



Yellow Rock Resources Limited (YRR:AU) Rating Review

This review of Yellow Rock Resources Limited has been prepared in accordance with the **PortfolioDirect** stock rating framework described on pages 2-4.

PortfolioDirect/resources offers strategy and portfolio recommendations for independent investors. The rating framework has been developed to assist investors and their advisers to grade individual stock risk so as to better match stocks in their own portfolios with their personal risk profiles and to take account of the differing risk characteristics of potential investments when structuring their portfolios.

A **PortfolioDirect** stock rating is not intended as a forecast of future share price movements. Share prices will be influenced by a range of factors including, significantly, macroeconomic conditions and the current cyclical positioning of the sector which are not taken into account in determining a stock rating. The **PortfolioDirect** analytical framework separates the view about market direction from the stock risk analysis contained in this review.

The most important driver of a stock rating for a company being reviewed is an assessment whether the company is likely to meet its exploration and development targets within the timeframes sought by investment markets and, when development has occurred, its ability to maintain positive value momentum over future years.

The Investment Decision Snapshot

Commodity Exposure	<i>What is the mineral to which the company is principally exposed?</i>	Vanadium in Western Australia
Prospect Quality	<i>How does the resource rank on the "GLOSS" rating scale?</i>	The company has been given an elevated 3.4 grade on the 5 point resource quality rating scale with special emphasis on the location and size of the deposit
Investment proposition	<i>Do investment returns depend on (i) a reduction in risk over the medium term, (ii) specific near term events or (iii) a future change in cyclical conditions?</i>	Investment returns will depend on a reduction of risk over the medium term as successful metallurgical test work leads to confirmation of financial terms and successful funding
Risk profile	<i>How does the project rank on the PortfolioDirect risk rating scale?</i>	The company has a 3.4 score on the 5 point risk rating scale with the highest risk attaching to availability of project funding and, to a lesser extent, confirmation of market access
Portfolio positioning	<i>What roles could the company play in a portfolio? Are other companies able to fulfill these roles more effectively?</i>	The company offers medium term value appreciation from successful project development, commodity diversification and exposure to technological changes affecting global energy markets. China exposure is low.
Liquidity	<i>How easily can buyers or sellers of the stock be accommodated?</i>	Unusually high liquidity widens access for a range of investors

Important Information Regarding the Preparation of this Report

This report is not intended as an offer or solicitation with respect to the purchase or sale of a security. Nothing in this report should be taken as a recommendation. Yellow Rock Resources has been rated without taking into account the particular objectives, financial circumstances or needs of any particular investor. Before taking any decision based on this communication, an investor should assess his or her own circumstances and seek professional advice.

This report is based on information disclosed publicly by Yellow Rock Resources at the date of the report, information otherwise available in the public domain at that time and analysis and technical inferences drawn by the staff of E.I.M. Capital Managers Pty Ltd, the publisher of **PortfolioDirect**.

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Yellow Rock Resources has not had an opportunity to comment on the report or request any amendments prior to its publication.

Trading in PortfolioDirect Rated Stocks by E.I.M. Capital Managers

Stocks rated in accordance with the criteria outlined in this communication may be bought or sold by E.I.M. Capital Managers on behalf of clients or funds whose investments are managed by the firm. Specific investment objectives and individual portfolio considerations may result in transactions by E.I.M. Capital Managers that are not consistent with **PortfolioDirect** ratings for individual stocks.

Stock Rating Criteria

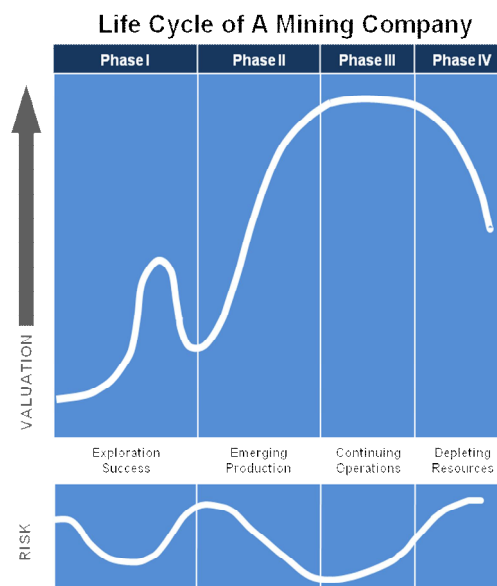
E.I.M. Capital Managers categorises sector investments based on the four phases in the life cycle of mining and oil and gas companies.

Phase I: the exploration phase during which relatively small amounts of capital may be deployed with the prospect of a high return but when investors also risk losing all the funds subscribed prior to the company having an agreed development plan.

Phase II: the emerging production phase in which companies are able to demonstrate access to a commercial resource and add value by meeting key development milestones along an agreed development path.

Phase III: the phase of continuing operations in which organic volume growth is limited and commodity price movements become the dominant driver of earnings and value.

Phase IV: a period typically characterised by falling ore grades and rising costs requiring additional capital to prevent output contracting.



