

# Alexco Announces Positive Pre-Feasibility Study for Expanded Silver Production at Keno Hill Silver District

29.03.2019 | [CNW](#)

VANCOUVER, March 28, 2019 - [Alexco Resource Corp.](#) (NYSE American: AXU, TSX: AXR) ("Alexco" or the "Corporation") pleased to announce the results of an independent pre-feasibility study ("PFS") on its 100% owned Keno Hill Silver project ("Keno Hill" or the "Project") in Yukon, Canada.

Highlights of the PFS:

Note that all dollar amounts referenced herein are in Canadian dollars ("CAD") unless indicated otherwise.

- Project pre-tax and after-tax net present value ("NPV") is \$136.4 million ("M") and \$101.3 M (5% discount rate), respectively, and pre-tax and after-tax internal rate of return ("IRR") is 84% and 74%, respectively, at an assumed average life of mine ("LOM") silver ("Ag") price of US\$17.90 per ounce ("oz").
- At current spot metal prices<sup>1</sup> and USD/CAD foreign exchange rate, the project has a pre-tax and after-tax NPV of \$79.9 M (5% discount rate), respectively, and a pre-tax and after-tax IRR of 63% and 57%, respectively.
- LOM average annualized mine production is projected to be 154,000 tonnes ("t") per year over an approximately 10 year project life at an average feed grade of 804 grams per tonne ("g/t") Ag, 2.98% lead ("Pb"), 4.13% zinc ("Zn") and 0.001% gold ("Au").
- Total payable metals in concentrate are approximately 27.2 M oz of Ag, 67.2 M pounds ("lbs") of Zn, 65.4 M lbs of Pb over an eight (8) year mine life. Average annualized contained silver in concentrate is 4.0 M oz per year, based on full production.
- Initial capital costs are estimated to be \$23.2 M comprised of \$17.9 M of surface and underground development and mill commissioning plus an additional \$5.3 M of net working capital for two (2) months of mill operations ramp-up to full production cash flow.
- Total sustaining capital (including underground development and property, plant and equipment ("PP&E")) is estimated to be \$76.5 M, which excludes the initial capital of \$23.2 M. Direct operating costs of \$321/t of ore are estimated over the LOM.
- Upon achieving commercial production, Alexco has calculated all-in sustaining costs ("AISC") (contained Ag, by-product Cu and Pb) over the LOM to be US\$11.98/oz of Ag. At current spot prices<sup>1</sup> over the LOM, the calculated AISC is US\$10.86/oz of Ag.

Footnote:

1. Current spot prices are calculated as of March 22, 2019 using the following assumptions: Ag US\$15.46/oz, Au US\$1311.30/oz, Pb US\$0.9187/lb, Zn US\$ 1.2961/lb and USD/CAD exchange rate of \$0.75.

Alexco Chairman and CEO, Clynton Nauman, commented, "The results of the PFS reflect the exceptional asset we have and demonstrate a robust high margin primary silver operation that can produce approximately four million ounces of silver annually. The operational and economic metrics of the PFS show an improvement over the previous preliminary economic assessment in nearly all categories including a higher NPV, increased annual silver production, reduced capital requirements, improved costs and productivities, increased mine tonnage and throughput, lower LOM AISC and an impressive IRR. With the results of the PFS now in hand, we are now on a clear path to production at Keno Hill."

Pre-Feasibility Study

The PFS includes existing mineral resource estimates for the Flame & Moth, Bellekeno, Lucky Queen and Onek deposits and an updated resource estimate for the Birmingham deposit. In addition, mineral reserve estimates are provided for assessing underground mining operations for all of the deposits with the exception of the Onek deposit. The PFS was compiled by Canada Consulting Ltd. ("Mining Plus") with contributions from a team of qualified persons and firms. The PFS assesses underground mining operations in all four (4) deposits, with two deposits in concurrent production at all times, feeding a conventional flotation mill to produce mineral concentrates containing silver, lead, zinc and gold.

\* See "Cautionary Note to Investors regarding Mineral Reserve and Resource Estimates" below.

