

2 May 2011

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## REED RESOURCES LTD

**Meekatharra's resources, plant and exploration prospects give Reed a rare walk up start in a rising gold market. Mt Marion lithium and Barrambie vanadium each carry potential for open ended returns.**

### INVESTMENT DATA

Share price (last trade 2 May 2011): A\$0.535  
ASX Code: RDR

### ISSUED CAPITAL

FPO shares: 261M  
Unlisted options: 20M  
Market capitalisation (fully diluted): A\$150M

### MAJOR SHAREHOLDERS\*

David Reed: 8.3%

### DIRECTORS

David Reed	Executive Chairman
Steven Cole	Deputy Chairman
Chris Reed	Managing Director
Peter Collins	Non Executive Director
Ian Junk	Non Executive Director

### KEY POINTS

- Reed Resources is preparing to resume gold production at the Meekatharra project. The project area is responsible for 4 Mozs of past gold production from over 50 mines.
- Meekatharra has infrastructure, plant and equipment in place supporting treatment capacity of up to 3 million tonnes of ore per annum.
- Reed is compiling an initial four-five year mine plan for Meekatharra from 420,000 ozs in reserves and 2.5 Mozs in resources left by previous operators.
- The Meekatharra bankable feasibility study is due for completion in February 2012. Green Leader estimates Meekatharra can produce +100,000 ounces at a cash cost of about A\$800/oz from 2013.
- Reed owns 70% of the Mt Marion lithium project, under construction south of Kalgoorlie.
- Mt Marion is due for commissioning in December 2011. Forecast annual production (100%) is 195,000 tonnes of spodumene concentrate grading +6% Li<sub>2</sub>O.
- Spodumene concentrate is a primary feedstock for Chinese lithium battery manufacture. Mass production in China of lithium batteries for cars and bikes is a recent and ongoing phenomenon that is driving unprecedented demand for spodumene.
- Resources at Mt Marion suggest a ten year project life with potential for further extension.
- Reed completed a feasibility study on the 100% owned Barrambie vanadium project in 2009. Vanadium demand is growing quickly and the bulk of vanadium supplies are met by a few, increasingly inefficient sources. Barrambie is a high grade vanadium deposit. An equity partner is sought to take Barrambie forward.
- Also in Western Australia Reed owns developed gold assets at Comet Vale and Nimbus, and diverse exploration prospects at Mt Finnerty.
- Post the completion of the recent share placement, Reed will have circa A\$15 million in cash and no debt upon final settlement for Meekatharra in June 2011. The capital cost of Mt Marion's construction is being financed by Reed's partner. Reed is forecast to need additional funds of up to A\$40 million in FY2012 for development and working capital.

## SUMMARY OPINION

**Reed has three main assets; Meekatharra gold, Mt Marion lithium and Barrambie vanadium. Each project differs widely from the others; in terms of commodity rationale, capital demands, and management input, so it is difficult at present to characterise Reed in terms of exposure to a single situation.**

**The commodity mix in Reed's portfolio gives an interesting net effect. Gold has risen to a point that should enable Meekatharra's successful development, and further rises would open up a field of opportunities. Lithium is ostensibly in the very early stages of an exponential growth phase. Mt Marion's JV arrangement, timing, and alignment with China's lithium aspirations, form a platform from which Reed plans to capitalise as the lithium market develops. Vanadium also has a persuasive investment case, albeit a longer term one. Continued industry interest in Reed's 100% owned Barrambie is expected.**

**Only informal forward estimates are available for Mt Marion and Meekatharra. Reed is securing managers and contractors for Meekatharra's development at a time of high industry demand. In recognition of these risks Reed has so far acquired and advanced its interests without incurring debt. Further capital will be required in 2012.**

**The relative importance of Meekatharra within Reed's portfolio will probably increase over the next few years as more capital and management time is devoted to it. Meekatharra arguably has both the resources depth and exploration prospects to justify investment in Reed alone.**

## 1. COMPANY BACKGROUND

Reed Resources Ltd (Reed) was admitted to the official list of the ASX in July 2002, after raising \$6 million for exploration and development of the Comet Vale and Mt Finnerty projects in Western Australia. The Barrambie Vanadium project, also in Western Australia, was acquired for 750,000 shares and \$110,000 in April 2003.

From 2003 Reed worked with joint venture partners to produce gold from Comet Vale and outline iron ore resources at Mt Finnerty, while studying the feasibility of a proposal to develop the 100% owned Barrambie vanadium project. In 2009 Reed added to its asset base around Kalgoorlie, acquiring the Nimbus silver project and processing plant, the joint venturer's share of Comet Vale, and the Mt Marion lithium project. Mt Marion became the focus of Reed's activities in 2010. By January 2011 construction of a lithium mine and processing plant at Mt Marion was poised to commence pending final approvals.

In January 2011 Reed contracted to buy the Meekatharra Gold Project for \$27 million and two million Reed shares.

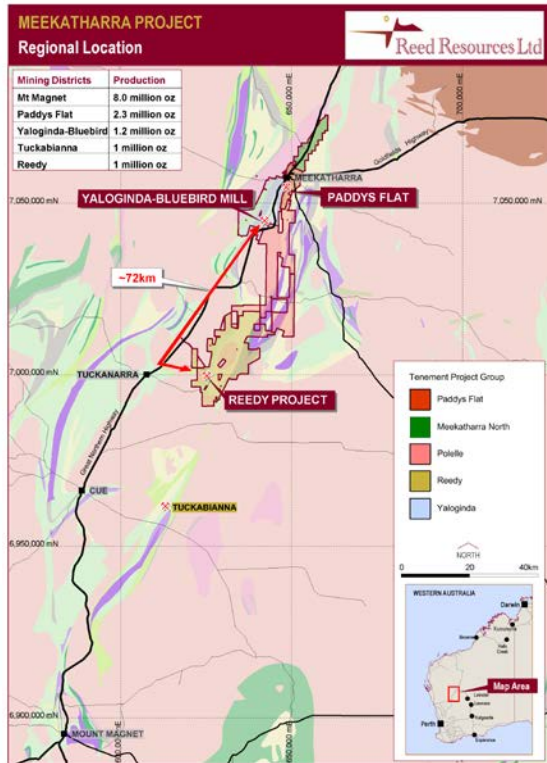
In 2011 Reed maintains a spread of diverse mineral interests in Western Australia, dominated by Mt Marion, Barrambie and Meekatharra. With a third party responsible for the finance and operation of Mt Marion, and Barrambie being readied for presentation to potential partners, the redevelopment of Meekatharra has taken operational priority within Reed's project portfolio in 2011.