Phase I companies will be scored (on a five point scale) on their potential to confirm a commercially viable development within an acceptable investment market timeframe. The duration of the investment horizon might vary from time to time depending on market conditions but will usually extend to a period of up to 24 months. Judgements will be based on publicly available information, including clarifying conversations with company management, and the resulting geological inferences drawn by E.I.M. Capital Managers analysts.

Phase II companies will be scored on a five point scale on their capacity to deliver positive value momentum (i.e. the ability to generate increasing fundamental value over future years without any reliance on higher commodity prices).

Since Phase III companies, by definition, no longer have any material organic growth prospects, they will generally fail the 'positive value momentum' test. A Phase III company may still play an important portfolio role depending on its relative financial strength, its capacity to withstand periods of cyclical weakness due to the competitiveness of its cost structure and its potential, arising from a large resource base, to operate through multiple economic cycles. Phase III companies will be scored on a five point scale on their absolute value proposition and how they meet these additional criteria.

No inferences about share price performance should be drawn from the rating of an individual stock. Investment returns will be influenced by a range of factors, some of which are included among the **PortfolioDirect** rating criteria, as well as investment market expectations about a range of macroeconomic variables. The **PortfolioDirect** rating does not take account of macroeconomic or investment market conditions that play a role in setting the price levels of securities.

There may be points in the cycle when stocks assessed by **PortfolioDirect** as being relatively risky and given a relatively low score on the **PortfolioDirect** rating scale are capable of producing relatively strong investment returns. This may arise, for example, because of strong leverage to changes or expected changes in market conditions among stocks with unusually depressed share prices or very small current market values.

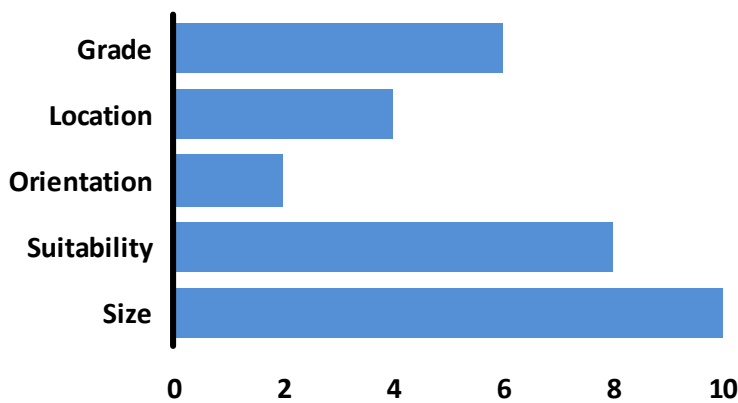
How does PortfolioDirect rate a late-stage Phase I company?

The **PortfolioDirect** rating system scores a Phase I company on its potential to confirm a commercially viable development within an acceptable investment timeframe. The rating will be a product of the underlying asset quality and the investment risk profile.

QUALITY + RISK = PORTFOLIODIRECT RATING

A company is classified as late-stage Phase I if a resource with commercial potential has been defined but uncertainties remain about its commercial viability without permitting approvals and funding. A company at this stage of its development will be assessed on the extent to which it meets the **PortfolioDirect** GLOSS rating criteria in conjunction with the risk characteristics relevant to the company's stage of development.

Resource Quality "GLOSS" Rating (1)



PortfolioDirect assesses the quality of a mineral resource using its 5-point "GLOSS" rating.

- GRADE** using the best available in the industry as a benchmark for the highest rating
- LOCATION** whether a deposit is situated within an existing mineral province for which infrastructure currently exists
- ORIENTATION** usually the extent to which a mineral deposit can be characterised as Flat-Thick-Shallow or Dipping-Thin-Deep
- SUITABILITY** whether ore is suitable for processing by conventional industry practices or the extent to which a novel or unproven treatment process must be used
- SIZE** a measure of the life of a project with resources capable of sustaining a multi-decade operation receiving the highest rating



1. This graphic representation is for illustrative purposes only and does not represent the rating for any particular company.

A Guide to the PortfolioDirect Rating Report

Each **PortfolioDirect** company rating report addresses questions affecting business outcomes and potential investment standing under five separate headings.

Primary Development Assets

- What are the most important geological or operational attributes of the company?
- Where are the assets located and what is the availability of local infrastructure?
- What potential impact does location have on business outcomes?
- How was ownership achieved - corporate exploration, acquisition or farm-in - and what obligations remain to the vendors or partners?
- Do historical outcomes on or near these exploration properties say anything about likely mineral characteristics on the company's own assets?
- Are there identifiable technical issues that need addressing before further work can be completed?

Regulatory Standing

- What approvals have been received?
- What additional approvals will be necessary to meet business goals?
- Has the company been in breach of any regulatory requirements at this site or elsewhere on any previous occasion?
- Can the company show a commitment to environmental and social needs?

