LEPIDICO LTD
ACN 008 894 442
THIRD SUPPLEMENTARY TARGET'S STATEMENT

1. IMPORTANT INFORMATION

This document is a third supplementary target's statement (**Third Supplementary Target's Statement**) made under section 644 of the *Corporations Act 2001* (Cth) (**Corporations Act**) and is supplementary to the target's statement dated and lodged with the Australian Securities and Investments Commission (**ASIC**) on 28 March 2017 (**Original Target's Statement**) and the first and second supplementary target's statements dated and lodged with the ASIC on 30 March and 10 April 2017 respectively (**First and Second Supplementary Target's Statements**), issued by Lepidico Ltd (ACN 008 894 442) (**Lepidico**) in relation to the off-market takeover offer by Lithium Australia NL (126 129 413) (**Lithium Australia**)for all of the fully paid ordinary shares in the capital of Lepidico (**Offer**).

This Third Supplementary Target's Statement was lodged with ASIC on 2 May 2017. Neither ASIC nor any of its officers takes any responsibility for the contents of this Third Supplementary Target's Statement.

This Third Supplementary Target's Statement must be read together with the Original Target's Statement and the First and Second Supplementary Target's Statements. If there is a conflict between the Original Target's Statement, the First and Second Supplementary Target's Statements and this Third Supplementary Target's Statement, this Third Supplementary Target's Statement will prevail. Unless the context otherwise requires, terms defined in the Original Target's Statement and the First and Second Supplementary Target's Statements have the same meaning in this Third Supplementary Target's Statement.

Please consult your legal, financial or other professional adviser if you do not fully understand the contents of this Third Supplementary Target's Statement. A copy of this Third Supplementary Target's Statement will be available on the Company's website (www.lepidico.com).

2. INDEPENDENT EXPERT'S REPORT CONFIRMS HYDROFLUORIC ACID (HF) MUST BE INVOLVED IN LITHIUM AUSTRALIA'S SILEACH™ PROCESS, CASTING DOUBT ON ITS ABILITY TO BE COMMERCIALISED

Further to its letter to Shareholders dated 10 March 2017 (released on the ASX announcements platform with the title "Letter to Shareholders – What reagent suite does Lithium Australia use in its Sileach™ process?"), Lepidico continues to have concerns about the level and accuracy of disclosures made by Lithium Australia in relation to the Sileach™ technology which it has repeatedly stated is crucial to the future success of Lithium Australia.

In particular, Lepidico is concerned that:

- Lithium Australia's public statement that "Sileach™ does not use hydrofluoric acid" (ASX announcement dated 13 March 2017, titled "Lithium Australia responds to LPD statements made on 1 and 10 March 2017") is, in the absence of further clarification, misleading and deceptive, or likely to mislead or deceive, and requires corrective disclosure;

- Lithium Australia has provided inadequate disclosure of the reagents and intermediate products generated in the Sileach™ process. The Sileach™ flowsheet has the annotation "reagents/catalyst". Lithium Australia has admitted that a fluoride mineral is added but this is just one reagent, not plural, with sulphuric acid shown as a separate input. Further, a catalyst in a slurry system is virtually unheard of. Lithium Australia needs to disclose any other chemicals and catalysts that are being used in the Sileach™ process;
- Lithium Australia has provided inadequate disclosure on progress with advancing the SileachTM process. No update on the "mechanical and materials handling issues" experienced in pilot testing in early February 2017 were provided in its March 2017 quarterly report. Further, results from the engineering study that Lithium Australia commissioned with CPC Engineering (announced in December 2016) were stated as being due in April 2017, however, no update has been provided on this key activity; and
- by reason of the above matters, investors have not been permitted to make a fully informed assessment about the possible hazards of the SileachTM process and, in turn, its potential for commercialisation. This lack of communication with the market raises significant concerns about the future potential of Lithium Australia.

Independent Expert's Report supports Lepidico's concerns

Lepidico has commissioned an independent report (see Annexure A of this Third Supplementary Target's Statement) from experienced geochemist Dr Chris Cuff, former Dean of Science at James Cook University and currently Director and Principal Scientist at C&R Consulting (Geochemical and Hydrobiological Solutions) Pty Ltd.

Based on the statement by Lithium Australia's Managing Director Adrian Griffin in the abstract to his paper (titled "HYDROMETALLURGICAL PROCESSES FOR THE RECOVERY OF LITHIUM FROM SILICATES") to be presented to the ALTA 2017 Conference that the SileachTM process involves the "addition of ground fluoride minerals… prior to the addition of sulphuric acid", Dr Cuff has concluded that:

- the addition of fluoride in mineral form, together with sulphuric acid, necessarily produces hydrofluoric acid during the processing of spodumene;
- although the hydrofluoric acid will be at least partly consumed by reactions with silicates from the spodumene, it will not be entirely consumed unless there is a precise internal balance of pressure, temperature and composition within the system;
- even if it were possible for this precise internal balance to be achieved, Lithium Australia has confirmed (ASX Announcement 13 March 2017) that "the main fluorine product produced is hexafluorosilicic acid", which in Dr Cuff's view will dissociate to produce, amongst other things, a significant concentration of hydrofluoric acid.

Lepidico understands from Dr Cuff's report that, contrary to Lithium Australia's public statements, the generation of hydrofluoric acid is both an integral part of the SileachTM process as applied to spodumene and a necessary by-product of certain reactions.

Lepidico invites Lithium Australia to correct the record and in particular the statement made in its ASX announcement dated 13 March 2017 that "Sileach™ does not use hydrofluoric acid".

In addition, Lepidico continues to note that none of Lithium Australia's announcements to the ASX have disclosed all the reagents used in the Sileach™ process. Since Lepidico published its letter to shareholders dated 10 March 2017, Lepidico has reviewed the abstract of a paper to be presented to ALTA later this month by Lithium Australia's Managing Director Adrian Griffin in which Mr Griffin has stated:

> "The halogens can be added to the process slurry in a number of ways however the preferred method is by way of the addition of ground fluoride minerals, to the process slurry, prior to the addition of sulphuric acid."

Lepidico considers this disclosure (that a fluoride mineral is added as part of the feedstock) is a material omission from the materials announced to ASX by Lithium Australia to date and Lepidico has published this statement in order to bring this fact to the attention of investors.

Lepidico repeats its request for Lithium Australia to go further and inform investors of the particular fluoride mineral that is used in the Sileach™ process, which is central to understanding the alleged uniqueness and risk profile of the technology. The fact that the feedstock and certain reagents have been described in the paper to ALTA indicates that disclosure to investors will not prejudice Lithium Australia's intellectual property in the Sileach™ technology. Further, as Lepidico has previously noted, Lithium Australia's patent over the Sileach™ technology means this disclosure can be provided without harming Lithium Australia's exclusive rights to the patented technology.

For these reasons, Lithium Australia has no reasonable basis to withhold material information from shareholders and investors relevant to the nature of, and risks associated with, its Sileach™ technology. Lepidico is of the view that this information should include:

1) the inverse relationship that exists between attempting to suppress the build-up of excess hydrofluoric acid and achieving acceptable process recoveries;

2) occupational health and safety management under continuous operation; and

3) specialist equipment required for containment and management of such hazardous and toxic chemicals. These elements coupled with there being no identified by-products from the Sileach™ process, as well as the relatively poor recoveries of 62% to 73% reported from pilot plant trials lead to concern that this process is neither economically nor practically viable.

Your Directors reiterate their advice that Lepidico Shareholders should in any case **REJECT** the ill-conceived and inadequate Lithium Australia scrip takeover offer, which the Independent Expert BDO has concluded is **neither fair nor reasonable**

---

3. ADDITIONAL DISCLOSURE PROVIDED BY BDO IN SUPPLEMENTARY INDEPENDENT EXPERT'S REPORT

Following a request by ASIC to provide additional information on the basis of its valuation conclusion as outlined in the Independent Expert's Report contained in the Original Target's Statement, BDO Corporate Finance (WA) Pty Ltd (**BDO**) has prepared a Supplementary Independent Expert's Report (see Annexure B of this Third Supplementary Target's Statement).

Importantly, ASIC's request in no way affects BDO's conclusion, nor your Directors conviction, that Lithium Australia's Offer is **NEITHER FAIR NOR REASONABLE** to Lepidico Shareholders.

4. STATUS OF LITHIUM AUSTRALIA'S TAKEOVER OFFER

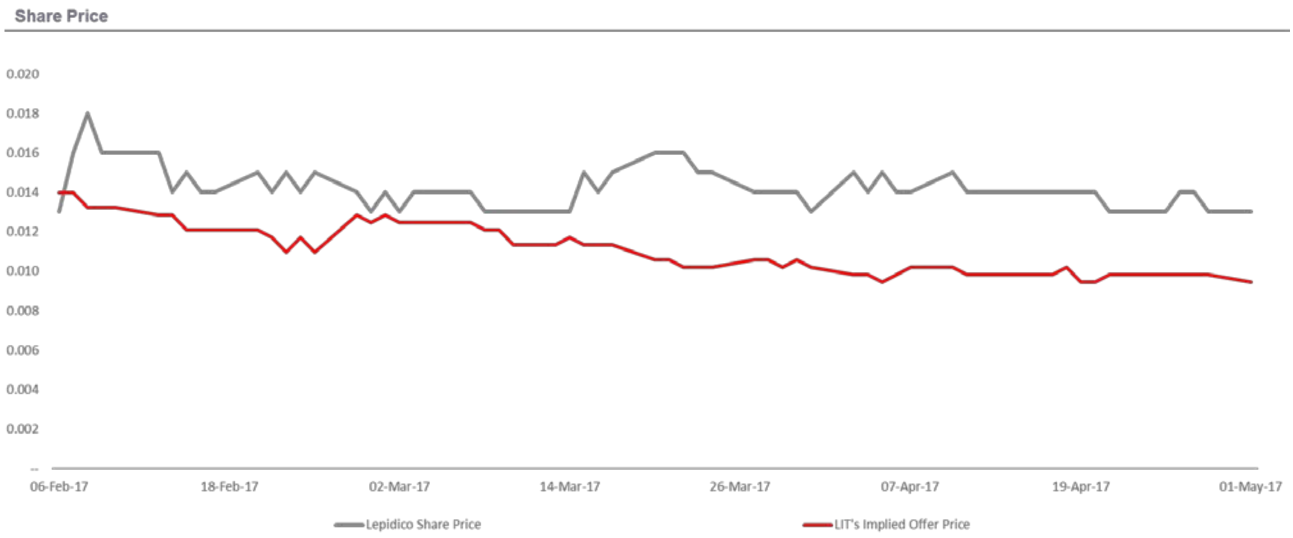
On the basis of the information outlined in the Original Target's Statement, the First and Second Supplementary Target's Statement and this Third Supplementary Target's Statement, your Directors continue to unanimously recommend that Lepidico Shareholders **REJECT** the Lithium Australia takeover Offer.

1. Lithium Australia's takeover Offer for your Lepidico Shares continues to trade at a significant discount to Lepidico's Share price.

As at 1 May 2017, Lithium Australia's closing share price implied an Offer price of only $0.009 per Lepidico Share; Lepidico's closing price of $0.013 per Share represents a 37.8% premium to Lithium Australia's implied Offer price. This is before allowing for an appropriate premium for control to apply to a takeover offer for your Company which BDO, the Independent Expert, assessed to be between 30% and 40%.

Furthermore, as noted previously, since 7 February 2017, the day after Lithium Australia announced its intention to make a takeover offer for your Company, Lepidico's Shares have consistently traded above the implied Offer price. This trend continues (see Figure 1 below) and again reinforces the highly opportunistic nature and inadequacy of the Lithium Australia Offer.

Figure 1: Lepidico's Share Price Performance vs. LIT's Implied Offer Price (Source: CapIQ)



Accordingly, your Directors are steadfast in their opinion that the Offer is **NEITHER FAIR NOR REASONABLE**, as confirmed by BDO, the Independent Expert, and unanimously recommend that Lepidico Shareholders **REJECT** Lithium Australia's ill-conceived and inadequate Offer.

If you have any questions regarding the Offer, please call Lepidico's information line on 1300 048 130 for callers within Australia or on +61 3 9415 4656 for callers outside Australia, or your professional financial adviser.

2. Lithium Australia's takeover Offer has received minimal acceptances

As at the date of its most recent shareholder notice on 21 April 2017, Lithium Australia had only received acceptances under its takeover Offer for 9,329,626 Lepidico Shares in addition to the pre-bid acceptances.

Taking into account the results of Lepidico's pro-rata Entitlement Offer to Shareholders but before taking into account the results of the Shortfall Offer, which is ongoing, Lithium Australia's shareholding represents only 16.10% of Lepidico's share capital. Strategic Metallurgy Pty Ltd has a relevant interest in 17.58% of Lepidico.

3. Lithium Australia's takeover Offer for Lepidico has stalled

Lithium Australia's takeover Offer is scheduled to close at midnight (AWST) on Friday, 5 May 2017. The level of acceptances since the Offer was extended on 18 April has stalled.

Given the extremely low level of acceptances to date, Lithium Australia's board should close the takeover Offer and allow both companies to continue with their respective businesses independently.

Lepidico's management has a clear strategy for the Company that is supported by our Shareholders - as demonstrated by the success of the recent Entitlement Offer and the failure of Lithium Australia's takeover Offer – and will deliver value over time.

5. INFORMATION IN RELATION TO THE TARGET

Since the lodgement of the Second Supplementary Target's Statement, Lepidico has released to ASX the following announcements.

11 April 2017	Q&A with Managing Director
18 April 2017	Entitlement Offer Closes
20 April 2017	Entitlement Offer – Share Allotment and Appendix 3B
28 April 2017	Quarterly Activities and Cashflow Report

6. CONSENTS

C&R Consulting (Geochemical and Hydrobiological Solutions) Pty Ltd (**C&R Consulting**) has given, and has not withdrawn before the lodgement of this Third Supplementary Target's Statement with ASIC, its written consent to be named in this Third Supplementary Target's Statement in the form and context in which it is so named and to the inclusion of the Independent Report contained in Annexure A of this Third Supplementary Target's Statement.

BDO has given, and has not withdrawn before the lodgement of this Third Supplementary Target's Statement with ASIC, its written consent to be named in this Third Supplementary Target's Statement in the form and context in which it is so named and to the inclusion of the Supplementary Independent Expert's Report contained in Annexure B of this Third Supplementary Target's Statement.

R.W. Nice & Assoc. Pty Ltd has given, and has not withdrawn before the lodgement of this Third Supplementary Target's Statement with ASIC, its written consent to be named in this Third Supplementary Target's Statement in the form and context in which it is so named and to the inclusion of the Supplementary Independent Technical Specialist Report accompanying the Supplementary Independent Expert's Report contained in Annexure B of this Third Supplementary Target's Statement.

7. DIRECTOR'S AUTHORISATION

This Third Supplementary Target's Statement has been approved by a resolution passed by the Directors of Lepidico Ltd.

Signed for and on behalf of
Lepidico Ltd
Gary Johnson
Non-Executive Chairman

ANNEXURE A

Independent Report

Dr Chris Cuff, Director and Principal Scientist at C&R Consulting (Geochemical and Hydrobiological Solutions) Pty Ltd

C&R CONSULTING
Geochemical & Hydrobiological Solutions Pty Ltd
ABN 72 077 518 784

Underground Coal Gasification / Coal Seam Gas Investigations
Mineralogical, Geological, Petrographic and Soils Services
Hydrogeomorphic and Palaeogeomorphic Evaluations
Terrestrial and Aquatic Fauna and Flora Surveys
Climate History and Extreme Events Analysis
Contaminated Site and Mine Water Analysis
Environmental Compliance and Monitoring
Estuarine and Marine Water Assessments
Surface and Groundwater Investigations

PO Box 1777
Thuringowa, Qld, 4817, AUSTRALIA

Tel: +61 (0) 7 4725 3751
Mob: +61 (0) 417 635 032

info@candrconsulting.com.au
www.candrconsulting.com.au

LEPIDICO LIMITED (LPD)

INDEPENDENT EXPERT REPORT RELATING TO THE PROCESSING OF LITHIUM (Li) BEARING SILICATE MINERALS (SPODUMENE).

Date: 26TH APRIL 2017

INITIAL STATEMENT

This report was prepared by Dr Christopher Cuff who is entirely responsible for the scientific content. Review and editing, where appropriate, was undertaken by Dr Cecily Rasmussen in conjunction with Dr Cuff.

Dr Cuff is a chemical mineralogist with a PhD from Imperial College, London. The basis of the PhD involved crystallography, geochemistry, and aqueous fluid/sediment interactions. His initial Honours Degree was at the University of Leeds where, through their Institute of African Geology, he was exposed to the pegmatite mineralogy of South West Africa (Namibia).

His initial employment was at the U.K. Ministry of Environment and Energy where his role was to provide high level scientific advice to the Ministerial Advisory Group. In 1971 he was appointed Lecturer in Geochemistry and Mineralogy at James Cook University, Townsville. For the years 1989 to 1994 he was Dean of the Faculty of Science. From 1993 to early 1998 he was Director of the National Key Centre in Economic Geology at James Cook University.

Since 1998 Dr Cuff has acted as a consultant through C&R Consulting (of which he is a Director). In this role he has undertaken numerous commissions for the mining industry. His expertise in fluid/rock reactions led to his appointment on the Independent Scientific Panel of the Queensland Cabinet charged with investigating the role that Underground Coal Gasification could play in meeting the energy requirements of Queensland.

Dr Cuff has undertaken numerous Expert Witness commissions including the “Dart Inquiry” in Scotland relating to a Coal Bed Methane development near Stirling. He is familiar with the roles and responsibilities of Expert Witnesses as documented in “Expert Evidence Practice Note (GPN–EXPT), Federal Court of Australia, 25th October 2016.

Dr Cuff’s CV is attached as Appendix 1.

EXECUTIVE SUMMARY

Hydrofluoric acid must be involved in the SiLeach^{TM} process, although not necessarily by direct addition. Hydrofluoric acid ($HF_{(AQ)}$) is generated by the action of the sulphuric acid on the fluorite, assumed to be added in the processing of spodumene).

The ratios of hydrofluoric acid ($HF_{(AQ)}$) to hexafluorosilicic acid (H_2 Si F_6) will be dependent on the exact stoichiometries (i.e. the relationship between the relative quantities of substances taking part in the reaction or forming the compound) of the input material and the PTX pathways (atmospheric pressure [P], temperature [T], and the precise proportions of spodumene, sulphuric acid and fluorite added [X]) of the reactions occurring during the SiLeach^{TM} process. The probability of HF species always being present is considered to be >90%.

Finally, it should also be noted that significant concentrations of hydrofluoric acid must be maintained with the hexafluorosilicic acid to maintain its stability and prevent dissociation and hydrolysis of the H_2 Si F_6.

Note: In the context of this report, dissociation means breakdown in solution into component parts. Hydrolysis means reactions with water. Specifically in the current opinion, it means that hexafluorosilicic acid will partially dissociate (break down) to HF, and there must be a significant concentration of HF in the solution to maintain the stability of the hexafluorosilicic acid.

IMPORTANT NOTE

No part of this document may be reproduced without written permission from the Clients and C&R Consulting Pty Ltd. If this report is to form part of a larger study, or is a response to a "Request for Additional Information" from a Compliance Agency, this report must be included as an Appendix within the full report without any additions, deletions or amendments.

C&R Consulting Pty Ltd do not accept any responsibility in relation to any financial and/or business decisions made for any other property or development other than that for which this information has been provided.

Christopher Cuff

Dr Chris Cuff
Director
C&R Consulting
Geochemical and Hydrobiological
Solutions Pty Ltd

Date: 26TH April 2017

Cecily Rasmussen

Dr Cecily Rasmussen
Director
C&R Consulting
Geochemical and Hydrobiological
Solutions Pty Ltd

Date: 26th April 2017

IMPORTANT INFORMATION

1. This report is prepared and written in the context of the proposals stated in the introduction to this report and its contents should not be used out of context. Further, new information, developing practices, and changes in legislation may necessitate revised interpretation of the report after its original submission.
2. The copyright in the written materials shall remain the property of C&R Consulting but with a royalty-free perpetual licence to the client deemed to be granted on payment in full to C&R Consulting by the client of all outstanding amounts.
3. Where data have been supplied by the client or other sources, including data from previous investigations, it has been assumed that the information is correct, but no warranty is given to that effect. While reasonable care and skill has been applied in review of these data, no responsibility can be accepted by C&R Consulting for inaccuracies in the data supplied.
4. This report contains only available factual data obtained for the site/s from the sources described in the text. These data were related to the site/s on the basis of the location information made available to C&R Consulting by the client.
5. The assessment of the site/s is based on information supplied by the client, and on-site inspections by C&R Consulting.
6. The report reflects both the information provided to C&R Consulting in documents made available for review and the results of observations and consultations by C&R Consulting staff.