## 2. MEEKATHARRA GOLD PROJECT

The Meekatharra gold project includes about 800 square kilometres of contiguous tenure within the Meekatharra greenstone belt. Over ten underground mines and fifty open cut mines have yielded in excess of four million ounces of gold from the project area since 1899. In the early 1990s three independent operations on the tenements were producing gold at a combined rate of 260,000 ounces per year from mostly open pit mines. The three principal projects, Yaloginda, Paddy's Flat and Reedys, were brought together by 2003, by which time the three million tonnes per annum CIL treatment plant at Yaloginda was the only remaining producer on the field. Since 2003 successive operators have extended, augmented and in some cases redeveloped select resource positions among the vast set of near mine targets within the Meekatharra project.

In 2011 Reed acquired Meekatharra and its substantial legacies - infrastructure, gold resources at various stages of development, and databases accrued

from many phases of determined exploration throughout the belt. Reed plans to complete a study in July 2011 into the feasibility of restarting mining and recommissioning the Yaloginda plant in 2011/2012.



## RE STARTING MEEKATHARRA YALOGINDA

Reed's approach to restarting the Meekatharra project necessarily begins from the base established by its predecessors. Mercator Gold plc was the last company to produce gold at Yaloginda. From 2005 Mercator spent \$21 million on resource definition and \$7 million refurbishing the Yaloginda plant before commencing mining of the Surprise and Bluebird pits. Mercator produced 44,000 ounces of gold in nine months of production before access to Surprise was unexpectedly lost due to a pit wall crack that undermined the nearby highway. As mining of the Bluebird pit was not sufficiently advanced to cover the loss of Surprise, operations were closed and Mercator was placed in administration in October 2008.

The highway was subsequently moved and Reed acquired two open pit mines in suspension; Bluebird and Surprise, from Mercator's administrator in 2011. Consultants to the administrator estimated the following reserves remaining for Bluebird, Surprise and the undeveloped Batavia deposit, also at Yaloginda;

## YALOGINDA PROBABLE RESERVES, DECEMBER 2008 – Non JORC

Deposit	Mt	gAu/t	'000 ozs
Surprise	0.14	3.0	13
Bluebird	1.50	1.9	87
Batavia	0.20	2.4	14
<b>TOTAL</b>	<b>1.84</b>	<b>2.0</b>	<b>114</b>

Reed is reviewing the base data for the Surprise and Bluebird mine plans, with updated gold price and cost assumptions. Given mining and stripping has advanced at both pits the reserves are unlikely to change much from Mercator's plans. Remaining waste:ore ratios are about 9:1 and 3:1 for Bluebird and Surprise respectively.

Together Bluebird and Surprise present Reed with a potentially convenient start to production. The remainder of Surprise must be mined in several short campaigns in concert with close pit wall monitoring, however the proximity of Bluebird allows flexible use of equipment. Both mines are within a kilometre of the Yaloginda mill. Both pits are currently dry. Bluebird's current pit design extends to 170 metres depth below surface, comprising a mixture of oxidised and fresh material.

With twelve months of production from Bluebird and Surprise in hand Reed is examining a range of complementary resources to extend the starting reserve base to three or four years. The Prohibition deposit at Paddy's Flat is a prime candidate for early open pit development.

## PADDY'S FLAT

Paddy's Flat, 17 kilometres north of Yaloginda, is historically the largest gold production centre on the field (>1.9 million ounces).

From 1906 to 1953 Paddy's Flat was explored and mined predominantly from underground shaft access to a maximum depth of 430 metres below surface. A second phase of production, 1984 to 1994, was almost entirely based on open pit mines feeding a large scale on-site treatment plant. Although mining at Paddy's Flat ceased in 1994 the lateral extent of the past workings and the occurrence of some consistent high grade deposits meant exploration campaigns and development studies continued, regardless of the gold price or the removal of the mill in 1995. In 2007 Paddy's Flat resources were estimated at 1.3 million ounces of gold, including 1.0 million ounces of indicated resources in seven separate positions.

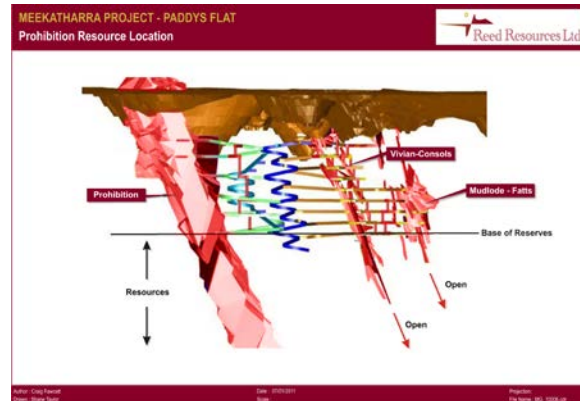
**PADDY'S FLAT RESOURCES, SEPTEMBER 2007  
– JORC COMPLIANT**

Deposit	Mt	gAu/t	'000 ozs
Prohibition	2.7	4.0	341
Vivian Consols	0.7	8.9	186
Fatts	0.7	2.8	63
Mudlode	0.4	5.8	68
Ingliston	1.4	1.1	49
Mickey Doolan	19.5	1.0	609
Golden Bar	0.4	1.4	19
<b>Total indicated</b>	<b>17.9</b>	<b>1.7</b>	<b>986</b>
<b>Total inferred</b>	<b>7.9</b>	<b>1.4</b>	<b>349</b>
<b>Total resource</b>	<b>25.8</b>	<b>1.6</b>	<b>1,335</b>