Project Potential

- What scale of development is anticipated or, if judgements about this cannot be made presently, what must happen before such a judgement can be made?
- What operational or market constraints might affect the project potential?
- What is the likely range of project capital needs in the event of development?

Capacity to Meet Targets

- What skills does the company currently have available?
- What additional or alternative skills will be needed for the next stage of activities?
- How does the track record of the existing management impact current judgements about the capacity of the company to meet its targets?
- What financial resources are currently available? Are they adequate for the targets being set?
- Are there unresolved technical, financial or regulatory matters that could impact the achievement of business targets?

Rating Discussion

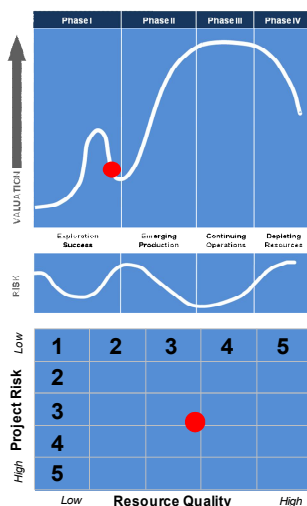
- Into which development phase has the company been classified?
- What are the key criteria against which the company is being benchmarked?
- How does the company stand against the rating criteria for a company at this stage of development?
- Are there criteria which have been more or less important in coming to a rating decision?
- Are there matters which might affect the rating in the future?
- Are there any special attributes displayed by the company that might impact on its role in a portfolio?
- How have historic investment returns affected judgements about current and future market risk?

Company Rating Review

Yellow Rock Resources Limited (YRR:AU)

NR 1 1+ 2 2+ **3** 3+ 4 4+ 5

Selection Criteria: Corporate subscriber



Statistical Risk Measures

Deviation from	
• 15 week moving average	-11%
• 25 week moving average	-8%
• 50 week moving average	0%
Historical return ranking (1-100)	
• Jan 2011 - Dec 2014	24
• Since 1 January 2015	29
Return volatility¹	1.2X
Liquidity²	182%
1. Relative to sector median	
2. Turnover for 12 months as % of current shares	

Recent Company Events

- The company obtained distribution rights for vanadium redox flow batteries in Australia from two German vanadium battery makers and signed a partnership agreement with a solar cell installer as steps toward vertical integration (ASX 9 September 2015).
- A 15-30 metre wide zone of vanadium-rich magnetite extending over a strike length of close to 1.5km was reported at the company's Gabanintha prospect in Western Australia with observed grades of up to 2.2% V2O5 placing the discovery amongst the highest grade accumulations (ASX 13 July 2015).
- The company lodged a Mining Lease application over the Gabanintha vanadium prospect with the Western Australian Department of Mines and Petroleum (ASX 30 July 2015).

Primary Development Assets

Yellow Rock Resources was listed on the ASX in February 2007 as an exploration company focused on the Gabanintha vanadium and uranium prospect in Western Australia and a number of uranium prospects located elsewhere in Western Australia and in the Northern Territory. The Gabanintha prospect has remained the primary focus of the company. In late 2007, the company secured additional uranium prospects in the Northern Territory through the acquisition of interests in private exploration companies Cabe Resources Ltd and Apogie Pty Ltd (ASX 31 October 2007).

The Gabanintha vanadium and uranium prospect had been originally mapped over a strike length of 4.2km with successive drill test programs since 1960. The most recent activities of the company have been aimed at defining a high grade core to the mineralisation to warrant development as a supplier of vanadium inputs to growing vanadium battery markets. In 2015, the company identified a laterally continuous higher grade zone within the mineralised body.

Gabanintha vanadium prospect, Western Australia, 100%

The Gabanintha vanadium prospect is located 43km southeast of the town of Meekatharra in Western Australia and is accessible from the sealed Great Northern Highway and the unsealed

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gazetted Sandstone Road. The prospect is 600km from the export port of Geraldton.

The area has been identified as prospective for uranium, base metals and gold. Occurrences of uranium have been defined at Cogla Downs, Nowthanna and Murchison Downs, all within 40km of the prospect. The Nowthanna prospect is only 5km away. The calcrete-hosted Yeelirrie deposit occurs 100km to the east. Some historical gold mining has occurred in the region, including at Yagahong, Yagahong North, Kavanagh, Terrells, Canterbury and Tunblegum, all directly north of the company tenements. The gold potential of the region was first recognised in 1897. Uranium was first identified in the 1970s.

The Gabanintha deposit is one of a series of pale coloured anorthosite-rich gabbros (leucogabbros) which occur in the region with some bodies containing distinctive layers of vanadium-bearing magnetite. These layered bodies have been the subject of earlier exploration, focused on vanadium and the potential occurrence of chrome and platinum-group elements.

The Gabanintha vanadium-iron-titanium deposit was initially drill tested in 1960 when the large scale and broad geometry of the body was defined. The Gabanintha deposit has a defined strike length of over 12.2km with a consistent 50-60 degree westward dip. The area has undergone extensive weathering. The gabbro occurs in some outcrop showing a distinctive pale colour in fresh samples. Where the magnetite layers occur, the gabbro is brown-red in colour. This geology is comparable to that currently exposed in the walls of the Windimurra pit which has been previously mined for vanadium-bearing magnetite within a similar layered leucogabbro host.