SUMMARY OF RELEVANT INFORMATION

Project Title	Expert Witness Evaluation: Lithium Minerals
Property Location	NA
Property Description	NA
Project Purpose	Evaluation of Lithium Production
Project Number	17047
Client Details	
Client	Lepidico Limited (LPD)
Nominated Representative	Mr Digby Robinson
Title/Position	Principal
Company	Williams+Hughes Commercial and Litigation Lawyers Perth
Postal Address	Ground Floor, 25 Richardson Street West Perth Western Australia 6005
Telephone	08 9481 2040
Email	digby.robinson@whlaw.com.au

DOCUMENT CONTROL

Version	Compiled by	Date issued	Reviewer(s)	Date Returned
Internal Review	CC	26/04/17	CER	26/04/17
Client Draft		27/04/17		01/05/17
FINAL	CC	01/05/17	CER	

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF APPENDICES

1. INTRODUCTION

Dr Christopher Cuff of C&R Consulting was commissioned by Williams+Hughes, acting on behalf of Lepidico Limited (LPD), to prepare an independent expert report relating to certain matters in dispute between LPD and Lithium Australia Limited (LIT) regarding the details of the processing of lithium (Li) bearing silicate minerals, principally spodumene ($Li\ Al\ Si_2\ O_6$)

This report considers questions listed in the Scope of Works provided by Williams+Hughes on 18th April and offers expert opinions on the matters raised within that Scope of works.

2. SCOPE OF WORKS

The Scope of Works provided by Williams+Hughes, Commercial and Litigation Lawyers, Perth, on 18th April 2017 was designed to provide specific advice and opinions on the processing of the non–strcturally layered lithium silicate mineral, spodumene, a single chain inosilicate pyroxene in which two apical oxygens of the alumina–silicate tetrahedron are shared with adjacent tetrahedral in the form of a single chain. The base formula unit is $(Al,Si)O_3$ or $(Al,Si)_2O_6$.

The letter of instruction relevant to this commission is attached as Appendix 1.

The Scope of Works requested whether:

- Lithium Australia (LIT) is using hydrofluoric acid in the SiLeach^{TM} process as applied to the extraction of lithium (Li) from spodumene.
- Lithium can be extracted from spodumene in the manner outlined by LIT without hydrofluoric acid being involved in, or generated as part of, the reactions in some way.
- If hydrofluoric acid is generated, but consumed by reactions with silicates, it is likely that an excess of hydrofluoric acid will remain after all silicates are consumed.
- If it is assumed that the main fluorine product produced is hexafluorosilicic acid, to what extent will the hexafluorosilicic acid decompose into hydrofluoric acid.

These matters arise from two statements made by LIT to the ASX on or about the 13th March 2017 that:

- “Lithium Australia advises that SiLeach^{TM} does not use hydrofluoric acid.”, and
- “The main fluorine product produced is hexafluorosilicic acid”.

3. OPENING STATEMENTS AND DEFINITIONS

3.1 OPENING STATEMENTS

- It is understood that LIT used spodumene in their lithium extraction processes. According to an abstract to ALTA, Perth, Australia, 2017, Adrian Griffin (Lithium Australia) stated (*inter alia*):
  - *"The SiLeach^{TM} process which relies on the reaction of halogens with Si=O bonds …."* (paragraph 1). And,
  - *"The halogens can be added in a number of ways. However, the preferred method is by way of the addition of ground fluoride mineral prior to the addition of sulphuric acid. Due to the kinetics of the competing reactions, this sequence allows the momentary generation of F^- in solution and its almost instantaneous reaction with the silicate without any accumulation of HF in the slurry."* (paragraph 2).
- In the absence of precise certified chemical analyses of the actual feedstock materials, it has been necessary to source generalised chemical compositions from the open literature.
- As a primary source, information used included:
  - Deer, Howie and Zussman: *the Rock Forming Minerals.* (Various editions published by the Mineralogical Society of London).
  - Other literature sources are noted within this report.

3.2 DEFINITIONS

The basis of all silicate structures is the Al,Si)$O_4^{(4/5-)}$ aluminosilicate tetrahedron which ma be linked by the sharing of apical oxygens with adjacent tetrahedral, and through cations ($^+$ve) to neutralise the negative charge on the tetrahedron.

Spodumene is a single chain monoclinic inosilicate pyroxene in which two apical oxygens of the alumina-silicate tetrahedron are shred with adjacent tetrahedral in the form of a single chain. The base formula unit is $(Al,Si)O_3$ or $(Al,Si)_2O_6$.

Spodumene (Li,Al $[Si_2O_6]$) usually exhibits very little chemical variation from the ideal formula. No fluorine should be present in the structure.

Lepidolite-type and zinnwaldite-type silicates are phyllo (leaf) silicates in which three of the apical oxygens are shared in a planar (sheet) with one apical oxygen unshared. The base formula unit is $(Al,Si)\ _2O_5$ or multiples thereof. These are not considered here.

The spodumene used in this investigation for reaction purposes was a wine yellow spodumene from a Swedish pegmatite and is given in Deer, Howie and Zussman (various editions). The analysis used is:

SiO_2	64.89 wt/%

Al_2O_3	26.74 wt/%
Fe_2O_3	0.57 wt/%
FeO	0.04 wt/%
MnO	0.01 wt/%
Na_2O	0.05 wt/%
K_2O	0.16 wt/%
Li_2O	7.12 wt/%

Note: wt/% = weight percent

This may be translated into the structural formula used in all modelling procedures:

$$(Na_{0.002}\,K_{0.006}\left\{\begin{array}{l} Li_{0.907} \\ \quad \text{OR (dependent on methodology),} \\ Li_{0.953} \end{array}\right\}(Fe_{0.015}\,Mn_{0.0003}\,Al_{0.094})\,Si_{2.03}O_6$$

As stated above, in the absence of precise certified chemical analyses, this investigation has assumed that the “ground fluoride mineral” added in the SiLeach^{TM} process is fluorite (fluorspar, i.e. CaF_2), the most common, economic source of fluoride that is likely to be available to a commercial process. Naturally occurring fluorite may exhibit a broad compositional range, but commercially available fluorite may be reasonably approximated by the stoichiometric formula CaF_2.

It should be noted that the production of “lithia” (Li_2O) using “fluorspar, sulphuric acid and petalite ($Li,Al\ Si_4O_{10}$) or spodumene ($Li,Al\ Si_2O_6$) was mentioned by Silliman in 1830 (Silliman 1830) as having been achieved earlier by Berzelius (Berzelius 1827).

3.2.1 HYDROFLUORIC ACID (HF)

HF is a solution of hydrogen fluoride in water. It is considered a weak acid because of its lower dissociation constant compared to the strong acids (i.e. it does not fully ionize in dilute aqueous solutions). The reaction of HF in water may be represented as (Greenwood *et al* 1984):

$$HF + H_2O \rightleftharpoons H_3O^+ + F^-$$

In this document HF represents hydrofluoric acid in general and HF^0 and $HF_{(AQ)}$ fiddolbrf, unfiddovisyrf HF in water with the superscript “^{0}” representing a dissolved species of zero charge and the subscript “$_{(AQ)}$” representing an uncharged aqueous solution species. HF^0 and $HF_{(AQ)}$ may be used interchangeably

Hydrofluoric acid is simply produced by the treatment of the mineral fluorite with concentrated sulphuric acid according to the reaction:

$$CaF_2 + H_2SO_4 \rightarrow 2HF + CaSO_4$$

Thus, if CaF_2 is reacted with concentrated sulphuric acid, as potentially in the SiLeach^{TM} process, if the mineral added is fluorite, then hydrofluoric acid is a usual product. Hydrofluoric acid is highly corrosive and interacts initially with the silicate material and then with ore formed according to the reaction:

$$2Si\,F_{4(GAS)} + 2H_2O_{(LIQUID)} \rightarrow SiO_{2(SOLID)} + 2HF_{(AQ)} + H_2\,Si\,F_{6(AQ)}$$

Source: www.essentialchemicalindustry.org/chemicals/hydrogen-fluoride.html)

Consequently, a possible bi–product of the fluorosilicic acid itself is equivalent to $HF_{(AQ)}$ (i.e. hydrofluoric acid).

3.2.2 HEXAFLUOROSILICIC ACID ($H_2\,Si\,F_6$):

As indicated above many industrial processes for the manufacture of hydrofluoric acid are based on the action of sulphuric acid on fluorite producing hydrogen fluoride gas (Ullmann Encyclopedia of Industrial Chemistry, 2003). Hexafluorosilicic acid, as according to the last equation above, is one of the common end products resulting from the action of HF on silicate containing material via reactions of the type:

$$SiO_2 + 4HF \rightarrow Si\,F_{4(GAS)} + 2H_2O\text{, and}$$

$$SiO_2 + 6HF \rightarrow H_2\,Si\,F_{6(AQ)} + 2H_2O$$

Source: Greenwood and Earnshaw 1984).

The concentrated solution of hexafluorosilicic acid thus produced generally contains a significant concentration of $HF_{(AQ)}$ (i.e. hydrofluoric acid) to prevent the dissociation and hydrolysis of the $H_2\,Si\,F_{6.}$

(source: www.chemicalbook.com/chemicalProductProperty_EN_CB3726895,html Hexafluorosilicic Acid CAS No:16961–83–4)

Therefore, it is very likely (at least 90% probability) that any process producing hexafluorosilicic acid will produce hydrofluoric acid (HF_{AQ}). The amounts produced will be dependent on the precise compositions of the input reactants, the precise amounts of the reactants used, and the exact stoichiometrics of the reactions occurring during the lithium extraction process.

In a statement to the ASX (13th March 2017) LIT stated:

> *"… and has monitored for HF and confirmed that negligible concentrations of HF are present during the processing".*

The veracity of this statement is doubtful on the basis of the definition of HF and $H_2Si\,F_6$ and how they are produced in the relevant industrial processes.

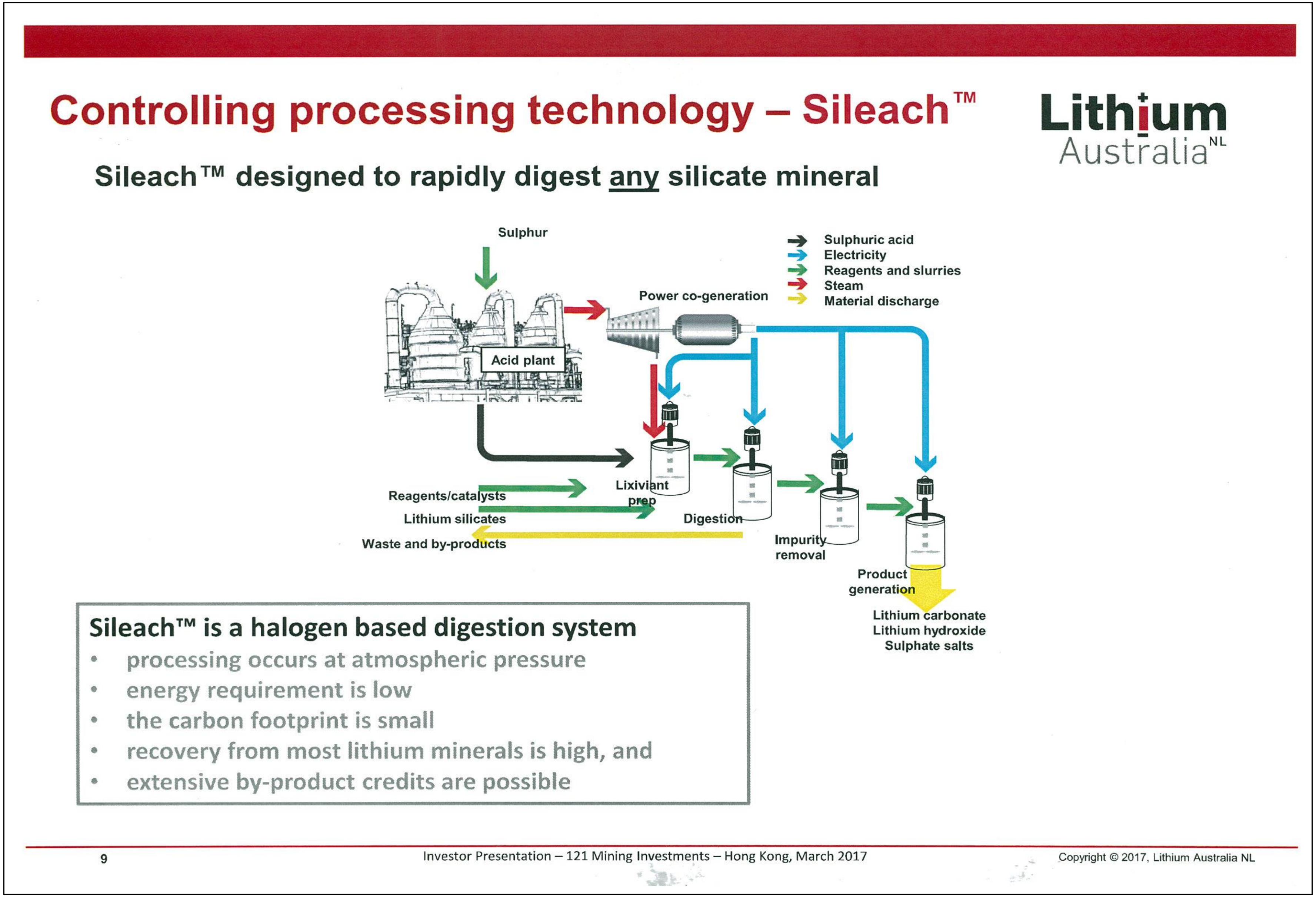
4. THE PROCESS USED BY LIT

4.1 INTRODUCTION

The SiLeach^{TM} process of Lithium Australia uses concentrated acids during the extraction of lithium from lithium ores without the need for an expensive roasting step (i.e. Lithium Australia statement to ASX, 13th March 2017).

4.2 THE LIT SILEACH^{TM} TECHNOLOGY

The SiLeach^{TM} process of Lithium Australia is designed for the recovery of lithium from silicates. The process has been tested on both lepidolite and spodumene feed materials by ANSTO Minerals (a division of the Australian Nuclear Science and Technology Organisation). Unlike other acid leach methods where spodumene is unreactive, in the SiLeach^{TM} process micaceous minerals and spodumene are reduced to a common extraction curve of up to 90% recovery (Lithium Australia Investor presentation 2017). All processing occurs at atmospheric pressure (refer Figure 1). Information on SiLeach^{TM} is based on primary information provided by Williams+Hughes and secondary material referenced in (a) References, and (b) Additional Consulted Material.



Controlling processing technology – Sileach™

Lithium Australia NL

Sileach™ designed to rapidly digest any silicate mineral

Sileach™ is a halogen based digestion system

- processing occurs at atmospheric pressure
- energy requirement is low
- the carbon footprint is small
- recovery from most lithium minerals is high, and
- extensive by-product credits are possible

9 Investor Presentation – 121 Mining Investments – Hong Kong, March 2017

Copyright © 2017, Lithium Australia NL

Figure 2: Schematic Representation of the SiLeachTM Process (Source: SiLeachTM Investor Presentation - 121 Mining Investments - Hong Kong, March 2017).

5. REACTIONS

Using the Swedish pegmatitic spodumene (refer Section B2.2) as a starting composition, schematic process equations, without attempting balance, may be developed for the reactions occurring during the SiLeach^{TM} process. In this representation a stoichiometric proportion of 0.907 Li is assumed for the input spodumene (refer Section B2.2)..

$(Na_{0.002}\ K_{0.006}\ Li_{0.907})\ (Fe_{0.015}\ Mn_{0.0003}\ Al_{0.984})\ Si_{2.03}O_6 + H^+$ (from sulphuric acid, i.e. dissolution)

$\longrightarrow$

$0.002Na^+ + 0.006K^+ + 0.907Li^+ + 0.015Fe^{3+} + <0.0003Mn^{3+} + 0.984Al^{3+}$ (mainly as complexes) + $2.03Si^{4+}$ + (mainly as complexes) + H^+ (from sulphuric acid) + SO_4^{2-} (from sulphuric acid) + CaF_2

$\longrightarrow$

$2HF + CaSO_4$

AND $HF + H_2O \rightarrow H_3O^+ + F^-$

AND Si^{4+} (as aq complexes) + $4HF \rightarrow SiF_{4(GAS)} + 2H_2O$

AND Si^{4+} (as aq complexes) + $6HF \rightarrow H_2Si\ F_{6(AQ)} + 2H_2O$

These reaction pathways are complex and their extents and kinetics will be dependent upon the PTX conditions under which the process is carried out where:

- atmospheric pressure (P),
- temperature (T), and
- the precise proportions of spodumene, sulphuric acid and fluorite added (X), (i.e. compositions are the variables in the system).

The above details were not made available to enable refinement of the reaction pathway to be carried out. However, as can be seen in the above equations, HF (hydrofluoric acid) is involved in the SiLeach^{TM} process as a reaction intermediary and/or product. The extent to which it is a product is dependent upon the PTX factors indicated. However, as stated in Section B2.2.2, *Hydrofluorosilicic Acid*, any concentrated solution of $H_2\ Si\ F_6$ produced needs to contain a significant concentration $HF_{(AQ)}$ to prevent the dissociation and hydrolysis of the $H_2\ Si\ F_6$.

6. MODELLING

6.1 INTRODUCTION

To assist in the definition of the chemical processes occurring during the SiLeach^{TM} process, preliminary speciation and reaction modelling was undertaken to define (a) the range of HF-type and SiF-type complexes that may form during the reactions and (b) an indication of their relative proportions. This modelling had to be carried out without specific compositions or proportions of the input feedstock (spodumene + sulphuric acid + fluorite) and consequently the findings must be regarded as indicative only, and not definitive. The model runs were:

(i) Spodumene + sulphuric acid only;

(ii) Fluorite + sulphuric acid only;

(iii) Spodumene + fluorite + a “dilute” sulphuric acid;

(iv) Spodumene + fluorite + a “strong” sulphuric acid.

Modelling was undertaken using the geochemical modelling package, GeoChemists Workbench Professional in SpecE8 (an equilibrium chemical speciation programme) and React (a kinetic/reaction modelling programmed) modes. These models were run using various combinations of pH, initial fluid concentrations, and reaction mixtures, at 25°C. Preliminary modelling was conducted to assess the action of sulphuric acid on zinnwaldite and lepidolite with a starting assumption that the dissolution reaction was congruent (i.e. the solid dissolved stoichiometrically without the production of a second solid). Modelling was also conducted on the reactions of spodumene and sulphuric acid with the addition of a ground fluoride mineral, assumed to be fluorite. Dissolution was assumed to be congruent. The same geochemical modelling packages were used for spodumene reactions.

6.2 MODELLING INVOLVING SPODUMENE AND FLUORITE

Starting fluid composition:

The starting fluid composition was consistent with congruent dissolution of the Swedish pegmatitic, spodumene. The fluid compositions used were various integer concentrations of the following proportions:

SiO_2	64.89 mg/kg of aqueous fluid
Al	14.15 mg/kg of aqueous fluid
Fe	0.46 mg/kg of aqueous fluid
Mn	0.008 mg/kg of aqueous fluid
Na	0.037 mg/kg of aqueous fluid
K	0.133 mg/kg of aqueous fluid
Li	3.307 mg/kg of aqueous fluid

H^+	2.016 mg/kg of aqueous fluid
SO_4^{2-}	96.08 mg/kg of aqueous fluid

Concentrations:

Concentrations of x10 and x100 were also used. In all cases the amounts of spodumene and fluorite used were one gram formula weight. This equates to:

For spodumene: Li Al $Si_2 \rightarrow$186.098 grams, and

For fluorite: $CaF_2 \rightarrow$ 78.08 grams.

6.2.1 REACTIONS IN VOLVING ONLY SPODUMENE (Li Al Si_2O_6)

There is no fluorine present in the parent mineral (Li Al Si_2O_6). Consequently, no fluorine species are initially present as a result of reaction. Dominant species are H^+, SO_4^{2-}, HSO_4^-, $SiO_{2(AQ)}$, Li^+ and aluminium sulphate species. After final reaction, all 186.098 grams of spodumene have reacted. Diaspore [Al O(OH)], hematite (Fe_2O_3), petalite (Li Al si_4 O_{10}), pyrolusite (Mn O_2) and spodumene (Li, Al, Si_2 O_6) are saturated in the system and quartz (SiO_2) just undersaturated. The dissolved species H Si O_3^- and H Si O_4^{2-} are now at major levels.

6.2.2 REACTIONS INOLVING ONLY FLUORITE (CaF_2)

Fluorite (CaF_2) is the parent mineral and as would be expected, fluoride is present in the system. H^+, SO_4^{2-}, HSO_4^- $SiO_{2(AQ)}$, Li and aluminium sulphate species are initially present from the reacting fluid. It should also be noted that even at the initial stages of reaction modelling, there are minor to very minor levels of hydrogen fluoride species (HF_{AQ}, $H_2F_2^o$ and HF_2^-) and trace levels of SiF_6^{2-} species present in the reacting fluid. Additionally, it should also be noted that the concentration of HF_{AQ} in the solution is (according to the model) approximately ten times (x10) that of the free F^- ion.

After final reaction, all 78.08 grams of fluorite have reacted bit it still remains saturated in the fluid. Quartz is also saturated in the system. Major species in the fluid are now H^+ SO_4^{2-}, HSO_4^-, HF, Ca^{2+}, Li, $CaSO_4^o$, AlF_3^o, dissolved O_2, AlF_3^+, F^-, $SiO_{2(AQ)}$ and AlF_4^-. Significant levels of $H_2F_2^o$, HF_2^- and SF_6^{2-} are also present with the concentration sequence for these fluoride ionic species being:

$$HF^o > F^- >> H_2F_2^o > Si\,F_6^{2-} > HF_2^-.$$

The ratio of HF^O **:** F^- is, according to the model) approximately x10.

The amount of SiF_2^{2-} will be limited by the level of $SiO_{2(AQ)}$ available from the initial solution as there is no Si in CaF_2. Thus, the ratio of HF^o to SiF_6^{2-} is an artefact of the modelling procedure and is approximately 300.

