

July 16, 2018

ASX: KAS

Share price: \$0.012



## ORE RESERVE UPGRADE AT ACHMMACH TIN PROJECT

### ABOUT KASBAH

Kasbah is an Australian listed mineral exploration and development company.

The company (75%) and its Joint Venture partners, Toyota Tsusho Corp (20%) and Nittetsu Mining Co. (5%), are advancing the Achmmach tin project towards production in the Kingdom of Morocco.

### PROJECTS

Achmmach Tin Project  
Bou El Jaj Tin Project

### CAPITAL STRUCTURE

Shares on Issue: 1,045m  
Unlisted Options: 6m  
Unlisted Rights: 52m  
Cash @ 31/03/18: \$2.3m

### MAJOR SHAREHOLDERS

Pala Investments 21.5%  
African Lion Group 13.1%

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- Increased tonnage and contained tin in Ore Reserve Estimate delivers positive impact to project economics in DFS released today
- Achmmach tin deposit remains open at depth and along strike – potential for near mine exploration to further increase Ore Reserve

Kasbah Resources (ASX: KAS) (Kasbah or The Company) is pleased to announce an upgrade to the Ore Reserve Estimate for the Achmmach Tin Project (The Project) in Morocco.

The increased Ore Reserve at Achmmach is based on the mine plan incorporated in the Project's 2018 Definitive Feasibility Study (DFS) released today. It has a 7% increase in total tin ore tonnes and a 4% increase in total contained tin.

The new Ore Reserve Estimate is 7.0 million tonnes @ 0.82% Sn (Tin) for 58,000 tonnes of contained tin, which represents an increase in contained tin of 2,000 tonnes from the previous Ore Reserve reported in 2016 (ASX announcement, July 29, 2016).

Summary details of the new Ore Reserve are provided in the following table:

	Ore Tonnes (t)	Grade (% Sn)	Sn Contained Metal (t)
2016 Total Proved	900,000	1.10	10,000
<b>2018 Total Proved</b>	<b>1,100,000</b>	<b>0.99</b>	<b>11,000</b>
Variance	200,000	-0.11	1,000
	22%	-10%	10%
2016 Total Probable	5,700,000	0.80	46,000
<b>2018 Total Probable</b>	<b>5,900,000</b>	<b>0.79</b>	<b>47,000</b>
Variance	200,000	-0.01	1,000
	4%	-1%	2%
2016 Grand Total Achmmach	6,600,000	0.85	56,000
<b>2018 Grand Total Achmmach</b>	<b>7,000,000</b>	<b>0.82</b>	<b>58,000</b>
Variance	400,000	-0.02	2,000
	7%	-2%	4%

Calculations have been rounded to the nearest 100,000 t of ore, 0.01% Sn grade and 1,000 t tin metal. Rounding errors may be present. (Source: Entech Achmmach Tin Project 2018 Ore Reserve Statement)

Kasbah engaged Entech Pty Ltd (Entech) to update the Achmmach Ore Reserve Estimate, which is fully compliant with the 2012 Australasian Code for Reporting of Exploration Results, Minerals Resources and Ore Reserves (the JORC code).

July 16, 2018

**ASX:KAS**



The Achmmach Tin Project 2018 Ore Reserve Statement and the associated JORC Code, 2012 edition, Table 1 report are attached to this announcement.

**Kasbah's Chief Executive, Russell Clark commented:**

*"We are delighted with the new Ore Reserve Estimate. It has been incorporated in the 2018 Achmmach DFS which has been released to the market today, and forms a key component of the DFS. The new and upgraded Ore Reserve was based on the improved cost base and revised mine plan for the Achmmach Project also included in the 2018 DFS, and the increased tonnage and contained tin has contributed to the positive results reported in the 2018 DFS today. In addition, the Achmmach tin deposit remains open at depth and along strike, and we see terrific potential for further near mine exploration success to deliver additional resources and ore reserves."*

The Ore Reserve Estimate is based on work completed by Mr Matt Keenan, who is a Member of the Australasian Institute of Mining and Metallurgy. Mr Keenan is a full time employee of Entech Pty Ltd and has sufficient experience which is relevant to the activity which 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'. Mr Keenan consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

END

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**JORC CODE, 2012 EDITION – TABLE 1 REPORT: ACHMMACH – AS AT 30 JUNE 2018**

**Section 4 Estimation and Reporting of Ore Reserves**

(Criteria listed in section 1, and where relevant in sections 2 and 3, also apply to this section.)

