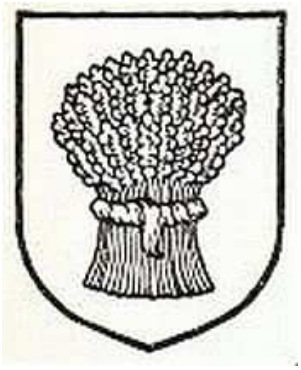
Friday, September 5, 2014



# HALLGARTEN & COMPANY

**Coverage Update**

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# Reed Resources (ASX: RDR)
## Strategy: LONG

| Key Metrics | |
|---|---|
| Price (AUD) | $ 0.035 |
| 12-Month Target Price (AUD) | $ 0.17 |
| Upside to Target | 386% |
| 12mth hi-low | $0.017-$0.07 |
| Market Cap (AUD mn) | $ 18.32 |
| **Shares Outstanding (mns)** | 523.5 |
| Fully diluted* | 567.2 |

| | FY13 | FY14e | FY15e | FY16e | FY17e |
|---|---|---|---|---|---|
| Consensus EPS | | n.a | n.a | n.a | n.a |
| Hallgarten EPS | | ($0.01) | ($0.01) | ($0.01) | $0.03 |
| Actual EPS | ($0.14) | | | | |
| P/E | n.a | (3.6) | (4.4) | 0.0 | 0.0 |
| Dividend | n/a | n/a | n/a | n/a | $0.005 |
| Yield | 0.0% | 0.0% | 0.0% | 0.0% | 14.3% |

# Reed Resources

## Testwork Propels Barrambie Towards Reality

- + Testwork results, at the company's pilot plant in Canada, on material from the Barrambie Ti-V-Fe project justifies the former process flowsheet assumptions
- + Work shall now begin on a Preliminary Feasibility Study
- + The weakening of the USD against the AUD has strengthened the hand of Reed in competitiveness terms on its two specialty metals' projects
- + The company has narrowed down its focus dramatically with the main emphasis being on specialty metals (lithium and titanium)
- + The company has an estimated $6mn in cash on hand, excluding a further $6.2mn in term deposits
- ✘ Financing the Barrambie project's estimated $109mn capex will require securing an offtaker or trader as a strategic partner

**Mighty Morphing Miner**

Reed Resources is nothing if not flexible as it attunes itself to the shifting trends in the mining space. While it has had interests in Lithium, Gold, Iron Ore, Nickel, Titanium and Vanadium in the time we have been acquainted with the story, the focus is now narrowed down to its two main projects (and a project generation role in nickel, now that this metal is fashionable again). The 100%-owned Barrambie project is the subject of this update. While it started out as Vanadium project, it is now being styled as a Titanium project with Vanadium (and Iron) as the by-products. Barrambie was pushed out of the limelight during the period in which gold was the main focus. Nevertheless it continued to move forward slowly despite, since 2008, being harder to access funding for a project of this nature.

