

ASX Announcement (ASX:AXE)

30 July 2019

Fourth Quarter Activities Report

For the three months ending 30 June 2019

Significant Activities

- The ¹²CQ Project commenced with the aim of building a carbon-based quantum computing device (chip) capable of room-temperature quantum information processing that would form the future basis of a quantum computer.
 - Archer team assembles first nanoscale materials components of the ¹²CQ qubit processor (chip) prototype.
 - Ink formulations of human antibodies are successfully printed and patterned on Archer's graphene-based biosensor components.
 - Modelling of the results from the copper drilling program at Blue Hills completed during the Quarter supports the presence of an intrusive style mineralising event that has the capacity to host copper-gold mineralisation.
 - The Company hosted shareholder presentations in Sydney, Melbourne and Adelaide with over 180 people registering to attend.
 - Completion of a share placement, raising \$300,000, before costs, to fund ongoing investment in Archer's growth opportunities.
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Commenting on the fourth quarter activities Greg English, Executive Chairman of Archer Exploration, said, "The June 2019 quarter was a significant period for the Company with the commencement of the ¹²CQ Project, which was the culmination of a lot of hard work by our CEO, Dr Mohammad Choucair, and his team. The assembly of the nanoscale materials components of the ¹²CQ qubit processor (chip) prototype within 3 months of the commencement of the ¹²CQ Project was a great achievement. We will now begin building prototype devices by assembling atom-scale componentry while overcoming technical challenges in controlling, reducing, or eliminating the technical risks associated with realising the 16 claims in the patent application."

"In relation to work undertaken in the Human Health vertical of our Advanced Materials business, we were able to formulate graphene-based inks incorporating process compatible biomaterials, with the intention that graphene ink will be used to make printable biosensors capable of testing a number of different diseases".

"In regard to our Mineral Exploration activities, the drill results and modelling at Blue Hills supported the presence of an intrusive style copper-gold mineralising event. We will now incorporate this information into a wider regional geological model to identify additional exploration targets in the area".

"The placement of \$300,000 of shares and the sale of the Sugarloaf farm land for \$1.35 million, has positioned us to continue the development of our projects and deliver further shareholder value."

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Quarterly Activities to 30 June 2019

Archer Exploration Limited (ASX: AXE) (“Archer” or the “Company”) is pleased to report on its activities for the three-month period ending 30 June 2019 (“Quarter”).

Archer’s vision is to build a long term and viable mineral and materials development business focussing on the key areas related to quantum technology, human health, and reliable energy. These three themes were targeted as they have associated industries with exponential growth opportunities. Archer’s in-house expertise, materials inventory, and access to extensive infrastructure provides an opportunity for rapid development and integration of materials-centric end-to-end solutions with the potential for positive global impact.

Advanced Materials

Quantum Technology

The ^{12}CQ Project commenced in April 2019 (ASX Announcement 3 April 2019). The Archer team is now building ^{12}CQ qubit processor chip prototypes (ASX Announcement 26 June 2019). Successful development of Archer’s ^{12}CQ chip could potentially enable widespread ownership of quantum computing powered technology and catalyse a global multibillion-dollar industry.

