

31 July 2014

## GEOPHYSICS BREAKTHROUGH IN KEMPFIELD LEAD/ZINC DETECTION

### HIGHLIGHTS:

- Downhole MagnetoMetric Resistivity (DHMMR) surveys completed for diamond holes West McCarron AKDD159 and Causeway AKDD177
- Clear, strong response detected on the known mineralisation in West McCarron hole AKDD159
- DHMMR survey confirmed as a powerful new geophysical technique for the detection of lead/zinc mineralisation at Kempfield
- Argent to proceed immediately with surface MMR survey over mineralised area, then over the broader target VMS lens and feeder zone, to delineate drill targets

### KEMPFIELD, NSW AUSTRALIA

Argent Minerals Limited (ASX: ARD, Argent, Argent Minerals or the Company) is delighted to report a significant breakthrough in the trialling of Downhole MagnetoMetric Resistivity (DHMMR) as a potential geophysical survey tool at the Kempfield Polymetallic Project.

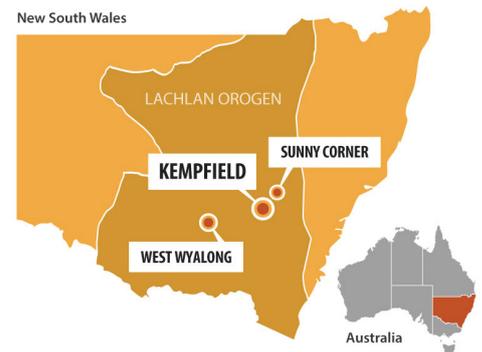
Argent Minerals Managing Director David Busch said, "We are extremely pleased with the DHMMR result, which is a significant breakthrough for exploration at Kempfield. We now have a geophysical tool which responds very specifically to the target lead/zinc mineralisation - predominantly sphalerite-rich mineralisation with galena. Being a relatively poor conductor renders this material a challenge to find with traditional geophysics techniques, but DHMMR has responded very clearly and convincingly. We look forward to now broadening the use of MMR at Kempfield as we seek to delineate targets for the upcoming drill program".

The application of the DHMMR technique is expected to accelerate Argent's exploration efforts at Kempfield, as the Company targets the significant upside potential that it has identified at the project.

This breakthrough coincides with commodities markets continuing to price in anticipated supply shortages in zinc due to scheduled mine closures<sup>1</sup>. Aggressive exploration for lead and zinc, especially zinc, forms a key tenet to the Company's strategy to take the Kempfield Polymetallic Project into production.

The Company's initial goal or aspiration is to locate an additional 5 million tonnes of lead/zinc/silver mineralisation at the higher base metal grades intercepted on the western edge of the known Kempfield deposit. Argent minerals has identified a trend of increasing grades from east to west in the deposit, pointing to the area immediately to the west where little or no drilling has been conducted. The Company believes this area to be highly prospective for lucrative mineralisation.

DHMMR is a geophysics technique which has been used successfully to delineate rich lead/zinc targets that have not responded to conventional electromagnetic (EM) survey techniques. Examples include Perilya's North Mine lead/zinc deposit at Broken Hill, NSW, where DHMMR was employed successfully to delineate the Zinc Lodes - rich mineralisation that had not been detected by previous Downhole EM (DHEM) surveys<sup>2</sup>. DHMMR is also considered to have made a significant contribution to the delineation of Perilya's Potosi deposit at Broken Hill.



<sup>1</sup> See ASX Announcement 22 July 2014: Quarterly Activities and Cash Flow Report - 30 June 2014

<sup>2</sup> See ASX Announcement 24 June 2014: Kempfield Exploration Update - Drill Target Delineation



DHMMR provides advantages over conventional DHEM in that it needs lower absolute conductivity, works well for elongated structures, has a greater area of investigation around the drill hole, gives absolute direction to conductors, and is less susceptible to shielding<sup>2</sup>.