The Gabanintha intrusive body (Gabanintha gabbro) is located within a package of rocks defined as the Norie Group which sits within the Northern Murchison Domain of the Archaean age Murchison Super group. The Norie, Polelle and Glen Groups contain various large gabbroic and doleritic bodies (Gabanintha gabbro, Narndee gabbro, Murroulli dolerite, Fleece Pool gabbro, Dalgara dolerite and Waladah gabbro) which have been related to periods of ancient volcanism.

The Gabanintha gabbro has been identified as the oldest intrusive body of the sequence (2861+/- 5 Ma) occurring at the base of the Norie Group. The Southern Cross Domain which occurs to the south contains the Kathleen Valley gabbro which is also younger than the Gabanintha body (at 2737 +/- 3 Ma).

These various large gabbroic bodies have been the subject of research which has linked them to the well-known Bushveld igneous complex of South Africa. A 2010 paper drew parallels with the now structurally dismembered greenstones of the Murchison Domain (which in some places are 6km thick and collectively cover over 2,500 square kilometres) to the similar age Bushveld complex (Ivanic T.J, Wingate M.T.D, Kirkland C.L, Van Kranendonk M.J, Wyche S (2010) Age and significance of voluminous mafic-ultramafic magmatic events in the Murchison Domain, Yilgarn Craton; Australian Journal of Earth Sciences; 57:5, 697-614). The largest Murchison Domain block, the Windimurra Igneous Complex, is the largest single mafic-ultramafic intrusion in Australia containing at least 13 reversals in geochemical fractionation linked to separate magmatic pulses. The research highlights the unique geological setting of the Gabanintha intrusive body placing it in the context of defined vanadium deposits and operations in South Africa.



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At the time of listing, Yellow Rock Resources referred to a historical indicated resource at Gabanintha prepared to the 2004 JORC Code standards. The 37.66Mt estimate was divided between weathered oxide (20.6Mt or 54.8%) and un-weathered rock. The confidence level was based on the observed continuity of the gabbro in magnetic surveys over the area and 15 drill traverses spaced 400 metres apart (ASX 8 January 2007). At the time, the resource was estimated to a vertical depth of 50 metres. The company subsequently released a revised resource estimate prepared by CSA Global Consultants (ASX 8 February 2011).

This resource estimate was prepared with two cut off grades. The high grade component is a different composite of rocks than that of the low grade owing to significant differences in the reported chemistry. The high grade material has 80% more iron (magnetite) and, for this reason, is emphasised here. The estimate was based on the results of 164 holes for a total of 13,124 metres. Drill sections were spaced between 100 metres and 500 metres.

Gabanintha Mineral Resource, February 2011

High grade, 0.7% V2O5 grade cut off

Measured

-

Indicated

14.4 Mt at 1.03% V2O5, 42.14% Fe, 12.07% TiO2 & 11.42% SiO2

Inferred

46.0 Mt at 0.97% V2O5, 42.15% Fe, 11.19% TiO2 & 12.37% SiO2

60.4 Mt at 0.98% V2O5, 42.15% Fe, 11.40% TiO2 & 12.15% SiO2

Low grade, 0.3% V2O5 grade cut off

Measured

-

Indicated

42.7 Mt at 0.44% V2O5, 23.37% Fe, 6.08% TiO2 & 29.25% SiO2

Inferred

22.7 Mt at 0.42% V2O5, 22.65% Fe, 6.08% TiO2 & 30.62% SiO2

65.4 Mt at 0.43% V2O5, 23.12% Fe, 6.08% TiO2 & 29.73% SiO2

In December 2014, the company received approval for a drilling program of 54 RC and 6 diamond holes (for 6,300 metres) at Gabanintha to allow a recalculation of the resource to current reporting standards (including some higher confidence level resources) and collect samples for a program of metallurgical test work and geotechnical analysis to permit the evaluation of potential mining pit shells.

The company set an objective of defining at least 5Mt of material at the higher confidence measured resource status which would underpin an initial five year mine plan (ASX December 11 2014). In March 2015, the drilling program commenced (ASX 26 March 2015) with the RC component completed in May (ASX 6 May 2015). The additional drilling was focused on a 2km strike length in the northern part of the Gabanintha resource.

The drilling program identified a massive magnetite zone within the host anorthosite gabbro confirming the presence of higher grade material (ASX 25 May 2015). In July 2015, Yellow Rock Resources reported the assay results from the diamond holes, including the initial holes which intersected the magnetite rich part the host anorthosite gabbro.