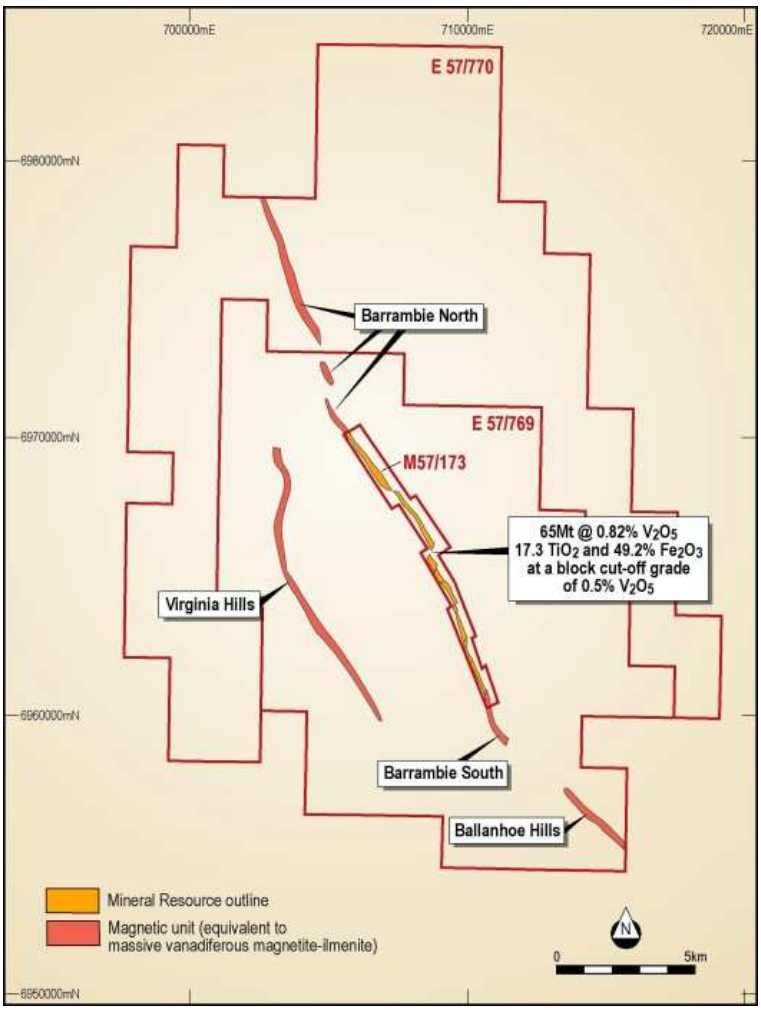
Reed has a DFS on both the high-grade Vanadium Central Band and a Scoping Study on the high-grade Titanium Eastern Band. The Barrambie Titanium Project contains total **Indicated and Inferred Mineral Resources** of **47.2Mt** at **22.2% $TiO_2$**, **0.63% $V_2O_5$**, and 46.7% $Fe_2O_3$, at a cut-off grade of 15% $TiO_2$, making it the world's second-highest grade hard-rock titanium deposit known.

The market's mood swings on these two metals in recent years made it difficult to decide which one should be developed first. The decision is made easier at the current time as Vanadium's linkage to the steel industry has made its price performance less than scintillating in recent times. Titanium is thus the strongest prospect at the moment.

**Some Background**

This project is by no means new having been spawned in the late 1960s when everyone, literally, was pawing over territory in Western Australia looking for nickel in the boom for that metal at that time. Drilling at Barrambie began in 1968 and continued to the most recent campaigns in 2008.

Companies having undertaken drilling campaigns on this target are Greenstone Investments Pty Ltd (GSI), Ferrovandium Corporation NL (FVC), Great Australian Resources Ltd (GAR), Trans Global Resources (TGR), Precious Metals Australia (PMA) and finally Reed. Drilling techniques have included rotary air blast (RAB), open hole percussion (OHP), reverse circulation (RC) and diamond drilling (DDH). Some of the campaigns were exploration for gold and therefore had no vanadium, titanium, iron or minor element assays.




In 2007, Reed completed three diamond drill programs, three RC drilling campaigns and a campaign of bulk sampling using a Caldwell bucket drill rig. In 2008, a RC and a diamond drilling campaign were completed.

In addition, in December 2009, Reed concluded the acquisition of two exploration licenses (E57/769, E57/770) that contain magnetite bearing formations along strike and to the west of the Barrambie deposit. The total consideration for these was AU$2 million dollars and 600,000 ordinary shares.

**Titanium Potential – all in the process**

According to Reed, Barrambie's Eastern Band is the world's second highest grade Titanium deposit after Rio's Lac Tio deposit in Quebec. According to Reed, its Fe/Ti ratio is 2:1 whilst those of Argex is 4:1, TNG (TNG.ax) is 5:1 and Speewah is 6:1. Iron is essentially the costliest element to remove while Ti is 75% of revenue while V is 25%.

The process for doing so was pioneered at McGill University, after which the inventors split. Similar technology is now the property of Canadian Titanium Ltd (CTL) which is half-owned by Argex. The advent of these technologies is the most significant change in Ti processing since the Kroll process and thus is regarded by Titanium mavens as a game changer.

During the March quarter of 2014 Reed began construction of a mini-pilot plant in Canada to demonstrate a successful transition from laboratory-scale batch testing to continuous operation. The plant is testing a proprietary chloride-based process for the recovery of titanium as titanium dioxide,

($TiO_2$), vanadium pentoxide ($V_2O_5$) and iron as hematite ($Fe_2O_3$) from run of mine ore at a feed rate of 10 kilograms per day.