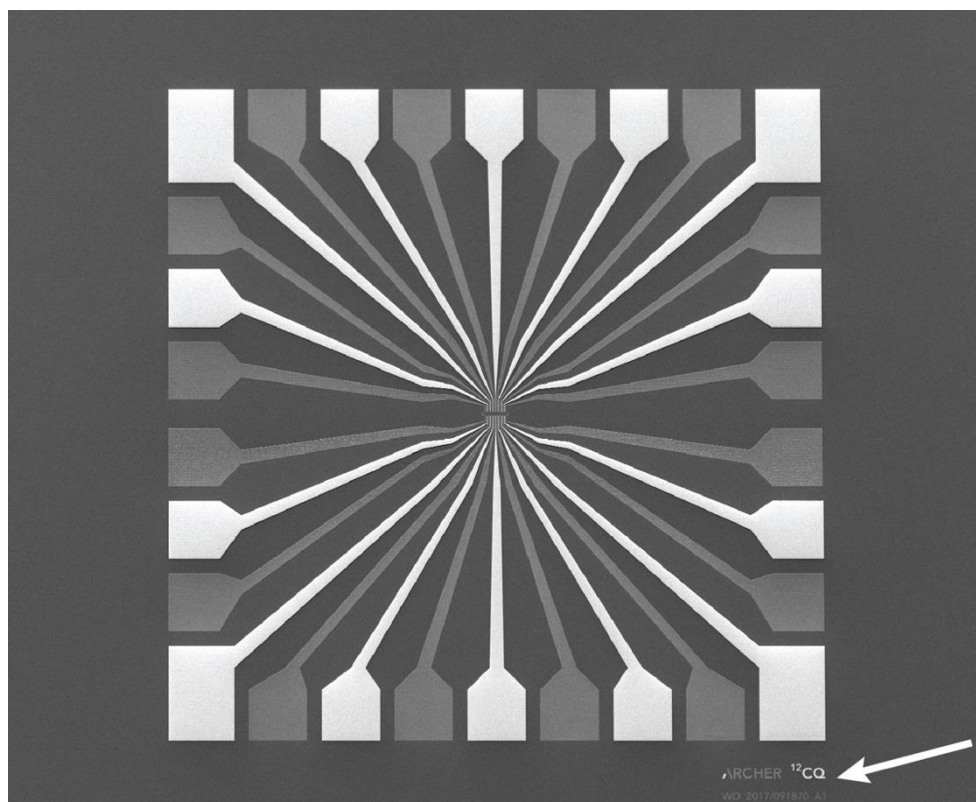


Fig. 1. Electron microscopy images of the first ^{12}CQ chip prototype micron-nanoscale components patterned on a silicon wafer. The arrow indicates the Archer ^{12}CQ logo and international patent application number fabricated on the device substrate. The logo size is less than the width of a human hair.

The componentry assembled and shown in Fig. 1. form the prototype chip's first-stages of basic device architecture (pattern assembly) intended to allow for the quantum computing functions of the ^{12}CQ carbon-based qubits once they are incorporated. This pattern assembly is an initial step towards fabricating a working **room-temperature qubit processor** prototype representing a minimum viable product: a product chip representing a commercial readiness that can practically address and validate solutions to **room-temperature quantum computing**. The chip pattern assembly is a unique and unoptimised structure, subject to changing functional configurations. The chip pattern assembly is currently designed for versatile testing and validation of ^{12}CQ 's chip prototype competitive advantages that include using **conducting carbon-based qubits for room-temperature quantum computing**.

The technical development at the heart of ^{12}CQ is a world-first. Archer intends to continue technology de-risking value-added development of the ^{12}CQ qubit processor chip by completing the next stages of component assembly towards a proof-of-concept prototype chip. The prototype chip validation is required to establish a minimum viable product solution **that can address industry problems of room-temperature quantum computing operation and ready integration into modern electronics**. The next stages of device assembly have commenced during the Quarter, with ^{12}CQ Project milestone achievements to be released as they become available.

Human Health

During the Quarter, a key milestone was met in the development of the biosensor technology (ASX Announcement 15 April 2019). Ink formulations comprised primarily of human antibody immunoglobulin G (IgG) as the active constituent successfully prepared and printed using proprietary methods. Printing techniques were employed using a state-of-art inkjet printer for the preparation of basic patterns (Fig. 2). The IgG inks were printed on resin-coated paper and a number of graphene-based electrodes and were able to withstand the chemical and physical processes in the formulation, printing, and post-printing steps. The electrodes were characterised and confirmed for adequate biosensor function by a range of techniques at the ARC Graphene Hub.

Archer has provisionally patented a potential solution to printable biosensors capable of multiplexing (ASX Announcement 19 February 2019). Archer is the sole applicant of the provisional patent, maintaining 100% ownership of the biosensor technology intellectual property (IP). **Archer has until 15 February 2020 to consider maturing the application to a full patent**. To mature the provisional patent, support of the claims in Archer's provisional patent requires detailed scientific protocols and evidence of the technical viability of the biosensor technology. This means that the exclusive right to commercially exploit the IP is fundamentally dependent on the successful development of the biosensor technology.

Archer is engaged in a collaboration agreement with the Australian Research Council Graphene Enabled Industry Transformation Research Hub (ARC Graphene Hub) at the University of Adelaide and has a material transfer agreement in place with a leading German Biotech.

Archer is in discussions with the German Biotech to cooperatively continue the development of the biosensor technology by establishing legally binding long-term material agreements. Collaboration with the ARC Graphene Hub will continue, with a focus on optimising ink formulations and their processing methods (e.g. synthesis, printing, post printing treatments), and identifying transduction methods, bioreceptors, analytes, coupling and assay reagents for the proper function of the biosensor technology to provide strong support for the claims and embodiments in the provisional patent.

