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## Infinity Lithium Corporation

ACN 147 413 956

ASX:INF

*Developing the world class San Jose lithium-tin deposit in Europe.*

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## Lithium Processing Update

### Battery grade Lithium Hydroxide and Carbonate Pathways

#### Highlights

- Study confirms ability to produce battery grade lithium hydroxide in addition to battery grade lithium carbonate for the Electric Vehicle industry
- The San Jose Lithium Project is now opened up to a broader end user market, at a time when lithium hydroxide is gaining increased market share in the lithium chemical market
- Infinity visited operating production facilities utilising the same lithium sulphate roast and water leach extraction process
- Independent verification of the Scoping Study front-end beneficiation plant and downstream processing Operating and Capital costs assumptions

Infinity Lithium Corporation Limited ("Infinity" or "the Company") is pleased to announce that it has received the results of a technical option study conducted to evaluate the potential production of lithium hydroxide at San Jose.

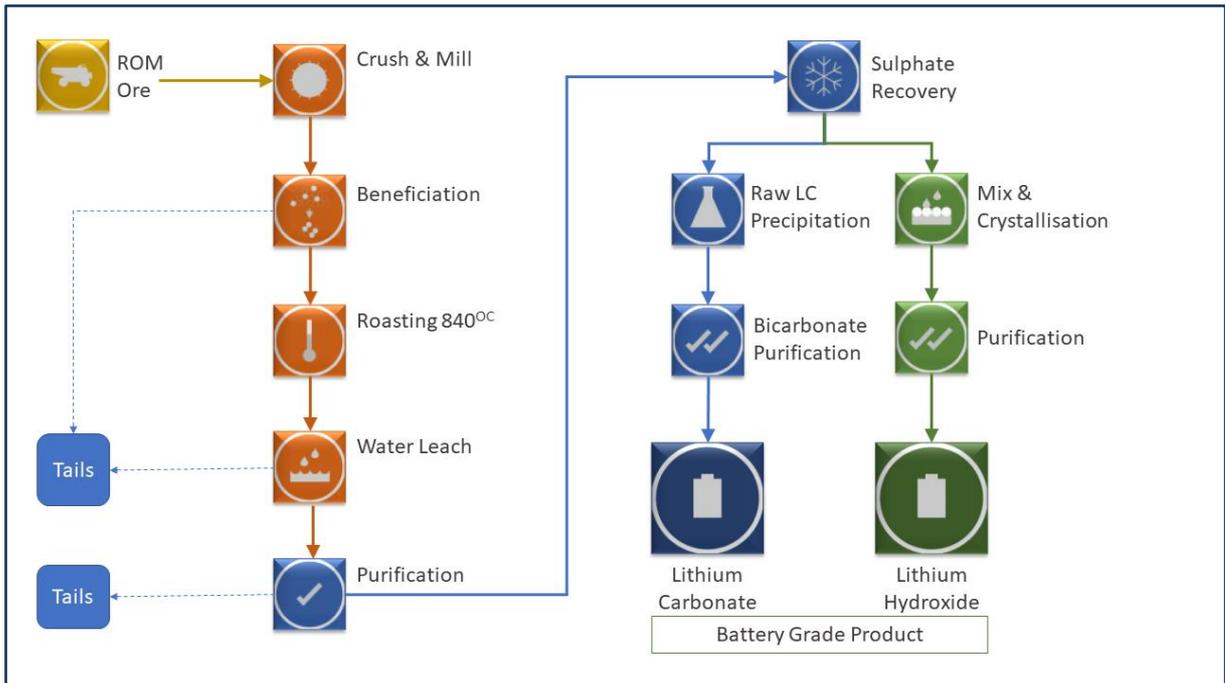
Wave International ("WAVE"), a highly experienced process engineering company in the lithium industry, completed a trade-off study to compare the operating cost and capital costs of a lithium carbonate plant and a lithium hydroxide plant. This study is to Scoping Study level. The San Jose Lithium project is currently in Feasibility Study mode with a Mining Licence Application being reviewed by the relevant regional authorities to produce battery grade Lithium Carbonate (" $\text{Li}_2\text{CO}_3$ ") on site.

