



20 August 2013

## EXCITING PRELIMINARY METALLURGICAL RESULTS FOR BALAMA VANADIUM

### Highlights:

- Initial testwork on Balama vanadium ore shows upgrade to a 5.02% V<sub>2</sub>O<sub>5</sub> concentrate
- Further work being conducted to increase the concentrate grade through optimisation of the flowsheet
- Balama possibly has the highest grade vanadium concentrate in the world based on research by investment groups and announcements by vanadium explorers
- Balama is a significant vanadium deposit in terms of its contained V<sub>2</sub>O<sub>5</sub>. The contained vanadium (based on Balama's Inferred Resource) exceeds that of Glencore's Rhovan deposit (world's largest operating vanadium mine) by about 4 times
- Balama's high grade Mualia Zone (Inferred Resource) is about the same size and grade as Rhovan in terms of vanadium
- Work is underway to prove up much higher vanadium grade zones based on the presence of a very high abundance of green minerals (known to contain vanadium) in the Sushi Zone (Balama East)

Syrah Resources Limited (ASX: SYR) is very pleased to provide an update on metallurgical work being performed on ore from the Balama Graphite and Vanadium Project (100%) to determine the potential to produce an economic vanadium concentrate.

Previously, it was believed that most of the vanadium was locked up in micaceous minerals such as roscoelite. However, further work has shown that the vanadium is also hosted in several other minerals which are magnetic to varying degrees. These include: ferro-vanadium magnetite, limonite and goethite. Approximately 75% of the vanadium is hosted in the above weakly magnetic minerals. The remaining 25% of the vanadium is hosted in non-magnetic minerals such as kaolinite, silicates and mica/muscovite.

A bulk sample of Balama ore from the Balama West Mualia Zone grading 0.46% V<sub>2</sub>O<sub>5</sub> was sent to a specialist laboratory for vanadium testwork. **The laboratory**

Syrah Resources Ltd (ABN 77 125 242 284). Level 9 - 356 Collins Street, Melbourne Victoria 3000 Australia  
Ph 03 96707264 Fax 03 96420698

ASX Code SYR

### Current Corporate Structure

#### Ordinary Shares

Issued Shares: 147,867,623

#### Options

Exercisable at \$0.26:	3,001,967
Exercisable at \$2.21:	500,000
Exercisable at \$2.90:	250,000
Exercisable at \$3.87:	1,000,000

#### Major Shareholders

Basapa PL	9.54%
National Nom Ltd	8.59%
Copper Strike Ltd	7.44%
Kitara Inv PL	6.91%

#### Board of Directors

Mr Tom Eadie  
*Non-Executive Chairman*

Mr Paul Kehoe  
*Managing Director*

Mr Tolga Kumova  
*Executive Director*

Mr Michael Chester  
*Non-Executive Director*

Mr Rhett Brans  
*Non-Executive Director*

Ms Melanie Leydin  
*Company Secretary*

#### Key Projects

##### Balama Graphite Project (Mozambique) and Nachingwea Graphite Project (Tanzania)

Balama is the largest and one of the highest grade flake graphite and vanadium projects globally. Balama is mainly medium to coarse flake and Nachingwea is fine to coarse flake.

##### Tanzania Mineral Sands

A very prospective portfolio of mineral sands licence areas, some of which have drill results up to 28% heavy minerals.

#### Website

[www.syrahresources.com.au](http://www.syrahresources.com.au)

has processed that ore to a  $V_2O_5$  concentrate of 5.02% with recoveries of 75%. This involved magnetic separation which used a combination of magnetic force, fluid and gravity to process magnetic minerals. This process will be used to produce a cleaner graphite concentrate by extracting the magnetic vanadium minerals.

The remaining 25% of the non-magnetic vanadium bearing minerals that report to the tails will now be tested to determine if they can be separated using standard flotation processes. Syrah is confident that this will result in further upgrading of the vanadium concentrate grade.