Work at Paddy's Flat since 1994 has centred on the adjacent Prohibition, Vivian-Consols and Fatts-Mudlode deposits. Prohibition is a 30 metres thick mineralised and faulted banded iron formation. Vivian-Consols is a complex set of narrow high grade veins 250 metres east of Prohibition, and Fatts-Mudlode is a stockwork vein and alteration system 80 metres east of Vivian-Consols.

Working off a substantial historical database, Mercator drilled over 60 deep holes in the area and prepared an underground mine plan to access reserves of 308,000 ounces in the three locations from a single decline. In 2007, with the underground mine plan in progress, Mercator also drilled 42 shallower RC holes into the southern end of Prohibition, targeting near surface oxide ore. Only two of the holes failed to intersect +1g/t mineralisation. Together with 14 holes drilled at Fatts the 2007 programs are the most recent drilling activity at Paddy's Flat.

The Prohibition resource estimated in March 2007 (2.5 million tonnes at 4.0 g/t indicated – from 200 RC and 50 core holes drilled over 800 metres of strike and to 500 metres depth) included the 2007 shallow RC drilling. However no open pit mine designs were completed for the southern extensions of Prohibition. Reed's preliminary assessment is that a viable pit will be designed around the southern end of Prohibition. Pending optimisation, Reed is confident that up to a million tonnes, at +2g/t and sub 10:1 waste:ore ratio, is a feasible target.



While the Prohibition pit prospects are readily and cheaply accessible the Prohibition/Vivian-Consols/Fatts-Mudlode underground mine concept remains an advanced, potentially higher value proposition.

The Prohibition banded iron hosts a well understood, bulk mineable ore reserve containing 180,000 ounces of gold to 500 metres depth. The Vivian-Consols veins are extensive and high grade, but highly subject to interpretation at current drill spacing. Reed is considering its options for underground development, including early capital expenditure and parallel development with the open pits, or later development using project cash flows. Preliminary modelling indicates a capital cost of less than \$15 million may be required to establish an underground mine at Prohibition.

The Prohibition underground ore is partly refractory. Mercator installed a gravity circuit and planned to add a small flotation and ultra fine grinding circuit at Yaloginda, in order to recover 93% to 95% of Prohibition's gold.

Throughout the Paddy's Flat system a number of resource positions have been outlined and left undeveloped. To the south of Prohibition resources at Mickey Doolan (609,000 ounces) and Golden Bar (19,000 ounces) are defined by 1,175 drill holes. Mickey Doolan extends over 1,200 metres strike and to 320 metres below original surface. The resource is the partially refractory extension of a mined oxide ore pit. In the northern sector a non-JORC compliant resource at Macquarie (520,000 tonnes at 3.1 g/t) has also been left due to metallurgical issues. Reed has resumed studies of the flotation-fine grinding circuit option at Yaloginda, which would also address the needs of processing Mickey Doolan and Macquarie material. Running the Yaloginda plant well within its rated capacity as planned would allow part of the former milling circuit to be used in a fine grinding configuration.

## REEDYS

Reedys, like Yaloginda and Paddy's Flat has a long history of gold production from multiple sources, both underground and open pit. Mining and ore treatment ceased in 1997 after which Reedys was merged with the Yaloginda operations. Due mainly to the distance from Yaloginda (70 kilometres by road) relatively little on the ground work has been carried out at Reedys since 1997.

Resources at Reedys were estimated by a consultant in 2005 and assessed in 2010 as JORC compliant. In March 2011 Reed remodelled the Jack Ryan deposit and added the Callisto resource to the inventory.

Deposit	Mt	gAu/t	'000 ozs
South Emu	0.7	3.3	78
Rand	2.5	2.5	180
Jack Ryan	1.0	2.5	80
Callisto	0.1	2.9	13
<b>Total indicated</b>	<b>1.9</b>	<b>2.6</b>	<b>164</b>
<b>Total inferred</b>	<b>2.3</b>	<b>2.6</b>	<b>186</b>
<b>Total resource</b>	<b>4.3</b>	<b>2.6</b>	<b>351</b>

All of the listed resources are extensions to mined pits within an eight kilometre section of the Reedy shear

## MEEKATHARRA PRODUCTION FORECASTS

Year Ending 30th June	2011	2012	2013	2014
Ore treated (000t)		610	1,470	1,370
Head grade (g/t)		2.1	2.5	2.8
Attrib gold prodn (000oz)		36	108	113
Capital expenditure (\$M)	5	27	35	4
Cash prodn cost (\$A/oz)		980	770	780
Inventory (Mt)	4.7	4.0	2.6	1.2
Inventory grade (g/t)	2.7	2.8	3.0	3.2
Attrib. inventory (000ozs)	410	370	250	120

## ASSUMPTIONS

The main assumptions underlying the projections for Meekatharra are;

- Bluebird and Surprise – mined as per reserves at 9:1 and 3:1 waste:ore respectively. Average cash cost A\$900/oz.

zone. Reed has identified Jack Ryan as a potential open pit re-development opportunity. Ten holes are planned to convert the majority of the inferred Jack Ryan resource (currently 60% of the total resource) to indicated and enable a reserve estimate.

## MEEKATHARRA - PLANT AND INFRASTRUCTURE.

The Yaloginda CIL plant has nominal capacity to treat 3 million tonnes of oxidised ore per year. Over one million tonnes of ore were treated in 2008 prior to the current care and maintenance regime. As a relatively recently refurbished (2007) plant using fresh process water, most items of equipment remain in good condition.