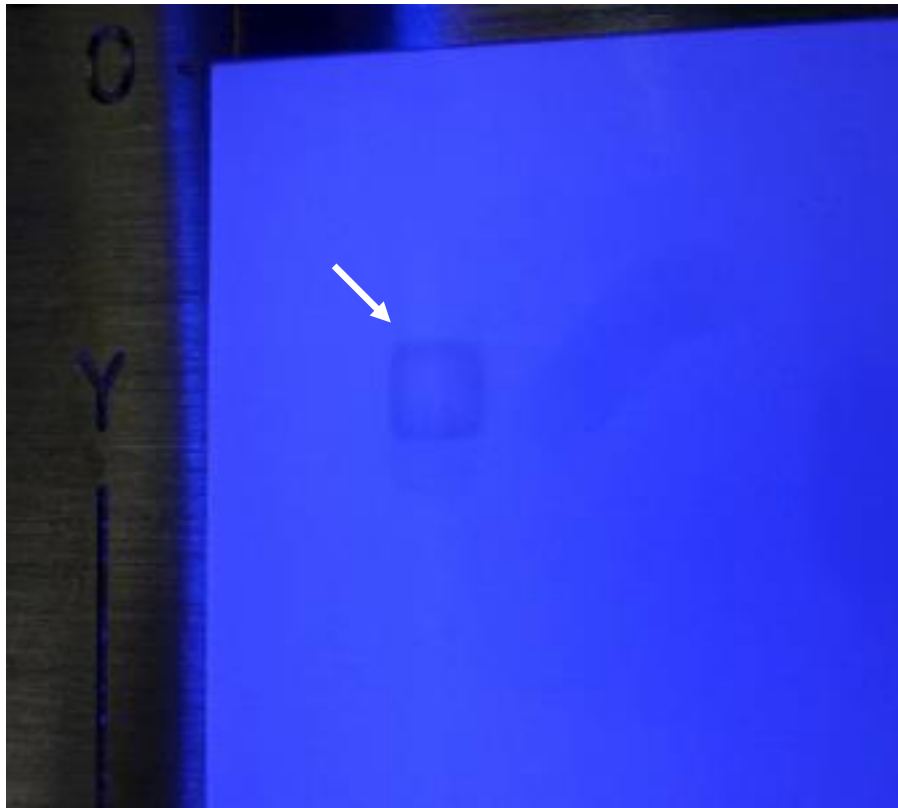


Fig. 2. An antibody ink formulation containing human immunoglobulin G (IgG) printed and patterned onto a resin-coated paper substrate using a Fujifilm Dimatix DMP-2850 Inkjet Printer. The freshly printed antibody ink is observed using ultra violet light (responsible for the blue colour) as a dark blue squared region indicated by the arrow.

Reliable Energy

During the Quarter, Archer and UNSW signed an agreement extending the term of the Research Service Agreement to January 2021. Archer is engaged in a Collaboration Agreement and Research Service Agreement with the University of New South Wales (“UNSW”) to focus on carbon-based energy storage technology (ASX Announcement 18 April 2018). The ongoing work with UNSW is focused on addressing the trade-off between cost and battery performance using Archer’s Campoona graphite at the anode of lithium-ion batteries and formulating, building, and testing full-cell batteries. Technical development with UNSW to test spherical graphite products commenced during the Quarter. This testing will involve value-add to Archer’s proposed Campoona development of optimal morphologies (such as spherical graphite; see Mineral Exploration below) for lithium-ion batteries useful for commercially relevant battery types.

Mineral Exploration

Eyre Peninsula Graphite Project

Last quarter, Archer reported that spherical graphite was produced from Campoona graphite materials of uniform 40-micron flake size (99%+ and 95% TCC) using small-scale (kilogram quantity) mechanical milling processes. The spherical graphite products were produced with a particle size centred around 15-microns with a narrow size distribution (i.e. $D_{90/10}$ ratio of less than 3). Testing of the spherical graphite products was commenced during the Quarter, with the results of this test work to be released as they become available.

Sale of Sugarloaf Land

Archer announced the sale of its Sugarloaf farmland for \$1.35 million (ASX announcement 28 November 2018). The transaction settled on 1 July 2019 with Archer receiving the \$1.35 million sale proceeds in July 2019. The purchaser of the farm land has granted Archer an option to buy back approximately 30% of the Sugarloaf farm land, which may be required for the construction of the Sugarloaf Graphite Processing Facility (Option). The Option may be exercised by Archer any time during the next 20 years.