Criteria	JORC Code explanation	Commentary
Mineral Resource estimate for conversion to Ore Reserves	Description of the Mineral Resource estimate used as a basis for the conversion to an Ore Reserve.	<p>The Mineral Resource estimates used by Entech Pty Ltd to estimate an Ore Reserve were prepared by independent geological consultants Quantitative Group (QG) and reported in the Achmmach Mineral Resource Estimate, Morocco, September 2013 Report and the Achmmach Western Zone Resource Estimate, Morocco November 2014. In these Resource estimates Ordinary Kriging (OK) was used to estimate 20 m (X) x 20 m (Y) x 5 m (Z) parent cells that had been sub-celled at the domain boundaries. The model estimates were assessed against the drill-hole sample data for Sn visually, and the global statistics of de-clustered input and output data were compared. The estimates were also validated by graphing summary statistics for the samples and estimates within 40 m spaced easting slices, 40 m spaced northing slices and 20 m spaced RL slices for each domain.</p> <p>Based on data density, domain geometry and resource confidence, QG recommended that most of the mineralised zones at Achmmach be classified as an Indicated Resource under the guidelines of JORC (2012). The area in the Meknès Zone that had been drilled on 20 m centres, which is about 250 m of strike length, was classified as Measured, and the remaining mineralised zones in the deposit were classified as Indicated.</p> <p>QG used a 0.5% Sn cut-off which was based on a tin price of US\$23 000/tonne, operating costs of US\$79/t (underground mining costs of US\$27/t, processing costs of US\$38/t, and smelting USD14/t) with processing recoveries of 70% at an average head grade of 0.8% Sn. QG assumed an annualised mining and processing rate of one million tonnes.</p> <p>The Ore Reserves estimated and presented in this report are wholly included within the Mineral Resource reported by QG in the Achmmach Mineral Resource Estimate, Morocco, September 2013 Report and in the Achmmach Western Zone Resource Estimate, Morocco November 2014.</p>
	Clear statement as to whether the Mineral Resources are reported additional to, or inclusive of, the Ore Reserves.	Mineral resources are reported inclusive of ore reserves.
Site visits	Comment on any site visits undertaken by the Competent Person and the outcome of those visits.	The Competent Person has not visited the site.
	If no site visits have been undertaken indicate why this is the case.	The site is a greenfields site with no surface disturbance other than exploration activities and local access roads. The Competent Person is satisfied with relying on information provided by other independent consultants who have visited the site. The Competent Person has reviewed detailed site topography data and site photographs.
Study status	The type and level of study undertaken to enable Mineral Resources to be converted to Ore Reserves.	The Ore Reserve is underpinned by mining and processing studies conducted to a Definitive Feasibility Study (DFS) level. Modifying factors accurate to the study level have been applied based on detailed stope design analysis. Modelling indicates that the resulting mine plan is technically achievable and economically viable.
	The Code requires that a study to at least Pre-Feasibility Study level has been undertaken to convert Mineral Resources to Ore Reserves. Such studies will have been carried out and will have determined a mine plan that is technically achievable and economically viable, and that material Modifying Factors have been considered.	
Cut-off parameters	The basis of the cut-off grade(s) or quality parameters applied.	<p>A cut-off grade of 0.55% Sn was used to identify mineable parts of the mineral resource and to design the stopes.</p> <p>An incremental cut-off grade of 0.25% Sn was applied to mine development. This cut-off grade includes material that is of sufficient value to cover the costs involved in transporting that material to the processing plant, processing and then selling the resultant product for a profit, if the material is required to be mined in order to access fully economic ore.</p> <p>Cut-off grades were determined based on previous detailed study work undertaken by Kasbah Resources Ltd (KAS) from 2014-2017.</p>
Mining factors or assumptions	The method and assumptions used as reported in the Pre-Feasibility or Feasibility Study to convert the Mineral Resource to an Ore Reserve (i.e. either by application of appropriate factors by optimisation or by preliminary or detailed design).	Cut-off grades and geotechnical inputs were used to apply mathematical optimisation algorithms on the Mineral Resource to identify economic areas. Detailed underground mine designs were then carried out on the deposit incorporating the optimisation results, and these were used as the basis of the Ore Reserve estimate.
	The choice, nature and appropriateness of the selected mining method(s) and other mining parameters including associated design issues such as pre-strip, access, etc.	The Ore Reserve is planned to be mined using a combination of bottom-up longhole stoping with cemented rockfill (CRF) and top-down mechanised longhole open stoping with in-situ pillars left unmined for support. Diesel powered trucks and loaders will be used for materials handling. Diesel-electric jumbo drill rigs will be used for development and ground support installation, and diesel-electric longhole rigs used for production drilling.

Criteria	JORC Code explanation	Commentary
		<p>The mining method chosen is well-known and widely used in the industry, and production rates and costing can be predicted with a suitable degree of accuracy. The selected mining methods are considered suitable for the deposit, the planned production rate and the mining jurisdiction.</p> <p>The underground mine will be accessed via declines developed from surface boxcuts.</p>
	<p>The assumptions made regarding geotechnical parameters (e.g. pit slopes, stope sizes, etc), grade control and pre-production drilling.</p>	<p>Independent geotechnical consultants Mining One Pty Ltd contributed appropriate geotechnical analyses to a suitable level of detail. These form the basis of mining method selection, mine design, mining factors, and ground support design for the Ore Reserve estimate.</p> <p>Based on the detailed geotechnical analysis stope spans were limited to 25 m in height by 20 m in length at Meknes and 20 m in height by 20 m in length at Western Zone.</p>
	<p>The major assumptions made and Mineral Resource model used for pit and stope optimisation (if appropriate).</p>	<p>The Mineral Resource models used for stope optimisation were the QG Resource models detailed previously.</p> <p>Stope economics were determined using the cut-off grade revenue and cost inputs. A minimum stoping width of 3.0 m with a dilution skin of 0.5 m on each contact was applied, making a minimum void width of 4.0 m. A sub-level interval of 25 m, and stope section strike length of 5.0 m, were also applied.</p>
	<p>The mining dilution factors used.</p>	<p>A dilution skin of 0.5 m was applied on each contact for a total dilution width of 1.0 m. The grade of this dilution was determined based on the Mineral Resource contained within this skin.</p> <p>Where stopes were mined against CRF, an additional 0.5 m skin of fill material at waste grade was applied mathematically.</p> <p>Ore development had no unplanned dilution applied, based on historical experience and industry standards.</p>
	<p>The mining recovery factors used.</p>	<p>A 95% mining recovery factor was applied to all stoping.</p> <p>An additional 2.5% ore loss was applied in wide stoping areas due to chamfering of stope shoulders.</p> <p>Mining recovery was also reduced based on placement of rib pillars in the longhole stoping areas as required by geotechnical recommendations, and 12.5 m thick sill pillars between CRF mining panels.</p> <p>Ore development had an assumed 100% mining recovery, based on historical experience and industry standards.</p>
	<p>Any minimum mining widths used.</p>	<p>A pre-dilution stope minimum mining width of 3.0 m was assumed.</p>
	<p>The manner in which Inferred Mineral Resources are utilised in mining studies and the sensitivity of the outcome to their inclusion.</p>	<p>Only Measured and Indicated Resources were included in the mine design process. There was no Inferred material in either Resource.</p>
	<p>The infrastructure requirements of the selected mining methods.</p>	<p>Infrastructure required to installed/constructed to extract the Ore Reserve includes boxcuts, portals, declines and lateral capital development, ventilation shafts and fans, escapeways, services infrastructure for provision of power, service water, compressed air and dewatering to the underground workings, a cement batch plant, surface roads, and surface ROM pads and waste dumps. All capital infrastructure requirements for the mine have been included in the DFS and costed to an appropriate level of detail.</p>
<p>Metallurgical factors or assumptions</p>	<p>The metallurgical process proposed and the appropriateness of that process to the style of mineralisation.</p>	<p>The metallurgical process has been determined based on detailed design, testwork and costing undertaken to DFS level by ATS and independent metallurgical consultants.</p> <p>The metallurgical process includes:</p> <ul style="list-style-type: none"> <li>• two stage crushing fed from the run of mine (ROM) stockpile by front end loader;</li> <li>• ore sorting to reject 30% of the ROM material;</li> <li>• high pressure grinding rolls in open circuit (with recirculating ball mill scats) followed by closed circuit ball milling to a minimum P80 of 106 µm, and up to 150 µm;</li> <li>• gravity beneficiation for the coarse (plus 38 µm) fraction using spirals and tables followed by dressing using magnetic separation, sulphide flotation and tabling;</li> <li>• regrind and beneficiation in a fine gravity circuit for the -38 µm +8 µm size fraction;</li> <li>• desliming, magnetic separation, sulphide flotation, attritioning, cassiterite flotation and dressing of concentrate with centrifugal gravity separation;</li> <li>• blending, filtration and bulk dispatch of final concentrate containing approximately 55.3% Sn;</li> <li>• tailings paste thickening; and</li> <li>• reagent and consumables storage and reticulation and plant services.</li> </ul>

