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POSITIVE RESULTS FROM METALLURGICAL TESTWORK - McDERMITT LITHIUM PROJECT, USA

- **Outstanding results from alkali salt roasting of McDermitt ore**
- **Lithium Phosphate (5.89% Li) produced from initial testwork**
- **89.5% Lithium leach extraction using recycled mixed salts**
- **Lithium Phosphate is the key precursor for LFP Li-ion batteries**

Jindalee Resources Limited (**Jindalee**, the **Company**) is pleased to announce positive results have been returned from initial alkali salt roast testwork on ore from Jindalee's 100% owned McDermitt Lithium Project located in Oregon, USA.



Figure 1. Li_3PO_4 produced from McDermitt ore

Lithium phosphate (Li_3PO_4) assaying 58,880 ppm (5.89%) Li has been produced from roasting and sequential leaching of a composite sample of McDermitt ore assaying 1,460 ppm Li (Figures 1 & 2).

Lithium phosphate has been shown to be a potential precursor chemical for production of Lithium Iron Phosphate (LFP) batteries. LFP batteries currently comprise 25% of the Li-ion battery market and are expected to grow to 40% by 2030 due to improved battery configurations increasing range performance[1].

Significantly, major US auto maker Ford has recently advised that it is adding LFP cell chemistry to its portfolio to help meet forecast compound annual growth for EVs of 90%, with 40GWh per year of LFP to be sourced from its North American battery factories by 2026[2].

The recent testwork has confirmed that alkali salt roasting of McDermitt ore can produce lithium phosphate, providing an alternative processing route for the Project, as well as a commercially important lithium chemical product. The positive results from use of recycled residue salts from initial roasting and the implications for reduced reagent usage are also very encouraging. Jindalee continues to investigate opportunities to optimise the flowsheet for McDermitt, ahead of more detailed studies later this year.

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Discussion

There are at least two potential pathways for the extraction of lithium from sedimentary deposits such as McDermitt: sulphuric acid leaching of either whole or beneficiated ore, and alkali salt roasting.

Initial metallurgical testwork completed by Jindalee focussed on beneficiation and sulphuric acid leaching, similar to the flowsheet proposed for the nearby Thacker Pass project[3]. The results of the acid leach testwork to date have been successful with beneficiation via attrition scrubbing increasing the lithium content in the <0.01mm fraction by 60.9% (from 0.23% to 0.37%), and lithium recoveries of 97% with sulphuric acid (H_2SO_4) leach at moderate temperatures and atmospheric pressure[4,5,6].

Metallurgical modelling completed as part of Jindalee's Preliminary Scoping Study[7] determined that more optimal lithium recoveries may be achieved using whole of ore alkali salt roasting. Alkali salt roasting is the processing route proposed for the Sonora Lithium Project, acquired by Ganfeng Lithium in January 2022[8].

Jindalee engaged Lithium Consultants Australasia to manage ongoing metallurgical test work programs at Nagrom, Perth, with an initial focus on the roasting flow sheet. A composite sample of McDermitt ore was roasted with alkali salts and the roast ore sequentially leached with the same leach liquor to increase the lithium tenor. Trisodium phosphate was then added to the final leach liquor to precipitate lithium phosphate.

A second roasting and leaching test was conducted using mixed salts recovered from the mother liquor from the sequential leaching testwork outlined above. These mixed salts were added to the roast mix as a substitute for one of the roast reagents (sodium sulphate) with subsequent leaching extracting 89.49% of the lithium, confirming that recycling the salt residue as a roast reagent improves lithium recoveries and reduces reagent usage.

Whilst Jindalee has not committed to a particular processing route the Company is delighted with the results from the initial alkali salt roasting testwork, which suggest a viable alternative processing route to sulphuric acid leaching.

Testwork to develop the most cost effective and energy efficient flow sheet for McDermitt is continuing, with further results to be announced when received.