The drilling program reported 158 intersections of over 4 metres in thickness reporting over 0.5% V2O5. There were 15 one metre thick intersections of over 1.5% V2O5. The company plotted the available data on three cross-sections 75 metres apart which show a laterally and vertically continuous zone of gabbro with elevated levels of vanadium-bearing titanomagnetite. The zone extends from surface and occurs in the lower part of the gabbro (ASX 12 June 2015).

Some of the better intersections from this initial phase of drilling were:

GRC0169	7 metres @ 1.44% V2O5 from 27 metres
GRC0173	7 metres @ 1.44% V2O5 from 70 metres
GRC0189	4 metres @ 1.38% V2O5 from 55 metres
GRC0163	12 metres @ 1.36% V2O5 from 36 metres
GRC0204	10 metres @ 1.36% V2O5 from 98 metres

The company interpreted the higher grade zone as an enriched part of the fractionated intrusive. In its June quarter activities report, the company contoured vanadium grades on the three

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sections it had shown in June (ASX 30 July 2015). The higher grade part of the intrusion occurs close to the base of the gabbro body with several zones of 0.4-0.7% V2O5 material occurring higher in the sequence. These intermediate and higher grade zones are separated by weakly mineralised gabbro.

In core trays, the mineralised anorthosite gabbro occurs as red-brown material within an otherwise weakly mineralised grey rock. The available core suggests that the mineralised gabbro is visually distinctive which would allow clear grade and geological boundaries for resource estimation purposes and any subsequent mine plan. The presence of equally distinct mineralisation in parts of the gabbro overlying the higher grade zone would suggest that this material could be preferentially mined in any open pit activity and treated with the higher grade zone material. This would have the effect of altering the amount of overburden removed and likely mining costs as a pit is deepened. The defined gabbro sequence is approximately 140 metres thick.

Regulatory Standing

The Gabanintha vanadium deposit is held under a package of four contiguous exploration licences (EL 51/1534, EL 51/843, EL 51/1576 and EL 51/1396) and related permits (P51/2634, P51/2635, P51/2636, P51/2566 & P51/2567) which are all 100% held. A mining lease application covers most of EL 51/843. Western Australian exploration licences are issued for eight year periods with set requirements on expenditure and progressive tenement reduction. Tenements can be renewed after the eight year period has passed provided conditions have been met.

The company signed a Heritage Agreement with the Yamatji Marlpa Aboriginal Corporation representing the Yugunga Nya people, the traditional owners of the area, in April 2015. The agreement covers the main Gabanintha prospect lease. A heritage survey was undertaken by Big Island Research Pty Ltd. Further discussions have subsequently taken place between the company and traditional owner groups focused on the development of the deposit.

In its June quarter activities report, the company disclosed that requirements for a mining lease application had been met and a mining lease application covering approximately 59 square kilometres (MLA 51/878) had been lodged with the Western Australian Department of Mines and Petroleum (ASX 30 July 2015). A granted mining lease would have a 21 year life and would be renewable for a further 21 years on a continuing basis.

On 3 August 2015, the company noted that it had initiated the collection of baseline environmental data over the prospect area, including the flora and fauna studies. This data will be required in the preparation of a future Environmental Impact Assessment study and mining approval. The company and its specialist consultant aims to collect all the necessary initial data in spring.

Project Potential

The Gabanintha project was the subject of an engineering concept study released on 15 September 2014. The study scoped an operation with an initial mine life of 20 years producing high purity vanadium pentoxide flake from an open cut mine and a salt-roast-leach extraction process, a proven operating technology.

The study estimated that 5-10,000t of vanadium pentoxide flake could be produced annually with a cash operating cost of A\$7.26/kg (or A\$3.29/lb) which would offer an attractive margin on the then prevailing vanadium pentoxide price of A\$7-9/lb. The estimated operating cost excluded off-site costs such as marketing and product transport. To achieve the higher end of production, some 2.1Mtpa of beneficiated gabbro would have to be processed.

The anticipated development cost of the project was in the range of A\$170-230M. The lower production rate of 5,000 t of vanadium pentoxide flake was noted as a potential option with a lower capital cost and highlighted as an area of further study.

The company has recently initiated a number of technical studies aimed at refining this analysis and providing greater confidence about the technical assumptions.

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Vanadium Battery Market

Adoption of battery and energy storage applications using vanadium is likely to play an important role in the development of the Gabanintha vanadium prospect, potentially eclipsing the influence of the steel-related market which currently dominates vanadium use.

In presenting its investment case, the company has highlighted the extent to which vanadium redox battery alternatives are a superior flow battery technology owing to their unique combination of scalability, long lifespan cycles, relative simplicity (one battery element) and safety. Vanadium redox batteries draw on the ability of vanadium to exist in solution in four different oxidation stages. The technology employs vanadium ions in different oxidation states to store and release chemical potential energy.

The energy storage opportunity arises as production of variable output energy sources such as wind and solar increase and the need rises for large-scale electrical energy storage systems to match supply and demand. Flow batteries are especially attractive for these load levelling applications.

A flow battery is a fully rechargeable energy storage device. Fluids containing the active materials are pumped through a chamber where they interact. In a reduction/oxidation reaction, two electrolytes with different valences press against either side of a membrane and, in reacting, generate a current.