If Syrah can produce both a magnetic and non-magnetic concentrate, there is substantial potential to sell into the two major vanadium market segments. Ferro-vanadium derived from magnetic sources is used as a hardening additive in the steel industry. Non-magnetic vanadium is used in specialty applications such as vanadium redox batteries and in the ceramic, glassware and specialty chemical industries.

Further work is still to be completed on extracting high purity vanadium pentoxide via hydrometallurgical process from the vanadium concentrates.

## **ANALYSIS OF RESULTS**

The highest grade vanadium deposit in the world is said to be Largo Resources' (TSX: LGO) Maracas project in Brazil (Ocean Equities Vanadium Sector Review 15 July 2011). Maracas has a Mineral Reserve of 17.2 million tonnes at 1.44%  $V_2O_5$  and is slated to come in to production later this year. Largo has signed an offtake agreement with Glencore, the world's largest vanadium producer to take 100% of the production for the initial 6 years of production at Maracas.

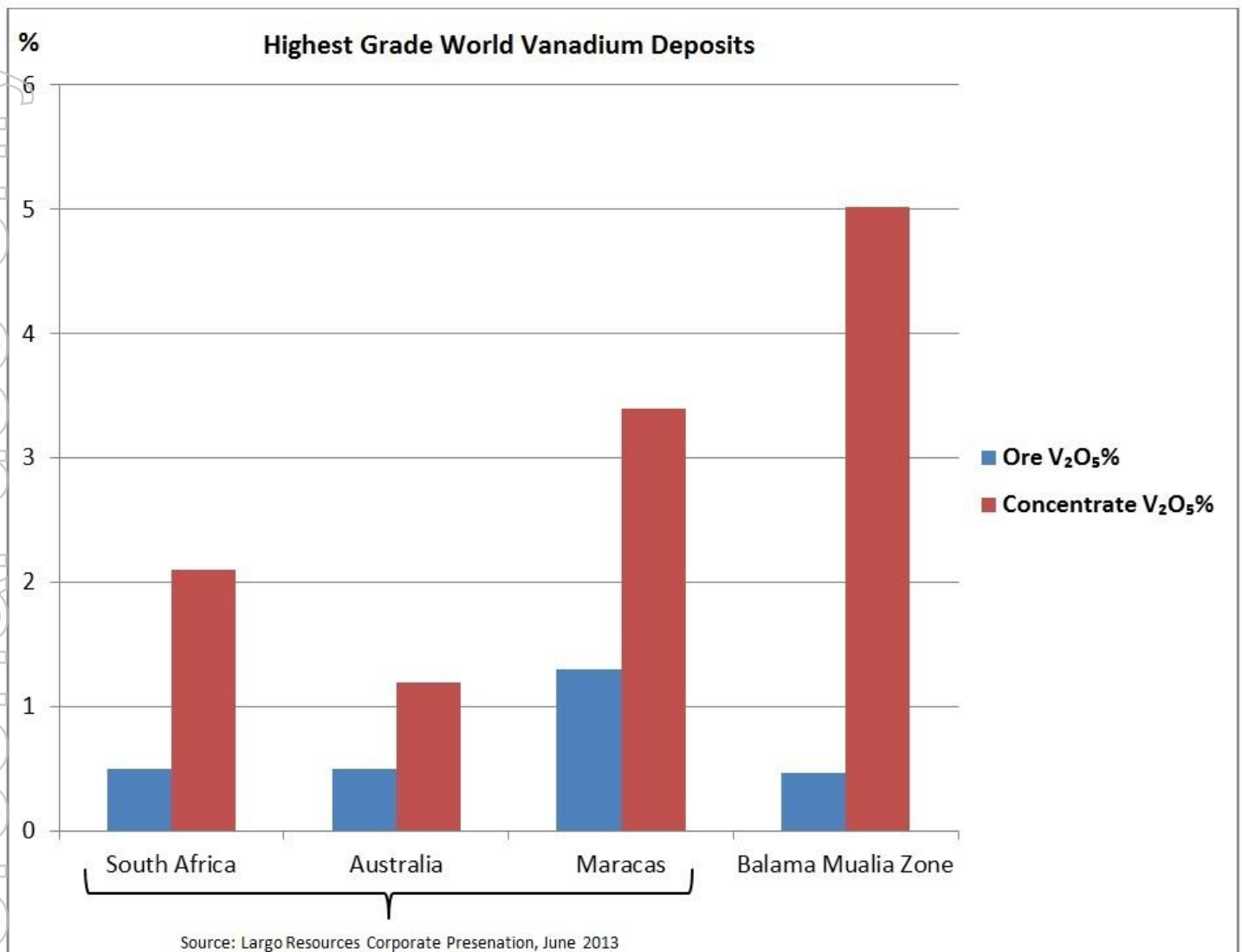
Balama currently has an Inferred Resource of **1.15 billion tonnes at 0.23%  $V_2O_5$** . However, included in this resource are the following high grade zones (in the Inferred Resource category) :