Authorised for release by the Board of Jindalee Resources Limited.

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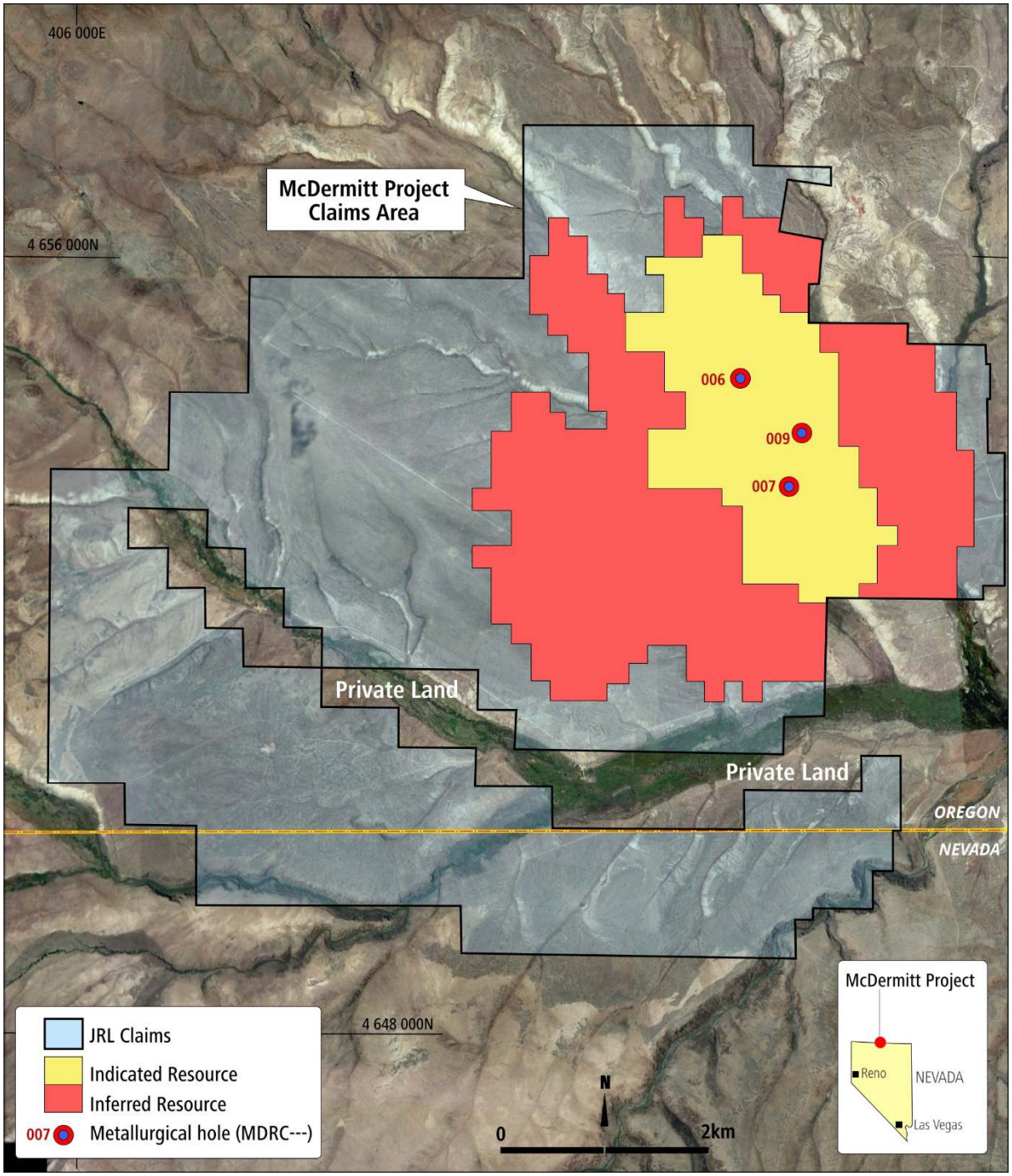

Figure 2. Plan of the McDermitt Project showing location of metallurgical holes and 2022 Mineral Resource[9] (at 1523mRL).