Criteria	JORC Code explanation	Commentary
	Whether the metallurgical process is well-tested technology or novel in nature.	The proposed process is well-tested and widely used. The proposed flotation concentration technology is standard industry practice in terms of flow sheet and reagents but introduces a feed preparation step that is novel for tin projects but has been used in other base metal applications with success.
	The nature, amount and representativeness of metallurgical test work undertaken, the nature of the metallurgical domaining applied and the corresponding metallurgical recovery factors applied.	<p>In 2014 a three tonne bulk sample was taken from crushed drill core from the Meknes zone, which is representative of the ore mined during the life of mine. This sample was split to three tonnes and was used by several internationally renowned metallurgical laboratories to confirm the process flowsheet.</p> <p>In 2015 bulk samples of Western Zone ore and original Meknes Trend Ore were tested to provide additional process design data. The results of this work substantially confirmed and improved upon the previous findings of the DFS.</p> <p>In 2018 further testwork was completed on four large samples of drill core (~500 kg each sample). The objective of this test work was to drive down comminution risk and power draw and confirm the gravity and flotation grade recovery response and its cost structure in the context of the new comminution system. This testwork confirmed the expected characteristics of the updated processing flow (including the addition of ore sorters, HPGR and adjusted flotation circuits)</p> <p>Physical characterisation of the Meknes Zone and greater Meknes Trend indicate the requirement for a high-powered comminution circuit. The Achmmach ore has a compressive strength typical of basalts, granites and dolomites. Crushing indices indicate a strong to very strong ore while high rod and ball mill work indices indicate large mills capable of significant power draw will be required. Abrasion indices of the altered sandstone material are characteristically high and this will have a bearing on the selection of materials of construction and crusher and mill lining systems for a future ore handling and comminution system.</p> <p>Metallurgical recoveries will vary with grade. The overall expected project metallurgical recovery based on the Ore Reserve mine plan is 79.8%, based on the DFS testwork.</p>
	Any assumptions or allowances made for deleterious elements.	Based on treatment/refinery quotations received from two refineries, a penalty of 1.14% is applied for Fe/WO <sub>3</sub> within the concentrate and impurity charges of \$69.68 per tonne of concentrate are applied to the Pb, Sb, Bi, As, Zn and S within the concentrate.
	The existence of any bulk sample or pilot scale test work and the degree to which such samples are considered representative of the orebody as a whole.	<p>In 2014 a six tonne bulk sample was taken from crushed rejects from the Meknes zone, which is representative of the ore mined during the life of mine. This sample was split to three tonnes and was used by several internationally renowned metallurgical laboratories to confirm the process flowsheet.</p> <p>In addition a 2 tonne representative bulk sample of drill core was used for ore sorting and HPGR test work in 2018.</p>
	For minerals that are defined by a specification, has the ore reserve estimation been based on the appropriate mineralogy to meet the specifications?	The concentrate has been confirmed as saleable by potential offtake partners.
Environmental	The status of studies of potential environmental impacts of the mining and processing operation. Details of waste rock characterisation and the consideration of potential sites, status of design options considered and, where applicable, the status of approvals for process residue storage and waste dumps should be reported.	<p>An Environmental and Social Impact Assessment (ESIA) scoping report was prepared in 2011 and presented to the National Committee for Environmental Impact Assessments (CNEIE) on the 15 June 2011 and the committee accepted the report and issued Terms of Reference for the Environmental Impact Assessment.</p> <p>The ESIA was carried out during the period May 2011 to June 2013 and included carrying out a two season environmental baseline survey, the first in May 2011 and the second in October 2011. A draft Final ESIA prepared as part of the Preliminary Feasibility Study (PFS) was submitted to the CNEIE in September 2012. A second version of the ESIA has been prepared as part of the Definitive Feasibility Study (DFS). This includes the findings of the social baseline survey that was carried out in April 2013. The present document integrates the answers to the CNEIE comments raised after its subsequent review in October 2013. The report was prepared by Artelia Eau &amp; Environnement, January 2014. The report was prepared in compliance with Morocco's environmental regulations.</p> <p>The ore contains traces of sulphides, which when discharged to the tailings management facility could be a source of acid seepage. To mitigate acid seepage, the ore treatment process has been designed to remove most of the sulphides, which will be isolated and disposed of to secure zones in exhausted areas of the underground workings in combination with cemented paste backfill. In addition, the tailings will be dosed with an excess of limestone neutralizing agent to ensure acid generation cannot occur. As a matter of standard practice the tailings management facility will be designed with a system to collect and recycle the small quantity of resultant lixiviate (seepage water) to the ore processing unit. Seepage from beneath the TMF is expected to follow natural bedrock downstream of the TMF where it will be captured in a seepage pond.</p> <p>Stockpiles of ore, mine waste dumps and the tailings management facility will be equipped with toe drains and sediment traps to prevent rainwater runoff from transporting sediment and fine rock material into the watercourses situated near the facilities. As a rule drainage from stockpiles will be directed to the TMF or the water storage dam (WSD).</p> <p>In the next stage in the ESIA process, public participation was conducted in line with Moroccan Decree n° 2-04-564 regarding public involvement during July 2013. This requires that an ESIA summary document be presented in a public hearing, and that the findings of the public hearing be taken into consideration by the National Committee for Environmental</p>