The process has produced high purity (>99%) titanium dioxide from Barrambie oxide ores and concentrates at high recoveries. A key feature of the patented process is the acid recovery and regeneration process which shows the potential to operate at significantly lower costs than established technologies previously evaluated by Reed. In addition, the green credentials of the selected process are enhanced by its energy efficiency, low emissions and inert tailings. This process was evaluated in the Snowden Scoping Study.

Reed, in December 2013, licensed the patented acid leach process to extract all the metals of value from its Barrambie deposit. In exchange for the non-exclusive license, Reed will pay a royalty of 5% of gross revenue. In addition, the patent holders will also receive up to 20% of the value of any transaction that involves a significant change in control of AVC.

**The Pilot Test Results**

Last week the company announced the results of the testwork. These showed:

- ✓ Continuous production of high-purity titanium dioxide via a proprietary hydrometallurgical process
- ✓ Results confirm potential to deliver lowest-quartile operating costs as indicated in Scoping Study from 2013

The goal of the mini-plant campaign was to test and demonstrate the successful operation of each of the major unit operations of the proprietary flowsheet on a continuous basis:

- leaching of the mineralised material
- titanium dioxide precipitation
- iron hydrolysis
- acid regeneration

Internal laboratory AAS assays indicate final product purity levels consistent with earlier testwork, being 99.9% pure titanium dioxide at recoveries exceeding 85%. External XRD assays are awaited to confirm the levels of trace impurities and more accurately define mineralogical qualities.

In the wake of the mini-pilot scale testwork program, Reed has appointed the consultants Sedgman and Snowden Mining Industry Consultants to produce a Pre-feasibility study to assess the technical feasibility and economic viability of the development of a hard rock titanium mining and processing operation with an output of high-purity titanium dioxide, iron and vanadium chemicals using its proprietary flow-sheet.

**The Preliminary Economic Assessment (Scoping Study)**

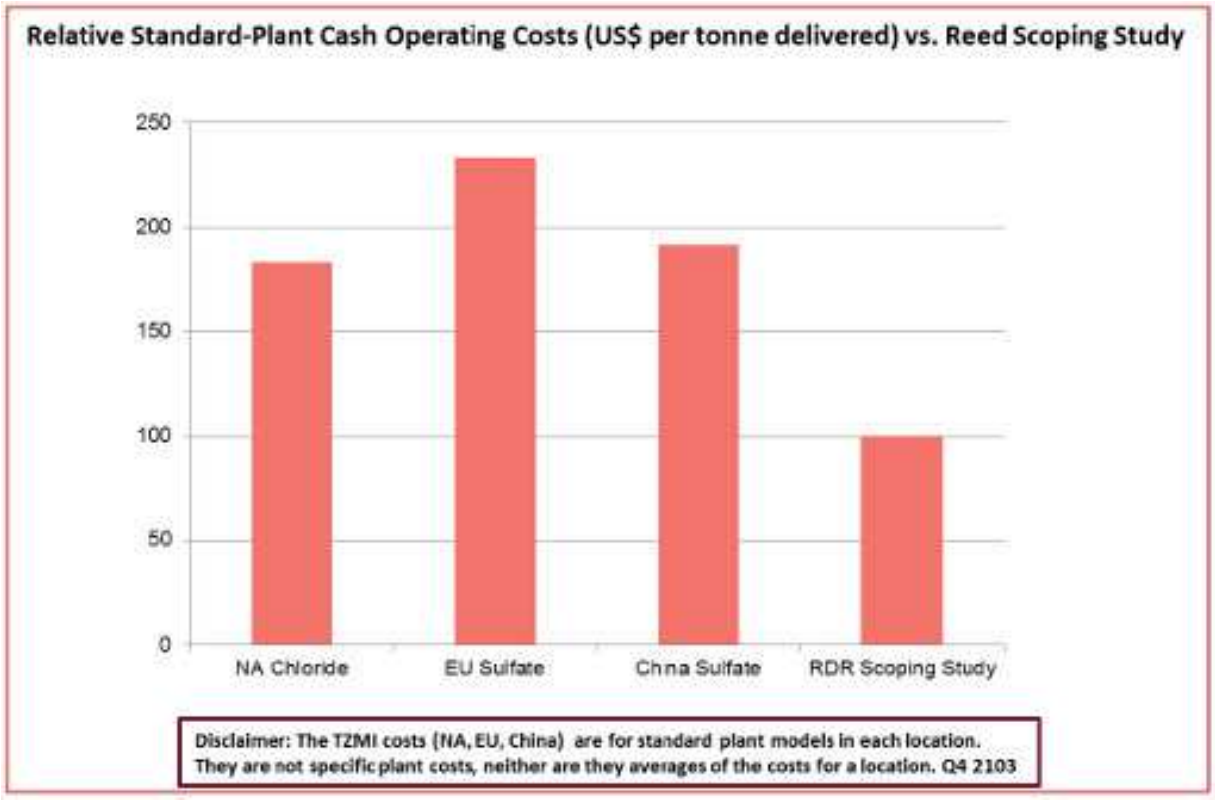
A Scoping Study by Snowden Mining Industry Consultants in October 2013, based on this process, indicated the potential for a viable hard-rock titanium and vanadium mining and processing operation