Key PFS metrics (and assumptions) are as follows:

#### Production Profile

Total Tonnes Mined/Milled	1,177,379 t
LOM Diluted Mill Feed Grades	804 g/t Ag, 2.98% Pb, 4.13% Zn
Total Payable Silver in Concentrate	27.2 M oz
Current Project Life	8 years
Metallurgical Recoveries	95.6% Ag, 88.6% Pb, 73.6% Zn
LOM Average Mill Throughput	430 tonnes per day ("tpd")
Annualized Silver in Concentrate <sup>1</sup>	4.0 M oz/yr
LOM Net Smelter Return ("NSR")	\$554/t
LOM AISC	US\$11.98

#### Capital Requirements

Pre-Production/Development Capital Cost	\$17.9 M
Working Capital Ramp-Up	\$5.3M
LOM Sustaining Capital <sup>2</sup>	\$76.5 M

#### Operating Costs

Underground Mining Direct	\$201/t
Milling	\$61/t
G&A	\$59/t
Total Direct Operating Cost	\$321/t
LOM Sustaining Capital <sup>2</sup>	\$68/t

#### Economics

	Pre-Tax	After-Tax
Cash Flow	\$174.1M	\$129.4M
NPV (5%)	\$136.4M	\$101.3M
IRR	83.7%	74.2%
Payback Period <sup>2</sup>	26 months	27 months

#### Notes:

1. Based only on full production years
2. Calculated after initial capital costs are incurred

The economic parameters are based on a metal price forecast with the following assumptions: US\$15.75/oz Ag in Year 1, increasing to US\$18.25/oz in Year 4 and long-term; US\$0.96/lb lead in Year 1, increasing to

US\$1.00/lb long-term; US\$1.25/lb zinc in Year 1, decreasing to US\$1.22/lb long-term; and USD/CAD foreign exchange of US\$0.75 in Year 1, increasing to US\$0.77 long-term.

Alexco President, Brad Thrall, commented, "The results reflected in this PFS include an optimized mine plan for Flame & Moth with increased tonnes and reduced development relative to the previous PEA. Similarly, at Bermingham we have a 65% or 142,000 tonne increase to the mine plan primarily as a result of 2018 exploration success at this deposit. Furthermore, the silver production from the Bermingham mineral reserve incorporates only one-third of the current Bermingham silver indicated mineral resource and is therefore a reflection of the potential upside at Bermingham, which will be a focus of ongoing mine optimization and expansion studies. With over 1,000 meters ("m") of development completed at Flame & Moth and Bermingham at the end of 2018, we are in a position to initiate mill operations and achieve concentrate production within 5-7 months after making a production decision for Keno Hill. Finally, with over 75% of projected revenue from Ag and a LOM Ag equivalent ("AgEq") grade of 1,136 g/t<sup>1</sup>, Keno Hill represents an exceptional silver development project with relatively low capital intensity and is now on a path to become Canada's only primary silver producer."

### Mining and Mineral Reserves

The PFS mine plan is centered on the Flame & Moth and Bermingham deposits with LOM production contributions of 60% and 30%, respectively. Supplemental mine production is sourced from the Bellekeno deposit early in the production period and from the Lucky Queen deposit later in the mine life. The LOM production schedule includes an annualized average of 430 tpd over an approximate eight (8) year period. Nominal production rates are an initial 250 tpd from the Bellekeno deposit, a variable 250 - 300 tpd from each of the Flame & Moth and Bermingham deposits throughout the entire mine life and 100 tpd from the Lucky Queen deposit in the final two (2) years of the mine plan. Mining methods are predominantly mechanized cut and fill with a trend toward long hole and drift and fill mining methods in areas of increased deposit thickness. A summary of the mineral reserve estimates from each of the deposits included in the PFS is set out below:

	Classification	Tonnes	Ag (g/t)	Pb (%)	Zn (%)	Au (g/t)	Contained Ag
Bellekeno	Proven	-	-	-	-	-	-
	Probable	40,109	843	11.79	6.31	-	1,087,000
Lucky Queen	Proven	-	-	-	-	-	-
	Probable	70,717	1,244	2.63	1.38	0.12	2,829,000
Flame & Moth	Proven	-	-	-	-	-	-
	Probable	704,211	672	2.71	5.73	0.49	15,214,000
Bermingham	Proven	-	-	-	-	-	-
	Probable	362,343	972	2.59	1.32	0.13	11,324,000
Total	Proven	-	-	-	-	-	-
	Probable	1,177,379	804	2.98	4.13	0.34	30,454,000

#### Notes:

1. Sum of all amounts may not add up to totals due to rounding.
2. The mineral reserves above are included in the mineral resource estimate table in Appendix 1.

\* See "Cautionary Note to Investors regarding Mineral Reserve and Resource Estimates" below.

Footnote:

1. AgEq equivalent was calculated using PFS average LOM metal prices and mill recoveries: Ag US\$17.90/oz, recovery 96%; Pb US\$1.00/lb, recovery 89%; Zn US\$1.22/lb, recovery 73%; Au US\$1,321/oz, recovery 49%.

