



15 May 2018

## SAL DE VIDA - UPDATED FEASIBILITY STUDY

### Highlights

- Results from the updated feasibility study for the Sal de Vida Project validate a technically superior, highly profitable, long life (40 years) and low-cost lithium and potash project
- Post-tax Net Present Value (“NPV”) of US\$1.48 billion at an 8% discount rate (real)
- Post-tax Internal Rate of Return (“IRR”) of 26.9%, with post-tax payback period of approximately 3 years from first production
- Capital cost estimate of US\$474 million, including US\$31 million for an optional potash production circuit
- Operating costs at full production of US\$3,144 per tonne of lithium carbonate after potash credits
- Average annual revenues of US\$360 million and EBITDA of US\$270 million
- JORC-compliant reserve estimate of 1.1 million tonnes of recoverable lithium carbonate equivalent (“LCE”), supports a long initial project life with 25ktpa of lithium carbonate and 94ktpa of potash production respectively

Galaxy Resources Limited (ASX: GXY) (“Galaxy” or “the Company”) is pleased to advise that it has completed an update of the Definitive Feasibility Study (“DFS”) for the Sal de Vida lithium project (“Sal de Vida” or “the Project”) located on the Salar del Hombre Muerto in northwest Argentina. The updated DFS economics reaffirm the potential for a long-life, low cost and highly profitable operation.

The revised post-tax net present value (“NPV”) of Sal de Vida is estimated to be US\$1.48 billion at an 8% discount rate. Sal de Vida has the potential to generate average annual revenues of US\$360 million and average annual operating cash flow (EBITDA) of US\$270 million.

Average operating costs to produce battery grade lithium carbonate have been estimated at US\$3,144 per tonne after potash credits and US\$3,410 per tonne, before potash credits (FOB Antofagasta, Chile), clearly evidencing the low cost nature of Sal de Vida.

The revised total capital cost for the Project is estimated at US\$474 million (US\$443 million excluding the potash circuit). The capital costs that relate to the optional potash plant and related infrastructure are approximately US\$31 million and the Company has flexibility to defer a decision to build the potash production circuit as construction progresses, depending on market conditions.

The Mineral Reserve estimate of 1.1 million tonnes of recoverable LCE and 4.2 million tonnes of potassium chloride (“potash” or “KCl”) equivalent for the Project supports a long initial project life with annual production of 25,000 tonnes of lithium carbonate and 94,000 tonnes of potash. The Project also holds significant potential for future upside from further resource definition and subsequent reserve upgrade. The DFS models an operation with an initial 3-year ramp up to full planned lithium carbonate production. Potash production is deferred for two years after the commencement of lithium carbonate production.

Galaxy Managing Director Anthony Tse commented: “We are very pleased that the formal revision to the economics of Sal de Vida continue to reinforce a world class asset, as well as a Project with a robust financial profile. Galaxy has appointed JP Morgan Australia as financial advisor to assist in evaluating potential strategic partnership and/or offtake opportunities to advance the development of Sal de Vida. With the updated economics now complete, Galaxy will now proceed with the next stage of this process.”

**Table 1: Updated Project Financials**

Item	Units	Figure
Operating Life	Years	40
Capital Cost <sup>1</sup>	US\$m	474
Operating Costs (Li <sub>2</sub> CO <sub>3</sub> units, after potash credits)	US\$/t	3,144
Production Capacity (Li <sub>2</sub> CO <sub>3</sub> )	tpa	25,000
Production Capacity (KCl)	tpa	94,000
IRR (post-tax)	% real	26.9
Payback (post-tax, from first production)	Years	3 years 2 months
Payback (post-tax, from first expenditure)	Years	6 years 2 months
NPV <sub>8% real</sub> (post-tax)	US\$m	1,475
NPV <sub>8% real</sub> (post tax) @ AUD:USD 0.75	A\$m	1,967

<sup>1</sup> Inclusive of capital costs associated with the potash plant and associated infrastructure of US\$31m including a 10% contingency

<sup>2</sup> The feasibility assumes a price of US\$14,750 during initial production ramp up and a long-term price of US\$13,911/t for Li<sub>2</sub>CO<sub>3</sub>, and a straight-line price of US\$220/t for KCl

## **Background**

Sal de Vida is located in the Puna Region of northwest Argentina, in an area known as the Lithium Triangle, which borders Argentina, Chile and Bolivia. It is situated on the eastern portion of the Salar del Hombre Muerto, adjacent to the operations of FMC Lithium which has been producing from that region over the past two decades. The salar is well serviced by nearby infrastructure, which includes major highways, a national and international rail link which connects Pocitos station (approximately 115 km away from the Project) to the Port of Antofagasta in Chile, as well as a power grid and gas pipeline. Sal de Vida's brine chemistry is excellent, with high grades of lithium and potash and low levels of magnesium and sulphate impurities.

