



Athena
Resources

ACN 113 758 900

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The Company Announcements Office
ASX Limited
4 Floor, 20 Bridge Street
SYDNEY NSW 2000

BYRO IRON ORE PROJECT

METALLURGICAL RESULTS ON Mt NARRYER MAGNETITE

Excellent results from Mineralogical Study and Metallurgical Beneficiation Test work from drill hole AHRC0089D from a coarse grind size of P₈₀ 90µm gives

- **Fe Concentrate Grade** **71.0%**
- **Fe Recovered in processing** **97.0%**
- **Mass recovered in processing** **54.7%**

The results indicate a simple processing circuit comprising crushing, grinding and wet low intensity magnetic separation resulting in savings in both capital and operating costs. The coarse grind size also simplifies handling logistics.

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Details

The Directors of Athena Resources Limited (ASX: AHN) are pleased to advise that the Company has received the final test work results from PQ diamond core from the Mt Narryer ore body

The Mt Narryer magnetite body is within tenement E09/1938, located 210 Km north from Mullewa and 310Km by road north from the Port of Geraldton. The ore body has had significant work completed through 2016 with validation of final ore characterisation completed in early 2017.

Drilling at the Mt Narryer ore body was logged and sampled and completed in June 2016 from which time analysis was underway to determine DTR grades subsequently announced in August 2016. During 2016 drilling, PQ diamond core was also retrieved and stored for further metallurgical characterisation. This to be conducted once DTR and grind establishment work was complete in August. This announcement is the subject of these characterisation results from a single combination RC / Diamond drill hole, AHRC0089D.

Test work initially focused on understanding the ore in order to develop tests that would ultimately lead to the design of a processing flow sheet. This first stage of characterisation test work took three months to complete with some work repeated in order to determine methods to achieve best procedures for the best results. The final results were received in late December 2016 and have now been collated and validated for this announcement.

Table 1. AHRC0089D Drill Collar,

Hole ID	Project	EOH	Easting	Northing	Dip	Azi	Tenement
AHRC0089D	Narryer	90.1	395966mE	7062853mN	-90	0	E09/1938