About Jindalee

Jindalee Resources Limited (ASX: JRL) is an exploration company with direct and indirect exposure to lithium, gold, base and strategic metals, iron ore, uranium and magnesite through projects generated by the Company's technical team. Jindalee has a track record of rewarding shareholders, including priority entitlements to several successful IPO's and payment of a special dividend.

Jindalee's strategy is to acquire prospective ground, add value through focussed exploration and either advance key assets to development, introduce partners to assist in funding further progress, or fund this activity via a dedicated company in which Jindalee retains a significant interest.

At 30 June 2022 Jindalee held cash and marketable securities worth approximately $10.8M[10], which combined with the Company's tight capital structure (only 57.4M shares on issue), provides a strong base for advancing projects currently held by Jindalee and leveraging into new opportunities.

References:
Additional details including JORC 2012 reporting tables, where applicable, can be found in the following sources and releases lodged with ASX and referred to in this announcement:

1. Source: https://www.ubs.com/global/en/investment-bank/in-focus/2022/ev-battery
2. Source: https://media.ford.com/content/fordmedia/fna/us/en/news/2022/07/21
3. Source: https://www.lithiumamericas.com/news/lithium-americas-files-technical-report-for-the--thacker-pass-pre-feasibility-study
4. Jindalee Resources ASX Announcement 19/07/2019: "Further Positive Metallurgical Test Results from McDermitt"
5. Jindalee Resources ASX Announcement 17/08/2020: "More Metallurgical Test Results from McDermitt"
6. Jindalee Resources ASX Announcement 22/02/2021: "More positive metallurgical results from McDermitt"
7. Jindalee Resources ASX Announcement 16/09/2021: "Positive preliminary Scoping Study"
8. Source: https://www.bacanoralithium.com/pdfs/Bacanora-FS-Technical-Report-25-01-2018.pdf
9. Jindalee Resources ASX announcement 06/07/2022: "170% Increase to Indicated Resource at McDermitt"
10. Jindalee Resources ASX Announcement 28/07/2022: "Quarterly Activities Report" and "Quarterly Cashflow Report"

Competent Persons Statement
The information in this report that relates to Exploration Results, Mineral Resources or Ore Reserves is based on information compiled by Mr Lindsay Dudfield and Karen Wellman. Mr Dudfield is a consultant to the Company and a Member of the Australasian Institute of Mining and Metallurgy and the Australian Institute of Geoscientists and Mrs Wellman is an employee of the Company and a Member of the Australasian Institute of Mining and Metallurgy. Both Mr Dudfield and Mrs Wellman have sufficient experience relevant to the styles of mineralisation and types of deposits under consideration, and to the activity being undertaken, to qualify as Competent Persons as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Minerals Resources and Ore Reserves.' Mr Dudfield and Mrs Wellman consent to the inclusion in this report of the matters based on this information in the form and context in which it appears.

The information in this report that relates to the Mineral Resource Estimates for the McDermitt deposit is based on information compiled by Mr. Arnold van der Heyden, who is a Member and Chartered Professional (Geology) of the Australasian Institute of Mining and Metallurgy and a Director of H&S Consultants Pty Ltd. Mr. van der Heyden has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken 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' (JORC Code). The Company confirms that it is not aware of any further new information or data that materially affects the information included in the original market announcement by Jindalee Resources Ltd (JRL) entitled "170% increase to Indicated Resource at McDermitt" released on 6 July 2022 and in the case of estimates of Mineral Resources, that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. To the extent disclosed above, 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.