Criteria	JORC Code explanation	Commentary
		<p>Impact Assessment when approving the report. The findings of the public enquiry were reported to the CNEIE by the Provincial Administration.</p> <p>The CNEIE reviewed the final version of the ESIA on 11 March 2014 and issued its approval of the report at that meeting, together with its requirements for the completion of a Project ESMMP. Final acceptance of the Project ESIA and ESMMP was granted in November 2014.</p>
Infrastructure	<p>The existence of appropriate infrastructure: availability of land for plant development, power, water, transportation (particularly for bulk commodities), labour, accommodation; or the ease with which the infrastructure can be provided, or accessed.</p>	<p>Achmmach will be serviced by the cities of Khemisset, El Hajeb and Meknes, with significant freight services and operating supplies being drawn from within Morocco via Rabat.</p> <p>Key expatriate and some senior Moroccan staff will be accommodated at the project site in the existing accommodation camp. Other mining and operations personnel will be bussed on a daily basis from cities and towns including Khemisset, Meknès, El Hajeb, Agourai and Ras Jerri.</p> <p>Past and contemporary forestry activities in the Achmmach area have resulted in the establishment of satisfactory all weather unsealed road access to Achmmach. Supplies and concentrate product will be transported within Morocco using road trains. A small amount of additional road construction will be required at the site.</p> <p>Detailed infrastructure design work has been undertaken on placement and construction of major infrastructure at the site. Suitable level ground exists for placement of infrastructure.</p> <p>Previous exploration and sampling programmes have established the presence of a ground water source at the depth of the existing mine workings.</p> <p>The Golder &amp; Associates water balance model undertaken in 2014 highlighted that the water from existing bores would only supply 8 L/s or 40% of the project water requirements. Kasbah will develop bore capacity to support start-up water requirements and to provide insurance against extraordinarily dry periods.</p> <p>The Water Storage Dam will provide sufficient water to satisfy project water requirements during statistically normal and occasional dry years. It will be located directly upstream of the proposed TMF where a cross-valley, earthen embankment will be constructed. The WSD will collect run-off during the winter. Golder has estimated water harvesting will normally be sufficient to support year round project operation.</p> <p>Morocco's electrical power supply is generated, distributed and transmitted by the state-owned company, Office National de Electricité et de Eau Potable (ONEE), which will provide power to the Achmmach Project. A 60 kV power line will be constructed, originating at Toulal (225/60 kV) near Meknès and traversing a distance of 44 km via Ras Jerry to Achmmach. This line will be used to provide 20 MVA to the mine, with future allowance of an additional 20 MVA.</p> <p>A waste dump and run-of-mine (ROM) pad will be constructed using mine waste.</p>
Costs	<p>The derivation of, or assumptions made, regarding projected capital costs in the study.</p> <p>The methodology used to estimate operating costs.</p> <p>Allowances made for the content of deleterious elements.</p> <p>The derivation of assumptions made of metal or commodity price(s), for the principal minerals and co- products.</p>	<p>Capital costs have been based on relevant supplier and contractor quotes for all major items. Where possible these estimates have been based on quotes from Moroccan suppliers. If these are not available, Australian and South African based suppliers have been used for cost estimation.</p> <p>The cost estimation for the excavation of box-cuts and establishment of portals are based on quotes provided by a specialist civil works contractor based in Morocco.</p> <p>Cost estimations for underground development and production were provided by reputable underground contractors with relevant international experience as part of a detailed request for quotation process.</p> <p>Where possible, 30 day quotes from Moroccan suppliers have been used as the basis of the mine operating cost estimate. Where pricing information from Moroccan suppliers has not been obtained, an alternative source (usually an Australian supplier) has been used for the purpose of estimation.</p> <p>ADP provided inputs to the costs of processing consumables and maintenance based on vendor quotes. Kasbah Resources Limited provided operating cost inputs for labour, power, concentrate shipping and smelting and in-country corporate costs.</p> <p>An allowance for deleterious elements is based on treatment/refinery quotations received from two refineries. The treatment and refining charges amount to USD541/tonne of concentrate.</p> <p>A tin price of USD21,000/t been used. This figure is based on the current spot price and also is the average of the 120 months past and 15 month future price. Financial modelling indicates that the project has an appropriate margin against adverse commodity price movements to provide a suitable level of confidence in the economic viability of the Ore Reserve, based on the current market position and forecasts.</p>

Criteria	JORC Code explanation	Commentary
	The source of exchange rates used in the study.	All costs have been given in US dollars (USD). Where quotes have been obtained in a different currency the relevant exchange rate was applied. Exchange rates for overall project cost reporting were set as at July 2018.
	Derivation of transportation charges.	Concentrate is assumed to be shipped FOB Casablanca.
	The basis for forecasting or source of treatment and refining charges, penalties for failure to meet specification, etc.	Treatment and refining charges are based on quotations from two refineries.
	The allowances made for royalties payable, both Government and private.	The Moroccan government royalty payment is 3% of net smelter return. There are no private royalties that need to be considered.
Revenue factors	The derivation of, or assumptions made regarding revenue factors including head grade, metal or commodity price(s) exchange rates, transportation and treatment charges, penalties, net smelter returns, etc.	Forecasts for head grade delivered to the plant are based on detailed mine plans and mining factors. Metallurgical recovery has been determined based on detailed testwork. Revenue has been based on the commodity price, marketing and exchange rate data provided by KAS.
	The derivation of assumptions made of metal or commodity price(s), for the principal metals, minerals and co-products.	A tin price of USD21,000/t been used. This figure is based on the current spot price and also is the average of the 120 months past and 15 month future price. Financial modelling indicates that the project has an appropriate margin against adverse commodity price movements to provide a suitable level of confidence in the economic viability of the Ore Reserve, based on the current market position and forecasts.
Market assessment	The demand, supply and stock situation for the particular commodity, consumption trends and factors likely to affect supply and demand into the future.	Market assessment was provided by KAS based on information from the International Tin Association.  The tin market saw a contraction in demand during 2015 of 3.8%. In 2016 demand grew by 2.5% and is estimated to have grown by 3.2% in 2017 to 357,000 tonnes of consumed refined tin, with all major global economies contributing to the growth. The World Bank and IMF are forecasting global growth of between 3% and 4% in 2018 and 2019 respectively. A conservative view for tin demand through to 2030 is steady growth of 1.1% per annum. This results in a forecast requirement of 65,000 tpa of tin metal in the global economy by 2022.  Assessments of short and medium-term technology threats and opportunities for tin show that threats to solders, notably from electronics miniaturisation, and in the tin plate sector, may be partially balanced by opportunities in energy related technologies, notably lead-acid batteries and other energy materials.
	A customer and competitor analysis along with the identification of likely market windows for the product.	Maintaining world tin production over the next five to ten years will continue to require a strong market environment and the development of new mines. Declining or static mine production from existing operations in Indonesia, Myanmar, Peru and China are forecast in the medium term. Existing operations in Peru and Indonesia face pressure from depleting resources and falling grades. Chinese mine output has remained quite stable and this is expected to continue in the medium-term, although output may recover to partially offset an anticipated decline in tin shipments from Myanmar due to rising costs and depleting resources. Tin production from Inner Mongolia is expected to grow in 2018 and beyond as a result of tin discoveries and investment in operations there.  Higher tin prices will be required to justify the development of new tin mines and or incentivise additional small-scale and artisanal mine production to replace declining production to offset rising demand. It is forecast that by 2022 approximately 65,000 tpa (tonnes per annum) of additional capacity will be required. Without new supply, mine production rates could fall to 270,000 tpa. Secondary production is expected to remain relatively stable at approximately 60,000tpy although higher prices could boost recycling.  The recent recovery in tin prices has led to a resurgence of tin development activity, with 21 tin projects identified by the International Tin Association which could potentially achieve 72,700 tpa of production by 2022 if the projects can be demonstrated to be feasible, funding is secured and they are built. It is optimistic to assume that all 21 projects will prove feasible and the likely outcome is that only a select number of these projects will actually be developed in the short to medium-term. Even these projects are likely to be subject to delays in commissioning and ramping up to design capacity. In fact, with a search through company websites, 10 of the listed projects do not currently have JORC reserves (only resources), representing 26,300t of potential tin production capacity. This suggests that the required 65,000 t of new tin supply required by 2022 is unlikely to be achieved.
	Price and volume forecasts and the basis for these forecasts.	Global stocks of tin remain at historically low levels. The market has been in deficit in recent years and is expected to remain so in the near term. ongoing market deficits will not be sustainable going forward and as a result prices are forecast to increase to correct the market imbalance.
	For industrial minerals the customer specification, testing and acceptance requirements prior to a supply contract.	The product will be a 60% Sn tin concentrate suitable for sale to most tin smelters globally.