Coordinate system MGA-94/50

Figure 1. Mt Narryer Drill Holes and AHRC0089D section line

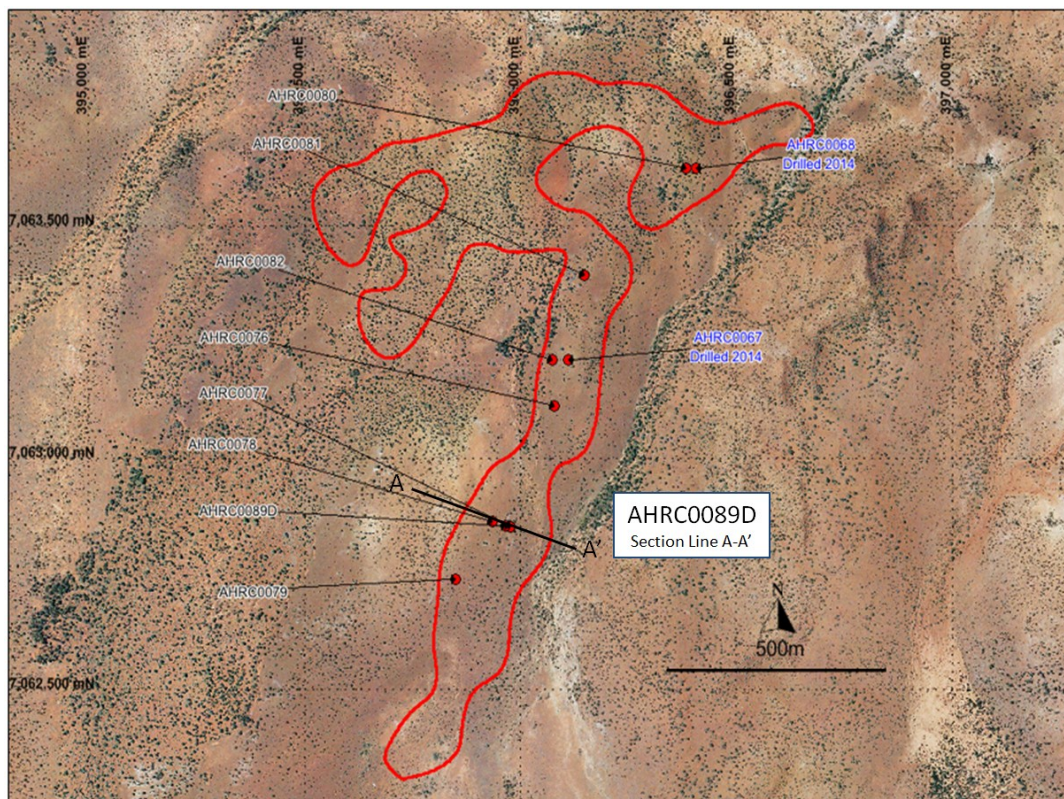
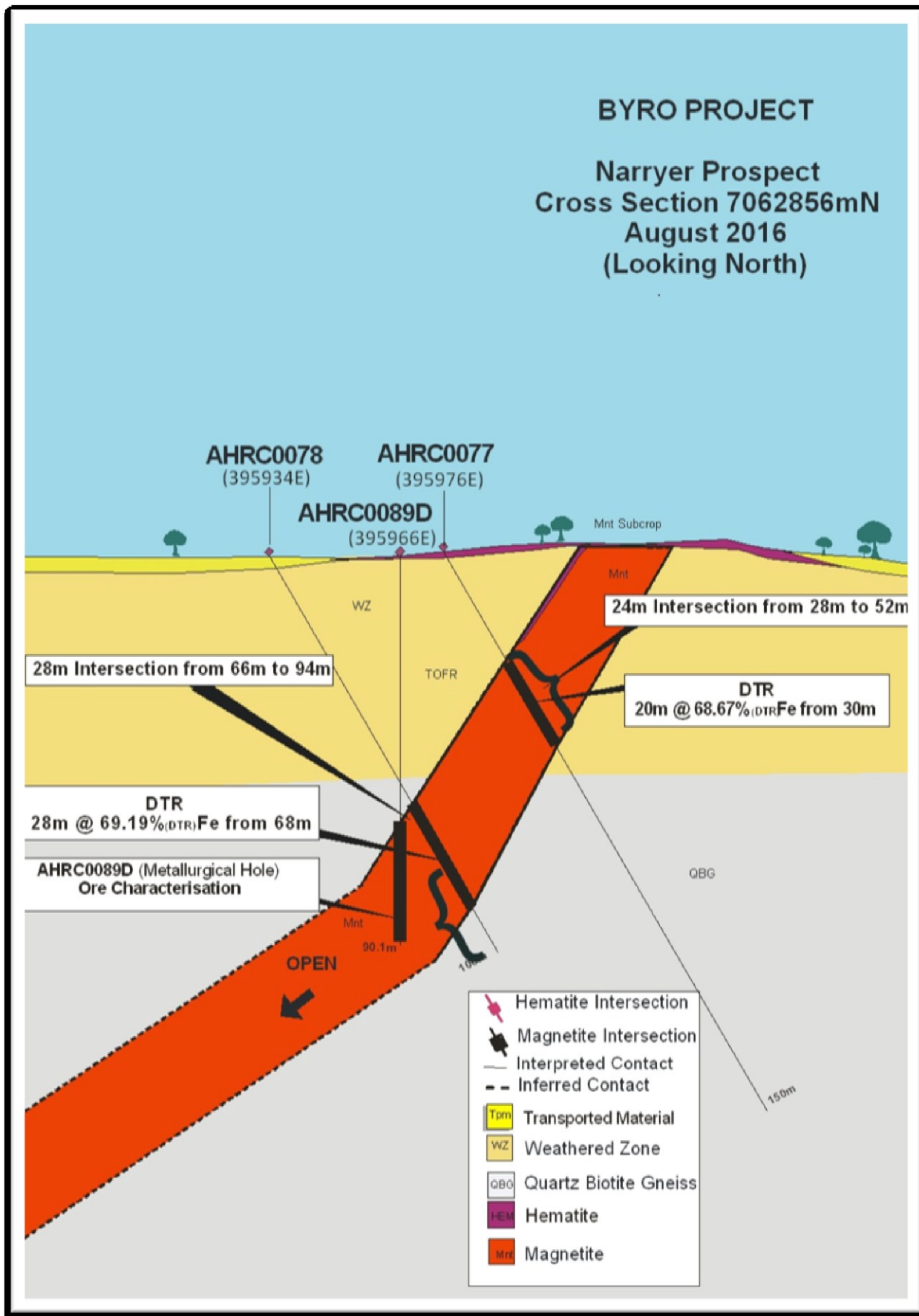