and recommended progression to a Pre-Feasibility Study. Average net operating costs per tonne of titanium dioxide recovered were estimated at AUD$1,214 per tonne with an indicative accuracy of ±35%, the long term price assumption used in the study was US$3,000 per tonne.

Key metrics for the proposed Titanium operation are:

- Annual Production 13,000 tonnes of $TiO_2$ & 300 tonnes of $V_2O_5$
- Life of Mine of 27 years
- Life of Mine Revenue of AUD$ 1,143 million
- Pre-tax Cashflow AUD$ 516 million
- Pre-tax NPV (at a 12% discount rate) AUD$ 87 million
- Pre-tax Internal Rate of Return 24%
- Average Net Operating Cost per tonne of recovered $TiO_2$ AUD$ 1,214
- Total initial capital costs of AUD$ 109 million
- Payback of capital costs within four years

The chart below shows the relative operating costs for Standard Plant models in North America, Europe and China using Chloride or Sulfate Process flowsheets (Q42013) compared to Reed's Scoping Study.




Source: TZMI

**The PFS**

The Pre-feasibility Study is expected to be completed in the March quarter of 2015. It will investigate the construction of a mineral processing facility to treat run-of-mine ore from the Barrambie Project. It is expected that run-of mine ore will be crushed and screened at the minesite and then trucked to a processing facility near Geraldton with a nominal capacity of 200,000t of feed per annum, where high purity titanium, vanadium and iron compounds will be produced.

Reed has engaged the services of Michael Spratt, an experienced process/construction engineer and former COO of Minproc, to head the owner's team managing the study.

**Geology**

The ferrovanadium titanium (Ti-V-Fe) deposit occurs within the Archaean Barrambie Greenstone Belt, which is a narrow, NNW-SSE trending greenstone belt in the northern Yilgarn Craton. The linear greenstone belt is about 60 km long and attains a maximum width of about 4 km. It is flanked by banded gneiss and granitoids. The mineralisation is hosted within a large layered, mafic intrusive complex (the Barrambie Igneous Complex), which has intruded into and is conformable with the general trend of the enclosing Greenstone Belt. From aeromagnetic data and regional geological mapping, it appears that this layered sill complex extends over a distance of at least 25 km into tenements to the north and south of M57/173 that have also been acquired by Reed. The layered sill varies in width from 500 m to 1700 m.

Exposure is poor due to deep weathering, masking by laterite, widespread cover of transported regolith (wind-blown and water-borne sandy and silty clay), laterite scree and colluvium. Where remnant laterite profiles occur on low hills, there is ferricrete capping over a strongly weathered material that extends down to depths of 70 m.

Ti-V-Fe mineralisation occurs as bands of cumulate aggregations of vanadiferous magnetite (martite)-ilmenite (leucoxene) in massive and disseminated layers and lenses.

The resource estimate, dating from December 2013, shows that Barrambie is one of world's highest grade titanium deposits, containing total Indicated and Inferred Mineral Resources as shown below, at a cut-off grade of 15% $TiO_2$.

