "Best Emergent Company, 2010"**

### Contacts

**Royal Resources Limited  
PO Box 1014, Canning Bridge,  
Applecross, WA, 6153**

**P +61 (0)8 9316 1356**

**E [info@royalresources.com.au](mailto:info@royalresources.com.au)**

**W [royalresources.com.au](http://royalresources.com.au)**

**ASX Code: ROY**

**Keep up to date with your company:  
join our mailing list on our website.**

## Royal in the community

**Environmental monitoring at Razorback is all part of the job.** As part of Royal's plan for Razorback to develop into a mine, it first requires a Mining Lease. Substantial work is being undertaken on the impacts on the community and the environment in support of a mining lease application. Royal has ongoing environmental studies around the proposed mine area, including flora and fauna surveys, baseline noise and dust surveys, and soil and rock tests for potential acid mine leach. Groundwater studies will commence in the coming year. Royal has also recently installed two weather stations around the Razorback Ridge area.

Spring and Winter baseline surveys have been carried out on Razorback to monitor the change in flora and fauna growth and numbers over the different seasons. These studies seek to identify the presence and approximate number of plants and animal life in the area. Here, animals are collected by the use of nonlethal traps placed around the site. Once trapped, biologists identify and record the species before releasing, to later compile a model of the local ecosystem. Three surveys have now been completed, with results suggesting no impediment to development exists.

### Did you know.....

*Magnetite crystals are widely found within the brains of animals. The crystals are believed to act as biological compasses aiding navigation by identifying polarity and inclination of the Earth's magnetic field.*



*Weather station at Razorback*

Two weather stations were installed and fully commissioned for use in June this year. These solar powered, automated weather monitoring systems were placed on the northern

### MagFax

*Per tonne, magnetite concentrate saves about 108 kilograms of CO<sub>2</sub> emissions when compared to DSO (haematite) fines due to its purity, hence its recognition as a premium iron product.*

and southern extents of the RPIP and make measurements of wind direction and speed, temperature and humidity and also solar radiation and rainfall every minute.

The data recorded is collected to form a complete picture of the local ecosystem and climate, and help in monitoring the potential impact of mining on local plants and wildlife so that we may better manage any disruption.

The results of these studies are a component of a much larger mining lease proposal, which is presented to DMITRE, as well as other stakeholders, before approval.

### Outcrop: Philip Crabb

**Philip Crabb, Non-Executive Chairman**, has been actively engaged in mineral exploration and mining for over 40 years. He has been closely associated with numerous private companies and floated many public companies, notable amongst these being Maitland Mining, Great Central Mines, Gascoyne Gold, Pilbara Mines and United Mining Corporation – all of which were bought out. Phil was particularly successful with the Plutonic Bore and Yilgarn Star gold mines. He has considerable experience in field activities, having been a drilling contractor, quarry manager and mining contractor. Phil is also currently chairman of Thundelarra Exploration and a Director of TSX-V listed Aldershot Resources. In his spare time Phil is a mad West Coast Eagles and Claremont Tigers Supporter,

having played for both South Bunbury and Claremont, and is the Vice Patron of the Claremont Football Club. He freely contributes his time and resources to a number of charitable causes, chief amongst them being Balya Self Help and Awareness Inc and the Cancer Foundation (WA). Phil was born in Kalgoorlie, the Hall of Fame there honouring his achievements, and schooled in Bunbury. With his wife June, Phil has three daughters and five grandchildren and has only recently retired from breeding horses and cattle at the couple's stud farm at Boddington, WA.



## Marcus' Musings

**Marcus Flis**

Managing Director



**The importance of access to infrastructure is no time more important than when dealing with a bulk commodity.** Major iron deposits around the world remain uneconomic because of the lack of it. Even here in Australia we see aspiring projects stopped dead for this reason. Projects such as Rio Tinto's Simandou in Guinea, Cap-Ex's Block 103 in Labrador, and Sundance's Mbalam in Cameroon require billions of dollars just for infrastructure development.

Shareholders will have read in our 25 September announcement that Royal has teamed up with private company Braemar Infrastructure Pty Ltd to outsource its off-mine infrastructure. Transport, power, water, access road and communications will all be provided by BIPL. The plan is for BIPL to create an ongoing business by building multi-user facilities that not only enables the iron projects in the Braemar region of SA to proceed, but at a cost that will keep those projects globally competitive. Royal's Razorback Project is a foundation partner in BIPL's plans. Razorback benefits immensely from this initiative by hugely reducing the capital required to build it while at the same time ameliorating operational risk. The importance of this project has been recognised by the SA Government by awarding it Major Project Status, so not only supporting the infrastructure project, but Razorback also.

**Royal** has always been an iron bull. It is gratifying to see that, after months of negative press, analysts are realising what was always apparent: iron pricing remains buoyant, China's demand continues to grow, and investment in iron becomes attractive again. The majors certainly think so, with recent announcements re-asserting their plans for capacity expansion. This should not be seen as a threat but a vote for the future of the commodity.

I wish all our shareholders peace and health in 2014.

*Contact me if you have any comments or you would like to ask a question:  
info@royalresources.com.au*