Figure 2. AHRC0089D on Section with AHRC0078 and AHRC0077



The physical test work undertaken comprised

- **Comminution Test Work;**
- **Dry Magnetic Separation Test Work;**
- **Wet Low Intensity Magnetic Separation Test Work;**
- **Davis Tube Recovery (DTR) Test Work; and**
- **DTR Calibration Test work**

Comminution Test Work Results

Multiple pieces of whole core were selected for Uniaxial Compressive Strength (USC) testing.

Strengths ranged from 25 to 87.1 Mpa.

Multiple pieces of whole core ore were selected for Bulk Density Determination by the Plastic Wrap method. The average bulk density of the ore was determined to be 3.45t/m³.

Selected Bond suite comminution tests were conducted on crushed and screened core giving the following results;

Crushing Work Index (CWi)	8.6kWh/t
Bond Ball Mill Work Index (BBMWi)	14.2kWh/t
Bond Abrasion Index	0.2723

Dry Low Magnetic Separation Results

Dry magnetic separation was carried out on 5kg of crushed ore at three top sizes 19, 10 and 5mm and passed over an Eriez Dry Magnetic Separator. The magnetic product accounted for 98.8 to 99.4% of the mass with Fe grade up to 41.8%.

Wet Low Intensity Magnetic Separation Results

A grind establishment was conducted to determine the grind times for P₈₀ 250, 150, 125, 106, and 75µm. All ground products were within 3% of size requirement and magnetic components were separated using a Eriez L8 Wet Magnetic Separator.

Magnetic products accounted for 55.2 to 64.4% of the feed mass with Fe grades of 59.1 to 69.4% and Fe recoveries of 93.7 to 96%

DTR Recovery Test Work Results

Magnetic products from DTR test work using established grind time for the size ranges are shown in Table 2. The average head grade from the ore feed material was 39.54 and ranged from 39.53 to 40.24.

Table 2 DTR Results

DTR Recovery Test Work Results					
Size µm	250	150	125	106	75
Grade Fe%	57.1	65.3	67.3	69.1	70.25
Recovery % Mnt	96.6	97.4	96.7	94.7	96.1

2 Stage DTR Calibration Test Work Results

Table 3. Stage 1 - Using an initial grind time only

Grind Time (Sec)	Actual Size μm	Assays (%)						
		Feed	Mag	%	Fe	SiO ₂	P	S
30	136	20.1	11.74	58.4	69.08	3.61	0.004	0.004
60	86	20.19	11.46	56.8	71.04	1.38	0.002	0.003
90	67	20.07	11.26	56.1	71.30	1.10	0.002	0.004
120	56	20.05	11.36	56.7	71.27	0.91	0.002	0.003
150	50	20.02	11.31	56.5	71.30	1.00	0.002	0.002
180	46	20.08	11.39	56.7	70.74	1.41	0.003	0.005

Table 4. Stage 2 Using Stage Grind – Wet Screen – Re grind method
Targeting P₈₀ 90 μm

P80 -90 μm	Assays (%)						
	Feed	Mag	%	Fe	SiO ₂	P	S
0	20.46	11.2	54.7	70.09	2.33	0.004	0.004
15	20.34	10.85	53.3	70.24	2.11	0.003	0.005
30	20.46	10.85	53.0	70.65	1.68	0.003	0.004

