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FOR IMMEDIATE RELEASE

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**Jaguar Announces Gold Production Increase in 2017
and Provides Update on Growth Exploration Pipeline Initiative**

Toronto, Canada, December 21, 2016 - Jaguar Mining Inc. ("Jaguar" or the "Company") (TSX: JAG) is pleased to announce its consolidated annual guidance for 2017 and to provide an update on its Growth Exploration Pipeline Initiative, announced on October 27, 2016. All amounts are in US dollars, unless otherwise stated.

2017 Guidance

- Gold production of 100,000 - 110,000 ounces, up approximately 10% compared to 2016 guidance
- Cash operating costs per ounce sold¹ ("COC") of \$720 - \$755
- All-in sustaining costs per ounce sold¹ ("AISC") of \$900 - \$1,000
- Total development includes primary of 4,700 - 5,500 metres, Secondary of 5,600 - 6,550 metres
- Definition and infill drilling totalling 26,000 - 31,000 metres
- Growth exploration investment (core operating assets) of \$7.5 - \$8.0 million

Exploration Update

- Commenced underground development of exploration drives in order to launch the planned deep drilling programs from the hanging wall at both Pilar and Turmalina to test the down-plunge extension of current inferred resources.
- Initiated exploration drilling at the the Pacheca and Cubas targets located in and around Pilar.

1. Cash operating costs and all-in sustaining costs are non-GAAP financial performance measures with no standard definition under IFRS. Refer to Non-IFRS Financial Performance Measures below. 2017 cost guidance has been prepared on the basis of a foreign exchange rate of 3.5 Brazilian Reais vs. the US dollar.

Rodney Lamond, President and Chief Executive Officer of Jaguar, stated: *"Looking at 2017, we are very pleased to announce that total gold production is expected to be between 100,000 and 110,000 ounces per year, approximately 10% higher compared to 2016 gold production guidance. We are confident that this level of production is an achievable and sustainable target. The management team in Brazil has remained disciplined with how and where capital is deployed while also initiating cost reductions across the mines. We are focused on delivering on a five-year strategy that will enable us to continue increasing our production profile and move us closer to our strategic goal of becoming a 200,000 ounce per year gold producer."* Mr. Lamond continued, *"On the exploration front, we initiated in October, an accelerated growth exploration program focused on brownfield exploration targets near our core assets in the Iron Quadrangle in Brazil. The programs are progressing as planned and we look forward to delivering more news on the exploration programs and results in the first quarter of 2017."*

2017 Guidance

The Company's 2017 gold production guidance has increased approximately 10% year-over-year and is a significant step towards the Company's five-year strategic plan of becoming a 200,000 ounce per year producer, focused on organic growth within the prolific mining district of the Iron Quadrangle, located in Minas Gerais, Brazil. Jaguar will be leveraging off of the successes achieved with its Operational Excellence Program at the Turmalina Gold Mine ("Turmalina") in 2016 and plans to expand the program into Pilar Gold Mine ("Pilar") during 2017. Furthermore, the Company continues to evaluate and improve the quality of its geological models and build confidence in its mine plans, as well as review its current asset base in the Iron Quadrangle with a commitment to continue enhancing its production profile while operating in a safe and environmentally compliant work place.

More detailed information relating to mine-by-mine guidance will be available with the Company's 2016 production announcement to be released in January 2017.

Growth Strategy

Jaguar continues to focus on safely delivering positive and sustainable physical performance, profitability, and cost optimization. The Company has also established a number of strategic initiatives such as the Growth Exploration Pipeline which are expected to create significant shareholder value. The Growth Exploration Pipeline Initiative investment of \$7.5 to \$8.0 million will be focused on brownfield exploration targets to expand and discover new mineral resources located in and around existing mine infrastructure and have a strong potential to extend expected mine life.

Update on Exploration Growth Pipeline Initiative

On October 27, 2016, the Company announced the commencement of an expanded and accelerated Growth Exploration Pipeline Initiative at its operating underground gold mines, Turmalina, Pilar, and Roça Grande, located in the Iron Quadrangle. Under this program, the Company has spent \$300,000 on exploration in and around the mines to date, including underground development of exploration drives in order to launch the planned deep drilling programs from the hanging wall at both Pilar and Turmalina to test the down-plunge extension of current inferred resources. The Company has also initiated \$200,000 in exploration drilling at the Pacheca and Cubas targets located in and around Pilar.

The initiative is focused on brownfield exploration targets to expand and discover new mineral resources located in and around existing mine infrastructure that have a strong potential to further grow sustainable production, lower unit costs, increase cash flows, and extend expected mine life by converting mineral resources at its core assets through the upgrading of current Measured and Indicated Mineral Resources to Mineral Reserves as well as identifying future Measured, Indicated, and Inferred Resources.

Exploration targets generated, as a result of extensive compilation work from previous exploration campaigns, in and around the current mine sites will be followed up by a combination of geochemical and geophysical surveys. Subject to the results, an additional 7,750 metres ("m") of surface drilling will be dedicated to test those targets.