DHMMR surveys have been completed for the full length of West McCarron diamond hole AKDD159 (171.3 metres) and for the first 145 metres of Causeway diamond hole AKDD177.

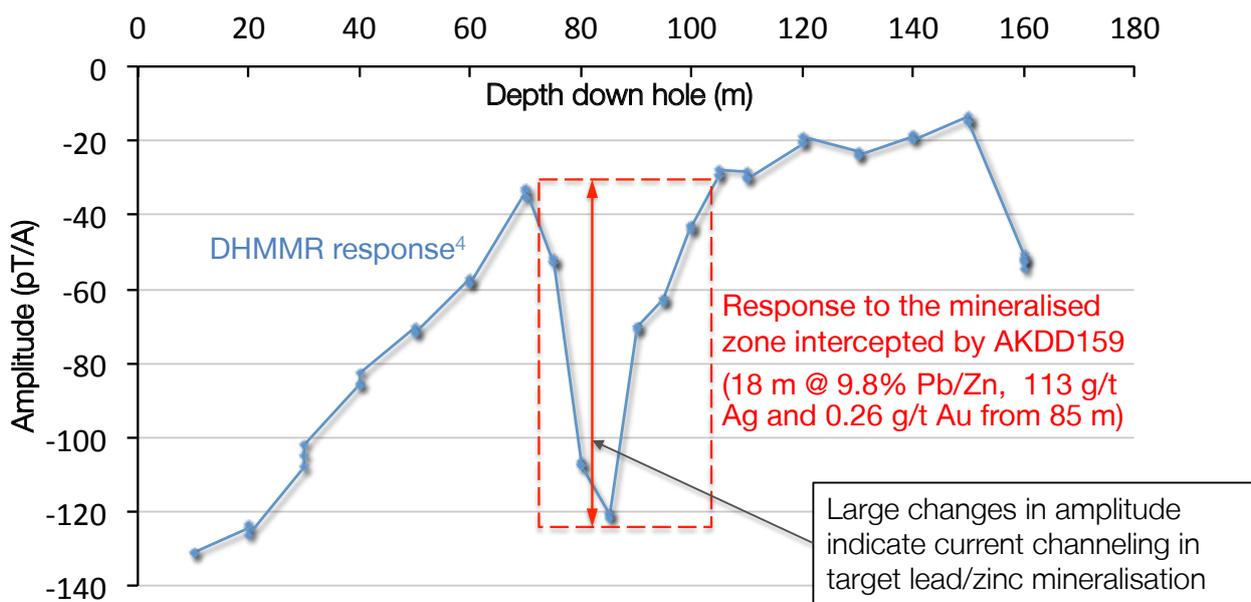
Preliminary analysis has been conducted by geophysicist Kate Hine of Mitre Geophysics Pty Ltd under the supervision of Dr. Vladimir David, Argent's resident expert in Volcanogenic Massive Sulphide systems. A clear, strong response has been observed in West McCarron diamond hole AKDD159, coinciding with the rich mineralisation intercepted by the hole - 18 m @ 9.8% Pb/Zn, 113 g/t Ag & 0.26 g/t Au from 85 m (including 5 m @ 17.9% Pb/Zn, 259 g/t Ag & 0.34 g/t Au from 88 m).

This breakthrough in geophysics follows Argent's recent breakthrough at West Wyalong, where it has identified a large porphyry copper-gold target<sup>3</sup>. The Company is planning to drill the Kempfield and West Wyalong targets.

**About the Kempfield DHMMR survey response**

Figure 1 shows the distinct response to the mineralised zone revealed by the preliminary analysis.

Figure 1 - West McCarron hole AKDD159 DHMMR response indicating target lead/zinc mineralisation<sup>4</sup>



The chart shows the large changes in the DHMMR response as the magnetometer probe passed through or adjacent to a mineralised area (see also Figure 2 and adjacent explanation). As current, measured in Amperes (A), was pulsed through the transmitter dipole on the surface, the magnetometer probe detected changes in the magnetic field strength generated by the current passing through the material adjacent to the probe, measured in picoTeslas (pT).