Galaxy acquired Sal de Vida in July 2012 through the merger with Lithium One Inc. The Company has since completed the original DFS, which included extensive hydrology work and modeling, drilling, pump tests, resource development, pilot plant test work, flow sheet development and engineering, logistics, market analysis and financial modeling. A formal review of the DFS economics was undertaken in 2016, led by Techint Engineering and Construction ("Techint"), a leading engineering firm in Argentina and Resource Engineers Pty Limited.

The economics of the feasibility study have now been further updated incorporating greater project definition, design and engineering work and taking into account the current economic conditions in Argentina. The feasibility study was updated to account for revised capital and operating cost estimates, as well as new tax legislation in Argentina. The price of battery grade lithium carbonate in the updated study economics assumes a price of US\$14,750 per tonne during initial production ramp up and a long-term price of US\$13,911 per tonne. The price of potash is assumed to be US\$220 per tonne for the life of the Project. These long-term prices are consistent with previous pricing assumptions.

Sal de Vida plans to produce both battery grade lithium carbonate and potash products through the treatment of lithium enriched brine from the Salar del Hombre Muerto. This updated study assumes the production of 25,000tpa of battery grade lithium carbonate and 94,000tpa of potash for the initial 40-year life of the Project.

## **Capital Costs**

For this feasibility update Galaxy commissioned Techint to review the capital cost estimates under 2018 pricing parameters. The revised capital cost estimate for the Project is now US\$474 million (US\$443 million excluding the optional potash circuit). The payback period on the capital cost of the Project from the time of first lithium carbonate production is estimated to be 3 years and 2 months.



Capital costs for the potash plant and related infrastructure is estimated at US\$31 million (including contingency). Galaxy retains the flexibility to defer the capital commitment on building the potash circuit as the construction of the Project advances, subject to potash market conditions.

Capital costs for Sal de Vida have been updated to reflect further optimisation in construction design and price adjustments for current materials and equipment pricing. The proposed location of Sal de Vida's evaporation ponds have been re-located to the south east of the previous location, west of the plant camp and above the salar floodplain, to avoid the risk of water logging. The new location also provides better geotechnical characteristics for pond loading and for future expansion of the Project. The revised pond and plant location has resulted in an increase to the capital costs previously estimated because of design optimisation and an increase in bulk earthworks. The updated capital cost estimate also includes an increased allowance for owner's costs, providing Sal de Vida with a greater working capital provision and a contingency of US\$43 million.

**Table 2: Capital Costs**

Cost Item	US\$m	%
General	13.2	2.8%
Brine Extraction Wells	32.3	6.8%
Evaporation & Liming Ponds	106.5	22.5%
Lithium Carbonate Processing Plant (Battery Grade)	86.1	18.2%
Potash Processing Plant (Not including Related Infrastructure)	28.1	5.9%
Reagents	8.9	1.9%
On Site Infrastructure	60.8	12.8%
Supporting Buildings & Sanitary Treatment	4.2	0.9%
Offsite Infrastructure	6.4	1.3%
Transfer station	1.4	0.3%
Other costs	23.8	5.0%
Owner's cost	58.9	12.5%
Contingency	43.1	9.1%
<b>Total capital expenditure</b>	<b>473.7</b>	