Criteria	JORC Code explanation	Commentary
Economic	The inputs to the economic analysis to produce the net present value (NPV) in the study, the source and confidence of these economic inputs including estimated inflation, discount rate, etc.	The Ore Reserve estimate is based on a financial model for that has been prepared at a DFS level of accuracy. All inputs from mining operations, processing, downstream costs, marketing and sustaining capital as well as contingencies have been scheduled and evaluated to generate a full life of mine cost model. Capital costs are based on quotations provided by suppliers and mining contractors. Operating costs are based on quotations from suppliers and mining contractors. The cost estimates are considered to be within an accuracy range of $\pm 15\%$ A project discount rate of 8% annually has been used to estimate the NPV. No inflation is included in the economic analysis.
	NPV ranges and sensitivity to variations in the significant assumptions and inputs.	Sensitivity analysis shows that the project is most sensitive to commodity price/exchange rate movements. The project is still economically viable at unfavourable commodity price adjustments of over 10%.
Social	The status of agreements with key stakeholders and matters leading to social licence to operate.	ESIA and ESMMP has been approved by the CNEIE Tenement licences are current Land rental agreement process is complete Forestry occupation permit is under application MOU's for the establishment of Community Development Programmes have been signed with the two local communes
Other	To the extent relevant, the impact of the following on the project and/or on the estimation and classification of the Ore Reserves:	
	Any identified material naturally occurring risks.	A formal process to assess and mitigate naturally occurring risks will be undertaken prior to execution. Currently, all naturally occurring risks are assumed to have adequate prospects for control and mitigation
	The status of material legal agreements and marketing arrangements.	The Moroccan Project operating company Atlas Tin SAS has been formed in accordance with Moroccan procedures. A JV shareholder agreement is in place  No marketing agreement has yet been signed but the Competent Person considers that such an agreement is reasonably likely. However, two refineries have expressed interest in the product and provided quotations. The JV partners of KAS in Atlas Tin SAS (Toyota Tsusho Corporation and Nittetsu Mining Corporation) are also potential offtake partners.
	The status of governmental agreements and approvals critical to the viability of the project, such as mineral tenement status, and government and statutory approvals. There must be reasonable grounds to expect that all necessary Government approvals will be received within the timeframes anticipated in the Pre-Feasibility or Feasibility study. Highlight and discuss the materiality of any unresolved matter that is dependent on a third party on which extraction of the reserve is contingent.	Investment convention approval is in progress. Permission to establish Project water bores has been given by ABHS Government approvals are in progress as above. Based on the information provided by KAS, the Competent Person sees no reason all required approvals will not be successfully granted within the anticipated timeframe
Classification	The basis for the classification of the Ore Reserves into varying confidence categories.	The Probable Ore Reserve is based on that portion of the Indicated Mineral Resource within the mine designs that may be economically extracted and includes an allowance for dilution and ore loss.  The Proved Ore Reserve is based on that portion of the Measured Mineral Resource within the mine designs that may be economically extracted and includes an allowance for dilution and ore loss.
	Whether the result appropriately reflects the Competent Person's view of the deposit.	The results appropriately reflect the Competent Person's view of the deposit.
	The proportion of Probable Ore Reserves that have been derived from Measured Mineral Resources (if any).	No Measured Mineral Resource contributes to Probable Ore Reserves.
Audits or reviews	The results of any audits or reviews of Ore Reserve estimates.	The Ore Reserve estimation has been subjected to an internal review by Entech's senior technical personnel.
Discussion of relative accuracy/confidence	Where appropriate a statement of the relative accuracy and confidence level in the Ore Reserve estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the reserve within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors which could affect the relative accuracy and confidence of the estimate.	The design, schedule, and financial model on which the Ore Reserve is based has been completed to a DFS standard, with a corresponding level of confidence.  The Ore Reserve is attributed a confidence classification of Proved (17%) and Probable (83%).