***Infinity has conducted this work in response to the expressions of interest from potential industry partners and end users. San Jose has an advantage in its ability to potentially produce Lithium Hydroxide ("LiOH") in close proximity to European end markets on site or off site through the transportation of intermediate stage product. These results highlight the flexibility and optionality of treating lithium mica in Extremadura.***

Infinity Lithium and our joint venture partners remain committed to a fully integrated battery grade lithium carbonate project in Extremadura. The demand outlook for lithium carbonate remains robust and the primary focus of the group, whilst working closely with regional stakeholders to promote the significant economic benefits and employment opportunities for Extremadura. The Mining Licence Application (MLA) submitted in Q4 2017 is subject to the current environmental permit process (AAU), as is the ongoing Feasibility Study work and related activity. The consideration of a lithium hydroxide end product in response to strategic investment and battery technology developments illustrates the ability to pivot within the existing process flow sheet whilst considering the opportunity to expand the end market reach if the relevant future process approvals were to be achieved.

A key advantage of hard rock mineral projects, such as San Jose, is the ability to split lithium-rich solutions which are leached from the proven 'sulphate roast – water leach' extraction process for downstream processing either on site or in alternate nearby locations. The LiOH is created by taking the concentrated lithium sulphate rich leach stream, as per the original flowsheet, and crystallising LiOH from it by the addition of sodium hydroxide. This LiOH is then purified and bagged for transport to market as battery grade, LiOH monohydrate (Figure 1).

Infinity Lithium Corporation



**FIGURE 1: A LARGE AMOUNT OF SHARED CAPITAL EQUIPMENT AND PROCESSING FOR EACH PRODUCT IS SHOWN WITH PRODUCT STREAMS FOR LITHIUM CARBONATE AND LITHIUM HYDROXIDE SPLITTING POST POTASSIUM SULPHATE RECRYSTALLISATION (RECYCLING) STAGES.**

Managing Director and CEO, Adrian Byass commented "This technical option study provides another strong boost to the San Jose lithium project and its development potential."

San Jose is now opened up to a broader end user market, at a time when lithium hydroxide is gaining increased market share in the lithium chemical market. In addition, the competitive advantages of conversion to lithium hydroxide locally are expected to result in considerable transport and shipping savings.

The ability to produce both key components required in the rapidly growing battery enhances increases the potential for San Jose to be a pillar in the local and regional economy for decades to come."

The increasing market share of LiOH in the lithium chemical market with year-on-year growth rates outstripping that of lithium carbonate and projected to continue doing so into the future. LiOH is used in a range of applications including greases and breathing gas purification systems, however the burgeoning growth in demand for LiOH has been driven increasingly through its application in lithium batteries.

The rechargeable battery market movement towards NMC chemistry batteries delivers a higher density energy charge from a reduced mass, and therefore greater ranges in Electric Vehicles (Figure 2).

Battery Cathode Type	Lithium Compound	
	Li <sub>2</sub> CO <sub>3</sub>	LiOH
NMC111		
NMC622		
NMC811		
NCA		

**FIGURE 2 - SOURCE: McKinsey Basic Materials Institute, company surveys, expert interviews, academics**

## Technical Discussion – Work undertaken by Wave International

The technical option study compared the cost of producing lithium hydroxide to cost of producing lithium carbonate. The analysis undertaken on the cost of producing lithium carbonate further confirmed the robustness of prior estimates as outlined in the Scoping Study report (ASX release October 2017).

WAVE’s work confirmed that the initial Scoping Study to produce battery grade  $\text{Li}_2\text{CO}_3$  provided a robust estimate of the CAPEX and OPEX at Scoping Study levels (ASX release October 2017). Infinity concluded that WAVE’s updated OPEX estimate to manufacture battery grade  $\text{Li}_2\text{CO}_3$  was materially in line with the Scoping Study. Furthermore, WAVE’s OPEX estimate to produce  $\text{LiOH}$  was materially comparable to the OPEX incurred to produce  $\text{Li}_2\text{CO}_3$ .

The WAVE study indicated that the additional CAPEX required to construct a  $\text{LiOH}$  facility would be US\$61M. Assuming the same ore feed from the pit as the 15ktpa  $\text{Li}_2\text{CO}_3$  plant, the  $\text{LiOH}$  plant would create approximately 16ktpa of battery grade Lithium Hydroxide Monohydrate ( $\text{LiOH}\cdot\text{H}_2\text{O}$ ).

