

ASX Announcement (ASX:AXE)

23 April 2018

Jamieson Tank manganese project

Highlights

- Test work by independent laboratory confirms that manganese from Archer's Jamieson Tank project can make electrolytic manganese dioxide (EMD).
 - EMD is a critical component used in the manufacture of cathodes for lithium ion, alkali and other types of batteries, and is the fastest area of growth in manganese production.
 - The development of the Jamieson Tank manganese project is consistent with Archer's new advanced materials and reliable energy storage focus.
 - Jamieson Tank is within 2km of the proposed Sugarloaf Graphite Processing Facility.
 - Jamieson Tank was drilled by previous explorers and Archer expects to announce a JORC compliant manganese exploration target in the coming weeks.
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Archer Exploration Limited (ASX:AXE, Archer, Company) is pleased to announce outstanding results from recent metallurgical test work conducted on a composite drill sample sourced from the Company's 100% owned Jamieson Tank Manganese Project (located near Cleve, South Australia).

The metallurgical test work was completed by Kemetco Research Inc, the same company that did the Ketchowla manganese and cobalt test work (ASX announcement 12 February 2018). The test work involved the leaching of the manganese from the old drill sample provided by Archer, purification of the leach to remove iron, cobalt, nickel and other potentially deleterious elements and finally the precipitation of the electrolytic manganese dioxide onto graphite cathode and titanium anodes.

The test work showed that the Jamieson Tank manganese was capable of making an EMD product with a manganese content of > 92% which is the standard required for alkaline and lithium ion batteries.

Executive Chairman, Greg English commented, "It is very exciting that our manganese at Jamieson Tank has been independently shown to be suitable in the production of high grade manganese EMD, with its high value applications in emerging and established battery technologies. This is consistent with our expanding exploration portfolio focus on advanced materials and reliable energy storage technologies. The Jamieson Tank Manganese Project complements our nearby Campoona graphite

and graphene project with its granted mining tenements, and our other manganese and cobalt exploration prospects at Ketchowla and North Broken Hill. We look forward to updating the market on further developments over the coming weeks.”

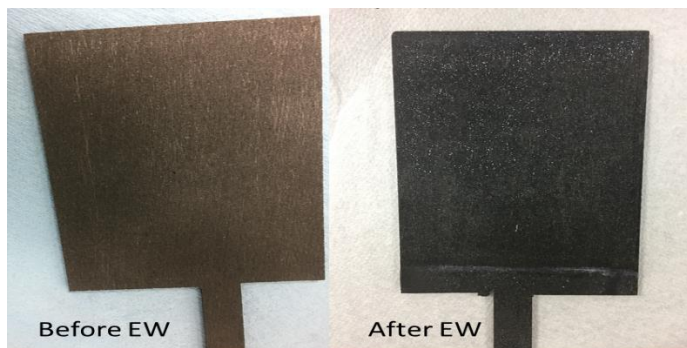


Figure 1. Cathode before and after EMD generation



Figure 2. EMD powder

The Jamieson Tank Manganese Project

The Jamieson Tank Manganese Project straddles two separate tenements both owned by Archer: Carapsee Hill (site of the proposed Sugarloaf Graphite Processing Facility) and Waddikee. The Carapsee Hill portion was initially drilled by Archer in 2008 with follow up drilling under a joint venture between Archer and the manganese miner and processor OM Holdings Limited (ASX:OMH). The Waddikee portion was drilled under a separate joint venture between OMH and Monax Mining Limited (ASX:MOX). Archer purchased the Waddikee tenement from Monax in 2014 and now owns all of the Jamieson Tank Manganese Project.

The Project extends for approximately 6km in a N-S strike direction and is open along strike. The southern end of Jamieson Tank is within 2km of the proposed Sugarloaf Graphite Processing Plant and also within close proximity of power, water and road infrastructure.

The drill sample provided to Kemetco had a head grade of 12% manganese. Whilst the grade of Jamieson Tank manganese is lower than direct shipping manganese (e.g. Jupiter Mines and South32) the manganese is low in iron and other impurities which makes it suitable for EMD production.

Over 11,000m of drilling was completed by Monax and OMH at Jamieson Tank and Archer is in the process of finalising a maiden manganese Exploration Target which the Company expects to be able to release within the next few weeks.

Electrolytic Manganese Dioxide

While manganese has traditionally been seen as a component in steel alloys, it is the battery applications of Electrolytic Manganese Dioxide (EMD) that are predicted to be the fastest growing segment of manganese production. EMD is a high value manganese product which is a critical component within various applications, especially for lithium ion battery cathode material for electric vehicles.

The global battery market is currently driven by the shift from nickel-based fuel cells to EMD based fuel cells. The high demand for EMD based Li-ion fuel cells is the major factor contributing to the growth of the batteries market. The global EMD market is forecast to grow at a compound annual growth rate of 6.34 % during the period 2018 - 2022, with the USA being the largest consumer of EMD globally at approximately 40%.

One of the most successful Lithium-ion battery systems is a cathode combination of nickel, manganese and cobalt (NMC). The cathode combination ratio of a NMC battery is usually one-third nickel, one-third manganese and one-third cobalt, meaning that the raw material cost is lower than for other options. The NMC cathode is currently being preferred for environmentally friendly, electric vehicles and hybrids, as well as in power tools.