Vanadium redox batteries have been among the most advanced of this style of device although an example of the technology with a zinc/chlorine combination is documented from the late nineteenth century to power an airship in France. Researchers are continuing to work with different materials in search of the most efficient storage media. Cost of the elements within the electrolyte and membrane replacement remain important determinants of how widely the technology and the specific metals used as electrolytes will be adopted.

The U.S. Department of Energy has been especially active in helping to remove some of the earlier disadvantages of the vanadium battery such as its need to operate within a narrow temperature range and the expense of the polymer membrane required to facilitate the underlying reaction.

In a December 2015 presentation, Bushveld Minerals outlined the potential impact on vanadium demand of its adoption as an electrolytical material. According to Bushveld Minerals, each 1MWh vanadium redox battery requires some four tonnes of pure vanadium. Forty GW of grid connected energy storage using vanadium redox batteries would require 160,000t of vanadium, more than twice the current annual use of vanadium by the steel industry. At a household level, a 0.05% penetration rate in the USA by 2020 (equivalent to some 100,000 households) would translate into 22,175t of vanadium (using consumption of 50 kwh and 440lbs of vanadium per household).

In March 2015, Imergy Power Systems, one provider of vanadium redox battery applications, reported that Sun Edison had placed an order for 1,000 ESP30 redox flow units to be delivered over the next three years to store off-grid power from solar sources in rural settings. This is the largest order for the company (and the technology) to date, building on some 100 currently operating units.

Yellow Rock Resources has foreshadowed battery storage capacity growing to 185 Gwh in the foreseeable future of which 30% would be taken up by vanadium redox batteries resulting in 300,000 tonnes of additional vanadium demand.

Against this background of the emerging use of vanadium in energy storage applications, Yellow Rock Resources recently obtained the distribution rights for Australia from two German vanadium redox flow battery technology providers. This will allow the company to actively promote and advocate the technology. The company has also partnered with an existing Australian solar installation company to establish an implementation capacity (ASX 9 September 2015). The approach is a stepping stone to a vertically integrated business model in which production of vanadium battery inputs would utilise material from the company's Gabanintha property.

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Capacity to Meet Targets

Whatever the potential of vanadium in battery storage applications, the company's prospects will depend on its management being able to demonstrate the economic viability of the Gabanintha project and on its capacity to move the project to the next stage of development.

The company has shown that it is able to manage the regulatory and approvals processes. The recent submission of a mining lease application and negotiations with native title holders indicates steady progress in this area. The company has demonstrated skills in the execution of exploration programs. The recent drill program has defined a higher grade domain to the Gabanintha deposit which has the potential to have a material impact on any future development plan.

Priority activities for the company will now include a program of drilling that will result in a JORC 2012 compliant resource being estimated. Although this may prove a relative formality since there is a resource already defined under the 2004 Code, it will be a necessary step to enable the company to progress.

The parameters of the mineralisation are still evolving with a recent exploration program identifying domains of different grade material within the mineralised anorthosite gabbro host, reflecting differential fractionation within the intrusive body, with particularly magnetite-rich thick zones close to a basal contact. Earlier work on the Gabanintha vanadium deposit had classified high grade and low grade mineralisation (with clearly different host mineral assemblages) but this new work offers a geological context to the grade variations and points to a potentially larger high grade domain with shallower intervals of intermediate grade material.

The mineralisation is aided by the intimate relationship of the vanadium with magnetite in the host anorthosite gabbro. This allows the magnetite to be separated from other rock forming minerals with available magnetic separation techniques resulting in minimal vanadium losses. An engineering concept study from September 2014 utilised a magnetite concentrate grading 1% V₂O₅ as the feedstock of a processing plant to recover vanadium.

Completion of a detailed metallurgical study to support upcoming feasibility analyses is expected by the end of 2015. This, too, is expected to be consistent with earlier test work although outcomes from the current round of tests should probably be considered less certain than the revision of resource estimates.

Completion of baseline biological surveys to support an environmental impact statement is the third critical step in the near term.

All these activities will rely on the expertise of external parties as the depth of personnel employed directly by the company is limited. As the company moves closer to more detailed mine planning and financial optimisation, this will have to change. While many companies continue to rely on external service providers through this phase of their activities, the resulting unfamiliarity with the detail that is often evident can mitigate against achieving the most cost effective development outcomes. This will be the case especially where more highly specialised knowledge about markets and processes is required.

The determination of the company to implement a vertically integrated business model would also imply a need for a deeper management than would normally be required and to which the company currently has access.

The board of directors has three members. Two of the three are executives of the company on the **PortfolioDirect** criteria. The third member is not technically qualified in a mining related discipline (although no adverse inference should be drawn about the value such an individual with public company board experience may be able to play). The only technically qualified member of the board is the chairman who is also the designated competent person for purposes of estimating the company's mineral resource. The resulting duality of interests compromises the ability of the board to effect independent oversight of the company's activities. The chief executive of the company, an experienced professional geologist, is not a director.

