

## SEPTEMBER- 2015 QUARTERLY REPORT

### ATHENA RESOURCES LIMITED

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### CONTACTS

Mr Ed Edwards  
Managing Director

### PROJECTS

**Byro:**  
Iron Ore, Nickel-Copper-PGE's

### SECURITIES

173M Shares - AHN

### SHAREHOLDERS

Mr E Edwards 17.55%  
Mr D Webster 5.69%

## BYRO IRON PROJECT

### HIGHLIGHTS

- **High Grade Iron Project Demonstrates Potential Cash Positive Margin**
- **Low Volume Mining Model of 1,000,000tpa Concentrate**
- **Mineralisation Reports Underway in Preparation for Mining Lease Applications**

“The quality of the coarse grain Byro magnetite is too valuable to put into a steel furnace”

## **BYRO PROJECT (Athena Resources 100%)**

Financial modeling for Athena's FE1 resource this quarter indicates the company's high grade Byro Iron Project would continue to produce a cash positive margin in the current oversupply market while benefiting from a low volume mining operation.

The valuable margin is a result of higher revenues from the company's 68% - 70% Fe product to the steel industry and is significantly enhanced by a split offtake into even higher premium industrial markets. At the same time term agreements at predictable rates will obviously soften unpredictable market fluctuations.

Falling costs for mining, processing and transport options over the September quarter have further lowered projected operating costs,

The Company considers its current position of no debt and no supply commitments for its high quality resource ideal for a low volume operation. If funding were available a purpose designed plant would allow the company to benefit from the current downward correction in development and operating costs while positioning itself well for the upturn.

The company has estimated that the cash margin from the Byro Iron Project would adequately support debt financing to cover initial capital expenditure for a low volume operation over a relatively short, proof of concept and repayment period of 3 to 5 years.

This quarter Athena Resources has enough assurance to proceed with mineralization reports and the preparation of applications for The Department of Mines and Petroleum to convert appropriate areas within exploration leases for FE1 in E09/1507, Byro South and Whistlejack ore bodies in E09/1781 and Mt Narryer ore body in E09/1938 to mining leases.

The mineralisation reports will fulfil the statutory requirement in Section 74(1) (a) and Section 74(ca) (ii) of the *Mining Act 1978* in support of an application to convert parts of an exploration lease to a mining lease and also a step towards mining and consequent mining proposals.

### **Summary of Byro Magnetite Mineralisation**

#### **Metallurgical Review**

Review of the physical and metallurgical characteristic of the Byro Magnetite.

- Observed crystal is granular
- Grain size up to 4mm (4,000 µm)
- Dissemination Granularity 95% between 0.2mm < 1.65mm (200µm < 1,650 µm)
- Hardness on Mohs scale 6.5 with Vickers Hardness Number (VHN<sub>100</sub>=681 - 792 kg/mm<sup>2</sup>)
- Specific gravity calculated at 5.18 g/cm<sup>3</sup>
- Uneven fracture parting on surface {111}
- Negligible cleavage planes within the crystal matrix.

#### **Chemistry Review**

The concentrate chemistry key attributes are,

- Mineral composition of the ore is simple.
- No significant secondary alteration.
- K<sub>2</sub>O, Na<sub>2</sub>O, P, and S, all low and with P and S particularly low.
- Product is a high-quality concentrate of primary acidic magnetite.
- SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, CaO, and MgO decrease as TFe increases.
- Magnetite represents the major iron-bearing mineral, while quartz represents the major gangue mineral.

## Athena Resources Limited – First Quarter Activities

- Tailings component of the ore is SiO<sub>2</sub>, accounting for 80.99% of the total
- Product and tailings have no significant environment impacts.

The major recoverable content in the ore is iron, at a grade of 37.52%; and 70% on concentration. Total iron over iron oxide ratio of the ore is 2.05, and the coefficient of basicity (CaO+MgO) / (SiO<sub>2</sub>+Al<sub>2</sub>O<sub>3</sub>) equals 0.09. This is important for the ammonia production industry as low impurities and oxygen reduction is helpful for improved ammonia synthesis.

Minerals to be disposed by separation for iron enrichment on concentration include mainly SiO<sub>2</sub>, followed by Al<sub>2</sub>O<sub>3</sub>, CaO, and MgO, altogether amounting 46.83% of the total weight. Contents of phosphorus and sulphur, which are the common hazardous contents, in like ores, are too low to cause any substantial influence on the quality of concentrate. Common Byro magnetite grains only microscopic impurities. The grain shown in Figure 1 displays a rare example of a 5µm (0.005mm) impurity within a 2,000µm (2mm) magnetite crystal.