The adoption of solar and wind-power systems across the world is also creating demand for high electric storage capacity batteries, which utilise EMD battery technologies.

In addition, EMD is critical for cathodes in modern alkaline and sodium batteries and in new battery technology developments, such as the Zinc-Manganese battery which is anticipated to become the replacement for the not so environmentally friendly lead/acid automotive starting and lighting market batteries. There is also significant potential in the emerging Lithiated Manganese Dioxide (LMD) Battery (which contains 61% Manganese by weight). LMD batteries are currently being used in the Chevy Volt and Nissan Leaf.



Figure 3. Archer Drilling in 2008 at Jamieson Tank.

For further information, please contact:

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Competent Person Statement

The information in this report that relates to Exploration Results is based on information compiled by Mr Wade Bollenhagen, a Competent Person who is a Member of the Australasian Institute of Mining and Metallurgy and is a full-time employee of Archer Exploration Limited. Mr Bollenhagen has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the “Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves”. Mr. Bollenhagen consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

JORC Code, 2012 Edition – Table 1

Section 1 Sampling Techniques and Data

Criteria	JORC Code Explanation	Commentary
Sampling Techniques	<ul style="list-style-type: none"> Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as downhole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling. Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used. 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 (e.g. ‘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 (e.g. submarine nodules) may warrant disclosure of detailed information. 	<ul style="list-style-type: none"> No exploration drilling results being reported.
Drilling Techniques	<ul style="list-style-type: none"> Drill type (e.g. core, reverse circulation, open hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (e.g. 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"> No exploration drilling results being reported.

Criteria	JORC Code Explanation	Commentary
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 and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material. 	<ul style="list-style-type: none"> No exploration drilling results being reported.
Logging	<ul style="list-style-type: none"> 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. Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography. The total length and percentage of the relevant intersections logged. 	<ul style="list-style-type: none"> No exploration drilling results being reported.
Sub-Sampling Techniques and Sample Preparation	<ul style="list-style-type: none"> If core, whether cut or sawn and whether quarter, half or all core taken. If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry. For all sample types, the nature, quality and appropriateness of the sample preparation technique. Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples. 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. Whether sample sizes are appropriate to the grain size of the material being sampled. 	<ul style="list-style-type: none"> No exploration drilling results being reported.

Criteria	JORC Code Explanation	Commentary
Quality of Assay Data and Laboratory Tests	<ul style="list-style-type: none"> The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total. 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. Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established. 	<ul style="list-style-type: none"> Certified standards were not used in the assessment of the analyses. Test work was by Kemetco Research Inc, located in Canada.
Verification of Sampling and Assaying	<ul style="list-style-type: none"> The verification of significant intersections by either independent or alternative company personnel. 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"> No exploration drilling results being reported.
Location of Data Points	<ul style="list-style-type: none"> Accuracy and quality of surveys used to locate drillholes (collar and downhole 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"> No exploration drilling results being reported.
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"> No exploration drilling results being reported.

Criteria	JORC Code Explanation	Commentary
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. 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 exploration drilling results being reported.
Sample Security	<ul style="list-style-type: none"> The measures taken to ensure sample security. 	<ul style="list-style-type: none"> It is assumed that best practices were undertaken at the time All residual sample material (pulp) are stored securely.
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"> None undertaken.

Section 2 Reporting of Exploration Results

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. 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"> Tenement status confirmed on SARIG. All work being reported is from EL 5815 and 5920 (owned by Pirie Resources Pty Ltd, a subsidiary of AXE). The tenement is in good standing with no known impediments.
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"> The most significant exploration was undertaken Monax Mining (ASX:MOX) in 2008 to 2012. Numerous ASX releases were made by the company in that period relating to the work undertaken by them on the project. Prior to this in WMC undertook a limited exploration program exploring for high grade Mn.
Geology	<ul style="list-style-type: none"> Deposit type, geological setting and style of mineralisation. 	<ul style="list-style-type: none"> The mineralisation is interpreted to be strataform.

Criteria	JORC Code Explanation	Commentary
Drillhole Information	<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 Downhole length and interception depth Hole length 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 exploration drilling results being reported.
Data Aggregation Methods	<ul style="list-style-type: none"> In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated. 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. The assumptions used for any reporting of metal equivalent values should be clearly stated. 	<ul style="list-style-type: none"> No exploration drilling results being reported.
Relationship Between Mineralisation Widths and Intercept Lengths	<ul style="list-style-type: none"> These relationships are particularly important in the reporting of Exploration Results. If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported. If it is not known and only the downhole lengths are reported, there should be a clear statement to this effect (e.g. 'downhole length, true width not known'). 	<ul style="list-style-type: none"> No exploration drilling results being reported.

Criteria	JORC Code Explanation	Commentary
Diagrams	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> See main body of report.
Balanced Reporting	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> The reporting is considered to be balanced.
Other Substantive Exploration Data	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> Considerable work has been completed in the area exploring for material that could be upgrade to +30% Mn, this has been unsuccessful. A composite 5kg sample was created from the drill sample interval 9m to 16m in hole JTRC083. This was sent to Kemetco for test work to determine if the Mn ore can have EMD made from it, which are discussed in this release.
Further Work	<ul style="list-style-type: none"> The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling). Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive. 	<ul style="list-style-type: none"> Further work on fresh drill material to validate these early results,