Forward-Looking Statements
This document may contain certain forward-looking statements. Forward-looking statements include but are not limited to statements concerning Jindalee Resources Limited's (Jindalee's) current expectations, estimates and projections about the industry in which Jindalee operates, and beliefs and assumptions regarding Jindalee's future performance. When used in this document, the words such as "anticipate", "could", "plan", "estimate", "expects", "seeks", "intends", "may", "potential", "should", and similar expressions are forward-looking statements. Although Jindalee believes that its expectations reflected in these forward-looking statements are reasonable, such statements are subject to known and unknown risks, uncertainties and other factors, some of which are beyond the control of Jindalee and no assurance can be given that actual results will be consistent with these forward-looking statements.

HOLE	INTERVAL (m)		HOLE	INTERVAL (m)		HOLE	INTERVAL (m)	
MDRC006	3.0	12.2	MDRC007	15.2	30.5	MDRC009	0.0	18.3
	24.4	32.0		44.2	61.0		35.1	53.3
	39.6	56.4		68.6	79.2		70.1	82.3
	74.7	91.4		86.9	103.6		99.1	112.8
	109.7	126.5						

Table 1. Drill Intervals composited to make master sample for metallurgical testwork (refer Annexure A & Figure 2 for hole locations).

Annexure A:
JORC Code, 2012 Edition – Table 1
Section 1 Sampling Techniques and Data

Criteria	JORC Code explanation	Commentary
Sampling techniques	• *Nature and quality of sampling (eg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling.* • *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.* • *Aspects of the determination of mineralisation that are Material to the Public Report.* • *In cases where 'industry standard' work has been done this would be relatively simple (eg 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (eg submarine nodules) may warrant disclosure of detailed information.*	**Reverse Circulation (RC)** • RC drilling was used to collect samples at 5 foot (~1.52m) intervals. • Approximately 2-4kg was collected for standard geochemical analysis from each interval using a riffle splitter (for dry samples) and a rotary splitter (for wet samples). • Larger samples (5-20kg; average 9.38kg) for metallurgical testwork were collected in large bags directly from the cyclone. • All samples were placed into individually labelled, consecutively numbered sample bags. • The RC samples obtained are considered representative of the material drilled.
Drilling techniques	• *Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).*	**Reverse Circulation** • RC drilling was completed using a conventional hammer, 2-slot interchange and 4.75 inch bit. • Water injection was generally used after setting 10' – 20' of casing (~6.1m) with holes drilled wet thereafter. • Holes were drilled vertically using 10 foot (3.05m) rods
Drill sample recovery	• *Method of recording and assessing core and chip sample recoveries and results assessed.* • *Measures taken to maximise sample recovery and ensure representative nature of the samples.* • *Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.*	**Reverse Circulation** • Two methods have been used to quantify any potential sampling bias in RC drilling. First the results from assaying of bulk samples taken for metallurgy have been compared to the geochemical sample. Secondly the Company has twinned several of the RC holes with diamond core drilling and compared assay results, with no bias noted.