The review indicated that although the OPEX for both the  $\text{Li}_2\text{CO}_3$  and the  $\text{LiOH}$  plants were materially comparable, additional personnel would be required to operate the plants under both scenarios in comparison to the original Scoping Study. Both the adoption of a  $\text{Li}_2\text{CO}_3$  and  $\text{LiOH}$  plant scenarios will employ a greater number of people from the region whilst the  $\text{LiOH}$  option will produce a greater amount of saleable product. The pricing differential between the two end products varies with the recently released Benchmark Mineral Intelligence Lithium Price Assessment May 2018 noted  $\text{Li}_2\text{CO}_3$  (CIF Asia) pricing averaging between US\$17,000 – 20,000/t whilst  $\text{LiOH}$  (CIF Asia) pricing averaging between US\$19,000 – 22,000/t.

	$\text{Li}_2\text{CO}_3$	$\text{LiOH}$
OPEX	Comparable to $\text{LiOH}$	Comparable to $\text{Li}_2\text{CO}_3$
Additional CAPEX requirement	Nil	US\$61M
Pricing US\$/t (May 2018)	\$US17,000–20,000/t	\$US19,000–22,000/t
Production Output	15,000tpa	16,000tpa

There is a low level of geological confidence associated with Inferred Mineral Resources and there is no certainty that further exploration work will result in the determination of Measured or Indicated Mineral Resources or that the Production Target or preliminary economic assessment will be realised.

## Processing plant visit and testwork update

### Beneficiation – Process Plant Visits and Test Work Results

Interaction with lithium industry leaders in China continued with process plant site visits and test work results received from San Jose material. Infinity visited many lithium processing plants including the China based Jindi Mining Industry Co. Ltd lithium-mica beneficiation plant (Figure 4) in May 2018. The plant uses flotation to upgrade lithium mica feedstock prior to roasting and refining in a process currently utilised in the San Jose Feasibility Study.

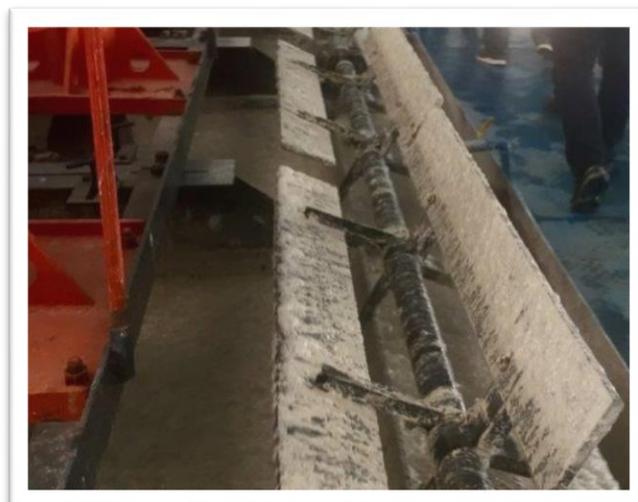


FIGURE 3: MICA BENEFICIATION VIA FLOTATION

Shandong Ruifu received a bulk sample in Q1 2018 and have subsequently confirmed the beneficiation results used by Infinity in the Scoping Study, previously published in October 2017. Beneficiation work completed by Shandong Ruifu, on the San Jose sample, included crushing and grinding to confirm liberation size for the mica, and a variety of flotation reagents were tested to upgrade the concentrate. Infinity continues to work with Shandong Ruifu to identify any potential gains in the beneficiation flowsheet. Shandong Ruifu first processed lithium mica to produce lithium carbonate in 2009. Shandong Ruifu utilise flotation to upgrade material for processing.

#### Sulphate Roast

The Jiangxi Nanshi Lithium New Materials Co Ltd operate a lithium refinery which uses potassium and sodium sulphate roast at 850 degrees C, followed by a fresh water leach to produce lithium carbonate (Sulphate rotary kilns are shown in Figure 4).