Reed plans to run the Yaloginda plant at less than full capacity by reconfiguring the three stage mill setup. Subject to further investigations, Reed expects to replace the power plant and at least a portion of the wiring. An overhaul of the camp facilities is planned.

Together with mobilisation, re-stocking of spares, first fill reagents and initial earthworks, up to \$20 million maximum cash draw down may be needed to re-start operations at Yaloginda, before considering adjustments necessary to process any partially refractory ore from Paddy's Flat. The cost of adding an appropriate flotation/fine grinding circuit to Yaloginda was estimated by a consultant at \$8 million in 2010. Reed's modified designs will not necessarily cost as much.

Existing tailings storage facilities at Yaloginda are sufficient for 18-24 months of operation.

- Prohibition pit – 900,000 tonnes at 2.2 g/t mined at 10:1 strip ratio, with 18 km haul. Average cash cost A\$880/oz.
- Prohibition underground – 1.4 million tonnes mined at 4.1 g/t to 500 metres depth. Initial capex A\$30 million, average cash cost A\$640/oz.

- Jack Ryan – 800,000 tonnes mined at 2.5 g/t, 10:1 strip ratio and 70 km haul. Average cash cost A\$860/oz.
- Plant refurbishment, infrastructure and mobilisation capital expenditure in FY2012 - A\$25 million.
- Contract mining costs - A\$8-11/bank cubic metre assumed according to pit depth.
- Ore haulage cost - 10 cents per tonne kilometre.
- Treatment cost - \$15/tonne ore.

### OTHER DEVELOPMENT AND EXPLORATION PROSPECTS

The breadth of past mining and exploration activity within the Meekatharra project will take time sort through. Past programs stopped in some instances through lack of money and sometimes because of a lack of understanding. Reed is conscious of the need to ensure the project is well financed and staffed.

Reed is also aware that discoveries of new deposits are likely to underpin Meekatharra's long term success. Deeper drilling is an obvious exploration strategy, as most lines of lode have limited drill testing beneath 200 metres depth and no drill information greater than 400 metres from surface. Less expensive, near surface prospecting throughout the massive lease holdings will also need to be instigated. Reed plans to spend \$10 million annually on exploration at the Meekatharra project.

### 3. MT MARION LITHIUM PROJECT

Mt Marion, 40 kilometres south of Kalgoorlie in Western Australia, contains lithium bearing pegmatite veins, similar to those mined at Greenbushes and Ravensthorpe. Various studies between 1960 and 1996, principally by Western Mining Corporation, considered plans to mine and process lithium minerals (spodumene) at Mt Marion. In 2009 Reed acquired an option to buy the still undeveloped Mt Marion from private concerns for \$3 million cash and a 2.5% royalty on spodumene concentrate sales. The option was exercised in July 2010.

In October 2009 Reed completed a deal whereby Mineral Resources Limited (ASX: MIN) would complete a feasibility study for Mt Marion, build own and operate the mine and processing infrastructure, in return for 40% of net profit from the operations. Mineral Resources formally committed to Mt Marion's development in July 2010.

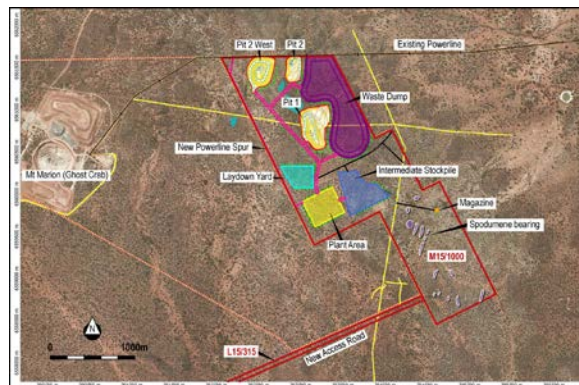
In February 2011 the Mt Marion arrangement was restructured so that Mineral Resources and Reed Resources shared 30% and 70% equity ownership of

Mt Marion respectively. As part of the agreement Mineral Resources committed to use reasonable endeavours to construct and commission the treatment plant at Mt Marion by December 2011.

### MT MARION RESOURCES, AUGUST 2010 0.3% Li<sub>2</sub>O cut-off

Category	Mt	Li <sub>2</sub> O%	Fe <sub>2</sub> O <sub>3</sub> %
Measured	2.1	1.5	0.9
Indicated	3.9	1.5	1.2
Inferred	4.5	1.3	1.6
<b>TOTAL</b>	<b>10.5</b>	<b>1.4</b>	<b>1.3</b>

The Mt Marion resource comprises five shallow dipping pegmatite deposits within a 2.5 by 2.5 kilometre area. Deposit 1 accounts for 4.0 million tonnes of the resource, including 1.3 million tonnes in the measured category. Drilling is sparse beneath 100 metres depth from surface. Resources remain on most sections at depth. The mineralised zones average 25 metres thick and are drilled mostly on a 40 by 40 metre spacing. Parts of the resource margins are open and require more drilling.



Reed is yet to publish formal reserve estimates but has indicated it expects to mine 10 million tonnes of ore at an average grade of 1.3% Li<sub>2</sub>O from pits at an average waste:ore ratio of less than 4:1.

Reed plans to extract 1.2 million tonnes of ore per year. A mining contractor was mobilised to site in February 2011 following receipt of final approvals.

Mineral Resources began construction of the Mt Marion processing plant in modular form at Perth workshops in 2010. Construction on site commenced in February 2011. Processing entails crushing to -6mm and screening, with the +0.5mm fraction proceeding to gravity concentration and two stage heavy media separation. Spodumene concentrate will be produced on site.