Criteria	JORC Code explanation	Commentary
Logging	• *Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.* • *Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.* • *The total length and percentage of the relevant intersections logged.*	• Qualitative lithological descriptions (colour, weathering, grain size, lithology, mineralogy, veining textures and other significant features) were recorded by the field geologist. • Representative samples of bedrock were collected from each 5 foot interval of every RC hole and were retained in labelled sample chip trays, with chip trays photographed on completion of each hole.
Sub-sampling techniques and sample preparation	• *If core, whether cut or sawn and whether quarter, half or all core taken.* • *If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.* • *For all sample types, the nature, quality and appropriateness of the sample preparation technique.* • *Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.* • *Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling.* • *Whether sample sizes are appropriate to the grain size of the material being sampled.*	• RC samples for geochemical assay were split in the field (riffle split if dry; rotary split if wet) and collected in pre-numbered calico bags. • Larger samples for metallurgical testwork were collected directly from the cyclone. • Sample preparation at the laboratory involved crushing to 70% less than 2mm, riffle split off 250g, pulverize split to better than 85% passing 75 microns. • Duplicate samples were inserted approximately every 15 samples to check the representivity of samples and precision in assaying. • The larger metallurgical samples were forwarded to Hazen Research Inc. in Golden, Colorado (Hazen) where they were crushed to 100% passing 1.7mm before compositing to make a master or head sample (total weight ~1000kg). A 200kg sub-sample of the master sample was forwarded to Nagrom in Perth, Western Australia to be used for the metallurgical testwork documented in this announcement.
Quality of assay data and laboratory tests	• *The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.* • *For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.* • *Nature of quality control procedures adopted (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.*	• Geochemical samples were assayed by ALS Laboratories in Reno Nevada via 4 acid digest of 0.25g sample split with a 48 element ICP-MS finish. • 4 Acid digests are considered to approach a total digest, as some refractory minerals are not attacked. • Certified lithium sediment standards were inserted approximately every 15 samples • Blank samples were inserted approximately every 15 samples to check for laboratory contamination. • Duplicates were taken approximately 1 in every 15 samples • All standards, blanks and duplicate data are reviewed as assays are received. Any QAQC data that fails to meet acceptable confidence limits set by Jindalee are followed up with the laboratory as an action

Criteria	JORC Code explanation	Commentary
		item. • Laboratory QAQC involves the use of internal lab standards, splits and replicates as part of in-house procedures. ALS Laboratories participates in external umpire assessments to maintain high levels of QAQC in relation to their peers. • The metallurgical samples the subject of this release were from holes MDRC006, MDRC007 and MDRC009 and were submitted to American Assay Laboratories (AAL) in Reno, Nevada for drying only. • Once dried selected samples from holes MDRC006, MDRC007 and MDRC009 were forwarded to Hazen Research Inc. in Golden, Colorado (Hazen) where they were crushed to 100% passing 1.7mm before compositing to make a master or head sample (total weight ~1000kg) (see table in main body of text). A 200kg sub-sample of the master sample was forwarded to Nagrom in Perth, Western Australia (WA) to be used for the metallurgical testwork documented in this announcement. • Sequential Leach Testwork: a sample of the ore was roasted with limestone, gypsum and sodium sulphate followed by sequential leaching (SL) of the roast ore into the same leach liquor (PLS) for 10 cycles to increase the lithium tenor. Trisodium phosphate (Na_3PO_4) was then added to the PLS to precipitate lithium phosphate (Li_3PO_4). The Li_3PO_4 precipitate was analysed by ICP-OES for a suite of elements. • Mixed Salt Roasting Testwork: salts evaporated from the barren liquor from the SL testwork were substituted for sodium sulphate and the ore roasted before leaching in water. • Metallurgical test work was conducted by Nagrom in Perth, WA and supervised by Lithium Consultants Australasia.
Verification of sampling and assaying	• *The verification of significant intersections by either independent or alternative company personnel.* • *The use of twinned holes.* • *Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.* • *Discuss any adjustment to assay data.*	• Assay results were verified by more than one Jindalee geologist. • Data is received and stored electronically with a comparison between the .pdf certificates and the .csv data files indicating no errors in transmission.