6.2.3 REACTIONS INOLVING BOTH SPODUMENE AND FLUORITE (DILUTE ACID CASE)

In this case, fluorine from fluorite, and silicon from spodumene are present from the start of the reactions together with the solution species in the initial fluid and a relatively dilute sulphuric acid (pH 2.016). Major dissolved species initially present in the fluid are H^+, SO_4^{2-}, HSO_4^-, $SiO_{2(AQ)}$, $Li^{+,}$ aluminium sulphate species and Al^{3+}.

Even at the initial stages of reaction modelling, the species $HF_{(AQ)}$, $H_2F_2^0$ and HF_2^- are present at minor to very minor levels as are trace levels of SiF_6^{2-}. According to the model, initial levels of $HF_{(AQ)}$ are approximately x10 those of the free F^- ion.

After final reactions, all 78.08 grams of fluorite and 186.098 grams of spodumene have reacted. Minerals now saturated in the system are andradite (a garnet Ca_3 Fe_2 Si_3 O_{12}), diaspore (Al^o OH), fluorite (Ca F_2), gismondine (a zeolite Ca Al_2 Si_2 O_8 $4G_2O$). Petalite (Li Al Si_4 O_{10}), pyrolusite (MnO_2) and spodumene (Li Al Si_2 O_6) are saturated. Quartz (SiO_2) is just undersaturated. Major species in the fluid are now Li^+, F^-, SO_4^{2-}, $LiSO_4^{-}$, $HSiO_4^{2-}$, and $SiO_{2(AQ)}$. Very minor levels of $HF_{(AQ)}$, HF_2^- and $H_2F_2^\circ$ are present as are trace levels of SiF_6^{2-}. The concentration sequence of these fluoride bearing ionic species is:

$F^- >> HF^\circ > HF_2^- > H_2F_2^\circ >> SiF_6^{2+}$.

According to the model, the ratio of HF^- to F^- is reversed and is now $6.920 \times 10^{-10} : 1$ (i.e. the concentration of the HF^- species is very low). This level of siF_6^{2-} is low and is not limited by the abundance of either $SiO_{2(AQ)}$ or F^- in solution. In this model it probably represents the extent of reaction in a dilute acidic system.

6.2.4 REACTIONS INVOLVING BOTH SPODUMENE AND FLUORITE (MORE CONCENTRATED ACID CASE)

As with Section B5.2.3, fluorine from fluorite and silicon from spodumene are present together with the solution species in the initial fluid and a more concentrated (pH 0.000) sulphuric acid. Major dissolved species initially present are similar to those listed in Section B5.2.3 and include H^+, HSO_4^-, SO_4^{2-}, $SiO_{2(AQ)}$, $H_2SO_{4(AQ)}$, Li^+, AL^{3+}, aluminium sulphate species and $LiSO_4^-$. $HF_{(AQ)}$, $H_2F_{2(AQ)}$ and HF_2^- are present at minor to very minor levels. $(SiF_6)^{2-}$ is present at trace levels. According to the model, the concentration sequence for these fluoride bearing ionic species is:

$HF^o >> F^- > H_2F_2^o > HF_2^- >> SiF_6^{2-}$, with the ratio $HF^o : F^-$ $1:9.316 \times 10^{-4}$.

This is a significant increase compared to the dilute acid initial reaction case, and a reverse compared to the dilute acid final reaction case.

After final reaction, all 78.08 grams of fluorite and 186.098 grams of spodumene have reacted. Minerals now saturated in the system are diaspore (AlO DH), fluorite (CaF_2)m gypsum ($CaSO_4 \cdot 2H_2O$ – anhydrite, $CaSO_4$ is just undersaturated), nontronite – Ca [a calcic smectite / montmorillonite) typically $Ca_{0.5}$ $(Si_2Al_{0.8}Fe_{0.2})$ $(Fe_{3,5}\ Al_{0.4}\ Mg_{0.1})\ O_{20}\ (OH)_4]$, pyrolusite ($MnO_2$) and quartz ($SiO_2$). It is also worthy of note that spodumene is still appreciably undersaturated in spite of its dissolution during the reaction. Major species in the fluid are now Li^+, SO_4^{2-}, $AlF_{3(AQ)}$, $LiSO_4^-$, AlF^{2+}, AlF_4^-m $CaSO_{4(AQ)}$, Ca^{2+} AlF^{2+}, F^-, HSO_4^-, $SiO_{2(AQ)}$ and $Al(SO_3)^-$. Levels of $HF_{(AQ)}$, HF_2^- and $H_2F_{2(AQ)}$ are minor as is the level of SiF_6^{2-}.

The concentration sequence of these fluoride bearing ionic species is:

$F^- >> HF^0 > HF_2^- > H_2F_2^{\ 0} > SiF_6^{2-}$

The ratio of HF^{o} to F^{o} is similar in nature to that of the low acidity case and, according to the model, is approximately 1.993×10^{-2} **:** 1,

In the strong acid case, the concentration with respect to the weak acid case, $HF_{(AQ)}$ has increased by approximately 3.65×10^5 times, whereas the concentration of SiF_6 has increased by approximately $6.12 \times 10^{2-0}$. That is, relative to $HF_{(AQ)}$, the concentration of SiF_6^{2-} has increased by 5.96×10^{14} times. This rate of relative incease was achieved with a pH change of 2.016 to 0.00, Since pH is a negative log base 10 scale, this represents an increase in acidity of approximately 100 (10^2) times. The modelling programme used did not permit negative log values as would pertain for the 70% concentrated sulphuric acid used in the SiLeach^{TM} process which would be approximately 12.6 molar and would, therefore, have a negative logarithm. Should the SiF62$^-$ rates of concentration increase relative to HF^{o} as found in the two mode runs (pH 2.016 and pH 0.000 be maintained, and applied to the change from 1 molar (pH0.000) to the 12.6 Molar (pH – 1.097) sulphuric acid used in the SiLeach^{TM} process, then the trends obtained from modelling suggest that the concentration of SiF_6^{2-} in the fluid would be significant, and be closer to those of HF^0.

Hence, there are significant concentrations of both HF^{o}($\equiv HF_{AQ}$) and SiF_6^{2-} in the fluid and not all of the $HF_{(AQ)}$ has been converted to SiF_6^{2} according to the reactions:

$$2Si\ F_{4(GAS)} + 2H_2O_{(LIQUID)} \rightarrow SiO_{2(SOLID)} + 2HF_{(AQ)} + H_2\,Si\,F_{6(AQ)}$$

AND

$$SiO_2 + 6HF_{(AQ)} \rightarrow H_2\,Si\,F_{6(AQ)} + 2H_2O$$

If the stoichiometry of the process is perfectly balanced, then it is possible that all the $HF_{(AQ)}$ will be converted to $H_2\,Si\,F_{6(AQ)}$. However, it must be emphasized that a significant concentration of $HF_{(AQ)}$ must be maintained in a solution of $H_2\,Si\,F_{6(AQ)}$ to prevent dissociation and hydrolysis (refer Section 3.2).

7. CONCLUSIONS. RESPONSES TO QUESTIONS RAISED IN SCOPE OF WORKS

7.1 INTRODUCTION

In making these responses it is emphasised that:

(a) Certain assumptions have had to be made relating to the feedstock into the SiLeach^{TM} process relating to the use of fluorite and the initial compositions of the mineral used (spodumene).

(b) In the absence of specific compositions of inputs, the results of the modelling are specific to the inputs used. Ideally, the modelling should be re–run using process specific inputs. Using the precise stoichiometries of the inputs it is not unlikely proportions of SiF_6^{2-} relative to $HF_{(AQ)}$ will increase.

7.2 RESPONSE TO WILLIAMS+HUGHES SCOPE OF WORKS, POINTS 9 & 10

Point 9 of the Williams+Hughes Scope of Works requests confirmation from documents attached to the Scope of Works, followed by a list of four sub–points as listed verbatim below.

9. Can you please confirm, from the attached documents, if:

9.1 You consider LIT is using hydrofluoric acid in the SiLeach process as applied to the extraction of lithium from spodumene.

9.2 It is possible to extract lithium from spodumene in the manner outlined by LIT without hydrofluoric acid being involved in or generated as part of the reactions in some way?

9.3 If hydrofluoric acid is generated but consumed by reactions with silicates, is it likely that an excess quantity of hydrofluoric acid will remain after all silicates are consumed?

9.4 Assuming the main fluorine product produced is hexafluorosilicic acid, to what extent will hexafluorosilicic acid decompose into hydrofluoric acid?

Point 10 of the Williams+Hughes Scope of Works requests that reasoning be provided for the conclusions, and that the author should also "*ensure that if it is necessary for you to rely on any scientific writings or other literature in support of your conclusions that you identify those sources in your report*". All literature searched, including documentation provided by Williams+Hughes, is listed as "Additional Literature Consulted" in this report.

For the convenience of the reader, each sub–point of Point 9 listed in the Williams+Hughes Scope of Works is listed individually for consideration. The response to the sub–point is placed immediately below the sub–point under consideration.

Again, for the convenience of the reader, the justification of the response (Point 10 of the Williams+Hughes Scope of Works) is included in the response.

9.1 (Do) *You consider LIT is using hydrofluoric acid in the SiLeach process as applied to the extraction of lithium from spodumene.*

Response to 9.1:

From the material presented in Sections B2 to B5 it is concluded that, if fluorite is the mineral added to the spodumene and sulphuric acid, then no hydrofluoric acid is **added** during the process.

Hydrofluoric acid is, however, **produced** in the process by the action of sulphuric acid on fluorite:

$CaF_2 + H_2SO_4 \rightarrow 2HF + CaSO_4$ (refer Section 3.2).

where fluorite is part of the spodumene + sulphuric acid + fluorite feedstock

9.2 (Is it) *possible to extract lithium from spodumene in the manner outlined by LIT without hydrofluoric acid being involved in or generated as part of the reactions in some way?*

Response to 9.2:

From the material presented in Sections B2 to B5 it is concluded that if fluorite is the mineral added to the spodumene and sulphuric acid, then hydrofluoric acid is **involved** in, and **generated as** part of numerous reactions occurring during the SiLeach^{TM} process. Schematic representations of these reactions are presented throughout Sections B2 to B5.

9.3 *If hydrofluoric acid is generated but consumed by reactions with silicates, is it likely that an excess quantity of hydrofluoric acid will remain after all silicates are consumed?*

Response to 9.3:

As demonstrated in Sections B2 to B5, hydrofluoric acid is generated and consumed by reactions with silicates. For example, process wise:

$CaF_2 + H_2SO_4 \rightarrow 2HF + CaSO_4$

AND: SiO_2 (from silicate material or fluid) + $6HF \rightarrow H_2Si\ F_{6(AQ)} + 2H_2O$

AND: SiO_2 (from silicate material or fluid) $+4HF \rightarrow SiF_{4(GAS)} + 2H_2O$,

AND: $2Si\ F_{4(GAS)} + 2H_2O_{(LIQUID)}$” $\rightarrow SiO_{2(SOLID)} + 2HF_{(AQ)} + H_2\,Si\ F_{6(AQ)}$

The likelihood of any excess of hydrofluoric acid remaining is entirely dependent upon the Pressure (P), Temperature (T), Composition (X) (i.e. the PTX pathway of the reactions) and the exact stoichiometrics (i.e. compositions) of all the materials used. For there to be no excess hydrofluoric acid remaining, there has to be an overall internal balance. If, as is likely, this balance is not achieved, then it is possible for some hydrofluoric acid to remain. The possibility of any hydrofluoric acid remaining is high (>90%).This, however, is desirable since a significant concentration of hydrofluoric acid is necessary to prevent dissociation and hydrolysis of the $H_2 Si F_6$ solution produced. By its very nature, this hydrolysis will produce HF species.

9.4 *Assuming the main fluorine product produced is hexafluorosilicic acid, to what extent will hexafluorosilicic acid decompose into hydrofluoric acid?*

Response to Point 9.4

As indicated, a reaction:

SiO_2 (from silicate material or fluid) + $6HF \rightarrow H_2Si F_{6(AQ)} + 2H_2O$,

is likely to occur during the process. However, like all reactions, it is reversible:

$$H_2Si\ F_{6(AQ)} + 2H_2O \rightarrow 6HF + SiO_{2(AQ\ OR\ SOLID)}.$$

That is, HF is always a component of this reaction.

These reactions indicate that if a significant concentration of hydrofluoric acid is not present in the hexafluorosilicic acid, then, in order to retain equilibrium, the hexafluorosilicic acid will hydrolyse and dissociate to give hydrofluoric acid and silica species. This is consistent with material presented in Section 3.2. The likelihood of a significant concentration of HF species remaining together with the hexafluorosilicic acid is considered to be >90%

8. CONCLUDING STATEMENT

Hydrofluoric acid must be involved in the SiLeach^{TM} process, but not necessarily by direct addition.

The ratios of hydrofluoric acid ($HF_{(AQ)}$) to hexafluorosilicic acid ($H_2\ Si\ F_6$) will be dependent on the exact stoichiometries of the input material and the PTX pathways of the reactions occurring during the SiLeach^{TM} process. There is a greater than 90% probability that significant concentrations of HF species will remain in the $H_2\ Si\ F_6$ output stream.

Finally, it should also be noted that significant concentrations of hydrofluoric acid must be maintained with the hexafluorosilicic acid to maintain its stability and prevent dissociation and hydrolysis of the $H_2\ Si\ F_6$.

Note: In the context of this report, dissociation means breakdown in solution into component parts. Hydrolysis means reactions with water. Specifically in the current opinion, it means that hexafluorosilicic acid will partially dissociate (break down) to HF, and there must be a significant concentration of HF in the solution to maintain the stability of the hexafluorosilicic acid.

9. REFERENCES

BERZELIUS J.J. (1827): **Manual of Chemistry.** Section III, Lithium.

GREENWOOD N.N., EARNSHAW A. (1984): **Chemistry of the Elemenets.** Oxford Pergamon Press. P.921. ISBN 0–08 022057–6.

LITHIUM AUSTRALIA, (2017): INVESTOR PRESENTATION, 121 Mining Investments, Hong Kong, March 2017.

SILLIMAN b., (1830): **Elements of Chemistry** In **the Order of Lectures Given in the Yale College**. Volume 1, page 257, *"Lithia".* Pbl: Mezekiah House, New Haven, Connecticut.

ULLMANN'S ENCYCLOPEDIA OF INDUSTRIAL CHEMISTRY. (2003): 6th Edition. Vol 1. Wiley–VCH Verlag GMBH & Co.

10. ADDITIONAL MATERIAL CONSULTED

CHINESE PATENT CN 102134644.A. Priority Date 25 Jan 2011: **Novel method for removing fluorine by lithium carbonate prepared by utilizing tantalum-niobium tailing lepidolite:** https://www.google.com/patents/CN102134644A?cl=en

CHINESE PATENT CN 102690961 A: Publication Date 28 Jun 2012: **Method for directly extracting lithium by utilizing low-grade alpha-spodumene as raw material.** http://www.google.sh/patents/CN102690961A?cl=en

FEDERAL COURT OF AUSTRALIA (2017): Expert Evidence Practice Note (GPN–EXPT): General Practice Note.

KRYSENKO G.F., GORDIENKO P. & EPOV D.G. (2009): *Sulphuric Acid Breakdown in the Presence of Silica.* In: **Russian Journal of Inorganic Chemistry.** Vol: 54. Dec. 1876pp. Pub: Springer Link.

LITHIUM AUSTRALIA (2016): ASX ANNOUNCEMENT

MINDAT.ORG (2017): Cleaning fluorite: www.mindat.org/mesg-19-28452.html

QUEENSLAND GOVERNMENT (2010) Queensland GOVERNMENT'S UCG INDUSTRY CONSULTATIVE COMMITTEE. In: **Queensland Government Mining Journal**. Summer 2010.

ROSALES G.D., RUIZ M.C. & RODRIGUEZ M.H. (2016): *Study of the Extraction Kinetics of Lithium by Leaching β–Spodumene with Hydrofluoric Acid.* In: **MINERALS**, Vol:6, p.98

SEDDON D (2016): *Economics: Lithium Production* [online]. In: **Chemistry in Australia**, Issue: Mar 2016. pp34-35. http://search.informit.com.au/documentSummary;dn=816594095340685;res=IELAPA> ISSN: 0314-4240 .

UNITED STATES PATENT US 2296118 A: Priority Date: 8 Apr 1940: **Process of producing hydrofluoric acid low in fluosilicic acid.** Louis Preisman.

UNITED STATES PATENT US 3017243 A: Priority Date: 11 Aug 1958: **Method of producing lithium carbonate from spodumene.** James Macewan, Maurice Archambault, Charles Olivier.

WILLIAMS+HUGHES COMMERCIAL; AND LITIGATION LAWYERS): 18 April 2017: Brief to Expert: Addressed to Mr Chris Cuff, C&R Consulting Pty Ltd, 188 Ross River Road, Aitkenvale Q 4814. Material supplied by Williams+Hughes:

ASX announcement by LIT dated 4 October 2016;
ASX announcement by LIT dated 27 February 2017;
ASX announcement by LIT 13 March 2017;
Presentation by Adrian Griffin (LIT's Managing Director) entitled "I think you're onto something

C&R CONSULTING
Geochemical & Hydrobiological Solutions Pty Ltd
ABN 72 077 518 784

Marine and Coastal Processes and Dynamics
Groundwater and Environmental Specialists
Environmental Compliance and Monitoring
Contaminated Site and Soil Assessment
HydroGeomorphic Evaluations
Chemical & Water Modelling
Spatial Analysis
GIS Services

PO Box 1777
Thuringowa Qld, 4817, AUSTRALIA
Tel: +61 (0) 7 4725 3751
Mob: +61 (0) 417 635 032
info@candrconsulting.com.au
www.candrconsulting.com.au

APPENDICES

APPENDIX 1

DR CHRISTOPHER CUFF CURRICULUM VITAE

BRIEF RESUMÉ

Chris has contributed to fundamental and applied research in the chemical mineralogical properties of clay mineralogy over the last 40 years. Specific methodological interests are in the evaluation of mineral / water interactions at ambient temperatures; the interactions between soils and waters under tropical conditions; the properties of swelling clays; soil dispersivity; layered clay structures; and the geotechnical properties of clays, soil/water interaction.

His applied interests are in:

- Geochemical modelling of water/soil interactions through constructed and natural landscapes;
- Predictive modelling of the potential impacts of extreme weather events;
- Bioremediation of contaminated soils in tropical environments;
- The remediation and treatment of acid sulphate soils using locally derived materials; and
- Holistic interpretation and understanding of the complete environment.

Since the early 1960s Chris has held academic appointments at Imperial College, London, and James Cook University (JCU), Townsville. During his tenure as Senior Lecturer in Chemical Mineralogy in the Department of Geology, Chris lectured extensively on the highly regarded Mining and Mineral Exploration Coursework MSc established by Bill Lacy in 1975. He established and became Director of the Advanced Analytical Laboratory at JCU, and in 1988 he was appointed Dean of the Faculty of Science, at James Cook University, followed by appointment as Director of the National Key Centre in Economic Geology in 1994. From 2011 to 2013 Chris was one of three Invited, Accredited and Appointed Panel Members to the Committee of Queensland Cabinet for the examination of all scientific and environmental aspects for the operations of UCG in Queensland.

During his period at JCU he was nominated to the ARC Panel of Experts in Environmental Mineralogy, and throughout his career Chris has been and/or is an accredited Member of AINSE; the Nomenclature Committee of the International Mineralogical Association (sub-committee of the International Union of Crystallographers); the Australian Institute of GeoScientists; the Geological Society of Australia; the Australian Association of Deans of Science, and the Scientific Review Committee AMIRA.

He is a dedicated and committed educator, and during his period with JCU undertook a full teaching role while simultaneously supervising numerous Post Graduate Theses on the chemistry of waters and soils and their interactivity with the environment. On leaving the University and establishing a private consulting company, Chris directed his passion for education into the continued education and development of junior and senior staff members, encouraging all staff to become involved with extra curricula activities within the various primary, secondary and tertiary organisations of Townsville.

PROFESSIONAL DETAILS

CURRENT POSITION

Director, Principal Scientist, and Environmental Chemical Mineralogist, C&R Consulting (Geochemical and Hydrobiological Solutions) Pty Ltd.

Managing Director and Principal Scientist Greensols (Australia) Pty Ltd (2007→).

Director and Principal Scientist C&R Research UK (2011 →)

Director and Principal Scientist REMCO2 (2012 →).

QUALIFICATIONS

BSc Chemistry/Geology, Leeds.

BSc (Hons) Chemistry/Mineralogy, Leeds.

PhD Imperial College, London.

CURRENT AFFILIATIONS

Member of Queensland Government Expert Committee on Coal Seam Gas Utilisation.

Fellow Geological Society of London

PAST AFFILIATIONS

Dean of Science, James Cook University, Australia.

Director, National Key Centre in Economic Geology, James Cook University, Australia.

Director, Advanced Analytical Laboratory, James Cook University.

Council Member of Australian Institute for Nuclear Science and Engineering.

Australian Research Council Assessor.

PROFESSIONAL HISTORY

Geologist / Pegmatite Mineralogist, Openheimer Centre for African Geology, Leeds.

Geologist, Dinorwic Slate Quarries, North Wales, UK.

Lecturer in Oil Technology, Imperial College, London.

Scientific Adviser, Ministry of Energy, UK.

Senior Lecturer in Chemical Mineralogy in the Department of Geology, James Cook University.