**Barrambie**
JORC- compliant Resource (December 2013)
15% TiO2 Cut-off

| Category | Tonnage (Mt) | TiO2 (%) | V2O5 (%) | Fe2O3 (%) | Al2O3 (%) | SiO2 (%) |
|---|---|---|---|---|---|---|
| **Indicated** | 34.70 | 22.25 | 0.64 | 46.77 | 9.48 | 14.95 |
| **Inferred** | 12.50 | 21.99 | 0.58 | 46.51 | 9.32 | 15.40 |
| **Total** | 47.20 | 22.18 | 0.63 | 46.70 | 9.44 | 15.07 |

**Vanadium and Windimurra**

As mentioned earlier, Barrambie was one of the most advanced of Reed's projects in 2010 but the Vanadium outlook clouded due to price considerations, driven in part by replacement with Niobium, and also due to the dimmer prospects in the steel space. Thus Barrambie was put on the backburner and changed its focus to Titanium. The issue here was that the capex, at over AU$620mn, was a mighty amount of money to raise either by debt, equity or a mixture thereof.

The closest parallel to Barrambie is the highly troubled Windimurra Vanadium project of Atlantic Ltd (also located in Western Australia). This has been a negative in colouring investor's view of Vanadium projects in Australia but at the same time has been a cost-and error-saving exercise in "what not to do" for Reed.

A key point to note is that while the tonnage at Barrambie is a fraction of that at Windimurra the grade at Barrambie is a multiple of that at the larger deposit, naturally implying less ore needed to be mined to produce the same output of $V_2O_5$.

The company revealed back in 2009 that a MOU had been entered into for the sale and marketing of the entire annual vanadium production with a leading vanadium marketer (believed to be Glencore) for the first ten years of production, at not less than Metal Bulletin's low price. If this Vanadium offtake could be revived, with regard to the now-Titanium focused project, that would be a major plus.

A Public Environmental Review (PER) document was approved in 2011.

**How to Move Barrambie Forward**

Firstly we should say that this will ONLY move forward with Titanium as the primary product, with vanadium relegated to a by-product as in most profitable vanadium production. Reed's take on Vanadium prices is rather close to ours, looking for flat at best in the near to medium term. The company also posits that massive substitution with ferro-niobium courtesy of expansions at CBMM (the dominant Niobium producer in Brazil) financed at first by the Japanese/Korean steel makers and then Chinese steelmakers (Ansteel, Baosteel, Shougang) have boosted Nb supplies and those of alternatives. There was also a massive build-up of slag processing capacity by China's Panzhizhua complex. One consolation is that the majority of vanadium pentoxide produced in China is not suitable for chemical or energy storage applications.

This is why Reed elected to not proceed with Vanadium project as Reed feels that being a standalone primary producer is too energy intensive in the high energy cost environment of current times.

With Titanium as the primary goal now the potential field of offtakers becomes clearer with paint and pigment manufacturers being the most obvious parties to partner with. The capex at only AUD$109mn brings this alternative much more into the realms of reality than the Vanadium path would have offered.

**Conclusion**

Since our last note the share price (and most particularly the volume) in Reed has gone wild. A mass of turnover just after our note resulted in a clear-out of stale old holders and the arrival of fresh shareholders unburdened by the gold baggage and more excited by the specialty metals angles of this name.

The narrowing down of Reed's portfolio is complete and the company has returned to its focus in large-deposit specialty metals, Lithium, Titanium and Vanadium with its exploration efforts concentrated on the revivified Nickel space.

The Titanium-Vanadium project is primed for a financing push should the pricing planets align in those particular metals. The recently completed testwork confirms that the Barrambie Titanium Project could be a globally significant lowest-quartile cost titanium dioxide producer.

Reed's current market cap is only slightly higher than its cash holdings. The market, at the current valuation, gives almost to its flagship Mt Marion Lithium project let alone the Titanium/Vanadium and Nickel assets. This is clearly an anomaly that will be corrected by an upward move once the production plans for the Titanium, Lithium and Vanadium start to coalesce. The addition of strategic partners or offtakers would be key to this.

We reiterate our Long call on Reed Resources with our twelve-month target price being $0.17.

## Important disclosures

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