Processing and Infrastructure

The Keno District mill facility has a nameplate capacity of 408 tpd and employs conventional crushing, grinding, differential flotation and dewatering processes to produce a Pb-Ag concentrate, a Zn concentrate and a filtered tailings product for storage in an established dry stacked tailings facility or to be used underground as backfill. Ag and Pb minerals are recovered together in a Pb-Ag concentrate and Zn minerals in a separate Zn concentrate. The mill was previously commissioned in 2011 and operated for three (3) years and has been under enhanced care and maintenance since 2014. Silver recoveries are estimated to be 94% with 91% reporting to the Pb concentrate, thereby enhancing Ag payability. The average LOM throughput in the mill is 430 tpd over the eight (8) year schedule, with a peak throughput to 550 tpd in the third year of the PFS schedule. This would require an amendment to the current quartz mining license ("QML") prior to the increase in mill throughput.

Prior to resumption of mill operations, an additional 1.8 m x 3 m, 150-kilowatt ("kW") ball mill (purchased and on site) would be installed to provide expanded grinding capacity ahead of the flotation circuit. Additional tailings filtering capacity and concentrate regrind mills will also be installed prior to mill commissioning. Updated metallurgical recovery performance in the PFS is based on five (5) additional locked cycle flotation tests on representative sample composites from Flame and Moth, Birmingham and Lucky Queen, as well as previous open cycle tests. Once in commercial production, the Pb-Ag concentrate would have an expected commercial grade of 54% Pb and 17,300 g/t Ag. The projected metallurgical performance in the PFS is as follows:

Mill Recoveries (Payable) &ndash; LOM

	Into Pb-Ag Concentrate	Into Zn Concentrate
Ag %	91.0	4.6
Pb %	88.6	-
Zn %	-	73.6
Au %	49.0	-

Concentrate Production (at full production)

	Pb-Ag Concentrate	Zn Concentrate
Ag g/t	17,316	704
Dry Tonnes	52,772	65,436
Pb %	54.0	-
Zn %	-	53.0

Additional pre-production site infrastructure improvements included in the PFS comprise a camp expansion, additional dry facilities, expanded administration offices, an additional maintenance facility, electrical power

grid substation at Bermingham and a water treatment plant at Bermingham.

#### Capital Costs

The Keno Hill Silver Project is a low capital intensity project due to its existing mine and mill infrastructure. The initial capital costs of \$23.2 M comprises \$17.9 M of surface and underground development costs to reach mill commissioning plus an additional \$5.3M of working capital to reach positive cash flow. PP&E expenditures in the amount of \$2.8 M are being allocated to mill upgrades to increase the grinding and filtering capacity and to complete other improvement modifications prior to reaching commercial production.

#### Initial Capital Costs (CAD\$ Millions)

Mine Development/PP&E	11.8
Mill Refurbishment	2.8
Site Infrastructure/PP&E	1.4
Owners Costs, Contingency	1.9
Total Pre-Production Capital	17.9
Working Capital	5.3
Total	23.2

#### Other

All of the regulatory approvals required for mining and processing activities associated with the Bellekeno, Lucky Queen and Flame & Moth deposits are currently in place. An amendment to the QML and Water Use Licence ("WUL") are required for mining and processing activities associated with the Bermingham deposit. Both of these license amendments are underway. The amendment to the QML is anticipated in Q2 2019 while the amendment to the WUL is anticipated to be received in Q3 2019.

The PFS was compiled by Mining Plus with contributions from a team of Qualified Persons as defined by National Instrument 43-101 – Standards of Disclosure for Mineral Projects ("NI 43-101") as follows:

- Zach Allwright, P.Eng. of Mining Plus
- Hassan Ghaffari, P.Eng of Tetra Tech
- Gilles Arseneau, Ph.D., P.Geo. of SRK Canada Inc.
- Cliff Revering, P.Eng., of SRK Canada Inc.
- Paul Hughes, Ph.D., P.Eng. of Mining Plus
- Adrian Churcher, P.Eng. of Mining Plus

All mineral resources are classified following the CIM Definition Standards for Mineral Resources and Mineral Reserves (May 2014), in accordance with the CIM Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines and NI 43-101.

See "Cautionary Note to Investors regarding Mineral Reserve and Resource Estimates" below.