Supervision of numerous Post Graduate Theses on the chemistry and interaction of waters and soils.

Principal of Nlambda Analytical Pty Ltd based in Townsville, North Queensland.

Director C&R Consulting (Geochemical and Hydrobiological Solutions) Pty Ltd.

Wide variety of consultancies across Australia and South East Asia.

BACKGROUND INFORMATION

Chris's initial training was in chemical mineralogy and ultimately to the study of tropical clay mineralogy, the evaluation of mineral / water interactions at ambient temperatures, the interactions between soils and waters under tropical conditions, the properties of swelling clays and soil dispersivity, layered structures, and the geotechnical properties of clays, consequently earning him an International reputation as a chemical soil scientist / hydrogeologist

During his PhD (essentially on the molecular aspects of clay-saline water interactions) Chris developed an early computer-based model for assessing the activities and equilibria of chemical species in moderately saline solutions. This type of programme forms the basis of the more complex models (e.g. PHREQC) currently used to assess aspects of water quality. Hence, he has extensive knowledge of the chemical analytical techniques used to produce data and the degree of uncertainty inherent in modelled formulae. This solid knowledge base enables Chris to quickly define real, as against analytical, anomalies, and to extend this to the rapid evaluation, synthesis and interpretation of complex data sets with many interactive chemical and physical variables relating to water composition and mineralogy. `This information can then be translated to the provision of cost effective, efficient, remediation strategies for real world situations.

TECHNICAL AND PROCEDURAL DEVELOPMENT

Based on his extensive experience with the effects of chemical reactions on metals and industrial mineralogical materials, Chris developed:

- Fine scale electron microscopic techniques for the identification of fibrous materials in the environment, including asbestos and (cristobalitic) silica and developed procedures for the rapid assessment of radiation damage to materials used in the construction of reactors in nuclear power plant;
- An approach for matching analysed water compositions, including salt aerosols and thin films, with phase mineralogy (as determined by X-ray diffraction), leading to the development of treatments for the inhibition of metal corrosion and scale deposition on industrial structures; and,
- A rapid, field-based technique for the identification of dispersivity classes in tropical soils.

Some of the studies associated with these techniques included:

- Scale formation and inhibition in multi-stage flash and other desalination plants (United Kingdom Atomic Energy Authority, 1970/71);
- Water compositional variations, reactions (corrosion) and depositions along the length of the Osborne Mine Pipeline (Osborne Mines 2001);
- Water compositional variations, reactions (metal valve corrosion) and depositions along the length of the feed pipeline to the Yabulu Peak Load Power Station (Transfield Australia 1999);
- Micro-precipitation of silica and other phases in pre-reverse osmosis membrane water filters (Siemens Australia, 2000);
- Identification of novel lightweight alloys and their potential properties (DSTO 1997);
- Investigation of floor stability of concrete pads under electricity turbines (Toorong Power Station);
- Formation and inhibition of scale in boilers associated with sugar refining processes;
- Acid mine drainage from Atlas Mines in the Philippines;

- The impact of genetically modified material on the waters draining from cotton fields in New South Wales;
- The evaluation and potential rehabilitation of dredge sediments and industrially and naturally contaminated sediments from Harbours;
- Remediation options for contaminated sites throughout Australia, both for private companies and for the Environmental Protection Agency. Impact and rehabilitation of sensitive, World Heritage areas, following release of acid mine waste;
- Reactivity and release of contaminants in shallow and deep (up to 2000m depth) marine waters in the event of the release of highly acidic mine waters;
- The suitability of dredged materials for ocean dumping;
- Geochemical modelling of waters within confined, partially open, marine basins;
- Reactivity and release of highly acidic mine waters to marine waters;
- Reactivity and release of contaminants and nutrients from fine particles following sediment disturbance;
- Detailed particle sized determinations 0.45µ upwards and above of sediments in a partially enclosed marine basin and adjacent areas;
- Treatment options for marine ooze;
- Detailed water chemistry (major, minor and trace elements) of ambient waters within partially enclosed marine basins;
- Sea-water – carbon dioxide equilibria in flue gas treatment;
- Water quality remediation strategies using naturally occurring local materials;
- Irregularities of flood modelling in the seasonally arid tropics; and,
- The behaviour of inundation protective earth structures during large scale, long term, flooding events.

All investigations demonstrated the necessity to use a series of short-spaced measurements during first flush and high intensity events, rather than equi-spaced, regular measurements during normal, low-flow conditions.

UNDERGROUND COAL GASIFICATION AND COAL SEAM GAS

Chris's reputation for detailed knowledge on geological, mineralogical and hydrological characteristics has led to the appointment as a scientific advisor to various organisations investigating UCG or CSG worldwide. Some example projects include:

- Independent Expert Witness for DART Energy in Stirling UK. This has involved considerable research on the data provided, site layout, location and depth of drilling; collating information provided by other expert witnesses in their field of specialty to ensure all information is collective and concise. He has prepared a report on the findings of the data and information provided, prepared his precognition in his area of expertise and provided a report detailing his opinion of the rebuttals from the claimants.
- Chris was engaged as a specialist sub-consultant by KBR on behalf of Arrow Energy to undertake geochemical modelling to investigate options for CSG water disposal via evaporation. C&R's role in this project was to investigate and model the water extracted by CSG under natural conditions to detail what would precipitate and how, determine by-products (precipitate) of evaporative concentration (under equilibrium and disequilibrium with atmospheric carbon dioxide) of extracted CSG water, determine the economic benefits of the various salt precipitates, determine disposal options and assist with design of the evaporation system.
- Experience on the Queensland Government Independent Scientific Panel (ISP), established to assess and evaluate Underground Coal Gasification in Queensland, exposed Dr Chris Cuff to a very broad cross-section of current practices in site selection, site monitoring design, valid sampling procedures, and assessment of results in the UCG and CSG industries.

  Selection as a member of the ISP demanded detailed knowledge of:
  - geological stratigraphic sequences,
  - sedimentological facies analysis,
  - structural analysis,
  - groundwater flow modelling,
  - groundwater chemistry (especially in relation to effects of geochemically significant components), and
  - coal quality in relation to gasification, and
  - pyrolosis processes.

The approach adopted by the ISP was unique in that it chose a risk based management approach for all stages of a gas/hydrocarbon production chain. This risk based approach:

- minimised the risks inherent in any hydrocarbon development, and
- highlighted the points at which real environmental and other concerns needed appropriate monitoring and process control.

It also stressed the requirement for:

- statistically valid and correctly constructed environmental monitoring arrays,
- process monitoring wells, and
- in-stream physical and chemical information.

ENVIRONMENTAL CHEMISTRY

In excess of 600 projects have been specifically designed for either commercial clients or for Honours, Masters and PhD students. These projects classify into the following areas:

- Major, minor, trace and ultra-trace elemental environmental geochemistry of soils, rocks, waters and plants and their pathways of migration.
- Definition of the mineralogy of solid materials and their stability in tropical environments.
- Trace metals in corals and clams as environmental indicators.
- Elucidation of metal transport pathways in natural systems including:
  - Estuarine Systems;
  - Marine Systems;
  - Saline intertidal flats and mangrove systems;
  - Spoil piles/Waste dumps;
  - Hydrothermal ore deposits;
  - Confined water bodies; and,
  - Metals processing streams.

Over the last 30 years, lecture courses and lectures in numerous aspects of environmental chemistry have been given to 3rd & 4th year, Honours, Masters and PhD students in the Disciplines of:

- Earth Science;
- Environmental Science;
- Biological Science;
- Chemistry;
- Physics; and,
- Engineering (Civil & Systems and Environmental).

These lecture courses have included: He has published and lectured in the areas of:

- Environmental chemistry;
- Hydrogeochemistry;
- Analytical chemistry;
- Hydrology;
- Analytical electon microbeam techniques of solid and biological material; and,
- Application of thermodynamics in low temperature/ low pressure sedimentary and soil systems.

Statistical analysis and interpretation of analytical data have been given within individual courses or offered to students on a one on one basis.

Key experience in these areas of expertise:

- Analysis (X-ray diffraction and other X-ray based methods);
- X-ray Fluorescence;
- Atomic Absorption Spectrometry (AAS);
- Vapour Generation Atomic Absorption;
- Graphite Furnace Atomic Absorption;
- Inductively Coupled Plasma - Mass Spectrometry (ICP-MS);
- X-ray Fluorescence Spectrometry (X.R.F);
- Infra Red (IR);
- reflectance IR;
- Mass Spectrometry;
- Stable Isotope Mass Spectrometry;
- Spark Source Mass Spectrometry;
- Statistical analysis; and,
- Data assessment and interpretation.

Chris was in charge of all geochemical analytical equipment at James Cook University for over 20 years and is now considered an expert in x-ray diffraction and electron-beam methods of analysis (electron microscopy and microprobe analysis).

MINE DRAINAGE AND MINE WASTE

Chris's background experience in chemical mineralogy, and the subsequent development of his skills as a hydrogeochemical pedologist, has led to a comprehensive understanding of environmental and process mineralogy and hydrogeochemistry. This knowledge has resulted in numerous investigations of mining related initiatives, both nationally and internationally. The following is a selected range of investigations that have been undertaken over the last 40 years.

- Development and chemical composition of soil crusts on rehabilitated areas of Central Queensland Coalfields.
- Suitability of soil properties for the construction of mine levees under the newly adopted constraints applied by DERM.
- Suitability and application of mine waters to irrigated lands.
- Discharge of mine waters to ephemeral streams and rivers.

- Acid generation and contamination of dump sites.
- Investigation of fluorine containing minerals in processing and environmental contexts.
- Mineralogical and chemical definition of mineral species in raw coals and washed products of the Central Queensland Coalfields.
- Geochemistry and mineralogy of leaking tailings dams and the interaction of the fluids with ambient soils and groundwaters, North and Western Queensland and Western Australia.
- Effect of phyllosilicates on flotation properties of galena.
- Development of mineral scales in acid environments in autoclaves used in gold extraction in New Guinea.
- Scale definition and chemistry in sugar evaporators.
- Contaminated sites - chemical assessment of waters and soils.
- Laboratory and in-field analytical assessment of Asbestos.
- Silica-bearing dust analysis.
- Pore water chemistry/clay mineral metastability.
- Spectral response of phyllosilicate minerals around hydrothermal ore deposits (AMIRA funded).
- Geochemistry and clay mineralogy around mineral deposits: Philippines, New Guinea, Herberton, Cloncurry, Charters Towers, Mt.Isa, Broken Hill, Northern New South Wales, Northern Territory and Western Australia.
- Mineralogical identification of rare minerals in a variety of ore deposits for the purposes of process control.
- Mineralogy and geochemistry of weathering and lateritic profiles: North Queensland. (AMIRA funded).
- Adsorption of base metals by clay minerals.
- Minerals deposits of the Cloncurry Region (AMIRA funded).
- Interaction of mine and industrial site waters with ambient soils and groundwaters, Philippines, Tanzania, New Guinea, North Queensland, Northern New South Wales, Northern Territory and Western Australia.

HUMAN TOXICOLOGY

- Involvement with chemical (in particular, mineralogical) aspects of toxicology has included:
- University Radiation Safety Officer at James Cook University;

- Responsibility for the Radiation Safety Monitoring programme at James Cook (as Dean of Science);
- Provision of specialist lecture courses at post-graduate level, both within and outside James Cook on radiation safety and the effects of radiation;
- Provision of professional lectures in safety aspects of minerals (e.g. asbestos);
- Provision of a series of lectures in Indonesia (for VTCC) on "Detection of Silica in the Environment and its Health Effects";
- Provision of expert consultancy services (expert witness) to Solicitors in the area of mineral matter in the body; and,
- X-ray diffraction (mineralogical) examinations of human biopsy material including lungs and eyes.

ENVIRONMENTAL TOXICOLOGY

Experience extends to a broad spectrum of environmental toxicological issues presented in several lecture courses relating to natural toxicological phenomena.

- Hyperfluoridosis.
- Molybdenosis, cuprosis and selenosis in cattle.
- Implications of naturally elevated lead (Pb) and other components in soils and waters (eg balkan nephrosis).
- Body (kidney) stone analysis and implications of high silica levels in groundwater; (interview given on Radio Australia, 1975).
- Internationally accredited training course in Jakarta on silica in the environment.

GROUNDWATER SAMPLING DESIGN AND IMPACT ASSESSMENT

An area of specialist expertise is that of soil, sediment, rock, groundwater interaction especially that of saline water/clay mineral interaction. As such parts of this expertise overlap the areas of groundwater sampling design and impact assessment, hydrogeology and soil science and geotechnology. For convenience, however, although arbitrary, details will be provided under these headings. Generally, generic titles are given rather than precise academic titles.

From the early 1970's Chris was involved in chemical aspects of groundwater assessment in the Townsville Region. In these years Chris supervised the honours theses of:

Peter Reid (1975)	Groundwater of the Townsville Area, North of Ross River
Robert Weller (1974)	Groundwater of the Upper Ross River area and the Ross River Dam
Peter Redford (1974)	Groundwater of the Ross River area

Supervised projects included:

- Groundwater Quality of the Deeper Aquifers of the East Portion of the Burdekin Delta;
- Groundwater Quality of the Herbert Delta;
- Experimental Study of a Salt Water Wedge, Burdekin North Queensland;
- Water/seagrass Nutrient Geochemistry, Tidal Flats, North Queensland;
- Groundwater/seagrass geochemistry, Tidal Flats, Magnetic Island;
- Groundwater Contamination Studies of a North Portion of Fraser Island;
- Groundwater Assessment of Areas Surrounding an Artificial Wetland, Ingham, North Queensland;
- Groundwater Monitoring and Assessment of an Area Surrounding an Artificial Wetland, Ingham Sewerage Works; and,
- Metal/nutrient relationships in waters and plants in an Artificial Wetland, Ingham, North Queensland.

Components of numerous other projects included groundwater and contamination assessments.

All Projects involved sampling designs and strategies with a view to elucidating the problems under investigation (e.g. diurnal variations, seasonal variations, tidal variations etc). In these designs and strategies recognition had to be paid to statistical validity and economic reality.

Numerous groundwater assessment programmes have been undertaken, again where statistical validity had to be balanced with pragmatic economics. All studies involved assessment against appropriate guidelines (NCPC/NEPM, ANZECC, NHMRC, Ontario, Dutch A, B, C etc).

- Aquifer connectivity of old tidal areas - Townsville Power Station;
- Contaminant movement through groundwaters - Department of Defence, Mount Stuart Training Area;
- Pioneer Mill;
- Yabulu Peak Load Power Station;

- Groundwater movement through tidal and sub-tidal zones - Yelgun-Chinderah Highway;
- Groundwater migration - Department of Defence, Ross Island;
- Aquifer connectivity and groundwater recharge - Yabulu Bore Field; and,
- Groundwater movement through palaeochannels – Central Queensland.

HYDROLOGY

Hydrogeological / hydrogeochemical investigations have been a major research interest of Dr Cuff's for many years especially those involving water/solid interactions. Numerous projects have been supervised including:

PhD	CE Rasmussen	1994	Geochemistry and Environmental Records in Coral Cores (Far North Queensland)
PhD	AB Pomeroy	1988	Geochemistry and hydrogeology of a salt flat, Mount Low, North Queensland
PhD	JP Taylor	Current	Water Quality Associated with Specific High Intensity Rainfall Events, Barron River
PhD	J Goudie1	1995	Geochemistry and Environmental Records in Corals Associated with the Herbert River Plume, North Queensland
BSc (Hons)	H MacGregor	1995	Geochemistry and Environmental Records in Corals Associated with Green Island
BSc (Hons)	JP Taylor	1992	Water Quality of Green Island Tidal Flat
BSc (Hons)	J Lowry	1994	Water Quality/Soil Relationships, Lake Buchanan
BSc (Hons)	W Aliano	1979	Geochemistry and Hydrogeology of Cape Bowling Green, Salt Flats
MSc	I Ward	1994	Geochemistry and Hydrogeology of Townsville Town Common, Salt Flats

All above projects involved the development of sampling design and strategies, often specifically orientated to obtaining data relating to specific, high intensity rainfall events in addition to the normal background monitoring.

Several other PhD's and numerous MSc and BSc (Hons) have been supervised in the areas of hydrothermal wall rock interaction during mineral deposition.

SOIL AND GEOTECHNICAL SCIENCE

A specific area of expertise, particularly in clay mineralogy of tropical regions, many of the X-Ray Diffraction techniques now normally used in the investigation of clay minerals in soils were developed by Chris in collaboration with others in the late 1960's. Many of the investigations of the late 1960's were carried out in conjunction with others into the nature of the London Clay along the Victoria Line construction, London. Since then numerous studies involving the inter-relationships between soil chemistry, mineralogy, fabric and geotechnical properties have been carried out. These have included:

AMIRA project PhD (Pending)	(K Camuti MSc / PhD)	Weathering at the Mt Leyshon Gold Deposit
AMIRA project PhD (Pending)	(K Camuti MSc / PhD)	Weathering at the Kidston Gold Mine, North Queensland
PhD (Pending)	K Camuti	Weathering, Clay Mineralogy and Microfabric of Tropical Soils, Dalrymple Shire, North Queensland.
B.Appl Sci (H) 1995	D.Whiting	Development and Geochemistry of Crusting in Soils, Coal Mines, Central Queensland.
PhD 1985	J Thompson	Magic Angle Spinning NMR Studies on Clay Minerals
PhD 1999	R Chitrakar	Weathering Studies in Arid Zone Tropics, Mount Garnet, North Queensland
PhD	P Catt	Weathering Studies, Biochemistry and Metals Migration in anomalous Soil Profiles, Dugald River, Far North Queensland
Main Roads	J Simmons and W So	Slope Stability of Soils, Palmerston Highway, North Queensland
PhD	M-A Ahearn	Adsorption of heavy metals by salt-flat clays, North Queensland.
M.Sc 1999	D.Monz	Geochemistry of Tidal Salt Flats, Townsville Town Common.

An area of specific research interest is the use of x-ray diffraction to predict the geotechnical behaviour of clay minerals and chemical methods of amelioration of undesirable geotechnical properties.

Numerous other studies in this area have been undertaken particularly in relation to the properties and genesis of clay minerals in weathered, mineralised hydrothermal systems and the mineralogical and geochemical signatures in the soils overlying them. Honours theses (15+) in this area have generally focussed on the granitoids of the Herberton, Charters Towers,Cloncurry and Ingham regions.Some studies have also been carried out in Northern NSW, Tasmania, N.Territory, Broken Hill/S. Australia and W.Australia. Five PhD theses have been supervised on weathering and geochemistry of the granites of the Herberton/Mt. Garnet region, two on weathering and geochemistry of North Queensland basalts and one similar doctoral study in Tasmania.

ACID SULPHATE SOILS

Development of a technique for the rapid evaluation of potential acid sulphate soils has considerably reduced the number of samples required for verification by laboratory analysis.

- Acid sulphate soil development and buffering capacity of North Queensland salt flats.
- Clay mineral / hypo/hypersaline water interactions and saline soil development of the Townsville Town Common, Bushland Beach and Bowling Green Bay.
- Nutrient and metals uptake of salt flat clays.
- Sediment geochemistry/mineralogy of mangrove systems.
- Flocculation/elutriation of mangrove clays.

STORMWATER FLOWS AND THEIR COMPOSITIONAL EVOLUTION THROUGH THE CATCHMENT

Chris's experience with soil/water interactions has also involved the assessment and interpretation of stormwater flows and their compositional evolution across both natural and constructed pathways. Such studies have lead to an understanding of compositional profiles with respect to discharge and compliance with license conditions and/or, by default, ANZECC / ARMCANZ Guidelines. Investigations have included:

- The necessity of using first flush run-off to assess chemical impacts on the environment, including changes to soil properties;
- Compositional variations from contaminated artificial catchments;
- Evolution of pit-lake compositions out to 1000 future years for major mine sites including Atlas Mines (Philippines) and Olympic Dam (South Australia).

GEOCHEMICAL AND PREDICTIVE MODELLING OF THE IMPACTS OF EXTREME WEATHER EVENTS

Over the last two years C&R Consulting has been involved in a major investigation and evaluation on behalf of a group of International Lawyers representing a major mining company dealing with the occurrence and modes of flooding in the seasonally arid tropics. This has led to a comprehensive understanding of the inadequacies of most, if not all, existing flood assessment models for tropical environments.

In particular, the manner of rainfall does not fit conventional models with respect to intensity, duration and frequency of occurrence. This invariably leads to an underestimation of the magnitudes of uncertainties in these models and significant underestimation of flood flow volumes associated with spatially-focused intense rainfall events in tropical terrains.

Reliable estimates of expected flow volumes and their recurrence intervals is vital to the assessment of the risks to infrastructure in tropical flood plains including those relating to open cut mines, dams, settlements and agriculture. The majority of these investigations are currently covered by legal privilege.

The flood studies have involved a return to an area of expertise initially explored during Chris's PhD Thesis (i.e. the statistics of infrequent (low probability) events). Extreme flooding is a low probability event, and in tropically terrains its assessment is hampered by only short periods of record, short periods of any flow through the river system, and long periods of zero flow. This means normal probabilistic right hand skewed statistical approaches may give aberrant answers, and all such statistical approaches need to be constrained by real, environmental, in field data.