Turmalina Gold Mine and Pilar Gold Mine

At Orebody A, 4,800 m of deep diamond drilling will be performed after the development of a new 250 m exploration drive is positioned in the hanging wall at Level 10. The proposed drilling is intended to reach the 12, 13 and 14 Levels, up to 240 vertical m below current development and 160 m below the current Inferred Resources.

At Orebody C, down-dip extension drilling of the south-eastern portion of Orebody C is expected to generate new mineral resources that are near surface and to contribute in the near-term to the Turmalina throughput profile.

Induced polarization ("IP") geophysics will test the hanging wall of Orebody C and eastern continuity of Orebody A. Following the IP work, an estimated 6,000 m surface diamond drilling program is expected to take place.

At Pilar, development of a new exploration drive is advancing in preparation of an underground drilling campaign of approximately 5,100 m that will test the down-plunge extension and continuity of ore bodies BFII, BF, and BA.

Deep diamond drilling at Pilar will be performed from the new exploration drive positioned in the hanging wall of the mine at Level 7. The proposed drilling is intended to reach the 12, 13 and 14 Levels, up to 250 vertical m below current development and 200 m below the current Inferred Resources.

It is expected that drill results from Turmalina and Pilar will be released in the second half of 2017.

Pacheca and Cubas Targets

Drilling at the Pacheca target commenced in early November 2016. Approximately 1,600 m of surface diamond drilling on the Pacheca target has been completed to date, with another 2,000 m to be completed.

Phase one of the diamond drilling campaign has successfully confirmed the presence of hydrothermal alteration associated with the presence of iron formation. Assays are pending at Pacheca and results are expected to be announced during the first quarter of 2017. The drill rig at Pacheca has been mobilized to the Cubas target located at the Pilar Mine.

The Pacheca target is located three km north-east of the Pilar mine and is characterized by a series of extensive open pit excavations made by Portuguese explorers during the 18th century. Similarly hosted in the Banded Iron Formation (BIF) encompassing most of the gold mineralization in the Iron Quadrangle, the Pacheca target is strongly delineated by soil gold geochemistry.

Drilling at the Cubas target commenced in mid December and is ongoing. Surface diamond drilling on the Cubas target of approximately 2,500 m (four holes) is planned to test the high chargeability and high resistivity geophysics anomalies associated with the southern continuity of the BIF and shear zone which host the Pilar mine ore bodies. The Company expects to deliver results regarding the Cubas target within the first quarter of 2017.

Qualified Person

Scientific and technical information contained in this press release has been reviewed and approved by Jean-Marc Lopez, BSc, P.Geo., MAusIMM Vice President of Geology and Exploration who is an employee of Jaguar Mining Inc., and is a "qualified person" as defined by National Instrument 43-101- *Standards of Disclosure for Mineral Projects* ("NI 43-101").

Quality Control

Jaguar continues to use a quality-control program that includes insertion of blanks, commercial standards, and duplicate core samples in order to ensure best practice in sampling and analysis.

NQ and BQ size drill core is sawn in half with a diamond saw. Samples are selected for analysis in standard intervals according to geological characteristics such as lithology and hydrothermal alteration contents. All diamond drill hole collars are accurately surveyed using a Total Stations instrument and down-hole deviations are surveyed using optical Reflex Maxibor.

Mean grades are calculated using a variable lower grade cut-off (generally 2 g/t Au). No upper gold grade cut has been applied to the data. However, the requirement for assay top cutting will be assessed during future resource work.

Half of the sawed sample is forwarded to the analytical laboratory for analysis while the remaining half of the core is stored in a secure location. The drill core samples are transported in securely sealed bags to the Jaguar in-house laboratory located at the Caeté Mine Complex in Minas Gerais. Some samples are also sent for check assaying to the independent SGS Geosol Laboratory located in Vespasiano, Minas Gerais. The preparation and analysis are all conducted at the respective facilities, either at the Roça Grande Mine Laboratory in Caeté, Minas Gerais or at the SGS Geosol Laboratory in Vespasiano, Minas Gerais. The Caeté Mine Complex laboratory does not carry an ISO certification. The SGS Geosol Laboratory is ISO 9001 accredited. As part of in-house QA/QC, the Caeté Mine Complex laboratory inserts certified gold standards, blanks, and pulp duplicate samples.

For a complete description of Jaguar's sample preparation, analytical methods, and QA/QC procedures, please refer to the "Technical Report on the Roça Grande and Pilar Operations, Minas Gerais State, Brazil", a copy of which is available on the Company's SEDAR profile at www.sedar.com.

The Iron Quadrangle

The Iron Quadrangle has been an area of mineral exploration for centuries, dating back to the 16th century. The discovery in 1699-1701 of black gold contaminated with iron and platinum-group metals in the southeastern corner of the Iron Quadrangle gave rise to the name of the town Ouro Preto (Black Gold). The Iron Quadrangle contains world-class multi-million ounce gold deposits such as Morro Velho, Cuiabá and São Bento. Jaguar holds the second largest gold land position in the Iron Quadrangle with just over 25,000 hectares.

About Jaguar Mining Inc.