### **Operating Costs**

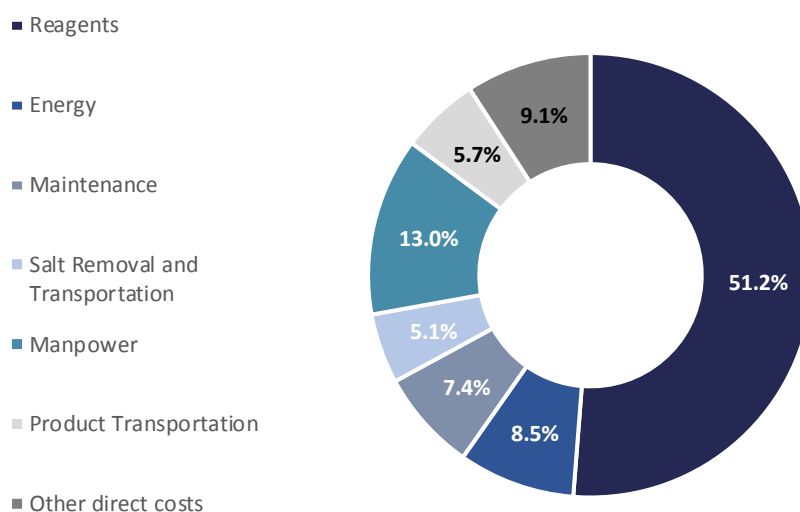
Operating cost estimates for Sal de Vida have been reviewed and updated by Andeburg Consulting Services incorporating current quotations from vendors, contractors and service providers. Operating cost estimates are based on an exchange rate of 20.5 Argentine pesos to one US dollar.

Operating costs were calculated for a facility with production of 25,000 tpa of battery grade lithium carbonate and the breakdown is outlined in Figure 1 below. Further engineering refinement and definitive contract negotiation will be ongoing with the objective of further optimising operating and development costs.

Revised feasibility operating costs are estimated to be US\$3,144 per tonne of lithium carbonate after potash credits and US\$3,410 per tonne of lithium carbonate before potash credits. The most significant component of the operating cost are reagent purchases (the majority of which is lime, soda ash and carbon dioxide), followed by manpower and energy.



Figure 1: Operating Cost Breakdown (Lithium Carbonate Operations)<sup>1</sup>



<sup>1</sup> Other costs include but are not limited to the indirect costs of general & administration and environment & closure

### Argentine Tax Regime

The revised feasibility also incorporates new tax assumptions resulting from recent tax reforms implemented by the Argentinian federal government. The Argentinian government issued Decree 1112/2017 (29 December 2017) enacting and making effective comprehensive tax reforms. The changes are aimed at promoting investment and competitiveness, as well as moving Argentina towards a more equitable, efficient and modern tax system.

The key tax reform measure impacting the economics of Sal de Vida is the reduction of the corporate income tax rate and an increase in the export incentive allowed to lithium mining companies operating within the Puna Region. Under these reforms corporate income tax was lowered from 35% to 30% in 2018 and 2019, followed by a further reduction to 25% from 2020 onwards.

In order to promote investment into mining project development within the Puna region, the federal Argentine government has increased the export incentive rebate to be received by qualifying mining companies. Under this agreement Galaxy will receive a 2.5% rebate on gross export revenues of lithium carbonate for operating in the Puna Region and a further 3.0% export rebate on gross revenue of lithium carbonate for being a lithium company. In addition, revenues that relate exclusively to export transactions would not be subject to the taxes on financial transactions associated with debits and credits on a bank account.

### Financial Sensitivity Analysis

As shown in Table 1 above the updated study demonstrates strong financial outcomes with a post-tax NPV<sub>8%, real</sub> of US\$1.48 billion, IRR of 26.9% and payback period from first production of 3 years and 2 months. Table 3 below sets out the sensitivity of the economics of Sal de Vida to commodity prices and assumed discount rates. The Project is most sensitive to movements in the price of battery grade lithium carbonate. The results presented in the table below highlight the robustness of project economics due to the low cost, long life nature of the project.

Table 3: Sensitivity Analysis

Pricing Scenario	Post Tax NPV (US\$m)			IRR %	Payback Years <sup>2</sup>
	Discount rates (real)				
	6%	8%	10%		
High	3,593	2,574	1,896	35%	5.6
Base	2,106	1,475	1,055	27%	6.2
Low	1,538	1,045	718	22%	6.9