HOLISTIC EVALUATION

Comprehensive background knowledge, together with local, national and international experience, enables solutions and/or alternative courses of action to be applied to investigations that are specific to the location, climate, weathering regime, and soil type. An example of this ability to understand the tropical environment and use this knowledge to prevent costly errors and minimise future expense is given below:

Townsville Port Authority, Reclamation Area, Townsville Port: Environmental Baseline Survey, 1998

The Scope of Project was to determine the baseline environmental conditions for a newly reclaimed site within Townsville Port Authority's reclamation area. The site was to be developed as a fertiliser holding depot for WMC Fertilisers Ltd. The controlling factor of the project was understanding the environmental hazards of the proposed site usage.

Through ongoing consultation with the client an extended laboratory assessment package was developed that was able to identify elevated levels of inherent contaminant concentrations naturally associated with the tropical environment.

These substances (potential 'contaminants'), are also found in high concentrations within the products to be stored at the site. From this understanding of the local environment the client was provided with an appropriate understanding of the baseline environmental conditions of the site. This has led to effective and efficient environmental management of the lease.

BIOREMEDIATION OF CONTAMINATED SOILS

Recognising the value of high intensity sunlight and rainfall on the geochemical composition of clay soils, Chris tested a variety of methods to remediate soils using little more than natural, readily available ingredients specific to the particular contaminant. The process has proven particularly cost effective where time is not a constraint.understanding tropical soils

Comprehensive background knowledge, together with local, national and international experience, enables solutions and/or alternative courses of action to be applied to investigations that are specific to the location, climate, weathering regime, and soil type. An example of this ability to understand the tropical environment and use this knowledge to prevent costly errors and minimise future expense is given below:-

Townsville Port Authority, Reclamation Area, Townsville Port: Environmental Baseline Survey, 1998

The Scope of Project was to determine the baseline environmental conditions for a newly reclaimed site within Townsville Port Authority's reclamation area. The site was to be developed as a fertiliser holding depot for WMC Fertilisers Ltd.

The controlling factor of the project was understanding the environmental hazards of the proposed site.

Through ongoing consultation with the client an extended laboratory assessment package was developed that was able to identify elevated levels of inherent contaminant concentrations naturally associated with the tropical environment. These substances (potential 'contaminants'), are also found in high concentrations within the products to be stored at the site. From this understanding of the local environment the client was provided with an appropriate understanding of the baseline environmental conditions of the site. This has led to effective and efficient environmental management of the lease.

PROJECTS SPECIFICALLY DESIGNED TO PROVIDE SOLUTIONS TO GEOCHEMICAL AND MINERALOGICAL PROBLEMS

- Chemical treatments to improve the flocculation and physical properties of the Miles Bentonite Deposit (National Lead Baroid).
- Use of innovative flocculants to improve the coagulation properties of clay-minerals and other fines affected by high pH water from an alumina refinery (Alcoa).
- Chemical treatments to improve chemical and physical properties of a commercial Kaolin deposit (comalco, Weipa).
- Investigation of physical and chemical properties of “Red Mud” to improve consolidation, settlement and environmental properties (Comalco; Glyde Point; Alcoa – three separate, individual studies).
- Flocculation and physical properties of mine-waste and tailings streams to improve water quality (Highlands Gold; Mount Isa Mines; Western Metals - three separate, individual studies).
- Use of red mud as an environmental sorbent (Atlas Mine, Philippines; Highlands Gold; Henderson Charlton).
- Beneficiation and amelioration of chemical and physical properties of fly-ash material (Atlas Mine, Philippines).
- In ground and on ground treatment of red mud and fly ash to improve chemical and settlement properties as road making material (Atlas Mine, Philippines; Main Roads Department; Glyde Point; Alcoa)Use of red mud as an environmental sorbent (Atlas Mine, Philippines; Highlands Gold; Henderson Charlton).
- Beneficiation and amelioration of chemical and physical properties of fly-ash material (Atlas Mine, Philippines).
- In ground and on ground treatment of red mud and fly ash to improve chemical and settlement properties as road making material (Atlas Mine, Philippines; Main Roads Department; Glyde Point; Alcoa).
- Use of flocculants to improve chemical and physical properties of ultra-fine dredge spoil material for emplacement as landfill (Townsville Port Authority; MIM; BHP Billiton, Cannington; BHP Billiton, Yabulu).
- Ensham Mine, Emerald. Currently carrying Commercial in Confidence profile.

ADVISORY PANELS

Specialist adviser and consultant to Industrial and Private Companies, Local, State and Federal Governments (both nationally and internationally, and often in a confidential capacity) on the production of acid-sulphates at mine sites and in association with exposed mangrove sequences.. Some of the Australian companies and Government Agencies that have sought advice include BHP, Western Mining, Placer, Con Zinc Rio Tinto, Lihir, Mt. Isa Mines, Pasminco, Queensland Nickel, Comalco, Alcoa ,the Department of Environment and Heritage, the Great Barrier Reef Marine Park Authority, the Department of Natural Resources, Queensland Cement and Lime, Townsville Port Authority and the Department of Defence.

Co-leader (with Dr Roger Taylor) of the Tin-Tungsten Research Group at James Cook University from 1975 to 1989.

Lectured extensively on the highly regarded Mining and Mineral Exploration Coursework MSc established by Bill Lacy in 1975.

The above interactions with industry led to the establishment of the National Key Centre in Economic Geology at James Cook University. Appointed Director National Key Centre in Economic Geology, James Cook University, 1994 to 1997 following completion of term as Dean Faculty of Science, James Cook ;University, 1989 to 1994.

Throughout the above period the Group attracted many students from within Australia and from overseas. All projects undertaken by these students were conducted in close collaboration with mining companies and/or AMIRA. Relationships established with the mining industry during this period continue and the majority of students trained within the Group now occupy middle to senior positions in the mining sector.

The following is an indication of the long association with these particular fields of expertise:

1973-1977	Lead Scientist for the Three Bays Project, Townsville. This project involved the identification of iron sulphide minerals in anoxic zones of mangrove sediments.
1975-1987	Long term study of estuarine system at the mouth of the Bohle River. This programme included the supervision of PhD Theses and resulted in two publications in the Department of Civil and Systems Engineering, James Cook University, on the hydrogeochemistry and mineralogy of salt flats.
1979-1980	Study of the mangrove system at the southern end of Bowling Green Bay. This programme included the supervision of Honours Students and resulted in the identification of mixed layer clay phases and their roles in exchange reactions.

1975-1991	Research programs involving the supervision of over 20 PhD students and numerous Honours and Masters students including- • The weathering and reaction of sulphide minerals exposed in tropical locations. • The roles of clay minerals as environmental sorbents. • Alteration mineralogy and geochemistry around hydrothermal mineral deposits. • Dispersion of gold in weathered laterite profiles. • Tin mineralogy.
1989-present	Studies on stabilities of sulphides including the production of sulphate phases and their remediation (a) at mine sites, and (b) in exposed mangrove sequences. This involved the supervision of two PhD students and numerous Honours students.
1995-present	The development of acid sulphate surficial crust in semi-arid tropical zones including (a) coal mines in central Queensland, and (b) sulphide mines in the Carpentaria Province. This included the supervision of several Honours and Masters projects.
Consultancies	Acted as consultant on the production of acid-sulphates at mine sites and in association with exposed mangrove sequences for Local, State and Federal Governments as well as for numerous Industrial Companies, (e.g. Department of Environment and Heritage; Great Barrier Reef Marine Park Authority; Department of Natural Resources; Queensland Cement and Lime; Townsville Port Authority; Department of Defence).

APPENDIX 2
BRIEF TO EXPERT
(DR CHRISTOPHER CUFF)

WILLIAMS
+HUGHES
COMMERCIAL AND
LITIGATION LAWYERS

Our ref: DR:NB:31193:957266v1

18 April 2017

Mr Chris Cuff
C & R Consulting Pty Ltd
188 Ross River Road
AITKENVALE QLD 4814

Email chris@candrconsulting.com.au

Dear Sir

Expert Report

We act for Lepidico Limited (**LPD**). LPD is listed on the ASX. We understand you are a geochemist/mineralogist and formerly senior lecturer in Geochemistry and Mineralogy, Dean of Science and Director of the National Key Centre in Economic Geology at James Cook University. We are instructed to engage you to prepare an independent report for LPD.

We are instructed as follows:

Background

1. Lithium Australia Ltd (**LIT**) is an exploration, research and development company which claims to have developed its own SiLeach™ process it describes as a "critical component of this strategy".

2. LPD is a lithium company involved in the exploration, development and operation of lithium assets.

3. LIT has made a takeover bid for all ordinary shares in LPD. The basis of the offer is 1 fully paid ordinary share for every 13.25 ordinary shares in LPD.

4. LPD opposes LIT's takeover bid and considers the offer over-values LIT's shares relative to LPDs.

5. On or about 13 March 2017 LIT made an ASX announcement stating that:

   "Lithium Australia advises that SiLeach does not use hydrofluoric acid."

6. LPD has concerns about the accuracy of this statement and would like independent verification. It may have an impact on the value of LIT's shares.

7. LIT also made in its 13 March 2017 announcement to ASX the statement that:

   "the main fluorine product produced is hexafluorosilicic acid".

Perth Office
Ground Floor, 25 Richardson Street
West Perth, Western Australia 6005
t +61 8 9481 2040
f +61 8 9481 2041
e office@whlaw.com.au

Geraldton Office
288 Foreshore Drive
Geraldton, Western Australia 6530
t +61 8 9921 2344
f +61 8 9921 2243
e office@whlaw.com.au

whlaw.com.au

Williams & Hughes Pty Ltd (ACN 109 119 253) trading as Williams and Hughes. Liability limited by a scheme approved under Professional Standards Legislation.

Documents

8. To enable you to make an assessment we **attach** copies of the following:

   8.1 ASX announcement by LIT dated 4 October 2016;

   8.2 ASX announcement by LIT dated 27 February 2017;

   8.3 ASX announcement by LIT 13 March 2017;

   8.4 Presentation by Adrian Griffin (LIT's Managing Director) entitled "I think you're onto something".

Issues for consideration

9. Can you please confirm, from the attached documents, if:

   9.1 You consider LIT is using hydrofluoric acid in the SiLeach process as applied to the extraction of lithium from spodumene.

   9.2 It is possible to extract lithium from spodumene in the manner outlined by LIT without hydrofluoric acid being involved in or generated as part of the reactions in some way?

   9.3 If hydrofluoric acid is generated but consumed by reactions with silicates, is it likely that an excess quantity of hydrofluoric acid will remain after all silicates are consumed?

   9.4 Assuming the main fluorine product produced is hexafluorosilicic acid, to what extent will hexafluorosilicic acid decompose into hydrofluoric acid?

10. Please:

   10.1 provide reasoning for your conclusions;

   10.2 ensure that if it is necessary for you to rely on any scientific writings or other literature in support of your conclusions that you identify those sources in your report.

If you have any queries or require further documentation then please contact us.

We **attach** a copy of the Federal Court's Guidelines for Expert Witnesses which is a guide as to the responsibilities and obligations as an expert witness. Although Court proceedings have not been commenced, the guidelines are considered appropriate for expert evidence generally.

Yours faithfully
Williams + Hughes

TAB 1

Lithium Australia NL

ACN: 126 129 413
ASX: LIT

Level 1
675 Murray St
West Perth WA 6005

PO Box 1088
West Perth WA 6872

4 October 2016

ASX ANNOUNCEMENT

LITHIUM AUSTRALIA ACHIEVES EXCEPTIONAL RESULTS IN CONTINUOUS SILEACH™ PILOT PLANT RUN

Highlights

- **Lithium Australia (ASX:LIT) completes successful Sileach™ pilot plant campaign**
- **Continuous operation over a scheduled six-day period**
- **Very high plant availability**
- **Exceptional lithium extraction**
- **High-purity lithium solutions for the production of lithium carbonate**

Pilot plant campaign preparation

On 1 September 2016, Lithium Australia announced the commencement of pilot plant testing at ANSTO Minerals' (a division of the Australian Nuclear Science and Technology Organisation) Lucas Heights testing facility, located on the outskirts of Sydney, NSW. "Hot commissioning" of the plant (photograph below) was undertaken over a one day run, the nature of leach liquors and residues was evaluated and final adjustments made to plant components in preparation for continuous operation.

Sileach™ continuous pilot plant operation, ANSTO Minerals, Lucas Heights, NSW.

Continuous pilot plant operation

The pilot plant was fed continuously from 12-17 September 2016, treating ore from Lepidolite Hill, W.A., using Lithium Australia's halogen based Sileach™ process. Approximately 650 kg of lepidolite ore was processed at an average throughput of 6 kg/h.

Circuit design and performance

The pilot plant consisted of leaching and impurity removal circuits. The design was based on test work conducted by ANSTO Minerals on similar ore to that processed during the continuous pilot plant run. The campaign produced a purified lithium-containing liquor, devoid of impurities. This purified liquor will be processed through to high-purity lithium carbonate in a second pilot campaign in the near future.

Extraction of lithium in the Sileach™ process exceeded 95% in the leach circuit, validating both the overall extraction and accelerated rate of extraction of lithium achieved in the laboratory test work program. The performance in the impurity removal circuits was comparable with the laboratory test work program, producing a liquor suitable for further processing. The operation of the pilot plant was robust and provided valuable materials handling and additional engineering design data for Lithium Australia's Sileach™ process.

Statement from the Managing Director

Lithium Australia's managing director, Adrian Griffin said:

> *"Plant performance could not have been better. The results show that exceptional lithium extractions can be achieved without the need for fine grinding, or the production of clean concentrates. The material processed was not subjected to pre-concentration but still achieved outstanding performance with minimal feed preparation. These are key parameters for processing at low cost.*
>
> *Lower-grade spodumene concentrates (about 4.5% Li_2O) from Pilbara Minerals' Pilgangoora project, will be processed in one of the subsequent test runs. We are intentionally concentrating on the lower-grade, hard rock products, from which no other processes can recover lithium commercially. Sileach™ provides significant processing advantages.*
>
> *Successful processing of spodumene from Pilgangoora is the first step of our commercialisation agreement with Pilbara Minerals, aimed at establishing a lithium chemical processing plant in Port Hedland."*

Adrian Griffin
Managing Director
Mobile +61 (0) 418 927 658
Adrian.Griffin@lithium-au.com

About Lithium Australia

Lithium Australia NL is a dedicated developer of disruptive lithium extraction technologies, and 100% owner of the Sileach™ process for the recovery of lithium from silicates. LIT has strategic alliances with a number of companies, potentially providing access to a diversified lithium mineral inventory. LIT aspires to create the union between resources and the best available technology and to establish a global lithium processing business.

MEDIA CONTACT:

Adrian Griffin	**Lithium Australia NL**	**08 6145 0288 | 0418 927 658**
Kevin Skinner	**Field Public Relations**	**08 8234 9555 | 0414 822 631**

TAB 2

Lithium Australia NL

ACN: 126 129 413
ASX: LIT

Level 1
675 Murray St
West Perth WA 6005

PO Box 1088
West Perth WA 6872

Phone +61 (0) 8 6145 0288
Fax +61 (0) 8 9475 0847

info@lithium-au.com
lithium-au.com

27 February 2017

ASX ANNOUNCEMENT

LITHIUM AUSTRALIA SILEACH™ DEVELOPMENT PROGRAMME

Sileach™ - a universal process for the recovery of metals from silicates - has been developed by Lithium Australia (ASX:LIT) with the assistance of Australian federal government grants, a Western Australian government grant, and the technical assistance of ANSTO Minerals ("ANSTO" a Division of the Australian Nuclear Science and Technology Organisation).

Lithium Australia is in a very strong position to develop Sileach™ on a global basis, with recent progress including:

- ➢ Successful testing of spodumene concentrates from Pilbara Minerals (ASX:PLS)
- ➢ Production of battery-grade lithium carbonate, and
- ➢ Resolution of process ownership issues in favour of Lithium Australia.

PROGRESS

During the development of the Sileach™ process, Lithium Australia has tested a range of lithium bearing ores, concentrates, and waste materials, from around the world. Sileach™ is a hydrometallurgical process; that is, it does not require an energy intensive roasting step.

Sileach™ is differentiated from other processes by its unique chemistry. Essential to the operation of the Sileach™ process is the addition of halogens, a group of reactive elements which attack the chemical bonds in the silicate mineral, causing all metals to go into solution. It is the very reactive nature of the halogens that drives the process, at the reaction rates required, to accomplish metal extraction into solution.

Major milestones achieved by Lithium Australia in the development of the Sileach™ process to date are outlined below.

- **Jan 2016** - First successful Sileach™ tests on spodumene carried out in a commercial laboratory in Perth, Western Australia
- **Feb 2016** - Sileach™ tests extended to other lithium and potassium bearing silicates including lepidolite from Lepidolite Hill, Western Australia
- **Feb 2016** - Australian patent application lodged for the Sileach™ process
- **Mar 2016** - Sileach™ breakthrough gains federal research grant funding and partnership agreement with ANSTO Minerals (a division of the Australian Nuclear Science and Technology Organisation)
- **Jun 2016** - Pilbara Minerals (ASX:PLS) agree terms of a commercialisation agreement to develop Sileach™ for Pilgangoora spodumene concentrates
- **Jun 2016** - Bench scale tests lead to ANSTO Minerals pilot plant design
- **Aug 2016** - State government grant through Minerals Research Institute of WA (MRIWA) awarded to research impurity deportment and by-product evaluation
- **Aug 2016** - Further federal funding awarded
- **Sep 2016** - Pilot testing of Lepidolite Hill ore commenced at ANSTO Minerals
- **Sep 2016** - Continuous lithium carbonate production achieved at ANSTO Minerals
- **Dec 2016** - Engineering design contract awarded for large-scale pilot plant
- **Dec 2016** - Sileach™ pilot tests on Pilgangoora spodumene commenced
- **Jan 2017** - Refined lithium carbonate achieves battery grade
- **Feb 2017** - Pilot testing of Pilgangoora spodumene concentrate completed at ANSTO Minerals
- **Feb 2017** - International patent application lodged for Sileach™
- **Feb 2017 - Litigation with Lepidico resolved, in LIT's favour.**

SILEACH ™ PERFORMANCE OPTIMISATION

Lithium Australia with co-operation from ANSTO Minerals and Murdoch University (the latter through a MRIWA research grant) have an active and coordinated optimisation programme focused on processing performance improvements and maximising the value of by-product credits. The programme is also evaluating impurity deportment and reagent recycling.

The performance enhancement programme studies are being conducted on a bench scale and improvements will be incorporated into ANSTO Minerals pilot plant work and into design specifications for the large-scale pilot plant currently being designed by CPC Project Design PTY LTD.

Further pilot testing is planned on a range of materials including lepidolite, zinnwaldite and spodumene.

FURTHER INFORMATION

For commercial reasons, and in accordance with intellectual property laws and protocols, much of the information relating to the Sileach™ process remains confidential, however the following information is provided to the extent commercial confidentiality and availability of results permit.

LEPIDOLITE PILOT TESTING

- **Lepidolite Hill** – Material processed at ANSTO Minerals was whole ore from Lepidolite Hill (Western Australia). No flotation was undertaken as the ore was high-grade (about 2.95% Li_2O) suggesting over 70% of the material was lepidolite with the balance comprising mainly quartz and feldspar. LIT has previously undertaken flotation test work on similar materials, achieving very high yields and good recovery (lithium recovered to concentrate regularly exceeding 90%).

  LIT is currently preparing for pilot testing of lithium bearing waste material, the location of which is subject to confidentiality. The waste material contains 27-30% lepidolite and has a head grade of 1.62% Li_2O. Previous bench scale tests on this material have produced concentrates with grades exceeding 4% Li_2O.
- **Process recovery on ore from Lepidolite Hill** – (whole ore): The average lithium leach extraction was 95% with approximately 18% Li losses reporting to solids during subsequent impurity removal stages. Funding under the terms of a grant provided through MRIWA is dedicated to improving the performance of that section of the circuit. Furthermore, vendor tests are being conducted to improve solid/liquid separation during that phase of the operation.
- **Major reagent suite** – Initial digestion stages are accomplished in an acid medium with the addition of halogens to disintegrate the silicate lattice. Impurity removal is accomplished by increasing pH by the addition of various alkalis including limestone. Sodium carbonate is used in the high pH refining stage of the circuit and also for lithium carbonate precipitation.
- **By-products produced and associated recoveries** – this remains work in progress at Murdoch University, under the auspices of the MRIWA grant.

SPODUMENE PILOT TESTING

Pilot testing of spodumene concentrates from Pilbara Minerals' (ASX:PLS) was recently completed at ANSTO Minerals. The test run produced the following outcomes:

- Pilot Sileach™ operations successfully recover lithium from Pilgangoora spodumene concentrates without the requirement for roasting
- Despite operations suffering mechanical disruptions, lithium extractions into pregnant liquor solution of up to 73% were achieved
- Sufficient pregnant liquor was recovered to continue with lithium carbonate refining tests
- Valuable data was generated to improve plant availability

Processing commenced in the Lucas Heights facility (Fig. 1) on 30 January 2017, utilising spodumene concentrates supplied by Pilbara Minerals as part of the Sileach™ commercialisation agreement between LIT and PLS.

Figure 1 Spodumene pilot processing facilities at ANSTO Minerals, Lucas Heights, and Australia.

The pilot run commenced on schedule and initial operations ran smoothly with the trial reaching steady state operations after 12 hours. During operations some mechanical and material handling issues were experienced. Having generated sufficient pregnant liquor for lithium carbonate refining test work, operations were terminated on 2 February 2017.

The pilot run provided valuable insights into operation of the spodumene leach circuit and operational data on mechanical and materials handling considerations needed to improve the performance of future pilot runs.