Criteria	JORC Code explanation	Commentary
	<p>The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.</p> <p>Accuracy and confidence discussions should extend to specific discussions of any applied Modifying Factors that may have a material impact on Ore Reserve viability, or for which there are remaining areas of uncertainty at the current study stage.</p>	<p>The Ore Reserve is based on a global estimate.</p> <p>Considerations in favour of a higher confidence in the Ore Reserve include:</p> <ul style="list-style-type: none"> <li>• The mining process is well-known and utilises proven technology and methods widely used in the global industry and applicable to Morocco, with sufficient data to generate adequate costing estimates to an appropriate standard.</li> <li>• Approximately 70 km of grade control drilling has been designed and costed in the Ore Reserve mine plan to assist in ore definition;</li> <li>• The mine is located in an area with good infrastructure and adequate population centres;</li> <li>• Further detailed metallurgical testwork has allowed for a process design adjustment which reduces risk associated with capital and operating costs of the treatment plant.</li> </ul> <p>Considerations in favour of a lower confidence in the Ore Reserve include:</p> <ul style="list-style-type: none"> <li>• Future commodity price forecasts carry an inherent level of risk;</li> <li>• There is a degree of uncertainty associated with geological estimates. The Ore Reserve classifications reflect the levels of geological confidence in the estimates.</li> <li>• There is a degree of uncertainty regarding estimates of impacts of natural phenomena including geotechnical assumptions, hydrological assumptions, and the modifying mining factors, commensurate with the level of study.</li> <li>• Although Morocco is currently considered to be a stable and functional constitutional monarchy with a reasonably robust rule of law, there is a degree of additional sovereign risk associated with mining operations in Northern Africa and the Arab world.</li> <li>• No signed offtake agreement currently exists for the concentrate. However, two refineries have expressed interest in the product and provided quotations. The JV partners of KAS in Atlas Tin SAS (Toyota Tsusho Corporation and Nittetsu Mining Corporation) are also potential offtake partners.</li> </ul> <p>Further, i.e. quantitative, analysis of risk is not warranted or considered appropriate at the current level of technical and financial study.</p>
	<p>It is recognised that this may not be possible or appropriate in all circumstances. These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.</p>	

**entech.**

MINING CONSULTANTS

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4<sup>th</sup> July 2018

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Evan Spencer  
Chief Operating Officer  
Atlas Tin SAS

electronic transmittal (*espencer@kasbahresources.com*)

## **ACHMMACH TIN PROJECT – JUNE 2018 ORE RESERVE STATEMENT**

Dear Mr Spencer,

The following letter summarises the mine plan used to generate the Achmmach Tin Project Ore Reserve, based on the works completed by Entech Pty Ltd in September 2017.

The letter also contains the sign-offs and statements required for announcement of the Ore Reserve to the market in conformance with the *2012 Australasian Code for Reporting of Exploration Results, Minerals Resources and Ore Reserves*.

Should you have any questions relating to this report please contact the undersigned.

Regards,

**Entech Pty Ltd**



Matt Keenan  
Senior Mining Engineer  
BEng BCom MSc MAusIMM (CP)

## 1 SUMMARY OF ORE RESERVE

The Achmmach Tin Project (Achmmach) is a green fields project located in the El Hajeb province of Morocco. Achmmach is held by Atlas Tin SAS (ATS), a joint venture company owned by Kasbah Resources Ltd (75%) (KAS), Toyota Tsusho Corporation (20%) and Nittetsu Mining Corporation (5%).

KAS engaged Entech Pty Ltd (Entech) to prepare a mine plan to definitive feasibility study (DFS) standard on the Achmmach deposit in 2015 (Keenan, 2015) (known as the Enhanced DFS (EDFS)), based on previous work carried out by Mining One Pty Ltd (Trembath, 2014). This mine plan was updated by Entech in 2016 (Keenan, 2016) to provide a higher grade, lower tonnage production profile (known as the Small Start Option (SSO)) to reduce up-front capital requirements associated with the processing plant.

In July 2017, KAS requested Entech Pty Ltd to update the Achmmach mine plan. This mine plan update involved the following work:

- Central Zone stope shapes were to be based on the 0.55% Sn cut-off grade (COG) shapes from the 2015 EDFS work, as opposed to the 0.8% Sn higher COG shapes assumed in the Central Zone in the 2016 SSO; and
- The mine plan was scheduled using these lower COG stope shapes assuming a more rapid production rate than the SSO (500 ktpa for Yr 1, ramping up to 750 ktpa from Yr 2 onwards).

KAS also requested that Entech update the Achmmach Ore Reserve estimate based on the new mine plan as summarised in this document. This estimate represents an update to the previous Achmmach Ore Reserve estimate announced to the market by KAS on 29<sup>th</sup> July 2016 and is fully compliant with the *2012 Australasian Code for Reporting of Exploration Results, Minerals Resources and Ore Reserves* (the JORC Code).

The Ore Reserve estimate is based on JORC-compliant Mineral Resource estimates which are unchanged from the most recent previous Ore Reserve estimate announced in July 2016. These Mineral Resources were estimated by independent geological consultants Quantitative Group Pty Ltd (QG) (Job, 2013 and Job, 2014). This Ore Reserve estimate represents the unmined Mineral Resources, with modifying cost and mining factors applied. Geotechnical input was provided by independent geotechnical consultants Mining One Pty Ltd to a DFS level of detail.

All Achmmach ore is planned to be extracted via underground mining. Mine access is planned via twin declines developed from surface boxcuts. Suitable geotechnical analysis has been completed to determine the locations and designs of these excavations. The twin portal access allows rapid implementation of a primary ventilation circuit. The Upper Eastern area is accessed from a separate portal system, and is mined initially whilst the main Central area is developed.

The mining methods assumed in the Ore Reserve plan were bottom-up mechanised longhole stoping with cemented rock fill (CRF) in the Central Zone and some parts of the Western Zone, and top-down mechanised open stoping with retention of in-situ ore pillars for support in other areas. These mining

methods have been selected with due consideration to available equipment and skill sets in the surrounding mining jurisdiction, geometry and thickness of the orebody, independent geotechnical expert recommendations and project economics.

A detailed waste mass balance was developed to ensure sufficient waste would be generated in the mine plan for stope filling and site construction purposes.

Development will be mined using twin boom jumbo drills with diesel powered charging units delivering blow-loaded ammonium nitrate fuel oil (ANFO) explosives for blasting. Ground support assumptions have been based on geotechnical analysis undertaken to a DFS level of detail. Development dimensions have been Stope drill and blast will be achieved using electric over hydraulic longhole drills, with blasting also using ANFO. Diesel loaders will be used to bog blasted material to stockpiles for loading on trucks for haulage to surface waste dumps and run-of-mine (ROM) pads.