The changes in the DHMMR response in the zone marked by the dashed red rectangle in Figure 1, measured in picoTeslas per Ampere (pT/A), indicate current channelling through a lead/zinc mineralised zone as a result of differences in conductivity.

The area of mineralised response is coincident with known lead/zinc mineralisation intercepted by hole AKDD159, enabling benchmarking or calibration of the technique for the drill target delineation at Kempfield.

<sup>3</sup> See ASX Announcement 17 July 2014: Mag Survey Reveals Large Copper-gold at West Wyalong

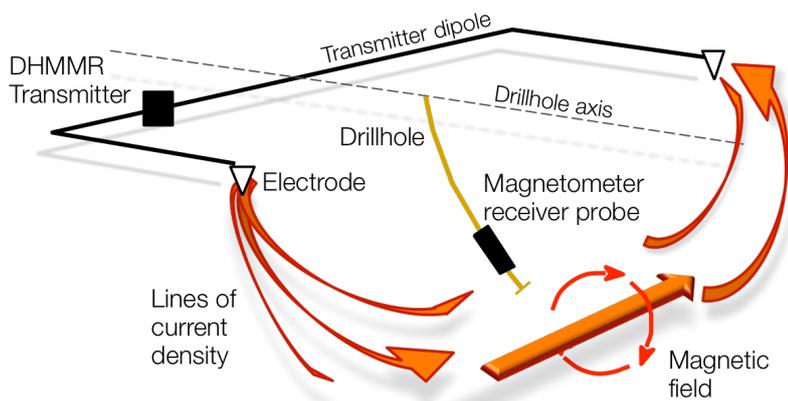
<sup>4</sup> Axial component, corrected for wire field

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### About the DHMMR survey technique

DHMMR surveys require only a conductivity contrast between the host rock and the target, whether or not the target itself is a good conductor. Previous research suggests that low conductivity mineralisation such as that at the Kempfield West McCarron Zone, could produce a sufficient DHMMR signal if the conductivity contrast between the target area and the surrounding material is greater than 3:1<sup>2</sup>.

Figure 2 - DHMMR technique diagram



The DHMMR technique involves the detection of this contrast by injecting a current directly into the ground via electrodes. The electrical current favours the path of least resistance; this is called 'current channelling', and the accompanying concentration in the magnetic (B) field generated by the current may be measured with the aid of a magnetometer receiver probe.

Source: Kate Hine/Mitre Geophysics

Figure 3 - Survey contractor Gap Geophysics with Argent site manager Brian Horspool next to the DHMMR transmitter



According to Gap Geophysics the HPTX-70 DHMMR transmitter is the most powerful of its type in Australia, delivering a maximum of 70 kW. The higher the injected current, the stronger will be the magnetic field produced by any current channelling, and the greater the ability to distinguish received signals from background noise.

**Next steps**

Further infill readings were conducted in the area of mineralisation response in AKDD159 in order to provide higher resolution in preparation for more detailed analysis and calibration.

Following the clear success of the DHMMR technique, a key outcome is that Argent will now proceed with surveying the area of interest with a variant of this technique - Surface MagnetoMetric Resistivity, also referred to as Sub-Audio Magnetics (**SAM**).

Further details of the SAM technique will be provided in a follow up announcement to the ASX, as the survey planning details come to hand.

Further news flow is expected and will be announced to the ASX as the surveys progress.

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## APPENDIX A - JORC 2012 EDITION TABLE 1

### KEMPFIELD DOWN HOLE MAGNETOMETRIC SURVEY

The following information follows the requirements of JORC 2012 Table 1 Sections 1, 2 and as applicable for ASX release related to conceptual model interpretation.