Blue Hills Copper-gold Project

In early February 2019, Archer completed a reverse circulation drill program (drilling program) at Blue Hills. The drilling program was targeting large coincident copper-gold in soils anomalies at Hood, Hawkeye and Katniss prospects and an electromagnetic signature proximal to a modelled intrusion. The Company formed the view that the drilling program supported the presence of a copper-gold mineralised system and subsequently engaged independent consultants to undertake a review of all of the available data to identify new exploration targets.

The independent review concluded that the drilling program results support the concept that the exposed mineralisation is proximal in nature to an inferred intrusion or intrusions located at depth immediately east of Hood, Hawkeye and Katniss (ASX announcement 23 April 2019). The presence of these intrusions is inferred from a series of five circular to ovoid shaped magnetic lows (**Fig. 3**) that are consistent with the magnetic signatures that would be produced from reduced I type granitic intrusions.

The possible presence of these buried intrusions is important as the intrusions are most likely to be the main source of the mineralisation. In addition to the modelled intrusives, the review identified several conductors that run parallel to regional west-northwest and north-northeast structural trends. Confirmation of the interpreted intrusions would require further drilling.

The reverse circulation drill holes drilled by Archer in 2017 and 2019 were targeting the areas of coincident high surface mineralisation and associated electromagnetic conductors. The holes that were drilled to relatively shallow depths at Hood appear to have gone over the top of the target. Based on the results described above, mineralisation encountered in HDRC19-01 and 02 may represent the edge of a stronger mineralised zone at depth and to the south.

A review of the geophysical data confirmed that the large-scale geology of the region is dominated by a large oroclinal flexure, where the dominant structural trend changes from N-S to NE. This flexure is associated with a NW-trending structural zone. Although many of the individual structures exposed at the current erosional surface that make up this zone are subtle; it is likely to represent a very fundamental deep-seated structural corridor. Such deep-seated

structural zones are normally associated with mineralisation, and in this case, the Blue Hills prospect does occur associated with this zone (i.e. in a zone of structural complexity where it is intersected by several other structural sets).

Modelling of the existing gravity data suggests the presence of a buried intrusive body within the main NW-trending structural zone at its intersection with the Delamarian granite intrusive belt. Any buried intrusive body may be the source of any mineralisation in the area. The new tenement (ELA 2019/00027) covers parts of this and other gravity and EM targets that warrant future exploration.