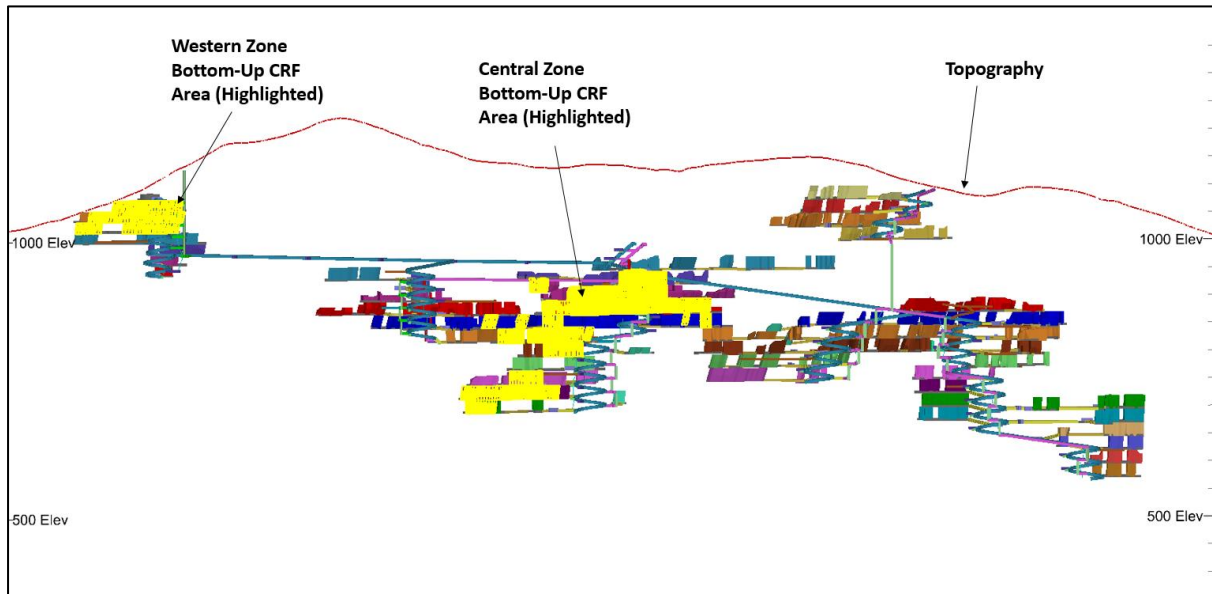
Stopes were designed based on the the outputs of automated optimisation software, with all shapes manually reviewed to ensure practical mineability. A stope cut-off grade of 0.55% Sn and development ore cut-off grade of 0.25% Sn were applied based on DFS cost estimation work. A sub-level interval of 25 m and a minimum mining width of 3 m were applied based on orebody geometry and geotechnical analysis. Stope dilution assumptions were based on geotechnical analysis to a DFS level of detail and were applied as a 0.5 m thick dilution 'skin' on each contact of the stope shapes (for a total 1 m dilution thickness) at contained Resource grade. This approach resulted in an average global stope dilution of 18%. An additional 0.5 m fill dilution was allowed for where stopes were blasted against CRF-filled voids.

Mining recovery assumptions were based on geotechnical advice and the proposed fleet, with 95% being applied to all stopes and an additional 2.5% ore loss in wide CRF areas due to stope shape chamfers. 12.5 m sill pillars were designed between all mining panels to eliminate the need to mine under cement fill. Rib pillars were designed in top-down open stoping areas based on geotechnical advice. Global ore tonne loss due to pillars was 10%.

Ore development had 100% mining recovery and no dilution assumed.

The Achmmach mine design is shown in Figure 1.1, with the CRF mining method areas highlighted.

Figure 1.1: Achmmach Mine Design (Long-Section Looking N)



The mine plan was scheduled assuming appropriate fleet and productivity assumptions. Underground capital infrastructure requirements for dewatering, power supply, ventilation and services supply were determined to a DFS level of detail based on this mine plan.

Financials and modifying factors underpinning the Ore Reserve estimate have been determined to a DFS level of detail. Mining costs have been based on detailed quotes from suppliers, including reputable underground mining contractors. Where possible, Moroccan suppliers have been used to provide capital item cost estimates. In the small number of items where this was not possible, Australian costs have been used.

Measured and Indicated Resources have been converted to Proved and Probable Ore Reserves respectively subject to mine design physicals and an economic evaluation. No Measured material has been included as a Probable Ore Reserve.

No Inferred material is contained within the mine plan. Some Unclassified Resource material carrying grade has been included as dilution within the Ore Reserve estimate. The grade contribution from this Unclassified dilution material accounts for ~0.5% of the Ore Reserve calculated metal.

The Ore Reserves have been defined at delivery to the planned processing plant ROM pad located at Achmmach. This statement relates to a global estimate.

All material was subjected to an economic evaluation. A detailed financial model for the project was prepared by Kasbah Resources Ltd based on the mine plan schedule. Entech has reviewed this financial model and considers that it provides a standard of detail and accuracy suitable for determination of economic viability of Ore Reserves. Metallurgical recoveries and processing costs were based on suitably detailed metallurgical studies. Commodity price assumptions of US\$21,000/t Sn were provided by Kasbah Resources Ltd based on current spot prices, the average of 120 months past and 15 months futures. The Competent Person considers that these commodity price assumptions are

based on sufficiently detailed and sensible estimates and are appropriate to use in this context.

The financial analysis indicated that the mine plan based on the Ore Reserves is economically viable with an appropriate margin against adverse movements in inputs.

Based on the information provided by KAS, Entech are not aware of any reason why ATS would not be able to obtain all remaining required permits and government approvals to commence mining at Achmmach within a suitable timeframe.

A summary of the key results of the 2018 Achmmach Ore Reserve mine plan is presented in Table 1.1.

**Table 1.1: 2018 Ore Reserve Plan Key Results**

Parameter	Unit	Value
Capital Lateral Development (m)	m	20,219
Operating Lateral Development (m)	m	24,093
<b>Total Lateral Development (m)</b>	<b>m</b>	<b>44,312</b>
Development Ore (t)	t	1,076,543
Development Ore Grade (% Sn)	% Sn	0.72%
Development Ore Metal (t Sn metal)	t Sn	7,735
Stope Ore Tonnes (t)	t	5,936,800
Stope Ore Grade (% Sn)	% Sn	0.84%
Stope Ore Metal (t Sn metal)	t Sn	49,910
Total Ore Tonnes (t)	t	7,013,343
Total Ore Grade (% Sn)	% Sn	0.82%
Total Ore Metal (Sn)	t Sn	57,645
Metallurgical Recovery	%	77.2%
Metal Tonnes Sold	t Sn	44,512
Project Capital Cost	US\$M	\$96.4
Project Operating Cost	US\$M	\$408.5
Project Total Cost	US\$M	\$609.6
Project Total Cost	US\$/ore t mined	\$86.90
Project Total Cost	US\$/Sn t produced	\$13,695
Project Life	Yrs	10.2
Project NPV (8% discount)	US\$M	\$98.1

**The Ore Reserve estimate for the Achmmach Tin Project as at June 2018 is 7,000,000 t of ore grading 0.82% Sn for a total of 58,000 t of tin metal.**

The updated Ore Reserve estimate summary is provided in Table 1.2.