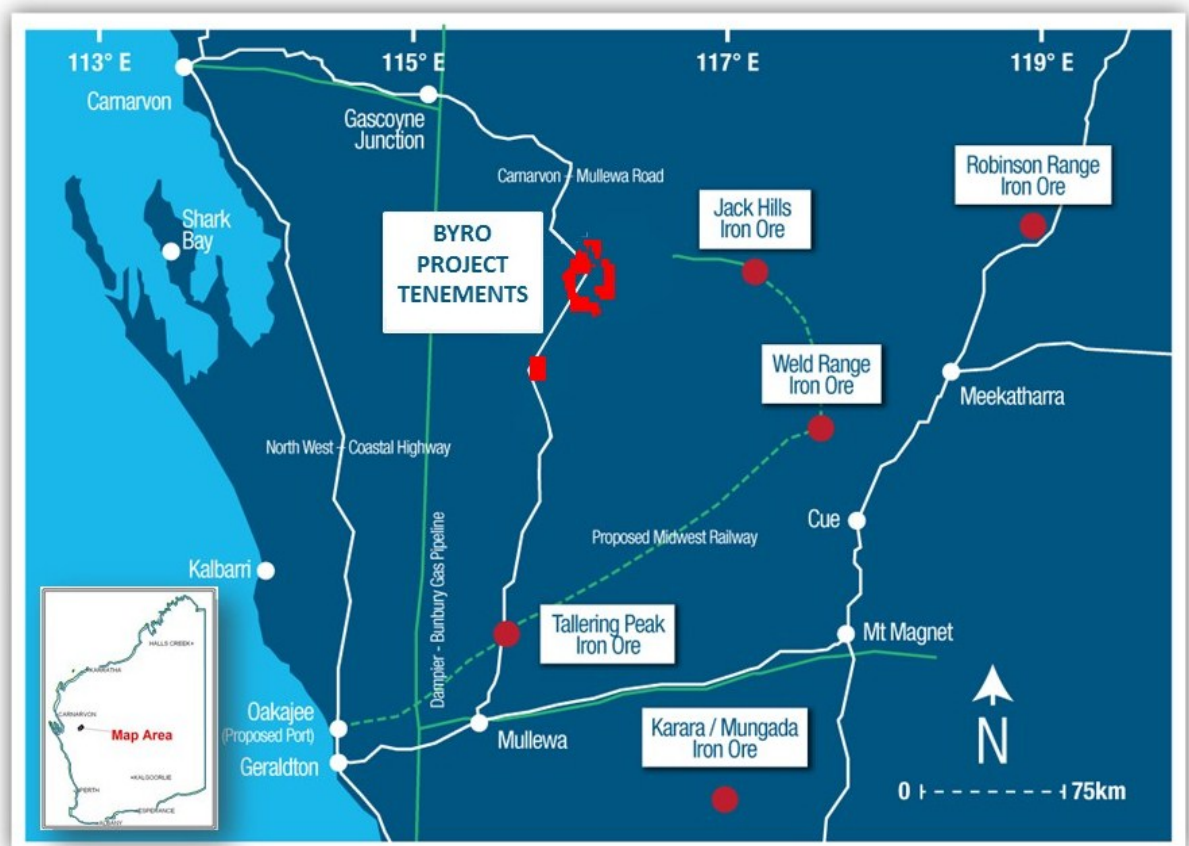
These are very pleasing results and assist greatly with understanding the economics of the Mt Narryer Ore body. The High grades from Mt Narryer can now be considered in terms of comparatively low energy costs and simple circuit processing.

About Athena Resources Limited.

Athena Resources Limited (ASX:AHN), which is based in Perth was listed on the ASX in 2006 and currently has 217 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 copper, nickel, PGE's and iron ore. Figure 3 below, shows the current tenement holdings which have been reduced in size since October 2014, this year towards meeting Department of Mines and Petroleum relinquishment requirements. Relinquishment was also in response to rising expenditure and was carried out on the basis that explored areas that have not produced significant exploration targets were withdrawn.

The Byro Iron Ore Project is strategically located in the Midwest Iron province 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. Development of the Byro Iron project is expanding the overall resource in the Midwest region along with neighbours at the Gindalbie and Ansteel's Karara Iron Project, Sinosteel's Weld Range Project, the proposed Jack Hills Expansion Project, Padbury's Robinson Range Project, and Mt Gibson's Extension Hill Mine, amongst others. 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 3 Regional Project Location



Yours faithfully

Ed Edwards
Executive Director
ATHENA RESOURCES LIMITED

JORC Code, 2012 Edition – Table 1 report template

Section 1 Sampling Techniques and Data

(Criteria in this section apply to all succeeding sections.)