Power will be drawn from a Western Power line established for the adjacent Mt Marion gold mine. Reed expects to meet the plant's water requirements from bores within 10 kilometres of the site.

A single stream of spodumene concentrate will be trucked to the port of Esperance on 360 kilometres of sealed highway. The concentrate is chemically stable and can be held on site and in Esperance storage facilities. Access to storage and handling facilities have been secured.

Commissioning of the Mt Marion crushing circuit is planned for December 2011. First spodumene concentrate is expected to be shipped from Esperance in February 2012.

Planned annual output from Mt Marion is 200,000 tonnes of spodumene concentrate grading +6% Li<sub>2</sub>O.

Spodumene concentration at Mt Marion involves conventional physical processes commonly applied in mineral extraction plants around the world. Initial focus will be on maximising recovery while maintaining an average 6% concentrate grade. Reed has targeted successful control of mining dilution, fines generation and mica separation among the keys to plant performance.

Reed aims to recover 75% of total lithium (non-spodumene lithium minerals such as lepidolite are present and will not report to concentrate) into a concentrate grading 6% Li<sub>2</sub>O. The higher the concentrate grade the higher both recovery and throughput at the conversion stage.

The option of installing a flotation circuit, post commissioning, to recover additional spodumene from the -0.5mm fraction is included in the process design. The benefits of increasing the recovery and the concentrate grade are to be weighed against the influence of the fines on calcine performance in the converters in China.

### MT MARION CAPITAL EXPENSE

Reed and Mineral Resources have not disclosed the estimated capital cost of Mt Marion's construction. A similar scale spodumene concentrator built in Ravensthorpe by Galaxy Resources is estimated to have cost about A\$70 million in 2010. Mineral Resources expects to spend less than A\$30 million in capital equipment at Mt Marion, drawing on in-house specialist capabilities in minerals process plant construction, logistics and site infrastructure management.

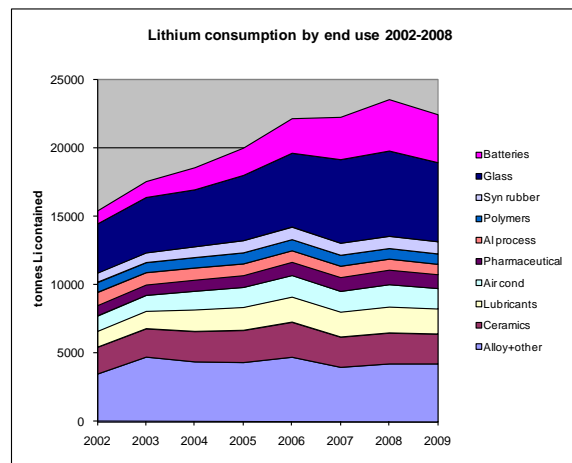
Mineral Resources is funding all project costs in a jointly owned company. Capital costs and initial working capital will be recovered over the life of the project through amortised charges.

### MT MARION PRODUCTION FORECASTS

Year end 30 June	2011	2012	2013	2014
Ore treated (000t)		700	1,200	1,200
Head grade (%Li <sub>2</sub> O)		1.30	1.30	1.30
Spodumene (000t)		114	195	195
Capital expenditure (\$M)		0	0	0
Cash cost (US\$/t spod)		300	270	270
Inventory (Mt)	10.0	9.2	8.0	6.8
Inventory grade (%Li <sub>2</sub> O)	1.30	1.30	1.30	1.30

### LITHIUM DEMAND

Lithium is a familiar component of the batteries commonly used to power portable electronic devices and electric tools. The success of lithium based battery technologies has led to a solid growth trajectory in demand for primary lithium.



Source: TRU Group

Battery lithium use has accounted for most of the 7% annual lithium consumption growth rate since 2002.

In 2009, a handful of primary producers shared total lithium revenue of about US\$500 million, of which only about 15% was due to battery demand. However from 2010 lithium demand began to transform as governments and auto manufacturers entered a concerted push to introduce a new generation of mass produced electric vehicles.

Prior to 2010, mass produced hybrid electric vehicles made by the major auto manufacturers almost exclusively used nickel metal hydride batteries. With the benefit of certain technological advances momentum has since shifted almost entirely to lithium batteries for automotive use.

By mid 2010 all major auto makers had plans, at various stages of implementation, to introduce vehicles incorporating lithium batteries in the drive

train. The first commercial facility manufacturing lithium ion cells for automotive use was commissioned in France in early 2009, producing 1.9 kWh lithium ion battery packs for Mercedes Benz and BMW hybrid cars. Among the first electric vehicles to enter the market, the Nissan Leaf has been sold in select markets in the US, Japan and Europe from December 2010. Each Nissan Leaf vehicle is driven by a 24kWh lithium ion battery pack containing 4 kg of lithium.

China is investing heavily in lithium battery technology as part of efforts to become an industry leader in both production and battery end use. The Chinese government has awarded substantial subsidies to electric car developers and buyers. Driven by a similar set of energy independence and pollution imperatives to the US, the Chinese market is further disposed to electric vehicle use because vehicle power expectations are not entrenched, commutes are generally short, legal liability laws are not problematic for car makers, and there is some official ability to direct demand. Moreover, aided by tax incentives and subsidies, Chinese domestic vehicle sales surged to 13.6 million units in 2009, surpassing US vehicle sales for the same period.