Lithium was successfully recovered from refractory alpha-spodumene (that is, un-roasted spodumene) throughout the pilot run. This resulted in extractions, based on pregnant liquor solution analyses, ranging from 62% up to 73%. Elimination of mechanical and material handling interruptions to plant throughput is expected to have a significant impact on future lithium recoveries. LIT and ANSTO Minerals will now review pilot plant designs ahead of follow-up pilot studies of Sileach™ on spodumene later in 2017.

Managing director, Adrian Griffin said:

> *"The success of Sileach™ development to date has been outstanding, and further process modifications being contemplated place us in a very good position with respect to delivering the right outcome for development of the large-scale pilot plant.*
>
> *While recoveries were lower than expected for the spodumene run, identifying the weakest links, and removing them from the processing chain is the very reason you do pilot testing. The valuable data collected will provide critical input to future plant design."*

Adrian Griffin
Managing Director
Mobile +61 (0) 418 927 658
Adrian.Griffin@lithium-au.com

About Lithium Australia

Lithium Australia NL is a dedicated developer of disruptive lithium extraction technologies, and 100% owner of the Sileach™ process for the recovery of lithium from silicates. LIT has strategic alliances with a number of companies, potentially providing access to a diversified lithium mineral inventory. LIT aspires to create the union between resources and the best available technology and to establish a global lithium processing business.

MEDIA CONTACT:

Adrian Griffin Lithium Australia NL 08 6145 0288 | 0418 927 658
Kevin Skinner Field Public Relations 08 8234 9555 | 0414 822 631

TAB 3

Lithium Australia NL

ACN: 126 129 413
ASX: LIT

Level 1
675 Murray St
West Perth WA 6005

PO Box 1088
West Perth WA 6872

Phone +61 (0) 8 6145 0288
Fax +61 (0) 8 9475 0847

info@lithium-au.com
lithium-au.com

13 March 2017

ASX ANNOUNCEMENT

Lithium Australia responds to LPD statements made on 1 & 10 March 2017

Shareholders of Lithium Australia (ASX: LIT) and Lepidico Ltd (ASX: LPD) may be aware that the Board of Lepidico has recently chosen to make statements in public forums that seek to discredit Lithium Australia's Sileach™ technology. A separate letter is being sent to Lepidico's lawyers.

Regrettably, the Lepidico Board has:

- made statements calculated to discredit Sileach™ that are false, misleading and designed to invent safety concerns without any proper basis.
- expressed mock outrage that Lithium Australia has not disclosed all of its proprietary and confidential technology on the key Sileach™ process to the world at large, which of course no owner of valuable intellectual property would ever contemplate.

The statements made by the Lepidico board are untrue and appear to have been manufactured with the sole purpose of attempting to inflict commercial harm on Lithium Australia. Sileach™ poses no greater level of safety concern than Lepidico's L-Max® process.

Lepidico does not have a detailed understanding of the confidential Sileach™ process or reagents used and the Lepidico Board continues to demonstrate poor judgment and a potentially damaging path for Lepidico shareholders in an attempt to distract from Lithium Australia's compelling value proposition to Lepidico shareholders. This reflects poorly on the Lepidico Board's duty to its shareholders.

To correct the public record in relation to Sileach™

Lithium Australia's 100% owned Sileach™ process, is designed for the recovery of lithium from silicates. Lithium Australia advises that Sileach™ **does not use hydrofluoric acid (HF)** and the main fluorine product produced is hexafluorosilicic acid which is commonly used as a source of fluoride for fluoridation of domestic water supplies.

ANSTO Minerals (a division of the Australian Nuclear Science and Technology Organisation (ANSTO)) has been conducting pilot testing of the Sileach™ process on both lepidolite and spodumene feed materials. Prior to commissioning these pilot plants, ANSTO conducted thorough investigations of the processes and safety aspects and approved operation on the basis of negligible HF risk (none in the case of processing lepidolite, a common lithium mica).

Lithium Australia has undertaken all Sileach™ pilot tests under stringent safety conditions and has monitored for HF and confirmed that negligible concentrations of HF are present during processing.

Both L-Max® and Sileach™ processes use concentrated acids during the extraction of lithium from lithium ores without the need for the expensive roasting step. Lithium Australia has confirmed, during the successful piloting of Sileach™ at ANSTO, that this requires similar occupational, health and safety procedures and requirements that are comparable to many operating plants in Australia and internationally.

Why should Lepidico shareholders accept Lithium Australia's Takeover Offer?

Lithium Australia believes its Takeover Offer provides a unique opportunity to bring Sileach™ and L-Max® into a single, ownership structure, thereby fast-tracking both technologies in parallel and:

- provides a cheaper route to commercialisation (looking to build a single pilot plant to test Sileach™ and L-Max® in parallel, rather than two separate plants);
- creates a better platform to attract necessary development capital; and
- potentially creates a 'one-stop-shop' for hydrometallurgical lithium extraction and production, using both Sileach™ and L-Max® processing streams on a fit-for-product basis.

The Lithium Australia Board believes that by exchanging LPD Shares for LIT Shares under the Takeover Offer Lepidico shareholders will, in addition to receiving the implied premium for their LPD Shares, become shareholders in a combined group that is stronger and more diversified, with attractive prospects in one of the world's most exciting and important growth sectors – the lithium battery market.

Adrian Griffin
Managing Director
Mobile +61 (0) 418 927 658
Adrian.Griffin@lithium-au.com

About Lithium Australia
Lithium Australia NL is a dedicated developer of disruptive lithium extraction technologies, and 100% owner of the Sileach™ process for the recovery of lithium from silicates. LIT has strategic alliances with a number of companies, potentially providing access to a diversified lithium mineral inventory. LIT aspires to create the union between resources and the best available technology and to establish a global lithium processing business.

MEDIA CONTACT:
Adrian Griffin Lithium Australia NL 08 6145 0288 | 0418 927 658
Kevin Skinner Field Public Relations 08 8234 9555 | 0414 822 631

TAB 4

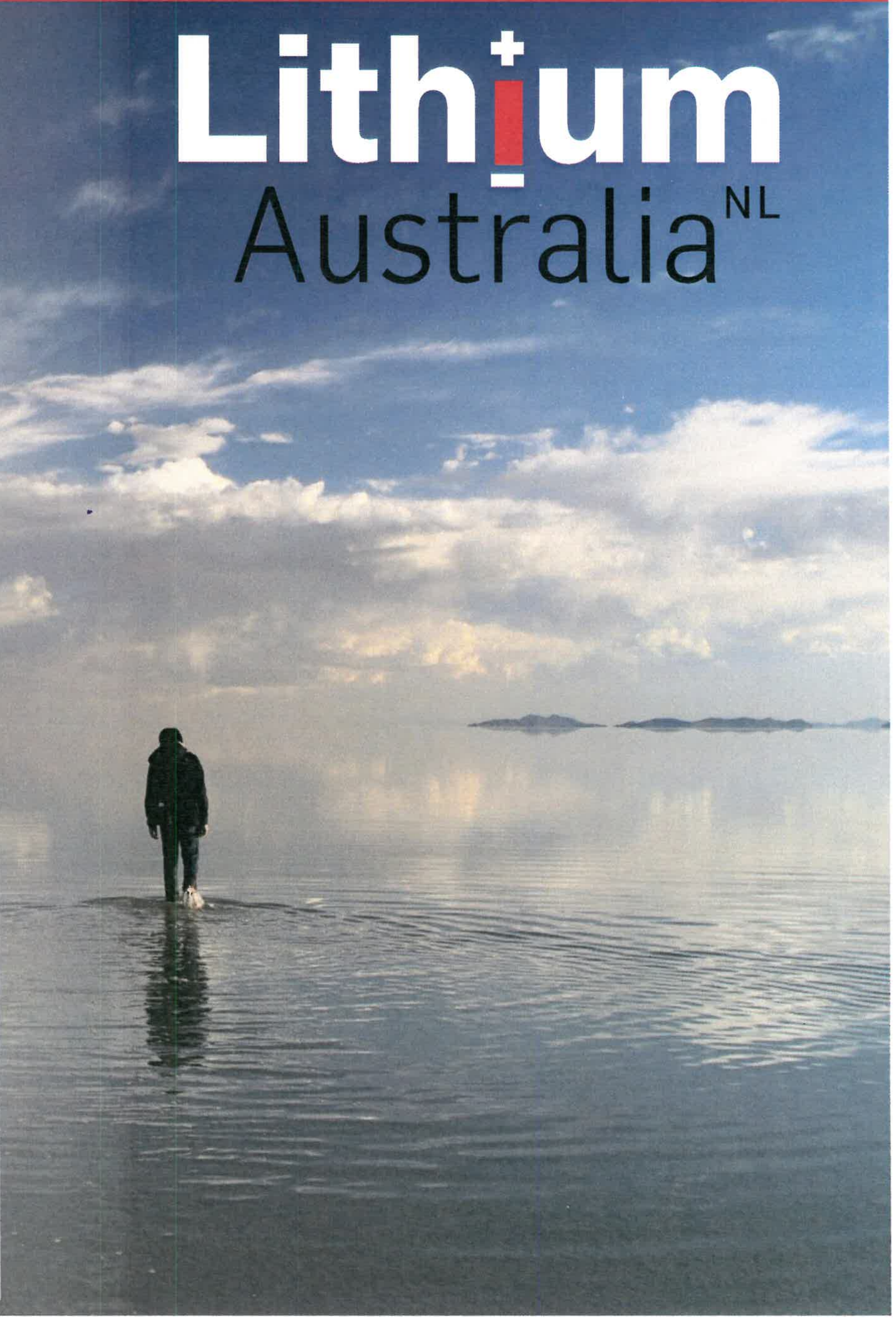
Lithium Australia NL

"I think you're onto something"

The history of disruptive technology in the lithium industry

Presented by

Adrian Griffin



Disclaimer

This presentation is for information purposes only. Neither this presentation nor the information contained in it constitutes an offer, invitation, solicitation or recommendation in relation to the purchase or sale of shares in any jurisdiction.

This presentation may not be distributed in any jurisdiction except in accordance with the legal requirements applicable in that jurisdiction. Recipients should inform themselves of the restrictions that apply in their own jurisdiction. A failure to do so may result in a violation of securities laws in that jurisdiction.

This presentation does not constitute financial product advice and has been prepared without taking into account the recipients' investment objectives, financial circumstances or particular needs, and the opinions and recommendations in this presentation are not intended to represent recommendations to particular persons. Recipients should seek professional advice when deciding if an investment is appropriate. All securities transactions involve risks, which include, among others, the risk of adverse or unanticipated market, financial or political developments.

Certain statements contained in this presentation, including information as to the future financial or operating performance of Lithium Australia NL ('LIT' or 'the Company') and its projects, are forward-looking statements. Such forward-looking statements are necessarily based on a number of estimates and assumptions that, while considered reasonable by LIT, are inherently subject to significant technical, business, economic, competitive, political and social uncertainties and contingencies, involve known and unknown risks and uncertainties that could cause actual events or results to differ materially from estimated or anticipated events or results reflected in such forward-looking statements, and may include, among other things, statements regarding targets, estimates and assumptions in respect of commodity prices, operating costs and results, capital expenditures, ore reserves and mineral resources and anticipated grades and recovery rates and are, or may be, based on assumptions and estimates related to future technical, economic, market, political, social and other conditions.

LIT disclaims any intent or obligation to update publicly any forward-looking statements, whether as a result of new information, future events or results or otherwise. The words 'believe', 'expect', 'anticipate', 'indicate', 'contemplate', 'target', 'plan', 'intends', 'continue', 'budget', 'estimate', 'may', 'will', 'schedule' and other, similar expressions identify forward-looking statements. All forward-looking statements made in this presentation are qualified by the foregoing cautionary statements. Investors are cautioned that forward-looking statements are not guarantees of future performance and, accordingly, investors are cautioned not to put undue reliance on forward-looking statements due to the inherent uncertainty therein.

Many known and unknown factors could cause actual events or results to differ materially from estimated or anticipated events or results reflected in such forward-looking statements. Such factors include, but are not limited to: competition; mineral prices; ability to meet additional funding requirements; exploration, development and operating risks; uninsurable risks; uncertainties inherent in ore reserve and resource estimates; dependence on third-party smelting facilities; factors associated with foreign operations and related regulatory risks; environmental regulation and liability; currency risks; effects of inflation on results of operations; factors relating to title to properties; native title and Aboriginal heritage issues; dependence on key personnel, and share-price volatility. They also include unanticipated and unusual events, many of which it is beyond the Company's ability to control or predict.

Photographs in this presentation do not depict assets of the Company.

COMPETENT PERSON'S STATEMENT

The information in this report that relates to reporting of Exploration Results is based on and fairly represents information and supporting documentation prepared by Adrian Griffin, a member of the Australasian Institute of Mining and Metallurgy. Mr Griffin is a shareholder in, and managing director of, LIT and has sufficient experience relevant to the style of mineralisation and type of deposit under consideration. He is qualified 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 Griffin consents to the inclusion in this report of the matters based on information in the form and context in which it appears.

The reporting of mineral species is generic in nature, and the term 'lepidolite' – as it is applied to mineral species, and not necessarily locality names – includes mineral species widely considered to be part of the solid solution series of polylithionite/trilithionite, of which the Competent Person considers lepidolite to be approximately a median member. It is also acknowledged that material processed from Lepidolite Hill has bulk compositions tending towards trilithionite, although the rubidium concentration is outside the range generally expected in such minerals.

Similarly, the term 'zinnwaldite' has been applied to minerals approximating the accepted composition of zinnwaldite but with variations tending towards lepidolite. This terminology is considered acceptable by the Competent Person, particularly with respect to the Cinovec deposit, the mineralization of which includes the type locality of zinnwaldite, being Zinnwald, close to the border of Germany and the Czech Republic.

Company snapshot

LITHIUM AUSTRALIA (LIT) – A UNIQUE FOCUS ON LITHIUM

BOARD OF DIRECTORS

George Bauk (non-executive chairman)
Expert in specialty metals, particularly rare earths – project management, marketing and financing.

Adrian Griffin (managing director)
Exploration, production, mine management.

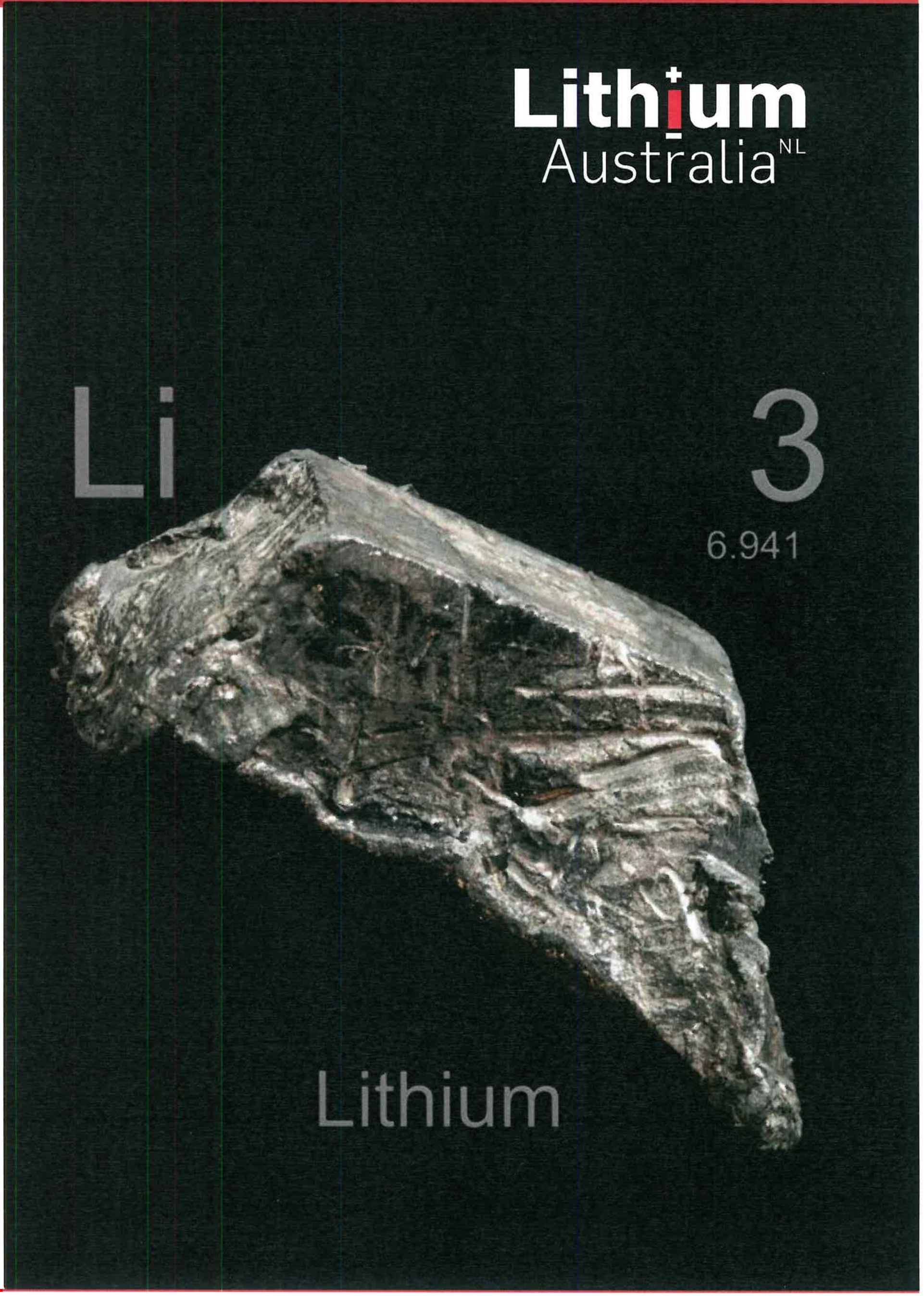
Bryan Dixon (non-executive director)
Corporate, finance, mine development.

ASX ticker: LIT
ACN 126 129 413

- 197 M Ordinary Shares
- 23 M Partly Paid Shares
- 29 M Unlisted Options
- 13 M Performance Rights
- $3.8M Cash at bank 31 Jan 2016

- **Market cap. $35 M (3 Feb 2016 – source Yahoo)**

info@lithium-au.com
www.lithium-au.com



Disruptive technology in the minerals industry

Lithium Australia NL

WHAT IS DISRUPTIVE TECHNOLOGY?

Disruptive technology is that which creates the paradigm shift, the compelling argument for strategic change.

WHAT WERE SOME OF THE GREAT INNOVATIONS?

- Refining iron to produce steel - a revolution starting with the Eiffel Tower
- Froth flotation - a revolution starting with washing a pair of overalls in Broken Hill
- Carbon in pulp - well who knows how that started?
- High pressure acid leach – born and bred in WA (but don't forget Cuba)

NEW BATTERY TECHNOLOGY – THE BIGGEST INNOVATION SINCE THE INDUSTRIAL REVOLUTION AND IT STARTS WITH MINERALS

BUT HOW ARE WE POSITIONED TO FEED INSATIABLE DEMAND?

- The supply chain is constipated
- The most accessible lithium is expensive

THE SOLUTION

- Improved efficiency for existing lithium sources
- Technology that transforms untouchables into ore

Fusion of thought – a retrospective

“In terms of economic value, no Australian invention can have been of more importance to Australia than the flotation process for the separation of minerals. It had been known since the late eighteenth century that powdered ores could be made to float by generating bubbles which attached them to the ore particles and raised them to the surface. But the first person to succeed in the large scale commercial exploitation of the flotation process was Charles Vincent Potter, a Melbourne brewer and chemist. His process was patented in 1901 and shortly afterwards was put into operation at Broken Hill, where it produced over six million tons of zinc concentrate, assaying up to 42 per cent zinc. Potter’s invention was the forerunner of several flotation processes to be developed and put into operation at Broken Hill.” Taken from StumpJump Plough to Interscan, A. Walsh, Australian Academy of Science, 1977.

The ability to recover lithium from silicates, without roasting will again put Australia at the forefront of mineral processing technology, the importance of which may eclipse froth flotation.