**Mepiche – 145 million tonnes at 0.43%  $V_2O_5$**

**Mualia – 136 million tonnes at 0.43%  $V_2O_5$**

**Ativa – 21 million tonnes at 0.38%  $V_2O_5$**

A key difference between Maracas and Balama is the concentrate grade. Largo reports that the average  $V_2O_5$  concentrate grade is under 3.5%. This is said to be the highest grade vanadium concentrate in the world (Ocean Equities Vanadium Sector Review 15 July 2011). **As noted, Balama can currently be upgraded to a concentrate grade above 5%.** A graph originally prepared by Largo comparing Maracas to South African and Australian vanadium deposits has been updated by Syrah to show the preliminary metallurgical results for Balama vanadium.



**Figure 1 – Graph showing ore and concentrate grade from vanadium mines in South Africa, Australia and Maracas in Brazil (based on Largo Resources’ research) and Balama Mualia Zone**

Also, Maracas has a strip ratio of 6.27:1. Largo has estimated OPEX of US\$61.50 per tonne of ore, including mining costs of US\$14.29 per tonne of ore. Balama outcrops at surface and is expected to have a negligible strip ratio. As Balama’s initial concentrate grade (>5%) is higher than that of Maracas (2.88%), Syrah anticipates that the total costs of producing vanadium at Balama could be substantially below that of Maracas.

## SCALE OF BALAMA'S VANADIUM DEPOSIT

In terms of scale, the largest operating vanadium mine in the world is Glencore's Rhovan deposit in South Africa. As at 31/12/2012, Glencore reported that Rhovan comprised a total resource of 134.5 million tonnes (Measured, Indicated and Inferred) at 0.5%  $V_2O_5$  for 670,000 tonnes of contained  $V_2O_5$ . Balama currently has an Inferred Resource of 1.15 billion tonnes at 0.23%  $V_2O_5$  for 2,650,000 tonnes of contained  $V_2O_5$ . **Thus Balama's global vanadium resource is approximately 4 times the size of Rhovan.** Even taking in to account just the high grade Mualia Zone, Balama is a very substantial and high grade vanadium deposit. The Mualia Zone has an Inferred Resource of 136 million tonnes at 0.43%  $V_2O_5$  for 580,000 tonnes of contained  $V_2O_5$ . **Accordingly, the Mualia Zone is almost the same size as Rhovan at similar grade. As Mualia is still open down dip and along strike, Syrah expects that the contained  $V_2O_5$  will well exceed that of Rhovan at similar grade.**

Based on information presented by Largo Resources, the South African vanadium mines produce a concentrate of about 2.1%  $V_2O_5$  (Figure 1). As noted, Balama's Mualia Zone can currently be upgraded to above a 5% concentrate.

## POTENTIAL FOR HIGHER VANADIUM ORE GRADES

As noted in Syrah's June 2013 quarterly report, spectacular zones of vanadium bearing graphite mineralisation were recently identified at surface at the Sushi Zone at Balama East (Figures 2 and 3). This is based on the presence of a very high abundance of green minerals which are typically vanadium rich based on previous mineralogical studies of Balama rock samples undertaken by Syrah. Rock samples have been taken for assaying. Drilling of this area will take place later in the current field season. Syrah believes that there is significant scope to prove up higher grade vanadium zones than currently reported.