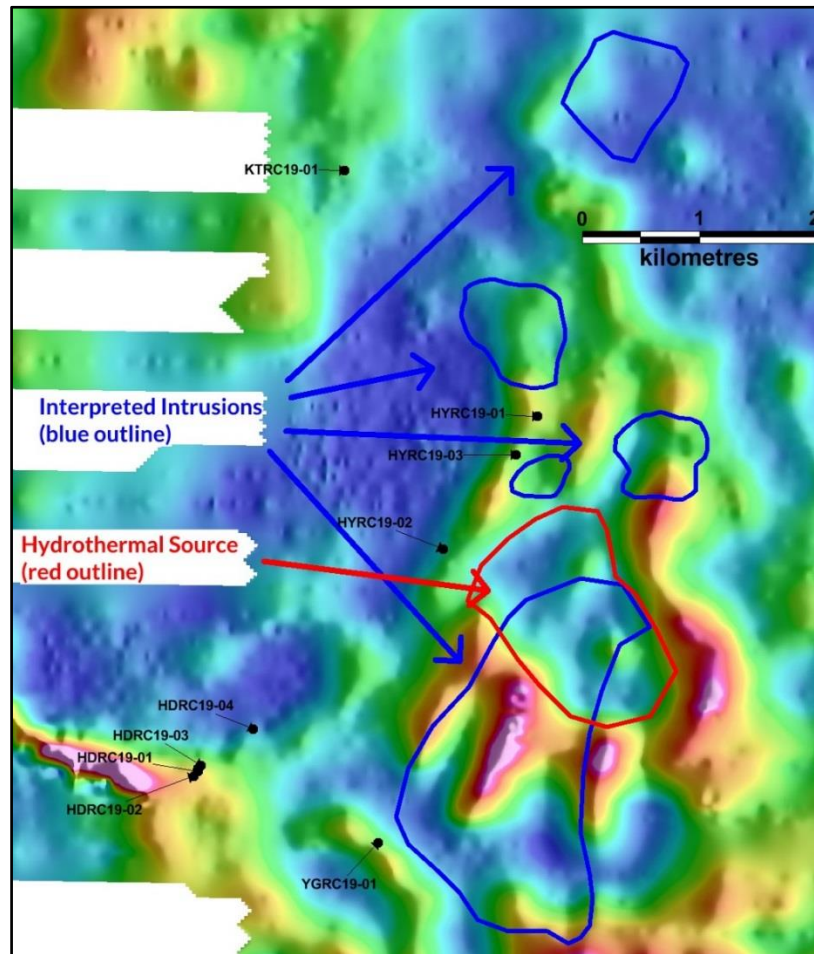


Fig. 3. Interpreted intrusions over 100m depths slice of EM data in proximity to Hood, Katniss, and Hawkeye prospects of the Project.

Broken Hill Project

A review of historical information led to the identification of scheelite hosted tungsten mineralisation within the area of Archer’s Broken Hill tenements (ASX announcement 10 July 2019). The tungsten mineralisation is stratigraphically hosted, and it is thought that the scheelite was partially remobilised into fold hinges and retrograde calc-silicate rocks in the deformation history.

The known outcrop has been mapped extensively over Archer’s tenement area and the mineralised horizon likely extends under cover. The outcropping areas are highly prospective for tungsten mineralisation.

Cobar Project (EL 5779 Crowie Creek)

In early 2019 the Company applied for an exploration licence (EL 5779) located approximately 80km, south-east of Cobar, NSW. The tenement is approximately 40km south-east of Aurelia Metal’s Hera Project and is prospective for copper, gold, zinc, silver, and tin (Fig. 4). The tenement was granted early July 2019 and is known as the Company’s Crowie Creek Project. The Company will commence exploration activities at Crowie Creek during the September quarter.

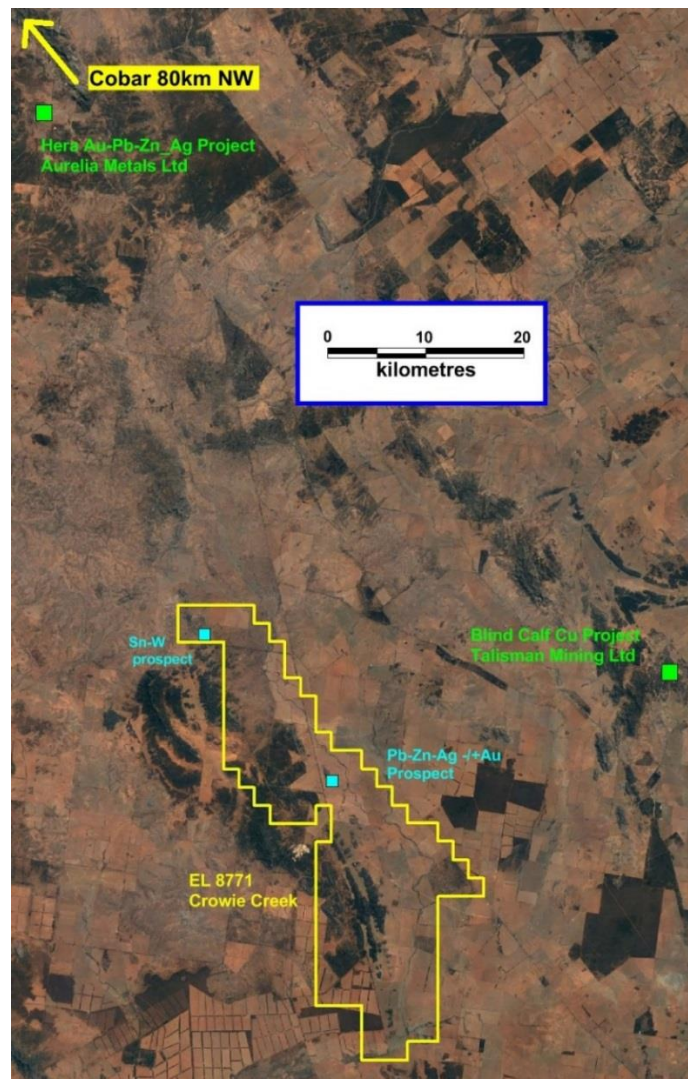


Fig. 4. Interpreted intrusions over 100m depths slice of EM data in proximity to Hood, Katniss, and Hawkeye prospects of the Project.

