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# NEWS RELEASE

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# ALMADEN UPDATES FEASIBILITY STUDY AT IXTACA

VANCOUVER, B.C. Almaden Minerals Ltd. ("Almaden" or "the Company"; NYSE American: AAU; TSX: AMM) is pleased to update investors on the environmental and engineering work relating to the feasibility study (FS) at the Ixtaca gold-silver project located in Puebla State, Mexico.

The Company has selected a team of independent engineers including SRK Consulting (U.S.), Inc. (SRK) and Moose Mountain Technical Services ("MMTS") to lead the FS.

Various programs currently underway include:

- A resource model update to include new drill hole data;
- Metallurgical test work to:
  - o demonstrate repeatability of metallurgical performance;
  - test opportunities to further improve metallurgical performance;
- Process and Infrastructure FS engineering design;
- Mine planning and production optimization studies;
- Further disassembly of the Rock Creek processing plant to accelerate preparations for moving the plant to the Ixtaca site;
- Construction and commissioning project management planning;
- Geotechnical site investigation work; and
- Water management studies.

Almaden is also in the final stage of preparing an Environmental Impact Assessment (Manifiesto de Impacto Ambiental or "MIA") for Ixtaca and expects to submit the MIA this year.

Morgan Poliquin, President and CEO of Almaden, stated "We are pleased to have selected SRK and MMTS to conduct the Ixtaca gold-silver project Feasibility Study. Along with greater detail on the feasibility of the project, we are developing a full understanding of social, hydrologic, hydrogeologic and geochemical conditions at the site well in advance of mining activity. This is all based on the work of the independent engineers we have engaged, utilising best practices to international standards and is peer reviewed. This understanding will help us ensure that the potential impacts associated with eventual project development are identified and mitigated and the opportunities for all stakeholders are capitalised upon through the project life and beyond. Over the last year exploration drilling has been delivering encouraging results, both in the mine plan area and beyond, which supports our belief that sustained exploration can extend the mine life."

### Hydrology and Geochemistry

Almaden is working closely with authorities and local communities to protect local water resources while improving quality and availability. The current mine plan includes a water storage reservoir to be co-operated and maintained by local residents during and after mine operation to provide a consistent and long-term supply of water to local residents.

Rainfall in the Ixtaca vicinity falls primarily during a relatively short rainy season. With no local water storage facilities the flash flows of water are lost to the community. Under the FS development plan, rainwater will be captured during the rainy season in the water storage reservoir and slowly released during the dry season, for use by both the mining operation and local residents. Almaden is also exploring additional solutions to improve the quality of drinking water available to residents in the context of a Social Investment Plan (see press release of December 12, 2017). Water quality and a consistent long-term supply for local residents is one of Almaden's top priorities at Ixtaca and a major component of the feasibility study.

In support of this priority for the FS, Almaden and SRK will expand upon the recent (2017) prefeasibility study (PFS)<sup>1</sup> through the completion of additional soil, surface water and ground water characterization that will facilitate a more detailed facility design. The PFS and subsequent studies include the following highlights relating to water:

- Local water resources are underutilized and the mine plan will not disturb local domestic water sources.
- In the current plan, groundwater pumping wells will not be required, according to baseline hydrology studies and water balance models.
- A robust tailings management facility (TMF) has been designed so that no process water is discharged, i.e. the TMF will be a "zero discharge facility".
- Mine development includes a water storage reservoir that, based on current water balance planning, could supply more than 2,000 m<sup>3</sup> per day to the local community.
- The neutralizing potential present in the site rocks is sufficient to neutralize any acid generated.

Two geochemical studies completed in 2015 and 2017 evaluated the potential for acid rock drainage and metal leaching from the waste rock and tailings using globally-accepted standardized methods of laboratory testing and in compliance with Mexican regulations; including NOM-157-SEMARNAT-2009, which establishes procedures to implement mine waste management plans and Anexo Normative 5 of NOM-141-SEMARNAT-2003, which describes the test methods for whole rock chemistry analysis, leach tests and acid base accounting. The studies stated that "there is more than enough neutralizing potential present in the site rocks to neutralize any acid generated," and also reported that laboratory testing indicates a low potential for metal leaching. To confirm these findings and to bring the geochemical data set to feasibility level, SRK's scope for the geochemical characterization program in the FS will be expanded to include additional geochemical sampling to evaluate the development rock and tailings in greater detail.

#### Community and Transparency

A key component of Almaden's work at Ixtaca continues to be engagement with people in the region. With the receipt of the summary Social Impact Assessment late last year, Almaden has

commenced the development of a Social Investment Plan ("SIP"). Representatives of GMI Consulting are currently preparing for consultations which will inform the SIP.