#### Section 1 - Sampling Techniques and Data

Criteria	Commentary
Sampling techniques	This report relates to the Down Hole MagnetoMetric survey (DHMMR ) at Kempfield conducted by GAP Geophysics Pty Ltd and supervised by Mitre Geophysics Pty Ltd and Argent Minerals personnel.
Drilling techniques	The ASX Release does not report any exploration drilling.
Drill sample recovery	The ASX Release does not report any exploration drilling.
Logging	The ASX Release does not report any exploration drilling or drill core logging.
Sub-sampling techniques and sample separation	<p><b>DHMMR Survey specification AKDD159</b></p> <p>Target: To illuminate the off hole extent massive Zn-Pb mineralisation intersected in the hole from 80 -110m</p> <p>Location (mga54): 708024 , 6257894mN, 765mRL, AGD66 AMG55</p> <p>Length: Total depth is 172m</p> <p>Frequency: Try 4Hz and 1Hz – if no EM effects are visible at 4Hz and the waveform is steady, then 4Hz should be sufficient.</p> <p>Current: Maximum possible</p> <p>Components: AUV</p> <p>Stations: 10m station spacing from surface to end of hole. 5m from 75-110m. 2.5m around any spikes</p> <p>Dipole direction: Approximately 020 magnetic</p> <p>Dipole location: Approximately 500m west of the drillhole collar</p> <p>Electrode location: Approximately 200m SSE from the drillhole collar.</p> <p>Dipole coordinates AGD66:</p> <p>707980mE, 6257700mN (southern POSITIVE electrode)</p> <p>707490mE, 6258000mN</p> <p>707900mE, 6258920mN</p> <p>708350mE, 6258700mN (northern NEGATIVE electrode)</p> <p><b>Survey specification for AKDD177</b></p> <p>Target: To illuminate potential off hole Zn-Pb mineralisation</p> <p>Location: 708337, 6258719mN, 740 mRL, AGD66 AMG55</p>



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	<p>Length: Total depth is 145m</p> <p>Frequency: Try 4Hz and 1Hz – if no EM effects are visible at 4Hz and the waveform is steady, then 4Hz should be sufficient.</p> <p>Current: Maximum possible</p> <p>Components: AUV</p> <p>Stations: 10m station spacing from surface to end of hole. 5m and 2.5m around any spikes</p> <p>Dipole direction: Approximately 020 magnetic</p> <p>Dipole location: Approximately 500m west of the drillhole collar</p> <p>Electrode location: Approximately 200m NNE from the drillhole collar.</p> <p>Dipole coordinates AGD66:</p> <p style="padding-left: 40px;">707980mE, 6257700mN (southern POSITIVE electrode)</p> <p style="padding-left: 40px;">707490mE, 6258000mN</p> <p style="padding-left: 40px;">707900mE, 6258920mN</p> <p style="padding-left: 40px;">708350mE, 6258700mN (northern NEGATIVE electrode)</p>
<p>Quality of assay data and laboratory tests</p>	<ul style="list-style-type: none"> <li>Acquired data are of high quality - QAQC conducted by Kate Hine – Mire Geophysics.</li> </ul>
<p>Verification of sampling and assaying</p>	<ul style="list-style-type: none"> <li>Initial verification of results conducted by Kate Hine – Mitre Geophysics.</li> </ul>
<p>Location of data points</p>	<ul style="list-style-type: none"> <li>Collar surveys of the sampled drill hole collars were conducted by a registered surveyor in GDA 94 (Zone 55) and then converted to AMG 66 (Zone 55) grid (also for consistency); all surveyed drill hole collars are surveyed by a registered surveyor.</li> <li>Down-hole surveys of dip and azimuth were conducted using either a single shot Eastman Camera and electronic camera every 50 or 30 metres to detect hole direction.</li> <li>The elevations for the Argent drill holes collars were surveyed by an independent registered surveyor and DTM which was derived from Light Detecting and Ranging (LIDAR) survey (with an accuracy of +/- 5 cm) conducted by Geospectrum for the Kempfield project during 2010.</li> </ul>
<p>Data spacing and distribution</p>	<ul style="list-style-type: none"> <li>Data collected measurements are at 10m station spacing from surface to end of hole; 5m from 75-110m in mineralised zone (in AKDD159) and 2.5m around any observed spikes. Distribution is sufficient to establish mineralisation response.</li> <li>There was no sample compositing.</li> </ul>
<p>Orientation of data in relation to geological structure</p>	<ul style="list-style-type: none"> <li>Surveyed hole AKD159 was drilled towards local grid west (azimuth 291°) at angle of 70° and hole AKDD177 was drilled towards local grid east (azimuth 111°) at angle of 72°.</li> </ul>
<p>Sample security</p>	<ul style="list-style-type: none"> <li>No physical samples were taken.</li> </ul>
<p>Audits or</p>	<ul style="list-style-type: none"> <li>Survey was conducted by GAP Geophysics Pty Ltd and supervised by Mitre Geophysics and Argent</li> </ul>