**FIGURE 4: ROTARY KILNS USED TO CALCINE LITHIUM MICA WITH SULPHATE PRIOR TO WATER LEACHING**

Post sulphate roasting, a lithium bearing solution is then purified and battery grade lithium carbonate is produced after the bi-carbonation stage (Figure 5).

The Jiangxi Nanshi Lithium New Materials Co receives feed from suppliers of Mica ores mining locally in the Yichun area. In addition, the refinery receives material from the Nanshi Group's Jindi facility that processes mica rich waste materials from a nearby tantalum mine plus fresh mica ores. Jiangxi has recently completed a deal to process lithium mica ores from the Desert Lion operation in Namibia.



**FIGURE 5: BICARBONATION TANKS USED IN THE UPGRADING OF LITHIUM CARBONATE**

The San Jose Lithium project flowsheet uses the same sulphate roast and fresh water leach technology followed by lithium carbonate precipitation and bicarbonate purification as this successful and operating process facility.

## **Summary**

San Jose is currently in Feasibility Study mode with a Mining Licence Application being reviewed by the relevant regional authorities to produce battery grade  $\text{Li}_2\text{CO}_3$  on site.

Lithium processing facilities using the same process flow sheet as that being used by Infinity for San Jose validate the production pathway chosen.

Independent industry groups have confirmed beneficiation results published by Infinity as well as CAPEX and OPEX costs with no material change for the production of  $\text{Li}_2\text{CO}_3$  as published in the Scoping Study.

The project has the ability to also produce  $\text{LiOH}$  from material sourced after leaching (lithium-bearing solution) or from an intermediate stage (technical grade lithium carbonate). This increases the market and investment attractiveness of San Jose.

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### **Competent Persons Statement**

The information in this report that relates to Exploration Targets is based on the information compiled by Mr Jeremy Peters, FAusIMM CP (Mining, Geology). Mr Peters has sufficient relevant professional experience with open pit and underground mining, exploration and development of mineral deposits similar to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of JORC Code. He has visited the project area and observed drilling, logging and sampling techniques used by Infinity in collection of data used in the preparation of this report. Mr Peters is an employee of Snowden Mining industry Consultants and consents to be named in this release and the report as it is presented.

The information in this report that relates to the December 2017 and updates in May 2018, updated Mineral Resources is based on the information compiled by Mr Patrick Adams, FAusIMM CP (Geology). Mr Adams has sufficient relevant professional experience with open pit and underground mining, exploration and development of mineral deposits similar to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of JORC Code. Mr Adams has not visited the project area and has relied on the documented (Peters, May 2017) drilling, logging and sampling techniques used by Infinity in collection of data used in the preparation of this report. Mr Adams is a Principal Geologist and a Director of Cube Consulting Pty Ltd and consents to be named in this release and the report as it is presented.

The information in this report that relates to Exploration Results is based on the information compiled or reviewed by Mr Adrian Byass, B.Sc Hons (Geol), B.Econ, FSEG, MAIG and an employee of Infinity Lithium Corporation Limited. Mr Byass has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the JORC Code. Mr Byass consents to the inclusion in the report of the matters based on this information in the form and context in which it appears.

### **Disclaimer**

Forward-looking statements are statements that are not historical facts. Words such as "expect(s)", "feel(s)", "believe(s)", "will", "may", "anticipate(s)" and similar expressions are intended to identify forward-looking statements. These statements include, but are not limited to statements regarding future production, resources or reserves and exploration results. All of such statements are subject to certain risks and uncertainties, many of which are difficult to predict and generally beyond the control of the Company, that could cause actual results to differ materially from those expressed in, or implied or projected by, the forward-looking information and statements. These risks and uncertainties include, but are not limited to: (i) those relating to the interpretation of drill results, the geology, grade and continuity of mineral deposits and conclusions of economic evaluations, (ii) risks relating to possible variations in reserves, grade, planned mining dilution and ore loss, or recovery rates and changes in project parameters as plans continue to be refined, (iii) the potential for delays in exploration or development activities or the completion of feasibility studies, (iv) risks related to commodity price and foreign exchange rate fluctuations, (v) risks related to failure to obtain adequate financing on a timely basis and on acceptable terms or delays in obtaining governmental approvals or in the completion of development or construction activities, and (vi) other risks and uncertainties related to the Company's prospects, properties and business strategy. Our audience is cautioned not to place undue reliance on these forward-looking statements that speak only as of the date hereof, and we do not undertake any obligation to revise and disseminate forward-looking statements to reflect events or circumstances after the date hereof, or to reflect the occurrence of or non-occurrence of any events.