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At the end of June 2015, the company had cash reserves of A\$1.8 million and anticipated spending commitments of \$445,000 (ASX July 2015) implying sufficient funding at the current rate of spending for another three quarters. For practical purposes, the company is likely to be in need of additional sources of funding before the end of 2015 or very early in 2016, at the latest. Attempts to meet ongoing funding needs may coincide with the release of further technical and financial analyses of the Gabanintha project later in 2015.

Fulfilment of the company's aspirations will require adoption of vanadium as an electrolyte of choice in storage battery applications. Vanadium has a lead over other materials but ongoing intensive research efforts leave open the possibility of other materials being adopted quickly to cut back the advantage currently enjoyed by vanadium. This risk is greater to the extent that the mining industry is unable to respond promptly to expanded demand arising from a widespread desire to use vanadium as a battery storage medium.

While there are competitors in the wings, vanadium redox flow batteries have advantages over currently known alternatives such as iron/chromium and zinc/bromide combinations. The primary advantage of vanadium is its ability to exist in several states allowing batteries to utilise only one element and, in doing so, avoid cross contamination of chemicals.

In assessing the outlook for the vanadium market, investors should be wary of the analytical danger arising from too readily accepting the optimistic market analysis of the vanadium potential. This danger is not confined to vanadium. It is evident in proliferating presentations unrealistically highlighting the potential for more of a commodity to be used than can be produced or sourced from stocks. In the case of vanadium, actual usage outcomes will depend on how quickly production can react, whether prices can remain competitive in the face of strongly rising demand and the ease with which alternative materials may be adopted to make up a production shortfall. Ironically, battery producers may prove less likely to adopt vanadium, in practice, the greater the perceived supply shortfall and strength of price rises.

Rating Discussion

PortfolioDirect has classified Yellow Rock Resources as a Phase I company. The **PortfolioDirect** rating framework scores Phase I companies on the potential to confirm a commercially viable development within a timeframe acceptable to investment markets.

Yellow Rock Resources is in the latter stages of Phase I having already demonstrated the existence of a resource at Gabanintha. While the resource was estimated in accordance with the 2004 JORC Code, there is enough recently accumulated information from which to conclude that it is sufficiently large to support future mine development. Very limited reinterpretation of the company's prospects is expected to arise from further exploration endeavours.

The transition from the latter stages of Phase I to Phase II, at which point development is underway, can often represent a value trap for investors as companies have typically passed the point at which they can generate sufficient positive surprise from exploration or resource sourcing to force a reassessment of market value. At the same time, they may not yet have made a commitment to development or may display insufficiently convincing project economics for investors to assume future development. There is a risk of this positioning being prolonged and extending well beyond a reasonable investment time horizon. In some extreme cases, the transition may never be completed. This is one of the highest risk phases of development.

Underpinning the **PortfolioDirect** rating approach is the view that companies with the most attractive trade-off between the "GLOSS" resource quality and corporate risk profile described on page 4 are the most likely to eventually make the transition from Phase I to Phase II.

The actual investment return from a company at this stage of development and its precise timing will often depend additionally on:

- whether the company faces an outcome which is critical to the development of the project and which offers an opportunity for the market to reassess the capacity of the company to move forward; and,

(Continued on page 13)

(Continued from page 12)

- the extent to which investors have previously lost faith in company progress, most frequently exemplified by its share price performance relative to other companies in the sector, providing leverage to the change in business circumstances.

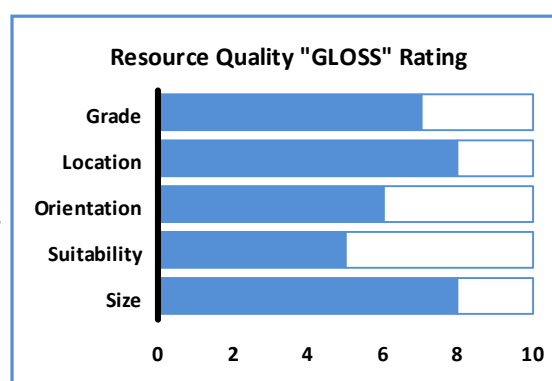
The "GLOSS" asset quality score for Yellow Rock Resources, based on the Gabanintha vanadium deposit, is in the upper end of the range of possible outcomes. Significant contributors to the elevated rating are the size of the deposit - offering the chance of a 20 year mine life after taking account of the possible lateral extent and depth of mineralisation - an above average grade in comparison with peers globally and the physical location. Large scale mining activity is underway in the Meekatharra region of Western Australia which supports relevant industry infrastructure.

The Gabanintha gabbro has an attractive geometry for large scale open pit extraction with mineralisation extending to surface. While the higher grade part of the gabbro body is located close to the basal contact, zones of intermediate grade material occur in domains closer to the surface. The strong visual characteristics of the mineralisation would enable these zones to be incorporated into a mining schedule to reduce overall waste stripping needs.