reviews	Minerals personnel.
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**Section 2 - Reporting of Exploration Results**

Criteria	Commentary																		
Mineral tenement and land tenure status	<ul style="list-style-type: none"> <li>Exploration Licence, Kempfield / EL5748, Trunkey Creek, NSW, held by Argent (Kempfield) Pty Ltd (100% interest), a wholly owned subsidiary of Argent Minerals Limited. There are no overriding royalties other than the standard government royalties for the relevant minerals.</li> <li>Argent Minerals has freehold title to the land which has historically been employed for pastoral usage. Heritage items have been identified on the property. On 29 April 1997 a native title claim (Gundungurra Application #6) was lodged over a very large area that includes Kempfield. A single counterparty only, the Gundungurra Tribal Council Aboriginal Corporation, has responded to Argent Minerals advertisements as part of the standard “right to negotiate” process, and is the sole registrant.</li> <li>The Company's Exploration Licence renewal application for the full licence area for a three (3) year term has been approved to July 2015.</li> </ul>																		
Exploration by other parties	<ul style="list-style-type: none"> <li>Argent Minerals Limited through its wholly owned subsidiary Argent (Kempfield) Pty Ltd is the sole operator of the project. Argent Minerals introduced best industry practice work.</li> <li>Kempfield has been explored for more than forty years by several exploration companies as set out in Table 1.2.1.</li> </ul> <p><b>Table 1.2.1 – Exploration history</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #8B4513; color: white;"> <th>Company</th> <th>Period</th> <th>Exploration activities</th> </tr> </thead> <tbody> <tr style="background-color: #E6E6FA;"> <td>Argent Minerals</td> <td>2007-current</td> <td>Drilling, VTEM survey, pole-dipole IP survey, gravity survey, ground EM and down-hole EM survey</td> </tr> <tr style="background-color: #E6E6FA;"> <td>Golden Cross</td> <td>1996-2007</td> <td>Drilling and high resolution airborne magnetic survey</td> </tr> <tr style="background-color: #E6E6FA;"> <td>Jones Mining</td> <td>1982-1995</td> <td>Drilling</td> </tr> <tr style="background-color: #E6E6FA;"> <td>Shell</td> <td>1979-1982</td> <td>Drilling, ground EM survey, dipole-dipole IP survey, and soil sampling</td> </tr> <tr style="background-color: #E6E6FA;"> <td>Inco</td> <td>1972-1974</td> <td>Drilling</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>Earlier exploration was performed to the industry standard of the time; available QAQC indicates that the historical data is reasonable and suitable for use in Mineral Resource estimates.</li> </ul>	Company	Period	Exploration activities	Argent Minerals	2007-current	Drilling, VTEM survey, pole-dipole IP survey, gravity survey, ground EM and down-hole EM survey	Golden Cross	1996-2007	Drilling and high resolution airborne magnetic survey	Jones Mining	1982-1995	Drilling	Shell	1979-1982	Drilling, ground EM survey, dipole-dipole IP survey, and soil sampling	Inco	1972-1974	Drilling
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Geology	<ul style="list-style-type: none"> <li>The deposit type is Volcanogenic Massive Sulphide (VMS);</li> <li>The geological setting is Silurian felsic to intermediate volcanics within the intra-arc Hill End Trough in the Lachlan Orogen, Eastern Australia; and</li> <li>The style of mineralisation comprises stratiform barite-rich horizons hosting silver, lead, zinc, +/- gold.</li> </ul>																		
Drill hole Information	<ul style="list-style-type: none"> <li>No new drillhole Exploration Results in this report.</li> </ul>																		
Data aggregation methods	<ul style="list-style-type: none"> <li>No new drillhole or assay Exploration Results in this report.</li> </ul>																		
Relationship between mineralisation widths and	<ul style="list-style-type: none"> <li>No new drillhole or assay Exploration Results in this report.</li> </ul>																		