Figure 2 – Outcropping rock from the Sushi Zone containing a very high amount of green minerals. Mineralogical studies at Balama indicate that the green minerals typically host vanadium

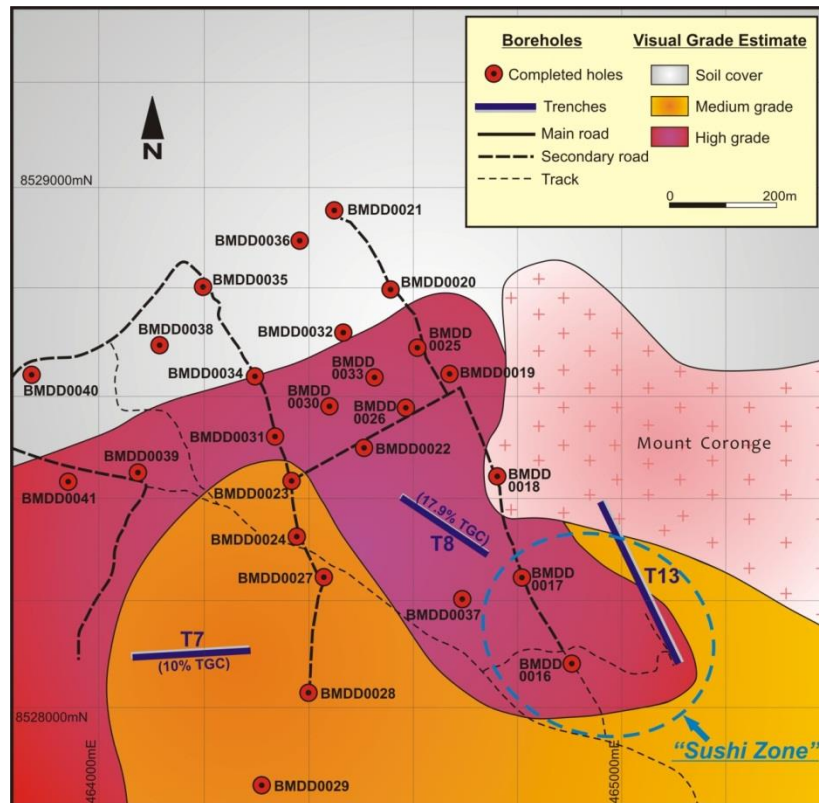


Figure 3 – Balama East geological map showing location of Sushi Zone

*The information in this report as it relates to geology, geochemical, geophysical and exploration results was compiled by Mr Tom Eadie, FAusIMM, who is a Competent Person and Chairman of Syrah Resources Ltd. Mr Eadie has more than 20 years' experience in the activities being reported on and has sufficient expertise which is relevant to the style of mineralisation and type of deposit under consideration. He consents to the inclusion of this information in the form and context in which it appears in this report.*

Paul Kehoe  
Managing Director  
Syrah Resources Ltd  
Mobile contact - +61 3 414156288  
Email – [p.kehoe@syrahresources.com.au](mailto:p.kehoe@syrahresources.com.au)

### **About Syrah Resources**

*Syrah Resources (ASX code: SYR) is an Australian resource company with a diversified exploration portfolio located in southeast Africa. The Company is rapidly progressing its core Balama Graphite and Vanadium Project in Mozambique to production. Balama is a 106km<sup>2</sup> granted prospecting licence located within the Cabo Delgado province in the district of Namuno in northern Mozambique. The project is approximately 265km by road west of the port town of Pemba. Pemba Port is a deep-water container port, and the third largest in Mozambique. The Balama project site is accessible by a sealed, main road, running directly from Pemba Port. The main road is located 1km from the airport.*

*Syrah's exploration portfolio also includes a strategic mineral sands portfolio in Tanzania, comprising eight tenement areas, some with high grade heavy mineral intersections, and the Nachingwea graphite project in Tanzania.*