Jaguar Mining Inc. is a Canadian-listed junior gold mining, development, and exploration company operating in Brazil with three gold mining complexes, and a large land package with significant upside exploration potential from mineral claims covering an area of approximately 191,000 hectares. The Company's principal operating assets are located in the Iron Quadrangle, a prolific greenstone belt in the state of Minas Gerais and include the Turmalina Gold Mine Complex ("Mineração Turmalina Ltda" or "MTL") and Caeté Gold Mine Complex ("Mineracao Serras do Oeste Ltda" or "MSOL") which combined produce more than 90,000 ounces of gold annually. The Company also owns the Paciência Gold Mine Complex, which has been on care and maintenance since 2012. Additional information is available on the Company's website at www.jaguarmining.com.

For further information please contact:

Rodney Lamond
President & Chief Executive Officer
rodney.lamond@jaguarmining.com
416-628-9601

Joanne Jobin
Vice President, Investor Relations
joanne.jobin@jaguarmining.com
647-964-0292

Forward Looking Statements

Certain statements in this news release constitute "forward-looking information" within the meaning of applicable Canadian securities legislation. Forward-looking information contained in forward-looking statements can be identified by the use of words such as "are expected", "is forecast", "is targeted", "approximately", "plans", "anticipates" "projects", "anticipates", "continue", "estimate", "believe" or variations of such words and phrases or statements that certain actions, events or results "may", "could", "would", "might", or "will" be taken, occur or be achieved. This news release contains forward-looking information regarding expected production during 2017 and cash operating costs, in addition to overall expenditures and results of operations during 2016. The Company has made numerous assumptions with respect to forward-looking information contained herein, including, among other things, assumptions about the estimated timeline for the development of its mineral properties; the supply and demand for, and the level and volatility of the price of, gold; the accuracy of reserve and resource estimates and the assumptions on which the reserve and resource estimates are based; the receipt of necessary permits; market competition; ongoing relations with employees and impacted communities; and general business and economic conditions. Forward-looking information involve a number of known and unknown risks and uncertainties, including among others the risk of Jaguar not meeting the forecast plans regarding its operations, gold production, mine exploration and development and financial performance, the uncertainties with respect to the price of gold, labor disruptions, mechanical failures, increase in costs, environmental compliance and change in environmental legislation and regulation, procurement and delivery of parts and supplies to the operations, uncertainties inherent to capital markets in general and other risks inherent to the gold exploration, development and production industry, which, if incorrect, may cause actual results to differ materially from those anticipated by the Company and described herein. Accordingly, readers should not place undue reliance on forward-looking information.

For additional information with respect to these and other factors and assumptions underlying the forward-looking information made in this news release, see the Company's most recent Annual Information Form and Management's Discussion and Analysis, as well as other public disclosure documents that can be accessed under the issuer profile of "Jaguar Mining Inc." on SEDAR at www.sedar.com. The forward-looking information set forth herein reflects the Company's reasonable expectations as at the date of this news release and is subject to change after such date. The Company disclaims any intention or obligation to update or revise any forward-looking information, whether as a result of new information, future events or otherwise, other than as required by law. The forward-looking information contained in this news release is expressly qualified by this cautionary statement.

Non-IFRS Measures

This news release provides certain financial measures that do not have a standardized meaning prescribed by IFRS. Readers are cautioned to review the above stated footnotes where the Company expanded on its use of non-IFRS measures.

1. Cash operating costs per ounce is a non-IFRS measure. In the gold mining industry, cash operating costs and cash operating costs per ounce are common performance measures but do not have any standardized meaning. Cash operating costs are derived from amounts included in the Consolidated Statements of Comprehensive Income (Loss) and include mine-site operating costs such as mining, processing, and administration as well as royalty expenses, but exclude depreciation, depletion, share-based payment expenses, and reclamation costs. Cash operating costs per ounce are based on ounces sold and are calculated by dividing cash operating costs by commercial gold ounces sold. The Company discloses cash operating costs and cash operating costs per ounce as it believes those measures provide valuable assistance to investors and analysts in evaluating the Company's operational performance and ability to generate cash flow. The most directly comparable measure prepared in accordance with IFRS is total production costs. A reconciliation of cash operating costs per ounce to total production costs for the most recent reporting period, the quarter ended September 30, 2016 is set out in the Company's third quarter 2016 MD&A filed on SEDAR at www.sedar.com.
2. All-in sustaining costs per ounce is a non-IFRS measure. This measure is intended to assist readers in evaluating operating performance and the ability to generate free cash flow from current operations. While there is no standardized meaning across the industry for this measure, except for non-cash items the Company's definition conforms to the all-in sustaining cost definition as set out by the World Gold Council in its guidance note dated June 27, 2013. The Company defines all-in sustaining costs as the sum of production costs, sustaining capital (capital required to maintain current operations at existing levels), corporate general and administrative expenses, and in-mine exploration expenses. All-in sustaining costs excludes

growth capital, reclamation cost accretion related to current operations, interest and other financing costs, and taxes. A reconciliation of all-in sustaining costs to total production costs for the most recent reporting period, the quarter ended September 30, 2016 is set out in the Company's third quarter 2016 MD&A filed on SEDAR at www.sedar.com.