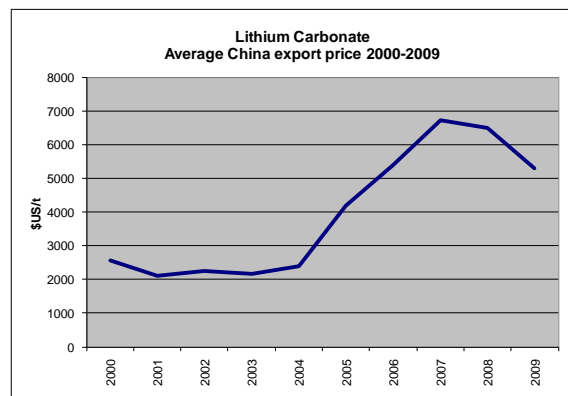
Some advanced electric vehicle programs have levered off established lithium battery technology and capacity in China. BYD, the Berkshire Hathaway backed Chinese company, has developed lithium ion battery manufacturing capacity in Shenzhen for its own auto models. CODA Automotive, in joint venture with Lishen Power Battery, has established lithium battery making capacity in Lishen to supply CODA electric cars initially destined for sale in the US. Other Chinese auto makers, SAIC Motor Co, and Geely Holding Group have agreements with US battery makers to build lithium battery plants in China.

Electric bicycles, scooters and motorbikes also present scope for increasing lithium consumption. To date the use of lithium based batteries for two wheeled transport has been limited, despite annual sales in China of over 20 million electric bicycles carrying lead-acid batteries. A switch to lithium batteries hangs on safety and pollution concerns, and the development of large scale manufacturing capacity. Honda and Yamaha introduced lithium battery driven electric motorbikes to the Japanese market in late 2010, with an eye on the massive south and east Asian markets that account for 60% of the world's two wheel vehicle demand.

In terms of contained lithium per unit, transport use is in another league to mobile phones and laptops. A typical mobile phone battery contains 0.4 grams of lithium and a laptop computer contains about 18 grams. 'Mild' hybrid vehicles like the Mercedes S400 (in which the batteries assisting the internal

combustion engine are recharged internally only), contain about 250 grams of lithium. Each Chevy Volt or Nissan Leaf (electric vehicles charged principally through mains electricity) carry between 2 and 5 kilograms of lithium.

Estimates of future automotive lithium demand depend on the technology mix and the adoption rate, neither of which are predictable with much assurance. 60 million new cars and 80 million new motorcycles are registered around the world each year. An adoption rate of 10% of new cars only, using an average of 1.5kg of lithium per vehicle, would require 9,000 tonnes of new annual lithium production, or about 40% of current world supplies. Assuming other applications maintain their current growth rate, the 9,000 additional tonnes of lithium consumed in autos by 2020 would require a 5% average annual growth rate in lithium supplies.



Source: Galaxy Resources

Lithium carbonate producers reduced prices in late 2009 in response to weaker demand from glass and ceramic sectors in particular. Volumes have since rebounded to 2007 levels. The Chinese export price averages reflect technical grade material (most battery grade lithium carbonate is consumed domestically).

### LITHIUM SUPPLIES

The first efforts to find and develop primary lithium sources began in the mid 1970s. Most early production came from coarse grained igneous rocks called pegmatites, in which lithium minerals are often associated with tin and tantalite. Established mines extracting tin and tantalite with physical separation processes added lithium streams as the lithium market developed in the 1980s.

Lithium also occurs in brine deposits, leached from the surrounding rocks and concentrated by evaporation in high altitude, dry climate salt lakes.

In 1997, the lithium carbonate price collapsed in concert with a major expansion of output from the

Salar de Atacama in Chile. Lithium from the Salar de Atacama dominated supplies from 1997 to 2010.

In 2010, about half of the world's lithium was produced from two brine complexes on the Salar de Atacama, operated independently by Chilean based SQM and Chemetall of the US. A third major brine operation, Salar del Hombre Muerto in Argentina, was developed by FMC Corp in 1998.

The largest pegmatite source of lithium is Talison Lithium's (TSE: TLH) Greenbushes operation in Western Australia. In 2010, Greenbushes supplied about 25% of the world's lithium, in the form of spodumene concentrates. Spodumene ( $\text{Li}_2\text{O} \cdot \text{Al}_2\text{O}_3 \cdot 4\text{SiO}_2$ ) is the most common and highest grade lithium mineral in commercial pegmatites. A third of Greenbushes' 2010 concentrates were sold as direct feed in glass and ceramics applications. Talison sold the remaining two thirds of its spodumene concentrates to Chinese 'converters'; small to medium scale manufacturers of lithium carbonate.

#### **SUPPLYING CHINA - AUSTRALIAN LITHIUM PRODUCERS**

Spodumene concentrate is a feedstock for lithium carbonate production, or conversion. Lithium carbonate is the base material for manufacturing various intermediate lithium chemicals that are delivered as cathode or electrolyte to battery makers.

Following greater than 10% growth in Chinese demand for lithium in each of 2009 and 2010, about a third of the world's lithium is consumed in China. Chinese firms are major players in battery manufacturing. About half of the world's intermediate lithium chemicals destined for battery use is manufactured in China.

With limited domestic supplies, an historical disposition to spodumene based lithium carbonate production and considering freight distances, Chinese lithium carbonate producers present a growing market for Australian producers of spodumene concentrate.

South American brines sourced material has not entered the Chinese market in significant quantities to compete with converted Australian spodumene. Apart from import duty issues, freight differential and firm demand in the US and Europe, brines sourced lithium chemicals may have different contaminant elements that the Chinese cathode makers are not necessarily geared to handle.

Talison has recently expanded its Greenbushes lithium output to meet the needs of the Chinese converters. There are currently up to a dozen Chinese converters with a collective capacity of about 50,000 tonnes of lithium carbonate. Talison supplied about

60% of the Chinese converters' spodumene feed before 2011. In 2011 Greenbushes is running at full capacity and seeking to more than double lithium output capacity by mid 2012 at a cost of \$A70 million.

Galaxy Resources Limited (ASX: GXY) built a spodumene mine and concentrator at Mt Cattlin, Australia in 2010, to be integrated with a chemical processing operation at Jiangsu in China. Shipment of Mt Cattlin spodumene concentrate from Esperance began in February 2011, destined for sale to third party converters pending construction of the Jiangsu conversion facility. At Jiangsu Galaxy intends to convert the entirety of Mt Cattlin's output to 17,000 tonnes of lithium carbonate each year.