Criteria	JORC Code explanation	Commentary
Sampling techniques	<ul style="list-style-type: none"> Nature and quality of sampling (eg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling. 	<ul style="list-style-type: none"> This Report includes whole core samples from Drill hole AHRC0089D
	<ul style="list-style-type: none"> Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used. 	<ul style="list-style-type: none"> Magnetic susceptibility readings were taken at every meter interval with the average reading noted from scanning mode
	<ul style="list-style-type: none"> Aspects of the determination of mineralisation that are Material to the Public Report. In cases where 'industry standard' work has been done this would be relatively simple (eg 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (eg submarine nodules) may warrant disclosure of detailed information. 	<ul style="list-style-type: none">
Drilling techniques	<ul style="list-style-type: none"> Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc). 	<ul style="list-style-type: none"> Reverse Circulation (RC) and PQ diamond tail
Drill sample recovery	<ul style="list-style-type: none"> Method of recording and assessing core and chip sample recoveries and results assessed. Measures taken to maximise sample recovery and ensure representative nature of the samples. Whether a relationship exists between sample recovery and grade 	<ul style="list-style-type: none"> No bias was observed between recovery and sample quality or loss or gain

Criteria	JORC Code explanation	Commentary
	<p><i>and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.</i></p>	
Logging	<ul style="list-style-type: none"> <i>Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.</i> <i>Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.</i> <i>The total length and percentage of the relevant intersections logged.</i> 	<ul style="list-style-type: none"> Core was logged geologically logged as well as recording major geotechnical features observable over the full depth of the holes.
Sub-sampling techniques and sample preparation	<ul style="list-style-type: none"> <i>If core, whether cut or sawn and whether quarter, half or all core taken.</i> 	<ul style="list-style-type: none"> RC Drilling followed by PQ Diamond whole core
	<ul style="list-style-type: none"> <i>If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.</i> 	<ul style="list-style-type: none">
	<ul style="list-style-type: none"> <i>For all sample types, the nature, quality and appropriateness of the sample preparation technique.</i> 	<ul style="list-style-type: none"> Industry standard sampling preparation procedures were used
	<ul style="list-style-type: none"> <i>Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.</i> 	<ul style="list-style-type: none"> Industry standard sampling preparation procedures were used
	<ul style="list-style-type: none"> <i>Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling.</i> 	<ul style="list-style-type: none"> Industry standard sampling procedures were used No field duplicate/second-half sampling
	<ul style="list-style-type: none"> <i>Whether sample sizes are appropriate to the grain size of the material being sampled.</i> 	<ul style="list-style-type: none"> Average sample size was 5kg
Quality of assay data and laboratory tests	<ul style="list-style-type: none"> <i>The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.</i> <i>For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.</i> <i>Nature of quality control procedures adopted (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.</i> 	<ul style="list-style-type: none"> The measurement tool used was a hand held KT-10 with serial number # 8791 using units of 10⁻³ Standard SI units Industry standard procedures were used in obtaining the magsus readings
Verification	<ul style="list-style-type: none"> <i>The verification of significant intersections by either independent</i> 	<ul style="list-style-type: none"> No adjustments have been made to readings

Criteria	JORC Code explanation	Commentary
of sampling and assaying	<p>or alternative company personnel.</p> <ul style="list-style-type: none"> The use of twinned holes. Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols. Discuss any adjustment to assay data. 	<ul style="list-style-type: none"> Assays have been verified using standard QA QC methods
Location of data points	<ul style="list-style-type: none"> Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation. Specification of the grid system used. Quality and adequacy of topographic control. 	<ul style="list-style-type: none"> Hand held GPS
Data spacing and distribution	<ul style="list-style-type: none"> Data spacing for reporting of Exploration Results. Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied. Whether sample compositing has been applied. 	<ul style="list-style-type: none"> Collar and end of hole surveys were taken and combined with collar location at surface
Orientation of data in relation to geological structure	<ul style="list-style-type: none"> Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type. 	<ul style="list-style-type: none"> Comminution results are not affected by orientation.
	<ul style="list-style-type: none"> If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material. 	<ul style="list-style-type: none"> No sampling bias was introduced by drilling orientation
Sample security	<ul style="list-style-type: none"> The measures taken to ensure sample security. 	<ul style="list-style-type: none"> Sample security was maintained during all stages of preparation
Audits or reviews	<ul style="list-style-type: none"> The results of any audits or reviews of sampling techniques and data. 	<ul style="list-style-type: none"> Sample security was maintained during all stages of preparation

Section 2 Reporting of Exploration Results

(Criteria listed in the preceding section also apply to this section.)