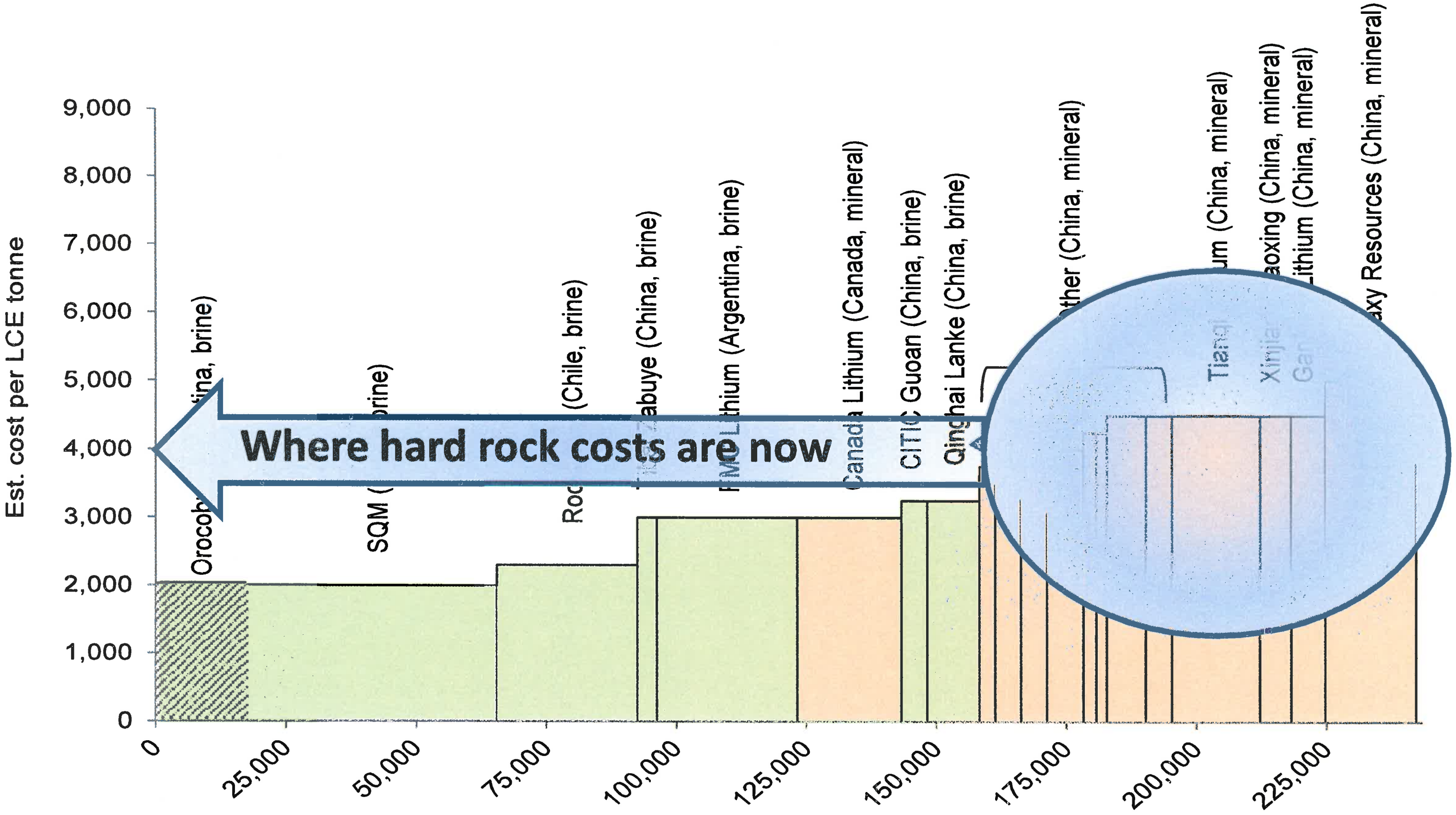
Fusion of thought – a retrospective

Broken Hill Proprietary Company Ltd about 1888

"Broken Hill led the world in the profitable treatment of zinc-lead sulfides. At the turn of the 20th century, three out of every four tons that came out of the mine could not be treated. It was stacked in huge dumps along the line of lode; dumps that would mark the grave of Broken Hill unless silver, zinc and lead could be separated cheaply,

In 1902 D.G. Delprat, the general manager of Broken Hill Proprietary Company Limited, invented a process that promised to extract the treasure in the dump. He added oil, salt cake and other chemicals to a tank of pulped ore, and pumped air in through a blower at the bottom. He was delighted to observe that the particles of minerals clung to the rising air bubbles and overflowed the tank which the barren particles sank to the bottom. His company erected the first efficient flotation plant in the world

Current cost profile – we need to re-evaluate the options



Estimated global lithium cost curve [sources: Roskill (with modifications) and Orecobre 2014 presentation].

BUT WHERE IS THE SMART MONEY INVESTING?

What's driving the cost of hard rock lithium?

Lithium Australia NL

STUBBORNESS AND TRADITION

- All commercial processes roast then leach (burning energy is burning dollars)
- To cover the energy cost ore/concentrates must be high-grade
- The starting point is spodumene at 6-7% Li2O

THE ULTIMATE IMPACT

- High operating cost
- Reduced reserves/resources
- Relegates other ore types to waste dumps and tailings

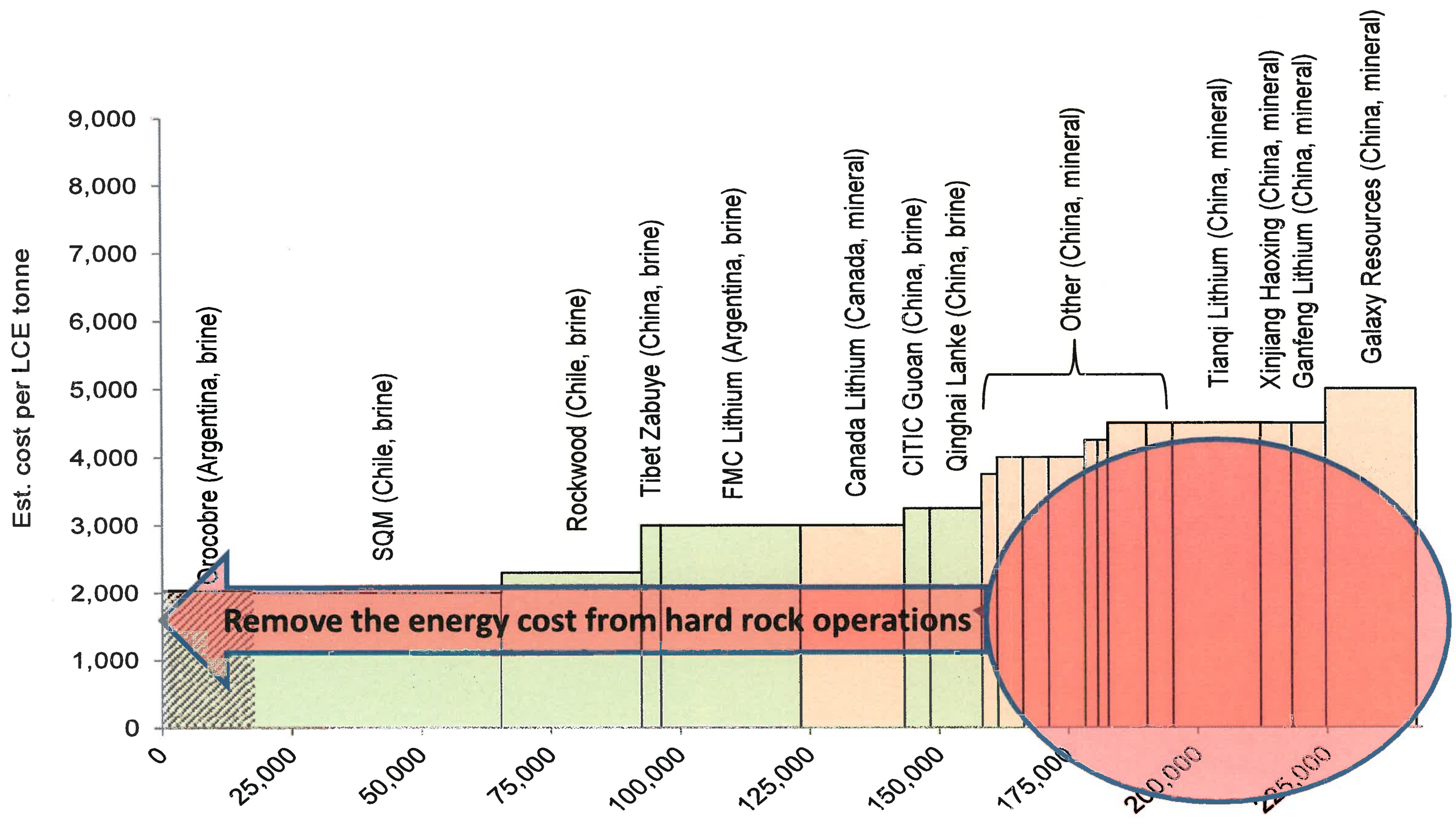
VERY POOR UTLILIZATION OF RESOURCES

LACK OF INNOVATION

REGARDLESS THE SMART MONEY IS INVESTING IN HARD ROCK

- Anticipation of rising prices
- Awaiting the breakthrough to eliminate energy costs

How do we fix the problem?



Remove the energy cost from hard rock operations

Estimated global lithium cost curve [sources: Roskill (with modifications) and Orecobre 2014 presentation].

What are the consequences?

EXISTING AND NEW SPODUMENE PRODUCTION COST COMPETITIVE

- Cutt-off grades can be decreased
- Resources expand with no additional capital cost
- Hard-rock production can compete with the brine deposits

LOWER VALUE MINERALS BECOME ORE

- The “forgotten resource” the micas become ore
- Potential for tourmalines, and clays

BROWNFIELDS EXPANSION CAPACITY

EXPEDITIOUS MATCH OF GROWING DEMAND WITH EXISTING SUPPLY

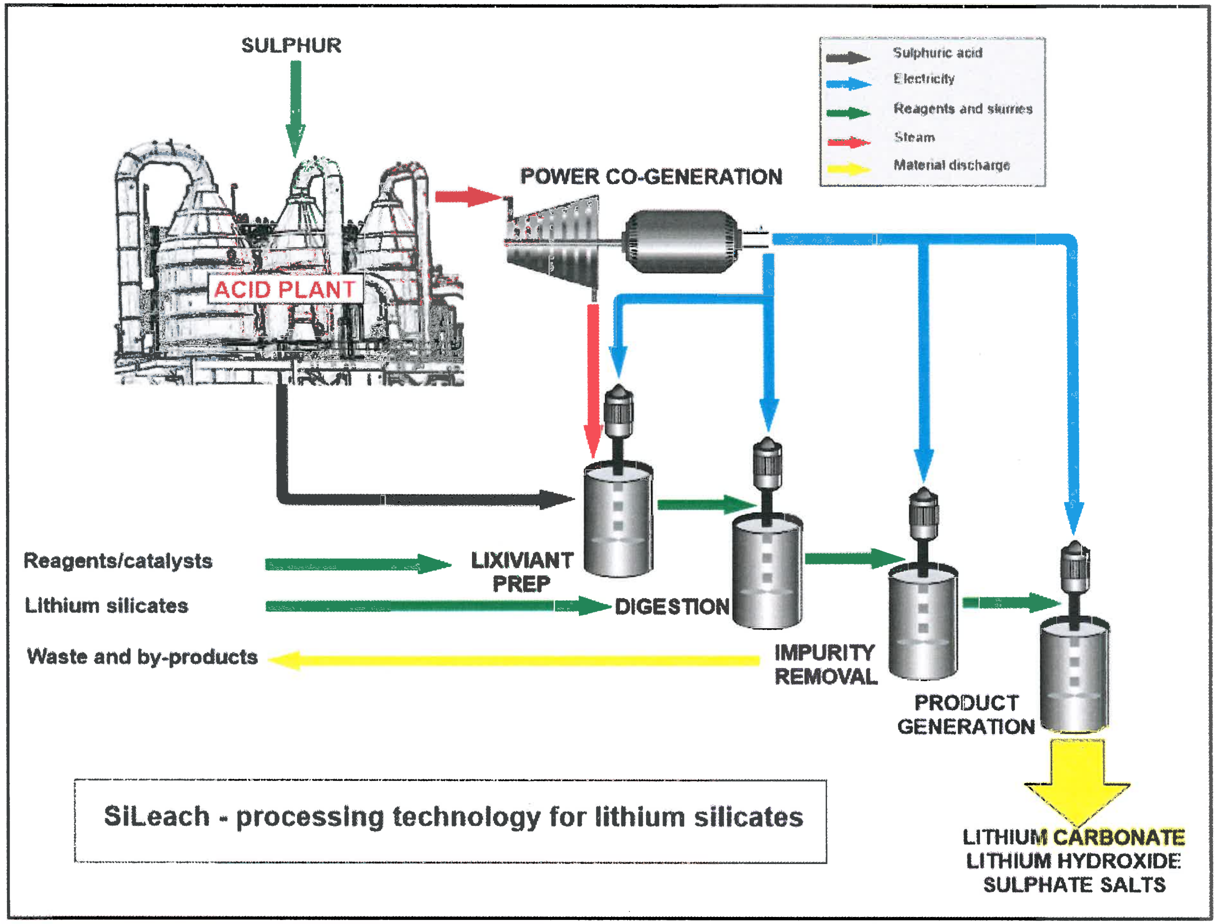
OTHER LOWER GRADE MINERALS POTENTIALLY BECOME ORE

How is it accomplished?

Lithium Australia NL

IT'S NOT ROCKET SCIENCE – IT'S CHEMISTRY

Determine the reaction mechanism and design the lexiviant
Add the catalysts
Mix in the mineral concentrate



SiLeach provides a universal process for the recovery of lithium from lithium silicates. It can process the most refractory feed materials, including spodumene, the tourmalines and jadarite without the requirement to roast before leaching. It can also process micas and clays.

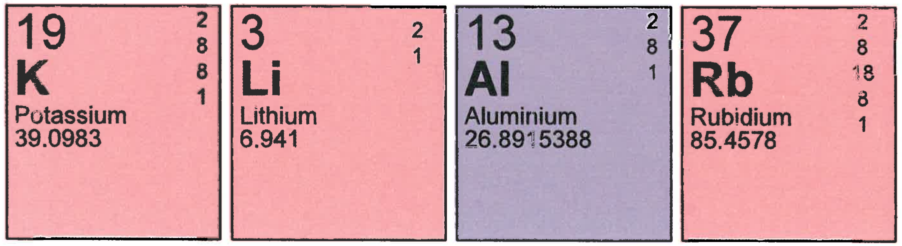
The process derives all of its energy requirements from the production of the lixiviant, that has a sulphuric acid base on chemical steroids.

The lixiviant can be tailored to the mineral feed to achieve optimum results.

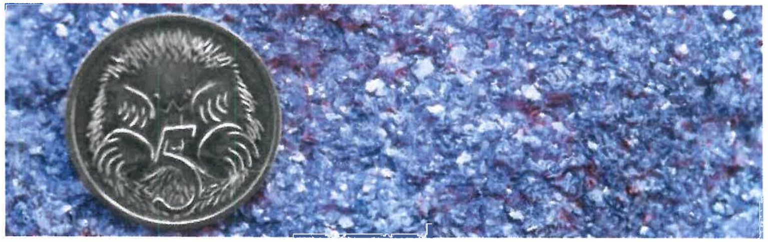
The case for lithium micas

Zinnwaldite – lithium mica
$K(Li,Al,Fe)_3(Al,Si)_4O_{10}(F,OH)_2$

Lepidolite – lithium mica
$K(Li,Al,Rb)_3(Al,Si)_4O_{10}(F,OH)_2$



19 **K** Potassium 39.0983 2 8 8 1	3 **Li** Lithium 6.941 2 1	13 **Al** Aluminium 26.8915388 2 8 1	37 **Rb** Rubidium 85.4578 2 8 18 8 1



99.6% lithium carbonate purity

to

99.9% lithium hydroxide purity

Marginal additional cost to achieve a 40% revenue uplift.

Positive results on:

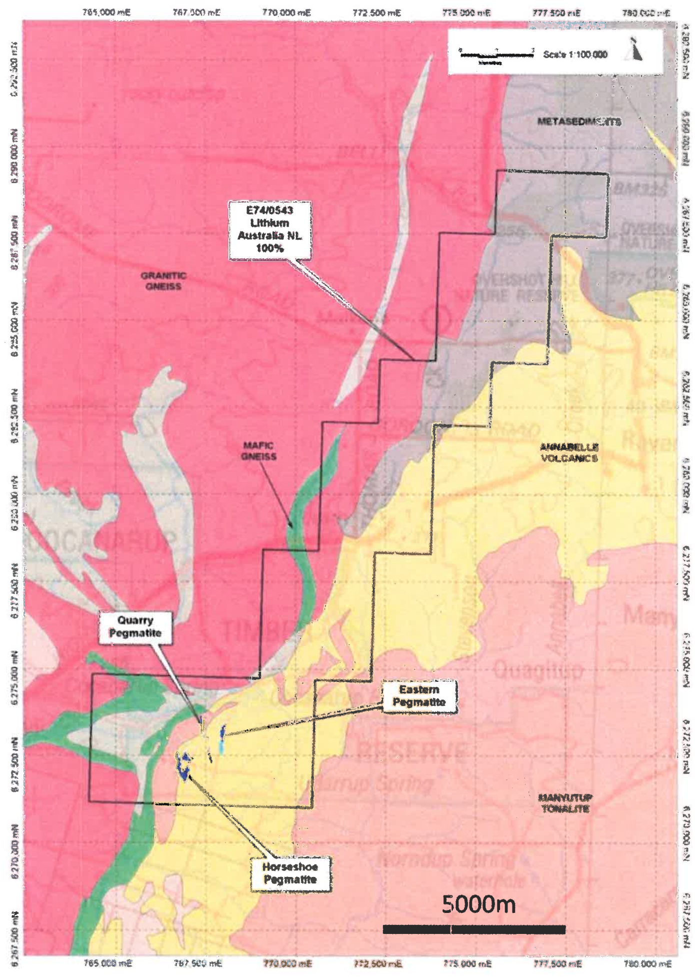
- Cinovec zinnwaldite
- 2 additional European Li mica deposits
- One Chinese Li mica resource, and
- Lepidolite Hill trilithionite

Watch this space

Lithium Australia NL

RAVENSTHORPE

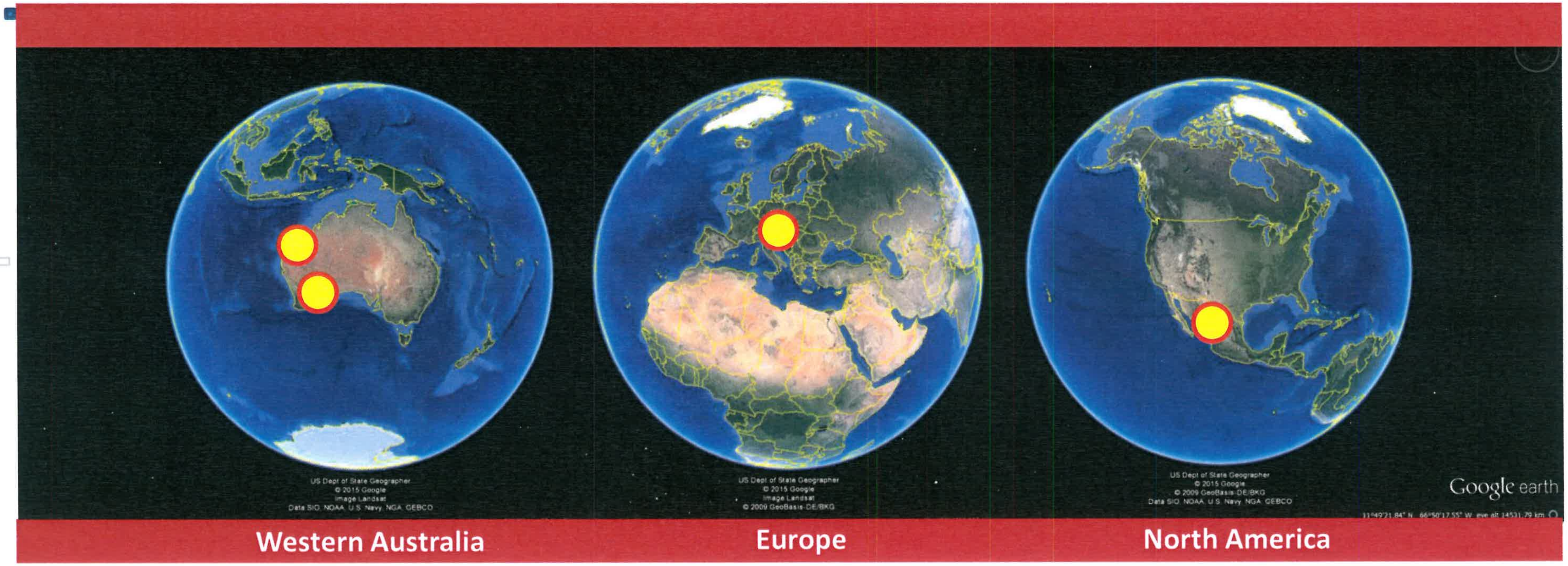
Assays average 2.96% Li_2O over the mineralized zone which has an aggregate strike length of over 750m. Further concealed pegmatites are anticipated.