The suitability of the ore for treatment - the lowest score on the "GLOSS" scale - is currently being tested. While a favourable outcome from the tests is expected, confirmation will be received late in 2015.

PortfolioDirect has purposefully taken a cautious approach to rating this feature to take account of the possibility that elements of the test results may not completely meet expectations or battery customer needs. This leaves scope for a rating

upgrade at a later time once the metallurgical attributes of the mineralisation have been more fully investigated enabling this risk to be more confidently discounted.



The risk rating is slightly elevated. Unsurprisingly, funding risk has been rated as high. A project with an estimated cost of around A\$200 million will have to be funded by a company with a current market value of less than A\$8 million. Other similarly positioned companies are experiencing considerable difficulty in completing equivalent (or even significantly lesser) financing tasks. In any event, before the major part of this requirement is sourced, the company will have to raise sufficient funds to maintain day to day activities leading to mine development.

Market opening risk is also relatively high because the company is seeking to tap still unproven market opportunities or achieve sales which require a higher level of customised servicing (notwithstanding outstanding potential) than many other mineral commodities. Similarly positioned companies attempting development of projects involving rare earth elements, lithium and graphite - all with similarly technologically oriented end markets - have typically found market cultivation time consuming and often a source of delays to the respective projects. The market opening risk must also be assessed against the background of the company having to simultaneously seek regulatory approvals, optimise mine development plans, complete metallurgical testing and finalise environmental assessments while pioneering new global markets with a management team in need of supplementing with a range of additional specialist skills.

The overall **PortfolioDirect** rating reflects a company well-positioned from a resource quality perspective with exciting end-market potential opportunities. In progressively overcoming the operational and financial hurdles in the path toward its development goals, Yellow Rock Resources could expect to receive a higher rating for resource quality and a lower risk rating. From a portfolio construction perspective, Yellow Rock Resources offers investors a unique combination of attributes with the potential to improve the risk profile of a resources portfolio through commodity diversification and a lessened direct reliance on Chinese economic outcomes. ■

Significant Investment Risks

In addition to general equity market risks reflecting unexpected changes in global economic or political conditions, investors in the resources sector may incur further risks specific to investments in the sector.

Commodity market risk: Resources sector investment returns are generally more volatile than returns from other equity market sectors due to the earnings of resources companies being exposed to commodity price and foreign exchange movements. Commodity prices can be influenced by a range of factors including economic events, which might affect the volume of commodities used, monetary policies which might affect levels of speculation and changes in output reflecting levels of industry exploration, investment and production disruptions.

Operational risk: Companies may fail to meet their development goals as a result of unexpected external influences, including political conditions and natural phenomena, as well as the skill base and operational capabilities of company management. Companies engaged in exploration activities may fail to locate or define mineral deposits of a sufficient size to be commercially viable.

Funding risk: Since companies in the resources sector require ongoing funding for development, expansion and maintenance of output, changes in financial market conditions can affect the value of investments adversely through the cost or availability of capital.

Regulatory risk: The value of investments in the sector may be affected adversely by changes in government policies relating to the conditions under which mine developments are permitted, including the need for more stringent environmental controls, higher taxation or royalty rates or requirements for local equity participation.

Small companies risk: Small or early stage companies generally have less diversified income streams, less stable funding sources and weaker bargaining positions with their counterparties than larger companies. The securities of small companies may also be less liquid than those of larger companies making the purchase or sale of securities more difficult or costly to complete, possibly with an adverse impact on portfolio performance.

Abbreviations and Symbols

lb	pound	cif	cost, insurance and freight
oz	troy ounce	fob	free on board
Koz	1,000 troy ounces	fot	free on truck
Mlbs	million pounds	g/t	grams per tonne
kg	kilogram	ppm	parts per million
t	tonne	RC	reverse circulation
kt	1,000 tonnes	RAB	rotary air blast
Mt	1,000,000 tonnes	U ₃ O ₈	yellowcake (uranium)
Mtpa	million tonnes per annum	Fe/FeO	iron/iron ore
kL	kilolitre (1,000 litres)	SiO ₂	silica
ML	megalitre (one million litres)	Al ₂ O ₃	alumina
GL	gigalitre (one billion litres)	P	phosphorus
ha	hectare	TiO ₂	titanium dioxide
m	metre	ZrO ₂	zirconium dioxide
m ³	cubic metre	LOI	loss on ignition
km	kilometre	mg/l	milligrams per litre
A\$	Australian dollar	Mj/kg	mega joules per kilogram
\$M	million dollars	EBITDA	earnings before interest, tax, depreciation & amortisation
US\$	United States dollar	EBIT	earnings before interest & tax
MG/GW	megawatt/gigawatt	ROM	run of mine
ct	carat	LOM	life of mine
bbl	barrel	MOU	memorandum of understanding
mbd	million barrels a day	VTEM	Versatile Time Domain Electromagnetic
MBOE	million barrels of oil equivalent		