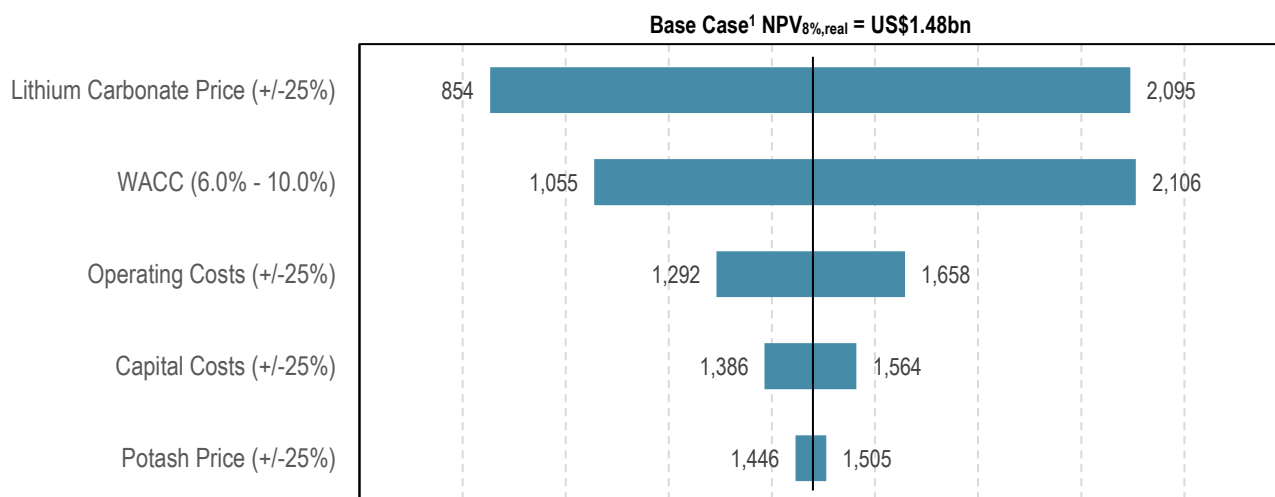
<sup>1</sup> The high price scenario assumes a price range of US\$18,800 – US\$20,450/t Li<sub>2</sub>CO<sub>3</sub> during initial production ramp up and a long-term price of US\$20,450/t for Li<sub>2</sub>CO<sub>3</sub> and a straight-line price of US\$230/t for KCl; The base price scenario assumes a price of US\$14,750/t Li<sub>2</sub>CO<sub>3</sub> during initial production ramp up and a long-term price of US\$13,911/t for Li<sub>2</sub>CO<sub>3</sub> and a straight-line price of US\$220/t for KCl; The low price scenario assumes a range of US\$11,500 – US\$12,500/t Li<sub>2</sub>CO<sub>3</sub> during initial production ramp up and a long-term price of US\$11,700/t for Li<sub>2</sub>CO<sub>3</sub> and a straight-line price of US\$210/t for KCl

<sup>2</sup> Years from initial capital expenditure (includes 3 years of construction)



The financial model was further evaluated for the sensitivities of the NPV to a variety of input parameters, including lithium carbonate and potash prices, discount rates, operating and capital costs. The results show that lithium carbonate prices are the most sensitive driver of the NPV of Sal de Vida, after assessing the impact with a +/- 25% sensitivity. Pricing sensitivity has been completed on +/-25% of the base case pricing assumption. Variances in capital and operating costs have a relatively lower impact on the overall project valuation.

**Figure 2: Financial Sensitivity**



<sup>1</sup> Base case assumptions for Li<sub>2</sub>CO<sub>3</sub> and KCl production capacities of 25,000 and 94,000 tpa respectively, base case pricing assumption and a real discount rate of 8%

**Table 4: Commodity Price Sensitivity Table (NPV, US\$m)**

NPV		Lithium carbonate price sensitivity										
	\$1,475	(25%)	(20%)	(15%)	(10%)	(5%)	-	5%	10%	15%	20%	25%
Potash price sensitivity	(25%)	824	948	1,073	1,197	1,321	1,446	1,570	1,693	1,817	1,941	2,065
	(20%)	830	954	1,079	1,203	1,327	1,452	1,576	1,699	1,823	1,947	2,071
	(15%)	836	960	1,084	1,209	1,333	1,458	1,581	1,705	1,829	1,953	2,077
	(10%)	842	966	1,090	1,215	1,339	1,464	1,587	1,711	1,835	1,959	2,083
	(5%)	848	972	1,096	1,221	1,345	1,469	1,593	1,717	1,841	1,965	2,089
	-	854	978	1,102	1,227	1,351	1,475	1,599	1,723	1,847	1,971	2,095
	5%	860	984	1,108	1,233	1,357	1,481	1,605	1,729	1,853	1,977	2,101
	10%	866	990	1,114	1,239	1,363	1,487	1,611	1,735	1,859	1,983	2,107
	15%	872	996	1,120	1,245	1,369	1,493	1,617	1,741	1,865	1,989	2,113
	20%	878	1,002	1,126	1,251	1,375	1,499	1,623	1,747	1,871	1,995	2,119
	25%	884	1,008	1,132	1,257	1,381	1,505	1,629	1,753	1,877	2,001	2,125