**Table 1.2: Achmmach Ore Reserve Estimate June 2018**

Achmmach Ore Reserve	Proved			Probable			Total		
	Ore (t)	% Sn	Tin Metal (t)	Ore (t)	% Sn	Tin Metal (t)	Ore (t)	% Sn	Tin Metal (t)
Meknes Trend	1,100,000	0.99	11,000	5,600,000	0.78	44,000	6,700,000	0.82	55,000
Sidi Addi Trend	-	-	-	300,000	0.86	3,000	300,000	0.86	3,000
<b>TOTAL</b>	<b>1,100,000</b>	<b>0.99</b>	<b>11,000</b>	<b>5,900,000</b>	<b>0.79</b>	<b>47,000</b>	<b>7,000,000</b>	<b>0.82</b>	<b>58,000</b>

Calculations have been rounded to the nearest 100,000 t of ore, 0.01% Sn grade and 1,000 t tin metal. Rounding errors may be present.

Material uncertainties relating to this Ore Reserve estimate are discussed below:

- There is a degree of uncertainty associated with geological estimates. The Reserve classifications reflect the levels of geological confidence in the estimates.
- Future commodity price and exchange rate forecasts carry an inherent level of risk.
- There is a degree of uncertainty regarding estimates of impacts of natural phenomena including geotechnical assumptions, hydrological assumptions and the modifying mining factors, commensurate with the level of study;
- Although Morocco is currently considered to be a stable and functional constitutional monarchy with a reasonably robust rule of law, there is a degree of additional sovereign risk associated with mining operations in Northern Africa and the Arab world.
- No signed offtake agreement currently exists for the concentrate. However, two refineries have expressed interest in the product and provided quotations. The JV partners of KAS in Atlas Tin SAS (Toyota Tsusho Corporation and Nittetsu Mining Corporation) are also potential offtake partners.

A summary of the changes to the June 2018 Achmmach Ore Reserve estimate compared to the most recent (2016) prior Achmmach Ore Reserve estimate (Keenan, 2016) is presented in Table 1.3.

**Table 1.3: Comparison of June 2018 Achmmach Ore Reserve Estimate with 2016 Estimate**

	Ore Tonnes (t)	Grade (% Sn)	Sn Contained Metal (t)
2016 Total Proved	900,000	1.10	10,000
2018 Total Proved	1,100,000	0.99	11,000
Variance	200,000	-0.11	1,000
	22%	-10%	10%
2016 Total Probable	5,700,000	0.80	46,000
2018 Total Probable	5,900,000	0.79	47,000
Variance	200,000	-0.01	1,000
	4%	-1%	2%
<b>2016 Grand Total Achmmach</b>	<b>6,600,000</b>	<b>0.85</b>	<b>56,000</b>
<b>2018 Grand Total Achmmach</b>	<b>7,000,000</b>	<b>0.82</b>	<b>58,000</b>
<b>Variance</b>	<b>400,000</b>	<b>-0.02</b>	<b>2,000</b>
	<b>7%</b>	<b>-2%</b>	<b>4%</b>

Calculations have been rounded to the nearest 100,000 t of ore, 0.01% Sn grade and 1,000 t tin metal. Rounding errors may be present.



## 2 REFERENCES

Hammans, J. and Trembath, D., 2016. *Geotechnical Evaluation of the Proposed Achmmach Mine Design*. Mining One Pty Ltd; West Perth.

Job, M., 2013. *Achmmach Mineral Resource Estimate, Morocco*. QG Pty Ltd; Fremantle.

Job, M., 2014. *Achmmach Western Zone Resource Estimate, Morocco*. QG Pty Ltd; Fremantle.

Keenan, M., 2015. *Achmmach Project March 2015 Reserve Estimation Update*. Entech Pty Ltd; Subiaco.

Keenan, M., 2016. *Achmmach Project Small Start Option Definitive Feasibility Study*. Entech Pty Ltd; Subiaco.

## **COMPETENT PERSON'S CONSENT FORM**

Pursuant to the requirements of ASX Listing Rules 5.6, 5.22 and 5.24 and clause 9 of the 2012 JORC Code (Written Consent Statement)

### **Report Description**

Achmmach Tin Project Ore Reserve Estimate, June 2018

Entech Pty Ltd

Kasbah Resources Ltd

4<sup>th</sup> July 2018

### **Statement**

I, Matthew Keenan confirm that:

- I have read and understood the requirements of the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code 2012 JORC Edition)
- I am a Competent Person as defined by the JORC Code 2012 Edition, having five years' experience which is relevant to the style of mineralisation and type of deposit described in the Report, and to the activity for which I am accepting responsibility.
- I am a Member or Fellow of The Australasian Institute of Mining and Metallurgy or the Australian Institute of Geoscientists or a 'Recognised Overseas Professional Organisation' ("ROPO" included in a list promulgated by ASX from time to time).
- I have reviewed the Report to which this consent statement applies.
- I am an employee working for Entech Pty Ltd and have been engaged by Kasbah Resources Ltd to prepare the documentation for the Achmmach Tin Project on which the Report is based, for the period ended 30 June 2018.

I have disclosed to the reporting company the full nature of the relationship between myself and the company, including any issue that could be perceived by investors as a conflict of interest.

I verify that the Report is based on and fairly and accurately reflects in the form and context in which it appears, the information in my supporting documentation relating to Ore Reserves.

**CONSENT**

I consent to the release of the Report and this consent statement by the directors of:

Kasbah Resources Ltd.



4<sup>th</sup> July 2018

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**Signature of Competent Person**

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**Date**

**Professional Membership:**

**MAusIMM (CP)**

**Membership Number:**

**209809**



Dan Donald

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**Signature of Witness**

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Subiaco

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**Print Witness Name and Residence  
(eg Town)**

Additional Deposits covered by the Report for which the Competent Person signing this form is accepting responsibility:

NA.....  
.....  
.....  
.....  
.....  
.....

Additional Reports related to the deposit for which the Competent Person signing this form is accepting responsibility:

NA.....  
.....  
.....  
.....  
.....  
.....



4<sup>th</sup> July 2018

Signature of Competent Person

Date

Professional Membership:

MAusIMM (CP)

Membership Number:

209809



Dan Donald

Signature of Witness

Subiaco

Print Witness Name and Residence  
(eg Town)