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intercept lengths	
Diagrams	<ul style="list-style-type: none"> <li>No new drillhole or assay Exploration Results in this report.</li> </ul>
Balanced reporting	<ul style="list-style-type: none"> <li>No new drillhole or assay Exploration Results in this report.</li> </ul>
Other substantive exploration data	<ul style="list-style-type: none"> <li>No new drillhole or assay Exploration Results in this report. No additional meaningful or material geophysics data to report other than that already provided.</li> </ul>
Further work	<ul style="list-style-type: none"> <li>No new drillhole or assay Exploration Results in this report. Further geophysics work has been outlined under the heading, 'Next steps':                             <ul style="list-style-type: none"> <li>Infill survey readings to be conducted around the mineralisation response 'spike' according to the specifications detailed in Table 1 Section 1 under the heading, ' Sub-sampling techniques and sample separation'; and</li> <li>Surface MagnetoMetric Resistivity survey, also referred to as Sub-Audio Magnetics (SAM) to be conducted according to scope and specifications to be determined by Mitre Geophysics, which will be reported to the ASX as the information becomes available.</li> </ul> </li> </ul>

## COMPETENT PERSON STATEMENTS

### Exploration Results

The information in this report that relates to Exploration Results is based on information compiled by Dr. Vladimir David who is a member of the Australian Institute of Geoscientists, an employee of Argent Minerals, and who has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activities being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting Exploration Results, Mineral Resources and Ore Reserves' (JORC Code). Dr. David consents to the inclusion in this report of the matters based on the information in the form and context in which it appears.

### Previously Released Information

This ASX announcement contains information extracted from the following reports which are available for viewing on the Company's website <http://www.argentminerals.com.au> :

- 24 June 2014 Kempfield Exploration Update - Drill Target Delineation;
- 17 July 2014 Mag Survey Reveals Large Copper-gold Target at West Wyalong;
- 22 July 2014 Quarterly Activities and Cash Flow Report; and
- 25 July 2014 Geophysics Team Mobilises for Kempfield DHMMR Survey.

The Company confirms it is not aware of any new information or data that materially affects the information included in the original market announcements, and, in the case of estimates of Mineral Resources or Ore Reserves, that all material assumptions and technical parameters underpinning the estimates in the relevant market announcements continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcements.

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This Announcement contains summary information about Argent Minerals, its subsidiaries and their activities which is current as at the date of this Announcement. The information in this Announcement is of a general nature and does not purport to be complete nor does it contain all the information which a prospective investor may require in evaluating a possible investment in Argent Minerals.

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- are necessarily based upon a number of estimates and assumptions that, while considered reasonable by

Argent Minerals, are inherently subject to significant technical, business, economic, competitive, political and social uncertainties and contingencies; and,

- involve known and unknown risks and uncertainties that could cause actual events or results to differ materially from estimated or anticipated events or results reflected in such forward-looking statements.

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All forward-looking statements made in this announcement are qualified by the foregoing cautionary statements. In particular, the corporate mission and strategy of the Company set forth in this Announcement represents aspirational long-term goals based on current expectations. Investors are cautioned that forward-looking statements are not guarantees of future performance and accordingly investors are cautioned not to put undue reliance on forward-looking statements due to the inherent uncertainty therein.

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