**Table 5: Capital and Operating Cost Sensitivity Table (NPV, US\$m)**

NPV		Capital Cost										
	\$1,475	(25%)	(20%)	(15%)	(10%)	(5%)	-	5%	10%	15%	20%	25%
Operating Cost	(25%)	1,746	1,729	1,711	1,693	1,676	1,658	1,640	1,623	1,605	1,587	1,569
	(20%)	1,710	1,692	1,674	1,657	1,639	1,621	1,604	1,586	1,568	1,550	1,532
	(15%)	1,673	1,656	1,638	1,620	1,603	1,585	1,567	1,549	1,532	1,514	1,496
	(10%)	1,637	1,619	1,601	1,584	1,566	1,548	1,531	1,513	1,495	1,477	1,459
	(5%)	1,600	1,583	1,565	1,547	1,530	1,512	1,494	1,476	1,458	1,440	1,422
	-	1,564	1,546	1,528	1,511	1,493	1,475	1,458	1,440	1,422	1,404	1,386
	5%	1,527	1,510	1,492	1,474	1,457	1,439	1,421	1,403	1,385	1,367	1,349
	10%	1,491	1,473	1,456	1,438	1,420	1,402	1,384	1,366	1,348	1,330	1,313
	15%	1,454	1,437	1,419	1,401	1,384	1,366	1,348	1,330	1,312	1,294	1,276
	20%	1,418	1,400	1,383	1,365	1,347	1,329	1,311	1,293	1,275	1,257	1,239
	25%	1,381	1,364	1,346	1,328	1,310	1,292	1,274	1,256	1,239	1,221	1,203



### Benefits of the Project

The development of the Sal de Vida Project will provide substantial benefits at the local, provincial and national levels. Sustainable mining development is Galaxy's key focus and the core value of all our operations. Such benefits include but are not limited to:

- Significant capital investment within the region
- Upgrade in local and regional infrastructure
- Improved access to basic health services for the local community
- Education and training to upskill the local workforce
- Creation of employment opportunities
- Opportunities for local service providers

### Sal de Vida Resource and Reserve Estimates

Consultants Montgomery & Associates (“M&A”) were engaged to estimate the lithium and potassium resources and reserves in brine for various areas within the Salar de Hombre Muerto basin in accordance with the 2012 edition of the JORC code (“JORC 2012”). Although the JORC 2012 standards do not address lithium brines specifically in its guidance documents, M&A followed the NI43 43-101 guidelines for lithium brines set forth by the Canadian Institute of Mining, Metallurgy and Petroleum (CIM 2012) which M&A considers complies with the scope and intent of the JORC 2012 guidelines with respect to providing reliable and accurate information for the lithium brine deposit in the Salar del Hombre Muerto. The information set out below relating to Mineral Resources and Mineral Reserves for the Sal de Vida project is extracted from the report entitled “Sal De Vida: Revised Definitive Feasibility Study Confirms Low Cost, Long Life and Economically Robust Operation” created on 22 August 2016.

#### Mineral Resource Estimation

The current Mineral Resource estimate of lithium (Li), lithium carbonate (Li<sub>2</sub>CO<sub>3</sub>), potassium (K) and potassium chloride (KCl) for the Sal de Vida Project is as follows:

**Table 6: Mineral Resource Estimate**

Resource Category	Brine Volume (m <sup>3</sup> )	Avg. Li (mg/l)	In situ Li (tonnes)	Li <sub>2</sub> CO <sub>3</sub> Equivalent (tonnes)	Avg. K (mg/l)	In situ K (tonnes)	KCl Equivalent (tonnes)
Measured	7.2 x 10 <sup>8</sup>	787	565,000	3,005,000	8,695	6,241,000	11,902,000
Indicated	7.0 x 10 <sup>8</sup>	712	501,000	2,665,000	8,021	5,641,000	10,757,000
M+Ind	1.4 x 10 <sup>9</sup>	750	1,066,000	5,670,000	8,361	11,882,000	22,659,000
Inferred	3.8 x 10 <sup>8</sup>	764	294,000	1,562,000	8,428	3,237,000	6,174,000
<b>TOTAL M+Ind+Inf</b>	<b>1.8 x 10<sup>9</sup></b>	<b>753</b>	<b>1,360,000</b>	<b>7,232,000</b>	<b>8,377</b>	<b>15,119,000</b>	<b>28,833,000</b>