Criteria	JORC Code explanation	Commentary
Location of data points	• *Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.* • *Specification of the grid system used.* • *Quality and adequacy of topographic control.*	• Hole locations were surveyed using a handheld Garmin GPS with an accuracy of +/- 3m horizontally, and +/- 5m vertically; hole positions were also checked against a Digital Elevation Model (DEM). • Collar coordinates for the metallurgical holes were: MDRC006: 412927E, 4654456N, RL:1609 MDRC007 413420E, 4653407N, RL:1585 MDRC009 413552E, 4653960N, RL:1583 • Locations are reported in metres N27 11A. • No downhole surveys were undertaken.
Data spacing and distribution	• *Data spacing for reporting of Exploration Results.* • *Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.* • *Whether sample compositing has been applied.*	• The metallurgical samples the subject of this report were from a 2020 RC drilling program designed to infill and extend an Inferred Mineral Resource reported by the Company on 19 November 2021 based on diamond drilling. • Drill spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource estimation and classification applied. • Drill spacing is approximately 400m for Indicated classification, and 800m for Inferred.
Orientation of data in relation to geological structure	• *Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.* • *If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.*	• Vertical drill holes were appropriate for assessing the flat lying units of interest. Downhole lengths reported are therefore the same as true widths.
Sample security	• *The measures taken to ensure sample security.*	• Samples were collected by qualified geological consultants engaged by Jindalee and stored on site in locked sample storage bins provided by ALS and AAL, who then collected the bins and transported them to their facilities in Reno (USA). • Metallurgical samples were sent from AAL in Reno, Nevada to Hazen Research Inc. in Golden, Colorado, USA, and the sub-sample the subject of this report sent from Hazen to Nagrom in Perth, Western Australia.
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	• QAQC data is reviewed regularly with each returned assay batch and reported on a per program basis.

Section 2 Reporting of Exploration Results

(Criteria listed in the preceding section also apply to this section.)

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	• *Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.* • *The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.*	• Samples reported are all from land managed by the US Bureau of Land Management, with the mineral rights held under placer claims owned 100% by HiTech Minerals Inc., a wholly owned US based subsidiary of Jindalee Resources Limited. • No joint ventures or royalty interests are applicable.
Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties.*	• At McDermitt, historic uranium exploration by Chevron first identified the presence of lithium. Lithium Americas Corp (TSX: LAC) is exploring the southern end of the McDermitt caldera, approximately 30km south of the Project area for lithium within geologically identical stratigraphy.
Geology	• *Deposit type, geological setting and style of mineralisation.*	• Lithium is hosted in flat-lying lacustrine sediments deposited within the Tertiary aged McDermitt caldera.

Drill hole Information	• *A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes:*
	  ○ *easting and northing of the drill hole collar*
	  ○ *elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar*
	  ○ *dip and azimuth of the hole*
	  ○ *down hole length and interception depth*
	  ○ *hole length.*
	• *If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.*
		• Please see table and figures in main body of text.

Data aggregation methods	• *In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (eg cutting of high grades) and cut-off grades are usually Material and should be stated.* • *Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used*	• Significant intercepts are presented as a simple average above a 1000ppm Li cut-off, with a maximum of 10 feet (3.05m) internal 'waste' (where 'waste' is defined as intervals with less than 1000ppm Li). • Lithium carbonate equivalent ('LCE') is calculated by taking the Li

Criteria	JORC Code explanation	Commentary
	for such aggregation should be stated and some typical examples of such aggregations should be shown in detail. • *The assumptions used for any reporting of metal equivalent values should be clearly stated.*	value and multiplying by 5.323 to determine the molar equivalent in standard industry fashion
Relationship between mineralisation widths and intercept lengths	• *These relationships are particularly important in the reporting of Exploration Results.* • *If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.* • *If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (eg 'down hole length, true width not known').*	• Vertical drill holes were appropriate for assessing the flat lying units of interest. Downhole lengths reported are therefore the same as true widths.
Diagrams	• *Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.*	• See main body of announcement.
Balanced reporting	• *Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.*	• All drilling results above a cut-off of 1000ppm lithium containing a maximum of 10 feet (3.05m) internal 'waste' (where 'waste' is defined as intervals with less than 1000ppm Li) are regarded as significant and have been reported.
Other substantive exploration data	• *Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.*	• Metallurgical test work is reported herein. Other data published is from previous releases and references to these have been provided.
Further work	• *The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling).* • *Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.*	• Further metallurgical test work will be undertaken to identify improved options for lithium extraction. • Additional drilling is planned to define extensions to known mineralisation, upgrade the mineral resource estimate and obtain samples for further metallurgical testwork.