### About Infinity's' Lithium Project

Infinity has partnered with the large Spanish company Sacyr and its wholly owned subsidiary Valoriza Minería in an earn-in JV over a large, lithium-tin project (San Jose) in central Spain. Infinity can earn up to 75% of San Jose by completing a Feasibility Study within 4 years (approximately A\$6 million in spend in staged increments of 50% and 75%).

San Jose is a highly advanced lithium project which is hosted in lithium-mica that hosts of JORC resource of lithium carbonate equivalent (LCE). A feasibility study completed in 1991 defined an open pit mining operation and a process flow sheet which produced lithium carbonate through acid-leach or sulphate calcine processing. This drilling, mining and processing study work highlights the advanced status and inherent advantages enjoyed by San Jose in relation to many other hardrock deposits. The Resource estimate for San Jose is shown below in Table 1;

**TABLE 1 SAN JOSE MINERAL RESOURCE, REPORTED ABOVE 0.1% LI CUT-OFF**

Classification	Tonnes (Mt)	Li (%)	Li <sub>2</sub> O (%)	Sn ppm
Indicated	59.0	0.29	0.63	217
Inferred	52.2	0.27	0.59	193
<b>TOTAL</b>	<b>111.3</b>	<b>0.28</b>	<b>0.61</b>	<b>206</b>

*Estimated using Ordinary Kriging methodology. Note: Small discrepancies may occur due to rounding*

Snowden Mining (2017) and Cube Consulting estimated the total Mineral Resource for the San Jose lithium deposit using Ordinary Kriging interpolation methods and reported above a 0.1% Li cut-off grade. Full details of block modelling and estimation are contained in the ASX announcement dated 5 December 2017 and updated 23 May 2018.

Lithium (Li) mineralisation is commonly expressed as either lithium oxide (Li<sub>2</sub>O) or lithium carbonate (Li<sub>2</sub>CO<sub>3</sub>) or Lithium Carbonate Equivalent (LCE). Lithium Conversion: 1.0% Li = 2.153% Li<sub>2</sub>O, 1.0%Li = 5.32% Li<sub>2</sub>CO<sub>3</sub>

The Resource was announced to the ASX on 5<sup>th</sup> December 2017 and updated 23 May 2018. Infinity is not aware of any new information or data that materially affects the information included in this ASX release, and Infinity confirms that, to the best of its knowledge, all material assumptions and technical parameters underpinning the resource estimates in this release continue to apply and have not materially changed.

**San Jose Lithium-Tin Project** (100% basis, no by-product credits included)

<b>NPV (8) @ US\$10,000/t LC</b>	<b>US\$401m</b>	<b>IRR 28%</b>
<b>NPV (8) @ US\$12,000/t LC</b>	<b>US\$634m</b>	<b>IRR 37%</b>
Capex	US\$273m inc 10% contingency	
Grade – Lithium Carbonate LOM	1.7%	
Potential annual production (tonnes lithium carbonate)	15,000tpa LC +99.5%	
Average C1 cost year 1-10 (US\$/tonne) without credit*	\$4,763/t	
Average gross operating cashflow p.a. years 1-10	US\$ 74.8m	

#### Scoping Study – Cautionary Statement

Refer to ASX announcement 18th October 2017. The Scoping Study referred to in this announcement is a preliminary technical and economic investigation of the potential viability of the San Jose Lithium-Tin Project. It is based on low accuracy technical and economic assessments, (+/- 35% accuracy) and is insufficient to support estimation of Ore Reserves or to provide assurance of an economic development case at this stage; or to provide certainty that the conclusions of the Study will be realised. Infinity confirms that all the material assumptions underpinning the production target, or the forecast financial information derived from the production target, in the initial ASX announcement continue to apply and have not materially changed. There is a low level of geological confidence associated with Inferred Mineral Resources and there is no certainty that further exploration work will result in the determination of Measured or Indicated Mineral Resources or that the Production Target or preliminary economic assessment will be realised.