Note: Assumes 500 mg/L Li cut off

#### Mineral Reserve Estimate

Total tonnages for the economic Mineral Reserve values provided in Table 7 account for anticipated leakage and process losses of lithium and potassium. Table 7 gives results of the Proven and Probable Reserves from the Southwest and East well fields when these percent estimated processing losses are factored in, assuming a continuous average brine extraction rate of 30,000 m<sup>3</sup>/d.



Table 7: Probable and Proven Reserve Statement

Reserve Category	Time Period (Years)	Tonnes Li Total Mass	Tonnes Equivalent Li <sub>2</sub> CO <sub>3</sub>	Tonnes K Total Mass	Tonnes Equivalent KCl
Proven	1 - 6	34,000	181,000	332,000	633,000
Probable	7 - 40	180,000	958,000	1,869,000	3,564,000
Total	40 years total	214,000	<b>1,139,000</b>	2,201,000	4,197,000

Note: Assumes 500 mg/L Li cut off

The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and that all material assumptions and technical parameters underpinning the Mineral Resources and Ore Reserves estimates in the 22 August 2016 market announcement continue to apply and have not materially changed.

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For more information, please contact:

#### Corporate

Nick Rowley  
 Director – Corporate Development  
 +61 (8) 9215 1700  
 nick.rowley@galaxylithium.com

#### Media Enquiries (Australia)

Nigel Kassulke  
 Cannings Corporate Communications  
 +61 407 904 874  
 nkassulke@cannings.net.au

#### Media Enquiries (International)

Heidi So  
 Strategic Financial Relations Ltd  
 +852 2864 4826  
 heidi.so@sprg.com.hk

#### About Galaxy (ASX: GXY)

Galaxy Resources Limited (“Galaxy”) is a global lithium company with lithium production facilities, hard rock mines and brine assets in Australia, Canada and Argentina. It owns the currently producing Mt Cattlin spodumene and tantalum project near Ravensthorpe in Western Australia and the James Bay lithium pegmatite project in Quebec, Canada.

Galaxy is advancing plans to develop the Sal de Vida lithium and potash brine project in Argentina situated in the lithium triangle (where Chile, Argentina and Bolivia meet), which is currently the source of 60% of global lithium production. Sal de Vida has excellent potential as a low cost brine-based lithium carbonate production facility.

Lithium compounds are used in the manufacture of ceramics, glass, and consumer electronics and are an essential cathode material for long life lithium-ion batteries used in hybrid and electric vehicles, as well as mass energy storage systems. Galaxy is bullish about the global lithium demand outlook and is aiming to become a major producer of lithium products.



### **Competent Persons Statements**

The information in this report that relates to the estimation and reporting of the Sal de Vida Project Mineral Resources and Ore Reserves is extracted from the report entitled "*Sal De Vida: Revised Definitive Feasibility Study Confirms Low Cost, Long Life and Economically Robust Operation*" created on 22 August 2016 which is available to view on [www.galaxylithium.com](http://www.galaxylithium.com) and [www.asx.com.au](http://www.asx.com.au). The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and that all material assumptions and technical parameters underpinning the Mineral Resources and Ore Reserves estimates in the relevant market announcement continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcement.

### **Caution Regarding Forward-Looking Information**

This document contains forward-looking statements concerning Galaxy.

Forward-looking statements are not statements of historical fact and actual events and results may differ materially from those described in the forward-looking statements as a result of a variety of risks, uncertainties and other factors. Forward-looking statements are inherently subject to business, economic, competitive, political and social uncertainties and contingencies. Many factors could cause the Company's actual results to differ materially from those expressed or implied in any forward-looking information provided by the Company, or on behalf of, the Company. Such factors include, among other things, risks relating to additional funding requirements, metal prices, exploration, development and operating risks, competition, production risks, regulatory restrictions, including environmental regulation and liability and potential title disputes.

Forward looking statements in this document are based on Galaxy's beliefs, opinions and estimates of Galaxy as of the dates the forward looking statements are made, and no obligation is assumed to update forward looking statements if these beliefs, opinions and estimates should change or to reflect other future developments.

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