The disclosure in this news release of scientific and technical information regarding exploration has been reviewed and approved by Alan McOnie, FAusIMM, Alexco's Vice President, Exploration, while that regarding mine development and operations has been reviewed and approved by Neil Chambers, P.Eng., Mine Superintendent, each of whom is a Qualified Person and has approved the disclosure herein. The technical information in this news release was reviewed by Zach Allwright, P.Eng. and Adrian Churcher,

P.Eng. both of Mining Plus, Gilles Arseneau, Ph.D., P.Geo. and Cliff Revering, P.Eng, both of SRK Canada Inc. and Hassan Ghaffari, P.Eng. of Tetra Tech, each of whom is a Qualified Person and has approved the disclosure herein.

#### Conference Call Details

Alexco will hold a conference call and webcast tomorrow, March 29, 2019 at 9:00 a.m. Eastern (6:00 a.m. Pacific). To participate in the live call, please use one of the following methods:

Dial toll free from Canada or the US: 1-800-319-4610

Dial from outside Canada or the US: 1-604-638-5340

Dial from Germany: 0800-180-1954

Dial from Switzerland: 0800-802-457

Dial from the UK 0800-101-2791

Confirmation Code#: Ask to join the Alexco conference call

Live audio webcast: [www.alexcoresource.com](http://www.alexcoresource.com)

Participants should connect five to ten minutes before the call.

The conference call will be recorded and an archived audio webcast will be available at [www.alexcoresource.com](http://www.alexcoresource.com).

#### About Alexco

Alexco owns the majority of the historic high-grade Keno Hill Silver District in Canada's Yukon Territory.

Alexco also operates a wholly-owned subsidiary business, Alexco Environmental Group, that provides mine-related environmental services, remediation technologies and reclamation and mine closure services to both government and industry clients in North America and elsewhere.

Please visit the Alexco website at [www.alexcoresource.com](http://www.alexcoresource.com)

Some statements ("forward-looking statements") in this news release contain forward-looking information concerning the results of the PFS, anticipated results and developments in Alexco's operations in future periods, planned exploration and development of its properties, plans related to its business and other matters that may occur in the future, made as of the date of this news release. Forward looking statements may include, but are not limited to, statements with respect to results of the PFS; future mineral exploration including the estimation of mineral reserves and mineral resources and the realization of mineral reserve and mineral resource estimates; future mine construction and development activities; future mine operation and production; the timing of activities and reports; the amount of estimated development and operational expenses; projected operational and economic metrics; the success of exploration and development activities; the potential upside and growth in respect of certain deposits comprising the Keno Hill Silver

Project; anticipated permitting time lines; requirements for additional permits (or amendments to existing permits); anticipated installation of certain infrastructure; projected equipment and production capacity; and potential capital, revenue and sources and uses of funds. Forward-looking statements are subject to a variety of known and unknown risks, uncertainties and other factors which could cause actual events or results to differ from those expressed or implied by the forward-looking statements. Such factors include, among others, risks related to actual results and timing of exploration and development activities; actual results and timing of mining activities; actual results and timing of environmental services activities; actual results and timing of remediation and reclamation activities; conclusions of economic evaluations; changes in project parameters as plans continue to be refined; future prices of silver, gold, lead, zinc and other commodities; possible variations in mineable resources, grade or recovery rates; failure of plant, equipment or processes to operate as anticipated; accidents, labour disputes and other risks of the mining industry; First Nation rights and title; continued capitalization and commercial viability; global economic conditions; competition; and delays in obtaining governmental approvals or financing or in the completion of development activities. Forward-looking statements are based on certain assumptions that management believes are reasonable at the time they are made. In making the forward-looking statements included in this news release, Alexco has applied several material assumptions, including, but not limited to, the assumption that Alexco will be able to raise additional capital as necessary, that the assumptions, projections and estimates in the PFS will proceed as planned, and that market fundamentals will result in sustained silver, gold, lead and zinc demand and prices. There can be no assurance that forward-looking statements will prove to be accurate and actual results and future events could differ materially from those anticipated in such statements. Alexco expressly disclaims any intention or obligation to update or revise any forward-looking statements whether as a result of new information, future events or otherwise, except as otherwise required by applicable securities legislation.

#### Cautionary Note to Investors regarding Mineral Reserve and Resource Estimates

This press release has been prepared in accordance with the requirements of the securities laws in effect in Canada, which differ from the requirements of United States securities laws. The terms "mineral reserve", "proven mineral reserve" and "probable mineral reserve" are Canadian mining terms as defined in accordance with NI 43-101 and the Canadian Institute of Mining, Metallurgy and Petroleum (the "CIM") - CIM Definition Standards on Mineral Resources and Mineral Reserves, adopted by the CIM Council, as amended. These definitions differ materially from the definitions in SEC Industry Guide 7 ("SEC Industry Guide 7") under the United States Securities Act of 1933, as amended. Under SEC Industry Guide 7 standards, a "final" or "bankable" feasibility study is required to report reserves, the three-year historical average price is used in any reserve or cash flow analysis to designate reserves, and the primary environmental analysis or report must be filed with the appropriate governmental authority.