### **FE1 Grain Size and Granularity Review**

Concentrate granularity key attributes are,

- Magnetite occurs mainly in disseminated to matrix form.
- Dissemination granularity size varies
- Grain size can be up to 4mm (4,000 µm)
- Large product range
- 94% of the useful magnetite can be separated free at -200 mesh / 45%.
- Discrete silica at magnetite crystal edges allow clean early extraction.
- Care to be taken to avoid over grinding
- Concentrate productivity 47.9%,
- Magnetite recovery 92.27%.

The widespread granular distribution in the coarse range demonstrates usable volumes for grooming to suite multiple target sizes for multiple product applications.

There is also scope for improving the extraction of the grain size in the upper spectrum of the product range. The sharp contrast between the 2.3mm > 1.65mm at 8.31% and 1.65mm > 1.17mm @ 20.77% suggests it would be possible to over mill the product. A very coarse fraction, >2mm, can be removed post grinding and at first pass milling to prevent overgrinding. Upcoming test work will determine the productivity of an early mill product.

### **Byro Magnetite Work Indices Review**

Determination of the Byro Magnetite Work Indices was completed at the same time as the granular classification in China. The Work Indices tests were repeated in Australia with near to identical results.

Work Indices already determined are

- Strong - Unconfined Compressive Strength (UCS) recorded values of 139.9 - 153.7 Mpa
- Bond Impact Crushing Work Index (CWi) recorded average value of 15.5 kWh/t
- Bond Ball Mill Work Index recorded a value of 16.5 kWh/t (test aperture of 106 micron).
- Bond Rod Mill Work Index recorded a value of 8.3 kWh/t.
- Bond Abrasion Index recorded a value of 0.3894

Athena is considering the practical steps in development of additional classification and clean-up modules for industry specific requirements. This will be based on 2015 pricing and the favourable material work indices already determined.

### **Summary of Premium Markets Suitable for Byro Magnetite**

## Athena Resources Limited – First Quarter Activities

The industrial magnetite product from Byro is suitable for a large range of industrial uses. In the previous quarter the company had commenced discussion with several industries and specific product users. Those discussions continue and market gaps identified by Athena endure. The Market gaps include common use areas as well specialist industries using coarse grain size and or purity are in high demand.

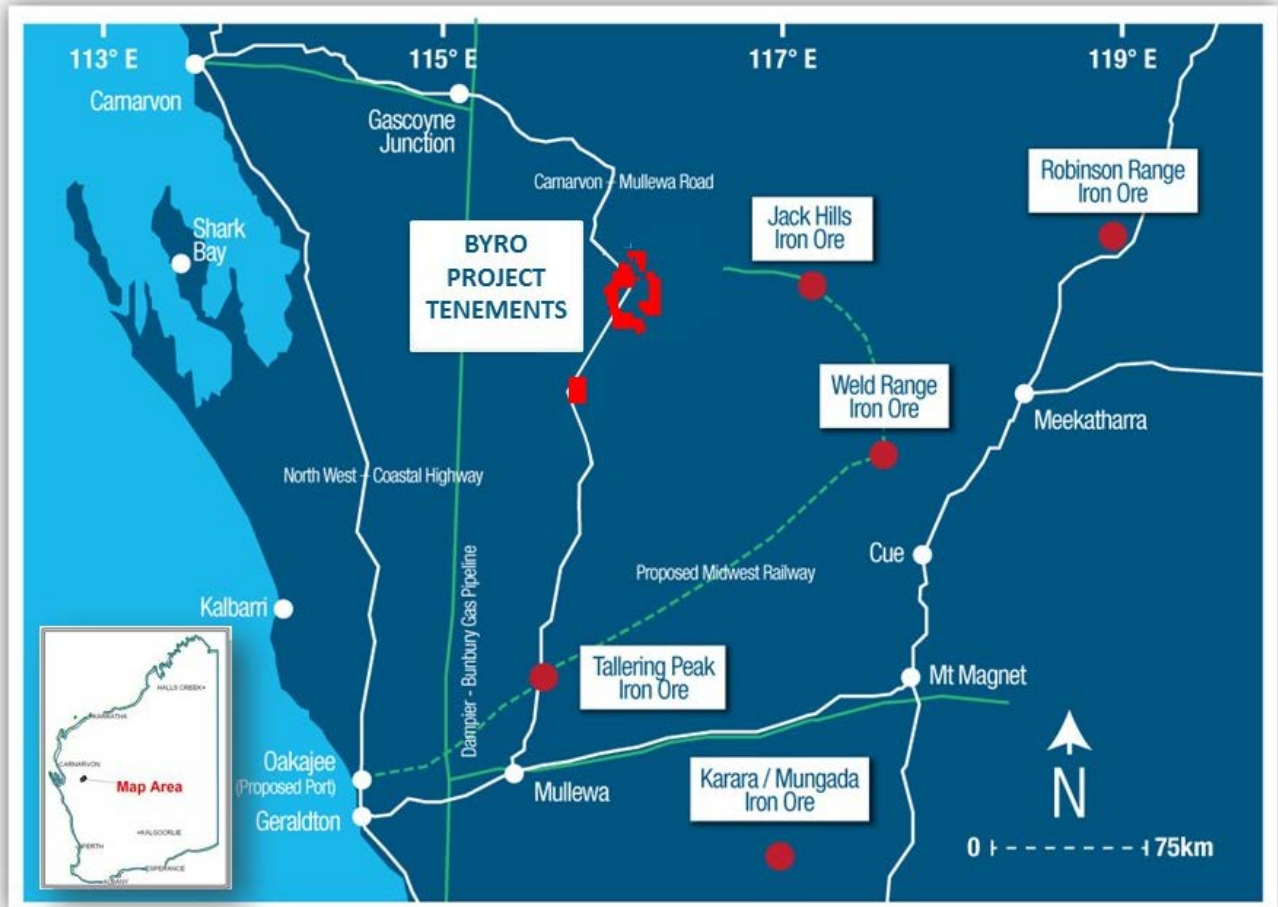
- **Dense Media Separation – Ragging**
- **Dense Media Separation – Coal Washing**
- **Catalyst in Ammonia Production**
- **Liquid Hydrocarbon Fuel Production from Coal and Natural Gas**
- **Industrial abrasives, sand blasting and ablation**
- **Aggregate in high-density concrete.**
- **Magnetite also used in smaller quantities as**