Other Projects

No work was undertaken during the Quarter at Archer’s other project areas not mentioned in this report.

Corporate

Shareholder presentations

In late May / early June, Archer held a series of shareholder presentations in Sydney, Adelaide and Melbourne, (Image 1) (ASX announcement 20 May 2019). The presentations were focussed on the Company's ¹²CQ Project and provided shareholders with the opportunity to meet Archer CEO, Dr Mohammad Choucair, and Manager of Quantum Technology, Dr Martin Fuechsle. The shareholder presentations were a great success with over 180 people registering to attend.



Image 1. Archer CEO presenting the ¹²CQ Project in Melbourne in June 2019.

Issued Capital

Time	Shares	Options	Performance Rights
Start of Quarter	192,018,569	Nil	1,050,000
New issues during Quarter	4,285,714 ⁽¹⁾	Nil	Nil
Exercised/cancelled during Quarter	Nil	Nil	Nil
End of Quarter	196,304,283	Nil	1,050,000
Date of this Report	197,091,783 ⁽²⁾	Nil	Nil ⁽²⁾

Notes

- (1) Share placement of 4,285,714 new shares, at \$0.070 per share, made to sophisticated and professional investors (ASX announcement 21 May 2019).
- (2) 787,500 Performance Rights were exercised and 787,500 new shares issued, the remaining 262,500 Performance Rights expired.

Cash balance

The Company's cash balance at the end of the Quarter was \$696,000. This amount excludes the \$1.35 million received by the Company from the sale of the Sugarloaf farm land in July 2019.

List of Archer Tenements

Tenement	Location	Commodity
South Australia		
EL 5434	North Cowell	Graphite
EL 5791	Cockabidnie	Graphite
EL 5804	Wildhorse Plains	Graphite
EL 5815	Waddikee	Graphite
EL 5870	Carpie Puntha	Graphite
EL 5920	Carapee Hill	Graphite
EL 6019 ⁽¹⁾	Witchelina	Magnesite
EL 5730 ⁽¹⁾	Termination Hill	Magnesite
EL 5433	Burra North	Base Metals
EL 5769	Napoleons Hat	Copper / Gold
EL 5794	Blue Hills	Copper / Gold
EL 5935	Whyte Yarcowie	Cobalt / Copper
EL 6000	Pine Creek	Copper / Gold
EL 6029	Altimeter	Copper / Gold
EL 6160	Franklyn	Copper / Gold
EL 6287	Peterborough	Copper / Gold
EL 6354 ⁽²⁾	Bendigo	Copper/Gold
ML 6470	Campoona Shaft	Graphite mining
MPL 150	Sugarloaf	Graphite and graphene processing
MPL 151	Pindari	Process water for Sugarloaf
New South Wales		
EL 8592	Morris's Blow	Cobalt / Copper
EL 8593	Broken Hill	Cobalt / Copper
EL 8594	Broken Hill	Cobalt / Copper
EL 8595	Broken Hill	Cobalt / Copper
EL 8779	Campbells Ck	Cobalt / Copper
ELA 5814	Stanthorpe	Tungsten / Tin
EL 5779	Crowie Creek	Copper/Gold
Western Australia		
E53/1926	Mt Keith	Nickel

Notes

- (1) These tenements have been sold with Completion scheduled to occur at the end of calendar year 2019.
- (2) This tenement was granted during the Quarter.
- (3) Broken Hill, NSW tenements EL 8596, EL 8597 and EL 8598 were relinquished during the Quarter.

Competent Person Statement

The exploration results reported herein, insofar as they relate to mineralisation, are based on information compiled by Mr. Wade Bollenhagen, Exploration Manager who is an employee of Archer Exploration Limited.

Mr. Bollenhagen is a Member of the Australasian Institute of Mining and Metallurgy who has more than twenty years' experience in the field of activity being reported. Mr Bollenhagen has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity that he is undertaking 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" relating to the reporting of Exploration Results. Mr. Bollenhagen consents to the inclusion in the report of matters based on his information in the form and context in which it appears.

General Enquiries

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Chief Executive Officer

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For more information about Archer's activities, please visit our:

Website:
<https://archerx.com.au/>

Twitter:
<https://twitter.com/archerxau?lang=en>

YouTube:
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