In addition, the terms "mineral resource", "measured mineral resource", "indicated mineral resource" and "inferred mineral resource" are defined in and required to be disclosed by NI 43-101; however, these terms are not defined terms under SEC Industry Guide 7 and are normally not permitted to be used in reports and registration statements filed with the SEC. Investors are cautioned not to assume that all or any part of a mineral deposit in these categories will ever be converted into SEC Industry Guide 7 reserves. "Inferred mineral resources" have a great amount of uncertainty as to their existence, and great uncertainty as to their economic and legal feasibility. It cannot be assumed that all or any part of an inferred mineral resource will ever be upgraded to a higher category. Under Canadian rules, estimates of inferred mineral resources may not form the basis of feasibility or pre-feasibility studies, except in rare cases. Investors are cautioned not to assume that all or any part of an inferred mineral resource exists or is economically or legally mineable. It is reasonably expected that the majority of inferred mineral resources could be upgraded to indicated mineral resources with continued exploration. Disclosure of "contained ounces" in a resource is permitted disclosure under Canadian regulations; however, the SEC normally only permits issuers to report mineralization that does not constitute "reserves" by SEC Industry Guide 7 standards as in place tonnage and grade without reference to unit measures.

Accordingly, information contained in this press release regarding descriptions of the Corporation's mineral deposits may not be comparable to similar information made public by U.S. companies subject to the reporting and disclosure requirements under the United States federal securities laws and the rules and regulations thereunder, including SEC Industry Guide 7.

#### APPENDIX 1 - MINERAL RESERVES AND MINERAL RESOURCES

The table below represents the current Keno Hill mineral resource estimate inclusive of mineral reserves in

the indicated mineral resource category. Mineral resource estimates for the Bellekeno, Flame & Moth, Onek and Lucky Queen deposits are unchanged from the Company's prior public disclosure. The Birmingham mineral resource estimate has been updated as disclosed in the footnote below.

	Classification	Tonnes	Ag (g/t)	Pb (%)	Zn (%)	Au (g/t)	Contained Ag (Oz)
Bellekeno	Indicated	262,000	585	3.5	5.3	n/a	4,927,000
	Inferred	243,000	428	4.1	5.1	n/a	3,344,000
Lucky Queen	Indicated	132,300	1,167	2.43	1.63	0.16	4,964,000
	Inferred	257,900	473	1.04	0.8	0.13	3,922,000
Flame & Moth	Indicated	1,679,000	498	1.85	5.33	0.42	26,883,000
	Inferred	365,200	356	0.47	4.25	0.26	4,180,000
Onek	Indicated	700,200	191	1.24	11.85	0.6	4,300,000
	Inferred	285,100	118	1.15	8.26	0.42	1,082,000
Birmingham <sup>1</sup>	Indicated	1,102,300	930	2.4	1.7	0.14	33,004,000
	Inferred	509,400	717	1.7	1.5	0.15	11,746,000
Total	Indicated	3,875,800	594	2.0	5.3	0.34	74,078,000
	Inferred	1,660,600	455	1.6	3.7	0.20	24,274,000

#### Notes:

1. The effective date of this mineral resource table is September 26, 2018, and is based on a revised narrow-vein interpretation prepared by Alexco on September 13, 2018. An initial vein model was prepared by Alexco on August 28, 2018, which was predicated on a wider vein interpretation that incorporated a significant volume of low-grade material (i.e. <100 g/t silver). Although an initial mineral resource estimate was completed using the wider vein model, a subsequent update has been completed using the narrow-vein model to remove this low-grade tonnage for use in the 2018 PFS study. The narrow-vein geological model was interpreted using a 100 g/t silver cut-off grade to define the mineralized veins but otherwise estimated using the same parameters.

#### Contact

Clynton R. Nauman, Chairman and Chief Executive Officer, Kettina Cordero, Director of Investor Relations, Mineral resources for Birmingham are reported at a value per tonne cut-off of CAD\$185/t using the following metal prices and recoveries; Ag US\$20.80/oz, recovery 96%; Pb US\$1.05/lb, recovery 97%; Zn US\$1.20/lb, recovery 88%; Au US\$1,450/oz, recovery 72%. Foreign exchange rate of \$0.80 USD/CAD. All numbers have been rounded to reflect the relative accuracy of the estimates. Mineral resources are not mineral reserves and do not have demonstrated economic viability.

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