### **About Athena Resources Limited.**

Athena Resources Limited (ASX:AHN), which is based in Perth was listed on the ASX in 2006 and currently has 173 million shares on issue. Athena owns a 100% interest in the Byro Project through its subsidiaries Complex Exploration and Byro Exploration where it is exploring for iron ore copper, nickel and PGE's.

The Byro Iron Ore Project is strategically located in the Midwest which includes a substantial mining sector. The projects southern boundary is 210km north of the Mullewa Rail Siding by road and 310km from the Port of Geraldton. Access and improved infrastructure to the maturing iron ore province is growing with development of the CSIRO SKA Project and increased capacity and further development at the Port of Geraldton.

**Figure 1 Regional Project Location**



## Athena Resources Limited – First Quarter Activities

Yours faithfully

Ed Edwards  
**Managing Director**  
**ATHENA RESOURCES LIMITED**

30 October 2015

### **JORC Compliance**

No new sampling or data was acquired in this quarter or released in this document that is required to be disclosed in compliance with the

#### **JORC Code, 2012 Edition Section 1 Sampling Techniques and Data**

No new sampling or data was acquired in this quarter or released in this document that is required to be disclosed in compliance with the

#### **JORC Code, 2012 Edition Section 2 Reporting of Exploration Results**

No new sampling or data was acquired in this quarter or released in this document that is required to be disclosed in compliance with the

#### **JORC Code, 2012 Edition Section 3 Estimation and Reporting of Mineral Resources**

<b>INTEREST IN MINING TENEMENTS</b> <b>Athena Resources Limited 100%</b>	
<b>Byro</b>	
E09/1507	E – Exploration License
E09/1552	
E09/1637	
E09/1781	
E09/1938	

### **Cautionary Notes**

#### ***Forward Looking Statements***

*This announcement contains certain statements that may constitute “forward looking statements”. Such statements are only predictions and are subject to inherent risks and uncertainties, which could cause actual values, results, performance achievements to differ materially from those expressed, implied or projected in any forward looking statements.*

#### ***JORC Code Compliance Statement***

*Some of the information contained in this announcement is historic data that have not been updated to comply with the 2012 JORC Code. The information referred to in the announcement was prepared and first disclosed under the JORC Code 2004 edition. It has not been updated since to comply with the JORC Code 2012 edition on the basis that the information has not materially changed since it was last reported.*

#### ***Competent Persons Statement***

*The information included in the announcement was compiled by Mr Liam Kelly, an employee of Athena Resources Limited. Mr Kelly is a Member of the Australasian Institute of Mining and Metallurgy, and*

## **Athena Resources Limited – First Quarter Activities**

*has sufficient relevant experience in the styles of mineralisation and deposit styles under consideration to qualify as a Competent Person as defined in “The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code 2012 Edition)”. Mr Kelly consents to the inclusion of the information in the announcement in the context and format in which it appears and that the historical information was compliant with the relevant JORC Code, 2004 Edition, and new information announced in this report is compliant with the JORC Code 2012 Edition.*

### **Competent Persons Disclosure**

*Mr Kelly is an employee of Athena Resources and currently holds securities in the company.*