Reed and Galaxy are both seeking to produce chemical grade spodumene concentrate principally for the battery market.

#### **MT MARION REVENUE**

Reed and Mineral Resources plan to sell spodumene concentrate to Chinese converters from early 2012.

The Mt Marion joint venture has not forward sold nor entered into any distribution/agency arrangements for spodumene concentrate sales, preferring to keep its downstream processing opportunities open.

The accompanying forecasts assume Reed sells spodumene concentrate at US\$350 per tonne (CIF China). Chinese importers have indicated a landed spodumene concentrate cost of about US\$250 per tonne in early 2011.

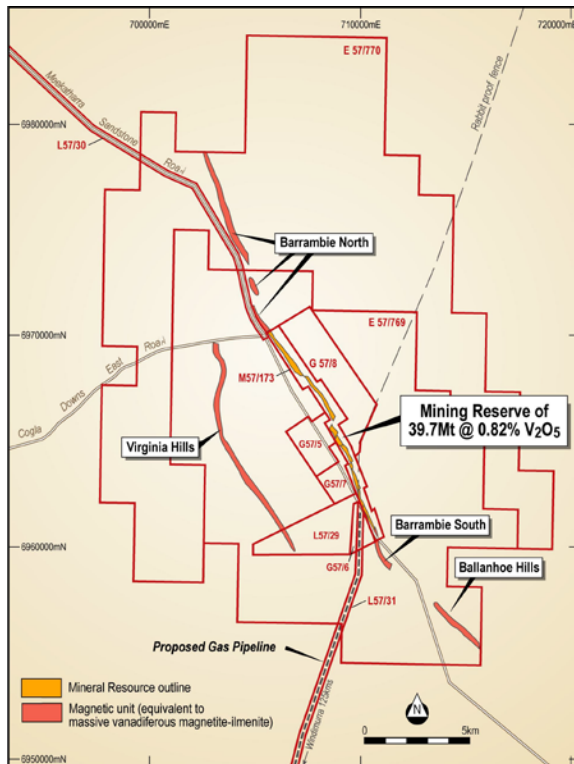
In 2010 the total Chinese conversion capacity was about 50,000 tonnes of lithium carbonate, or more than double the total produced in 2008. By mid 2012 three Australian producers plan to have the capacity to export spodumene concentrate containing enough lithium to produce 140,000 tonnes of lithium carbonate each year (Talison 95,000 tonnes, Galaxy 17,000 tonnes and Reed/Mineral Resources 28,000 tonnes). The increase in capacity equates to a more than six-fold expansion of Chinese conversion capacity in four years.

Prices and volumes at each point of the lithium battery manufacture chain are in a state of flux as the various participants jostle for commercial and political influence in this pivotal new industry. At present, China's best source of lithium is Australian spodumene concentrate of which Mt Marion promises to be one of very few competitive suppliers. A wide range of revenues and opportunities may spring from Mt Marion's development.

## 4. BARRAMBIE VANADIUM

Reed has spent about A\$30 million advancing the 100% owned Barrambie vanadium project through feasibility and approval processes since 2003.

Barrambie is a high grade titano-magnetite deposit in the Murchison region of Western Australia. Barrambie is 125km north east of the Windimurra vanadium project and the Midwest gas pipeline. Access to the port of Geraldton is via 450 km of regional roads. Sufficient water is available from onsite bores. A native title agreement is in place.



The Barrambie reserve has an estimated waste:ore ratio of 4.4:1. Barrambie material is partially oxidised, which reduces crushing and milling costs but also reduces vanadium recovery in magnetic separation.

The feasibility study completed in April 2009 was based on treatment of 3.2 million tonnes of ore per year at an average grade of 0.82% V<sub>2</sub>O<sub>5</sub> and production of 6,300 tonnes of vanadium per year in ferrovandium, over a minimum 12 year mine life. The capital cost of construction was estimated at A\$630 million, including A\$456 million in direct construction costs. Operating costs were estimated at US 20/kg contained vanadium.

In November 2010 Reed signed a memorandum of understanding (MOU) with Chinese construction conglomerate, NFC. NFC agreed to assist with financing Barrambie and take on the construction

contract. NFC is updating the Barrambie capital and operating cost estimates as at May 2011.

Upon receipt of NFC's updated estimates Reed intends canvassing potential development partners and investors for Barrambie.

### VANADIUM DEMAND

About 85% of vanadium production is used to strengthen steel. Over the past decade Chinese vanadium consumption has driven worldwide demand sharply higher. Since 1999 vanadium consumption has grown at an average annual rate of 5%, due almost entirely to Chinese crude steel production growth and an increasing intensity of vanadium use in Chinese steel.

In 2010 the vanadium content in Chinese steel averaged 35g of vanadium per tonne. From mid 2011 Chinese government regulations will require a minimum vanadium content of 50g per tonne of steel used in all construction works.

### VANADIUM SUPPLIES

About 95% of the vanadium produced in the world comes from titano-magnetite (magnetite Fe<sub>3</sub>O<sub>4</sub> that contains varying amounts of titanium and vanadium in the mineral lattice) deposits.

Titano-magnetite concentrations in layered mafic complexes are numerous worldwide. However there are only four complexes in the world hosting deposits currently being mined for titano-magnetite;

- The Bushveld Complex in South Africa. There are two separate mines on the Bushveld; Mapochs (operated by Evraz Group S.A, estimated annual output 14,000 equivalent tonnes of vanadium) and Ba-Mogopa (or Rhovan owned by Xstrata plc, estimated output 8,000 equivalent tonnes of vanadium).
- The Damiao Complex, Hebei Province China (Chengde Iron and Steel Group Co., Ltd, estimated output 9,000 equivalent tonnes of vanadium).
- The Panzihua Layered Intrusion, Sichuan Province China. (Panzihua Iron and Steel Group Co., Ltd, estimated output 11,000 equivalent tonnes of vanadium, expanding to 20,000 tpa).
- The Kachkanar Complex, Southern Urals Russia (Evraz Group S.A, estimated output 14,500 equivalent tonnes of vanadium).