Criteria	JORC Code explanation	Commentary
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Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	<ul style="list-style-type: none"> Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings. 	<ul style="list-style-type: none"> Tenement referred to in this report E09/1938 is 100% Athena owned and operated within native title claim WAD 6033/98, made on behalf of the Wajarri Yamatji People.
	<ul style="list-style-type: none"> The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area. 	<ul style="list-style-type: none"> The tenements are in good standing and no known impediments exist. See tenement listing attached.
Exploration done by other parties	<ul style="list-style-type: none"> Acknowledgment and appraisal of exploration by other parties. 	<ul style="list-style-type: none"> Historic exploration within the project area largely confined to south of a line extending from Imagi Well to the Byro East intrusion (Melun Bore). The earliest work with any bearing on Athena's activities is that of Electrolic Zinc Co (1969) exploring for chromitite at Imagi Well, followed closely by Jododex Australia (1970-1974) at Byro East. Much of the exploration of a more regional nature is of limited use either because of the vagaries of the accuracy of positional information and the limited range of elements analysed. More recent surveys pertinent to Athena's current investigations include that of Redback Mining (1996-2002), Yilgarn Mining Limited (2003-2008) and Mithril (2007, JV with Yilgarn) at Byro East, and Western Mining Corporation (1976-1979) and Precious Metals Australia at Imagi Well. Newcrest Mining carried out a limited reconnaissance RAB drilling programme for platinum just to the east of Byro homestead (1998-1990).
Geology	<ul style="list-style-type: none"> Deposit type, geological setting and style of mineralisation. 	<ul style="list-style-type: none"> Upper amphibolite to granulite metamorphic facies with mafic to ultramafic intrusive. Granite and migmatite are common

Criteria	JORC Code explanation	Commentary
<p>Drill hole Information</p>	<ul style="list-style-type: none"> A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes: <ul style="list-style-type: none"> easting and northing of the drill hole collar elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar dip and azimuth of the hole down hole length and interception depth hole length. 	<ul style="list-style-type: none"> AHRC0098D see main body of announcement
	<ul style="list-style-type: none"> If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case. 	<ul style="list-style-type: none"> No information has been excluded
<p>Data aggregation methods</p>	<ul style="list-style-type: none"> In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (eg cutting of high grades) and cut-off grades are usually Material and should be stated. 	<ul style="list-style-type: none"> min max, ave, techniques were used in this report and all workings are shown within this report. References are used where information has been previously announced
	<ul style="list-style-type: none"> Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail. 	<ul style="list-style-type: none"> aggregation has been used and is restricted to sample intervals which do not overlap assayed composite boundaries
	<ul style="list-style-type: none"> The assumptions used for any reporting of metal equivalent values should be clearly stated. 	<ul style="list-style-type: none"> No metal equivalent are referred to in this report
<p>Relationship between mineralisation widths and intercept</p>	<p>These relationships are particularly important in the reporting of Exploration Results.</p>	
	<ul style="list-style-type: none"> If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported 	<ul style="list-style-type: none"> See main body of report

Criteria	JORC Code explanation	Commentary
lengths	<ul style="list-style-type: none"> . <i>If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (eg 'down hole length, true width not known').</i> 	<ul style="list-style-type: none"> All reference to widths are down hole length, true width is not calculated
Diagrams	<ul style="list-style-type: none"> <i>Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported. These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.</i> 	<ul style="list-style-type: none"> Refer to Figures 1, 2, and 3 in the body of the report
Balanced reporting	<ul style="list-style-type: none"> <i>Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.</i> 	<ul style="list-style-type: none"> This report contains all meaningful drilling results for this campaign
Other substantive exploration data	<ul style="list-style-type: none"> <i>Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.</i> 	<ul style="list-style-type: none"> This report contains all meaningful drilling results for this campaign
Further work	<ul style="list-style-type: none"> <i>The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling).</i> 	<ul style="list-style-type: none"> Drilling programs have been planned and approvals had been granted.
	<ul style="list-style-type: none"> <i>Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.</i> 	<ul style="list-style-type: none"> The planned drilling information is commercially sensitive and is not included in this report.

INTEREST IN MINING TENEMENTS**Athena Resources Limited 100%****Byro**

E09/1507	E – Exploration License
E09/1552	
E09/1637	MLA - Mining Lease Application
E09/1781	
E09/1938	
MLA09/166	
MLA09/168	

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.

Drilling to date supports aspects of the estimates in this report which were published earlier this year. The quantity and grade reported is conceptual in nature. There has been insufficient exploration to define a mineral resource. Further exploration is warranted to improve understanding and reduce uncertainty about this body.

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 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.