In recent years, with the continued advancement of engineering studies, Almaden has had the opportunity to expand its program of social engagement in the area of the Ixtaca project, with a special focus on providing opportunities for local stakeholders to learn about the Ixtaca project in particular and the mining industry in general. Videos showing some of the approaches we are using are available on the Almaden website (<u>www.almadenminerals.com</u>). To date, Almaden has:

- Coordinated eight large community meetings, with total attendance at these meetings of more than 3,300 people.
- Taken a total of approximately 480 people, drawn from local communities, on 24 trips to see an operating mine (see video on website).
- Arranged 35 sessions of "Dialogos Transversales", wherein community members are invited to attend discussions with experts on a diverse range of issues relating to the mining industry, such as an overview of Mexican Mining Law, Human Rights and Mining, mineral processing, explosives, water in mining, risk management, and mine infrastructure, among other things (see video on website).
- Opened a central community office in the town of Santa Maria Zotoltepec, which is open to community members and includes an anonymous suggestion box.
- Developed a "Mobile Information Module" which allows company representatives to visit communities and provide information to communities more distant from the project. To date 35 communities have been visited.
- Employed as many local people as possible, reaching up to 75 people drawn from 5 local communities. Almaden operates the drills used at the project, and hence can draw and train a local workforce as opposed to bringing in external contractors.
- Initiated a program of scholarships for top performing local students, with 100 scholarships granted to date to individuals from 31 different communities (57 women and 43 men).
- Established several clubs, including English, reading, zumba, football, and theatre clubs, to contribute to the vitality of local communities.
- Focused on education, enabling over 4,300 people to be positively impacted by our investments, such as rehabilitation of school-related infrastructure, donation of electronic equipment, and scholarships for top-performing students.

## About SRK and MMTS:

SRK Consulting is an independent, international consulting practice providing focused advice and solutions to the earth and water resource industries. They offer specialist services in fields such as due diligence, feasibility studies, permitting, operation optimization, mine waste and water management, and mine closure. They have been involved in a wide range of projects in most areas of the world and across the full spectrum of mineral commodities. Formed in 1974, SRK employs more than 1,400 professionals in over 45 offices on 6 continents.

MMTS is an association of Geologists, Engineers and Technicians providing experienced knowledge in Geology, Mine Engineering, and Metallurgical Services and Support to the mining industry for over 15 years. Through their network of associates, they provide an integrated team of experts and QP's. Services range from early grassroots exploration and development, block model builds, resource and reserve estimates, advanced planning and studies for mine proposals (including operational support), process design and permitting process guidance and

support. MMTS has experience working on coal, gold, silver, copper, molybdenum, and tungsten deposits throughout North and South America and around the world. A list of specific projects worked on by MMTS can be found at www.moosemmc.com.

# About Ixtaca:

The proposed Ixtaca mine is anticipated to process 7,500 tonnes per day of primarily limestone host rock with lesser amounts of shale and volcanic tuff to produce gold and silver dore. The Pre-Feasibility Study announced in April, 2017<sup>1</sup> projects that the mine will employ 400 people during construction, 430 over the mine life, and contribute on the order of US\$248 million in taxes, including approximately US\$55 million to Puebla State and US\$35 million to the local municipality.

Since 2014, Almaden has been conducting a detailed water monitoring program in the project area to measure the pre-mining water quality conditions and to establish a baseline against which potential future impacts to surface water and groundwater from mining activity can be evaluated. The program includes eight groundwater monitoring wells and 12 surface water monitoring stations. As part of the FS, groundwater monitoring will be expanded with the installation of additional wells completed under SRK's hydrogeologic study for the open pit. In addition, the existing surface water monitoring program will be augmented to supplement the existing database of streamflow data.

A sitewide water balance model was developed in support of the 2017 PFS to develop a water management strategy that focuses on consuming all impacted water generated at the site in the mineral extraction and beneficiation process and avoids having to treat and discharge water to the environment or require additional external sources of water. As part of this strategy, a large portion of the water used by the process plant is recycled water collected from the tailings facility. Additional water required by the process plant is supplied by collection of runoff and rainwater through the construction of a water supply reservoir. The current water management strategy calls for up to 850,000 m<sup>3</sup> of runoff and rainwater to be released annually to the downstream communities during and following mine operations.

Based on the results of the water balance model and water management plan, impacts on the groundwater aquifer and surface water sources in the area are not anticipated to be significant, as the proposed project facilities do not impact the current water supply for local communities. In addition, the groundwater aquifer around the mine is not over-exploited according to a 2007 CONAGUA study, and additional studies found that the Water Stress Index in the region is very low (0.029 on a scale of 0.01 to 1.0, with least stressed at 0.01 to most stressed at 1.0). During the FS the water balance model will be updated to include a daily simulation model based on project design changes and additional site monitoring data and a more robust water footprint will be developed for the mine to confirm the current outlook.

Tracey Meintjes, P.Eng., a qualified person ("QP") under the meaning of NI 43-101, and Principal of MMTS, reviewed the technical information in this news release.

## About Almaden:

Almaden Minerals Ltd. owns 100% of the Tuligtic project in Puebla State, Mexico, subject to a 2.0% NSR royalty held by Almadex Minerals Limited. Tuligtic covers the Ixtaca Gold-Silver Deposit, which was discovered by Almaden in 2010.

<sup>1</sup>Available on SEDAR or at: <u>http://www.almadenminerals.com/DOCUMENTS/Reports/N43-101%20-%20Ixtaca%20PFS%20-</u> %2017May2017.pdf

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