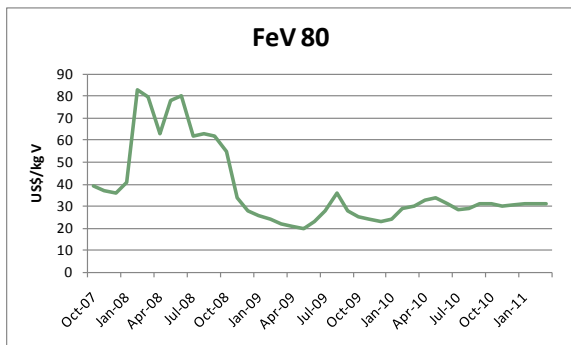
The Rhovan operation aside, the vanadium producing centres were developed in the 1960s as part of integrated steel production facilities, (with vanadium by products) under the technical, political and commercial conditions prevailing at the time. Steel

production from titanomagnetites has since remained a niche business, buttressed at least until recently by government support. Titanomagnetites are low grade and/or attenuated sources of iron relative to the massive hematite deposits developed since the 1970s. Titanomagnetites also require additional process steps to separate out titanium from the iron ore prior to blast furnace smelting.

Despite apparent competitive disadvantages the titanomagnetite steel producers have progressively expanded and restructured operations, managing to meet the bulk of vanadium demand. Panzhihua Steel is expanding operations further in 2011, encouraged by rising iron ore prices. Only the Rhovan operation, built in 1994, produces vanadium pentoxide and ferrovandium without attendant steel production. The Chinese and Russian titanomagnetite steel producers are too low grade to support independent vanadium production.

After over 40 years of reliance on steel by-product sources the development of new, higher grade vanadium sources to meet future demand growth makes increasing sense, particularly under a moderate iron ore price outlook. While established mines push into lower grades, higher strip ratios and greater distances from infrastructure, techniques for extracting vanadium products from higher grade titanomagnetites are being developed and refined. The 0.82% V<sub>2</sub>O<sub>5</sub> average head grade estimated for Barrambie compares to about 0.3% for the Chinese mines and Kachkanar, 0.5% at Rhovan and about 1.6% at Mapochs. The Windimurra deposit reserve grade is 0.46% V<sub>2</sub>O<sub>5</sub>.

In May 2011 the market price of vanadium in ferrovandium is US\$31/kg, still well below the US\$80/kg levels set in early 2008. Barrambie remains under scrutiny because of general industry recognition that new vanadium sources independent of steel production will need to be developed in the medium term.



Source: Metal Pages

## 5. OTHER ASSETS

Reed resumed 100% ownership of the Comet Vale gold project in June 2010. The Sand Queen underground mine at Comet Vale was placed on care and maintenance in June 2010. Exploration of several mature prospects is continuing.

Reed is refurbishing the Nimbus processing plant, 15 kilometres east of Kalgoorlie, with the intention of re-opening Sand Queen and accepting toll treatment ore. Subject to securing a toll treatment agreement Reed expects to establish 250,000 annual tonnes of CIL capacity at Nimbus by December 2011, at a cost of about \$10 million. Permit and milling capacity allowances have been made for an expansion to 500,000 tpa throughput. Reed also expects to re-establish access to high grade underground resources containing 40,000 ounces of gold at Sand Queen once Nimbus is refurbished.

Reed holds 600 square kilometres of tenements at Mt Finnerty, 120 kilometres west of Kalgoorlie. Mt Finnerty's greenstone belt and banded iron formations are being explored for iron ore in joint venture with neighbouring operator Cliffs Natural Resources and for nickel and gold.

## 6. FINANCE

At the end of December 2010 Reed had A\$13 million in cash.

In February 2011 Reed announced plans to raise \$40 million through a two stage placement and underwritten share purchase plan, both from new shares to be issued at 58 cents each. At the date of this report Reed had completed the capital raising.

Under the Meekatharra project acquisition terms A\$17 million was paid by 31 March 2011 and a further A\$10.8 million (including replacement of environmental bonds) is payable on 30 June 2011.

The accompanying projections assume that Reed has cash on hand of about \$15 million at the end of June 2011. Further funds (Green Leader estimate \$40 million) may be required in FY2012 to establish the Meekatharra and Mt Marion projects.

## 7. VALUATION

Assets	A\$M	Cents /share
Meekatharra	118	45
Mt Marion 70%	100	37
Barrambie	45	17
Other Assets	20	8
Exploration		
Equity dilution		
Cash	15	6
Other Asset		
Option dilution	-5	-2
<b>Share Valuation</b>	<b>293</b>	<b>111</b>

The valuation of Meekatharra is based on Green Leader estimates of mining inventories, capital costs, operating costs and gold price, and includes \$25 million in value attributed to exploration potential. All resource and operating assumptions are subject to a current feasibility study. The discounted cash flow model used to value Meekatharra assumes a 7% real, after tax discount rate.

The Mt Marion valuation is a Green Leader estimate of the asset's market value as at mid 2011. The market value estimate exceeds discounted cash flow model derived values at current spodumene indicative pricing. The additional value requires realisation of strategic opportunities such as downstream processing or sale of the asset to an integrated lithium manufacturer.

Like Mt Marion Barrambie's value is a subjective call. The probability of eventual development is considered high; however the development timing and partner equity take are uncertain. To justify development a minimum 20% internal rate of return on an up front investment of +US500 million would be required, suggesting at least \$200 million in project value at decision to proceed.

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