The growing lithium inventory

Lithium Australia NL

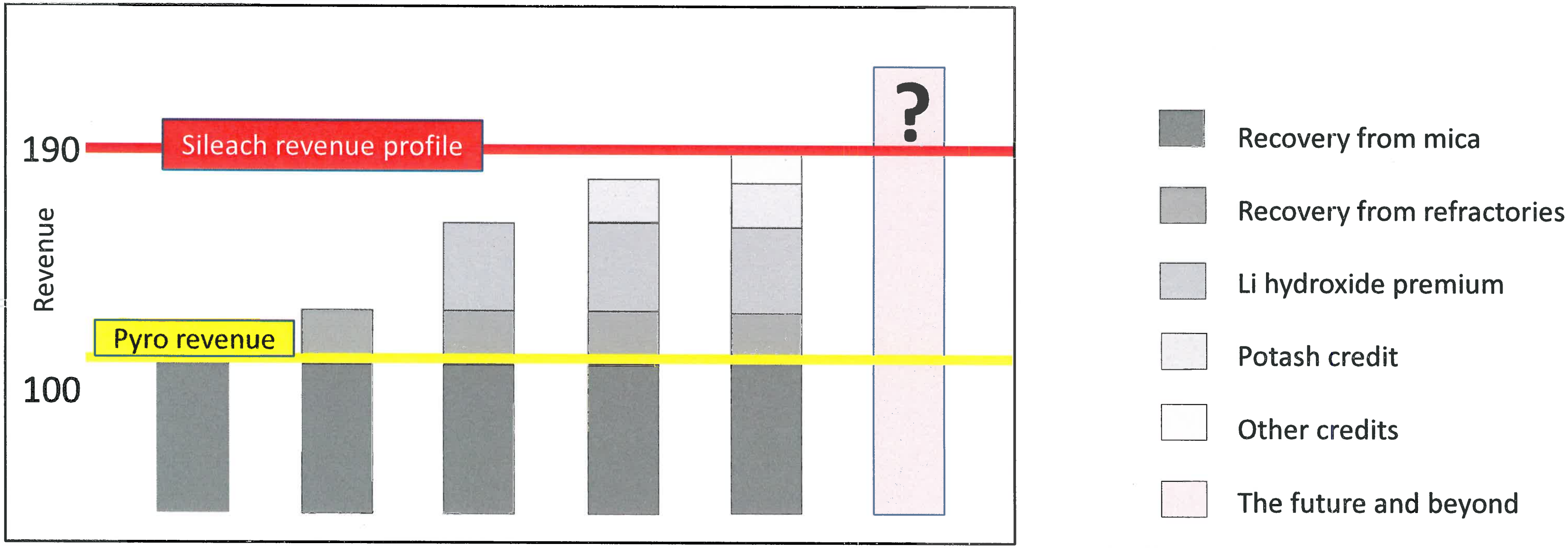
- The Yilgarn Project (WA)
- The Pilbara Region (WA)
- Europe
- Mexico



Changing the lithium chemical cost curve

ACHIEVING THE PRODUCTION GOALS
- High feed grades
- Fast reaction time – low capital cost
- Product options include carbonate and hydroxide
- High by-product credits

A European hypothetical



... and all with zero energy footprint

Company advantages

VALUE-ADDING FACTORS

Proprietary lithium extraction processes
Advanced exploration techniques
Access to lithium sources

First-mover advantage
LIT is the leader in the production of battery-grade lithium carbonate and hydroxide and developer of advanced extraction processes for other silicates. Assets extend over three continents with diversification from lithium micas to a range of more conventional lithium silicates.

Alliances with Pilbara Minerals, Focus Minerals, Tungsten Mining and Venus Metals Corporation

Opportunities previously overlooked
- Tailings
- Current mine-waste discharge streams
- Primary lithium mica deposits

Escalating demand
- Revolutionary innovations in transport
- New renewable-energy storage solutions
- Emergence of smart-grid systems

Cinovec – non-binding HoA with EMH
- Giant lithium mica deposit in the Czech Republic
- Scoping study complete
- High-purity lithium carbonate produced
- Advancing to feasibility

ALiX JV
- Lithium clay evaluation
- Exploration potential
- Springboard into lithium-hungry North America

Improved economics for conventional sources
Licensing and royalty opportunities

FURTHER INFORMATION
info@lithium-au.com
www.lithium-au.com

ANNEXURE B

Supplementary Independent Expert's Report

BDO Corporate Finance (WA) Pty Ltd

LEPIDICO LTD
Supplementary Independent Expert's Report

1 May 2017

Financial Services Guide

1 May 2017

BDO Corporate Finance (WA) Pty Ltd ABN 27 124 031 045 (**'BDO'** or '**we**' or '**us**' or '**ours**' as appropriate) was engaged by Lepidico Ltd (**'Lepidico'** or the **'Company'**) to provide an independent expert's report on a conditional off-market takeover offer received from Lithium Australia NL. You were provided with a copy of our report as a retail client because you are a shareholder of Lepidico. BDO is now providing a Supplementary to that report. The Supplementary report is attached.

Financial Services Guide

In the above circumstances we are required to issue to you, as a retail client, a Financial Services Guide ('**FSG**'). This FSG is designed to help retail clients make a decision as to their use of the general financial product advice and to ensure that we comply with our obligations as financial services licensees.

This FSG includes information about:

- Who we are and how we can be contacted;
- The services we are authorised to provide under our Australian Financial Services Licence, Licence No. 316158;
- Remuneration that we and/or our staff and any associates receive in connection with the general financial product advice;
- Any relevant associations or relationships we have; and
- Our internal and external complaints handling procedures and how you may access them.

Information about us

BDO Corporate Finance (WA) Pty Ltd is a member firm of the BDO network in Australia, a national association of separate entities (each of which has appointed BDO (Australia) Limited ACN 050 110 275 to represent it in BDO International). The financial product advice in our report is provided by BDO Corporate Finance (WA) Pty Ltd and not by BDO or its related entities. BDO and its related entities provide services primarily in the areas of audit, tax, consulting and financial advisory services.

We do not have any formal associations or relationships with any entities that are issuers of financial products. However, you should note that we and BDO (and its related entities) might from time to time provide professional services to financial product issuers in the ordinary course of business.

Financial services we are licensed to provide

We hold an Australian Financial Services Licence that authorises us to provide general financial product advice for securities to retail and wholesale clients.

When we provide the authorised financial services we are engaged to provide expert reports in connection with the financial product of another person. Our reports indicate who has engaged us and the nature of the report we have been engaged to provide. When we provide the authorised services we are not acting for you.

General Financial Product Advice

We only provide general financial product advice, not personal financial product advice. Our report does not take into account your personal objectives, financial situation or needs. You should consider the appropriateness of this general advice having regard to your own objectives, financial situation and needs before you act on the advice.

Fees, commissions and other benefits that we may receive
We charge fees for providing reports, including this report. These fees are negotiated and agreed with the person who engages us to provide the report. Fees are agreed on an hourly basis or as a fixed amount depending on the terms of the agreement. The fee payable to BDO Corporate Finance (WA) Pty Ltd for this engagement is approximately $60,000.

Except for the fees referred to above, neither BDO, nor any of its directors, employees or related entities, receive any pecuniary benefit or other benefit, directly or indirectly, for or in connection with the provision of the report.

Remuneration or other benefits received by our employees
All our employees receive a salary. Our employees are eligible for bonuses based on overall productivity but not directly in connection with any engagement for the provision of a report. We have received a fee from Lepidico for our professional services in providing this report. That fee is not linked in any way with our opinion as expressed in this report.

Referrals
We do not pay commissions or provide any other benefits to any person for referring customers to us in connection with the reports that we are licensed to provide.

Complaints resolution
Internal complaints resolution process
As the holder of an Australian Financial Services Licence, we are required to have a system for handling complaints from persons to whom we provide financial product advice. All complaints must be in writing addressed to The Complaints Officer, BDO Corporate Finance (WA) Pty Ltd, PO Box 700 West Perth WA 6872.

When we receive a written complaint we will record the complaint, acknowledge receipt of the complaint within 15 days and investigate the issues raised. As soon as practical, and not more than **45 days** after receiving the written complaint, we will advise the complainant in writing of our determination.

Referral to External Dispute Resolution Scheme
A complainant not satisfied with the outcome of the above process, or our determination, has the right to refer the matter to the Financial Ombudsman Service ('**FOS**'). FOS is an independent organisation that has been established to provide free advice and assistance to consumers to help in resolving complaints relating to the financial service industry. FOS will be able to advise you as to whether or not they can be of assistance in this matter.

Our FOS Membership Number is 12561. Further details about FOS are available at the FOS website www.fos.org.au or by contacting them directly via the details set out below.

Financial Ombudsman Service
GPO Box 3
Melbourne VIC 3001
Toll free: 1800 367 287
Facsimile: (03) 9613 6399
Email: info@fos.org.au

Contact details
You may contact us using the details set out on page 1 of the accompanying report.

Tel: +61 8 6382 4600
Fax: +61 8 6382 4601
www.bdo.com.au

38 Station Street
Subiaco, WA 6008
PO Box 700 West Perth WA 6872
Australia

1 May 2017

The Directors
Lepidico Ltd
Level 1, 254 Railway Parade
West Leederville WA 6065

Dear Directors

SUPPLEMENTARY INDEPENDENT EXPERT'S REPORT

1. Introduction

On 2 March 2017, Lepidico Ltd (**'Lepidico'** or the **'Company'**) received a Bidder's Statement from Lithium Australia NL (**'Lithium Australia'**) in relation to the offer to acquire all the ordinary shares in Lepidico. The consideration offered by Lithium Australia is one (1) Lithium Australia Share (**'Offer Consideration'**) for every 13.25 Lepidico Shares (the **'Offer'**). Lithium Australia does not intend to make an offer in respect to the current Lepidico Options that are on issue. If holders of the Lepidico Options exercise their Options and are issued Lepidico Shares during the Bid Period, however, the Offer will extend to those Lepidico Shares.

BDO Corporate Finance (WA) Pty Ltd (**'BDO'** or **'we'** as appropriate) prepared an independent expert report dated 27 March 2017 (our **'Report'**) which was included in the Target's Statement dated 28 March 2017 issued to Shareholders in respect of the Offer.

Our conclusion and opinion in relation to the Offer remains unchanged, that is that **the Offer is neither fair nor reasonable to Shareholders**.

However, the Australian Securities and Investments Commission (**'ASIC'**) has requested we provide additional disclosure on the assumptions we relied upon when opining on the valuation of a Lepidico Share. In particular, the assumptions included in the valuation of the L-Max® technology under the Discounted Cash Flow (**'DCF'**) methodology. To address these additional disclosures, BDO has requested the independent specialist, RW Nice & Associates Pty Ltd (**'RW Nice'**), to prepare a Supplementary Independent Technical Report. This Supplementary Independent Technical Report has been included at Appendix 1.

We are also taking this opportunity to provide additional explanation in relation to our valuation of a Lepidico Share.

This Supplementary Independent Expert Report should be read in conjunction with our Report dated 27 March 2017 and Lepidico's previous Target's Statement, Supplementary Target's Statement and Second Supplementary Target's Statement.

2. Valuation of a Lepidico Share

Our valuation of a Lepidico Share, on a control basis, is shown in Section 10.3 of our Report and is also repeated in the below table.

	Low $	Preferred $	High $
Value of 1 Lepidico Share - QMP methodology	0.016	0.018	0.021
Value of 1 Lepidico Share – Sum-of-parts methodology	0.012	0.014	0.016

Source: BDO analysis

Our valuation of a Lepidico share determined under the QMP methodology (including a premium for control) is higher than our valuation determined under the sum-of-parts methodology in the low, preferred and high scenarios.

Based on the results above we consider the value of a Lepidico Share to be between $0.016 and $0.021, with a preferred value of $0.018. Our valuation range incorporates both the sum-of-parts methodology and the QMP methodology. The high value determined under the sum-of-parts methodology has been adopted as our low value and the high value determined under the QMP methodology has been adopted as our high value. However, as we noted in Section 9.1 of our Report we are of the view that the QMP methodology best represents the fully informed market value of the Company as compared to the sum-of-parts methodology which is limited in capturing the value represented by being able to licence out the technology to additional projects to reduce their costs or to install further instances of the L-Max® technology at other sites.

Commentary on the difference between the results of our valuation methodologies

We adopted the QMP methodology as our primary valuation approach and we adopted the sum-of-parts methodology combined as our secondary valuation methodology.

The Company's main asset is the intellectual property that it holds, being the L-Max® technology, and the Company has recently completed its Preliminary Feasibility Study. We consider that we have a reasonable basis under Regulatory Guide 170 'Prospective financial information' to apply the DCF methodology and have instructed RW Nice to act as an independent specialist to perform a review of the technical project assumptions contained in the cash flow model prepared by the Company, this has been adopted as our high valuation under the sum-of-parts methodology. We note that this is only based on Lepidico developing L-Max® at Kenora as we do not have reasonable grounds for further developments or royalties payable by other parties.

As a secondary method we have also considered the adjusted historical acquisition cost of the L-Max® technology as a low valuation case. As the acquisition completed on 30 May 2016 was as a result of an arm's length negotiation we believe it provides a floor value which can be considered in our valuation range. In considering this value, we have considered the events that have occurred since acquisition to ensure that there are no indications that this value would be impaired.

The remaining assets and liabilities of Lepidico are valued using the NAV methodology. We also note that it is likely that Lepidico would undertake periodic capital raisings in order to limit dilution by seeking to raise capital following the achievement of milestones that are expected to result in share price increases. This is in relation to the notional capital raising which has been undertaken in accordance with Regulatory Guide 111.15 'Content of Expert's Reports'.

We are of the view that these issues account for the difference in the two valuation ranges particularly as the bottom end of our sum-of-parts methodology is based on a cost approach.

Sum-of-parts valuation of a Lepidico Share

Our valuation of a Lepidico share, as determined under the sum-of-parts methodology, incorporates a valuation of the L-Max® technology. One valuation methodology used to value the L-Max® technology is the DCF methodology. We have requested the independent specialist, RW Nice, to prepare a Supplementary Independent Technical Report which provides additional disclosure on the assumptions we relied upon when opining on the valuation of a Lepidico Share under the sum-of-parts methodology. This Supplementary Independent Technical Report has been included at Appendix 1.

In addition to the Supplementary Independent Technical Report, we understand that lithium recovery rates may vary depending on the feedstock source. We have assessed the impact on the Net Present Value (**'NPV'**) if the recovery rate were to reduce to 88% and are satisfied that the NPV remains within our adopted valuation range. We have also assessed the impact on the NPV on the assumption that the throughput of the plant feedstock will increase (or decrease) with any decrease (or increase) in feedstock recoverability, and therefore, lithium carbonate produced over the life of mine at approximately 3.0ktpa may vary. Based on our sensitivity analysis of the recoverability of the lithium carbonate, we are satisfied that the NPV remains within our adopted valuation range.

3. Closure of the Entitlement Offer

We note since the date of our Report Lepidico has closed its non-underwritten, non-renounceable 1 for 4 Entitlement Offer to raise a maximum of $5,689,247 (**'Entitlement Offer'**) at an issue price of $0.013 per share. Valid applications for 238,659,066 new shares were received under the Entitlement Offer, representing 56% of the total eligible amount and raising $3,102,567. The shortfall from the Entitlement Offer was 188,871,852 shares equivalent to $2.5 million. Applications forms have been mailed to eligible shareholders under the shortfall offer.

Our valuation of a Lepidico share under the QMP methodology, excluding a control premium, was between $0.012 and $0.015, with a midpoint value of $0.013 as outlined in Section 10.1 of our Report. The level of application received under the Entitlement Offer at the issue price was $0.013 per share, on a minority basis, further supports our valuation of a Lepidico share determined under the QMP methodology.

4. Opinion

We reiterate that our conclusion and opinion in relation to the Offer remains unchanged, that is that **the Offer is neither fair nor reasonable to Shareholders**.

This Supplementary Independent Expert Report should be read in conjunction with our Report dated 27 March 2017 and Lepidico's previous Target's Statement, Supplementary Target's Statement and Second Supplementary Target's Statement.

Yours faithfully

BDO CORPORATE FINANCE (WA) PTY LTD

Adam Myers

Adam Myers
Director

Sherif Andrawes
Director

Appendix 1 – Supplementary Independent Specialist Report

LEPIDICO LTD

TECHNICAL ASSESSMENT

for

PHASE 1

PRE-FEASIBILITY STUDY
for

L-MAX® LITHIUM EXTRACTION TECHNOLOGY

SUPPLEMENTARY REPORT

by: R.W. NICE **FINAL** **01 MAY 2017**

R.W. NICE & ASSOC. Pty. Ltd **CONSULTING METALLURGICAL ENGINEERS**
25/ 1 - 5 RUSSELL St **Telephone: +612-9966-4530**
WOLLSTONECRAFT NSW **Mobile: +612-418-209-276**
e-mail: rwnice@pacific.net.au

INTRODUCTION

This report is a Supplemental report to the Technical Assessment report as issued by RW Nice & Assocs. Pty Ltd (ñRWNò) on 27 March 2017. The initial report was prepared for BDO Corporate Finance (WA) Pty Ltd (ñBDOò) who had instructed RWN to review the technical assumptions and provide an assessment on the reasonableness of assumptions used in the Lepidico Project Evaluation Model. Lepidico Ltd (ñLepidicoò) is the company that owns the proprietary technology, namely the L-Max® technology, which can be used to extract lithium and other metals from mica based mineral deposits.

Subsequent to the issue of the report BDO has requested that RWN provide additional explanation regarding the assumptions included in the valuation of the L-Max® technology under the Discounted Cash Flow (**'DCF'**) methodology.

The questions that BDO consider require response from RWN are;

1. Affirm the reasonableness of adopting different plant feed sources for the purposes of the DCF valuation. In relation to this point we specifically note that of the plant feed tested (Avalon, Bland and Alvarroes), only the Avalon plant feed returned results that would produce the high grade lithium required for battery use
2. Explain the adjustments required to the processing design to accommodate differing plant feed sources, including any resulting adjustments to capital and operating expenditure requirements;
3. Explain the impact on production rates resulting from any reduction in recovery rates (and by-products as applicable)

This report will provide responses from RWN and are in accordance with ASIC Regulatory Guide RG 170 óProspective financial informationô.

SUMMARY

With regard to the questions put forth by BDO, RWN provides the following responses in summary form:

Question 1; It is reasonable to assume that the Kenora plant using the L-Max® technology can treat any number of different feedstocks and still produce battery grade lithium carbonate (99.5% Li_2CO_3). However, each feed material will have differing physical characteristics which will necessitate minor changes on the operating procedures. There will not be any significant equipment or flowsheet modifications required.

Question 2; In the event that different plant feed sources are utilised, with potentially lower recoverability than that of Lepidicoôs current expectations, there are two likely scenarios, as follows:

1. Lepidico expected the Kenora plant to maintain production of 3.0ktpa battery grade lithium carbonate by increasing (or decreasing) the throughput of the plant feedstock. This may necessitate an increase (or decrease) in grinding requirements either by increasing the energy input or, if the material parameters are known prior to construction, by increasing the size of the grinding equipment. These costs are minor both in a capital cost perspective and operating cost perspective. Extra leaching may require extra tanks or larger tanks. Extra washing capability has already been incorporated within the Kenora plant design.

   In this scenario, it is unlikely that capital costs would increase more than 10%. Similarly, operating costs should not vary more than 5%; or
2. Lepidico expects to maintain the same throughput of the Kenora plant feedstock, which may consequently decrease (or increase) the amount of battery grade lithium carbonate produced.

In this scenario, any increases (or decreases) in capital costs and operating costs would not be material.

Question 3; If a different feedstock is fed to the existing plant and this material would not have as high a recovery rate as the Avalon material then either the Kenora plant treats more material or the production rate drops by the same proportion as the recovery rate drops. The most likely scenario would be something in between as the plant could probably be capable of ñpushingò more material through and thereby make up some or all of the differential.

Such a circumstance would occur if the feedstock has a lower grade than that used for the design of the Kenora plant.

RWN notes that the ñnormalò practice with a properly designed plant is that the operators can increase throughput from nameplate by good operating practices. This would hold true also with increasing recovery rates.

QUESTION 1

> *Affirm the reasonableness of adopting different plant feed sources for the purposes of the DCF valuation. In relation to this point we specifically note that of the plant feed tested (Avalon, Bland and Alvarroes), only the Avalon plant feed returned results that would produce the high grade lithium required for battery use*

It is readily accepted that treatment of different ore deposits to extract similar economic minerals and elements requires similar processing approaches but these approaches can and will differ slightly as every deposit differs slightly.

Treatment of different lithium bearing mica ores will also require minor changes to the processing approach. Nevertheless, the technology use is essentially identical; only the operating procedures will change.

Lepidico has tested a number of differing source materials and has reported in their Pre-Feasibility Study (ñPFSò) results for three of these deposits, Avalon, Bland and Alvarroes. The majority of the testwork was conducted on the Avalon material with very good results. The results for the other two materials showed lower extraction performance and lower final product quality. These poorer results indicated different characteristics of the source material but also reflected the degree of less testwork detail. A table from the original RWN report illustrates this as shown below.

Table 2.1

Bench-Scale Laboratory Testwork Results on Selected Samples

Sample Source		**Avalon**	**Bland**	**Portugal**	
Material Treated		**Flotation Concentrate**[1]	**Tailings Samples**	**Costanho Mine Channel Sample**	**Alvarroes Mine Waste**
Head Grade	Li %	2.09	1.75	1.20	1.0
Leaching					
Tenor	g/L Li[2]	5.73	6.3	n/a	n/a
Recovery	%	98.5	91.0	>90	n/a
Impurity Removal					
Li Recovery	%	95.1	92.3	n/a	n/a
Lithium Precipitation					
Grade	% Li	18.77	18.1	n/a	n/a
Li Recovery	%	99.9	99.9	n/a	n/a
Final Product					
Grade	% Li_2CO_3	99.88	96.8	n/a	n/a
Final Li Recovery	%	93.1[3]	83.9	n/a	n/a

[1] *Ore grade was 1.01% Li and Flotation Recovery was 95.8%.* [2] *Diluted with wash water tenor.* [3] *Includes flotation losses.*

Bland Extraction and Grade: The testwork conducted on the Bland material was limited to leaching four samples and then combining the liquors to allow production of the lithium carbonate. The samples contained large amounts of lepidolite and lithium bearing muscovite micas.

Throughout the testwork report it was stated that the wash steps following the various impurity removal processes was inadequate and that with more efficient washing utilising counter-current washing in these steps the recovery of lithium recovery would improve. Not surprising, more testwork was recommended.

RWN accepts these arguments to increase recoveries. Washing precipitates is critical to maintaining good product recoveries to solution in most hydrometallurgical operations involving the extraction of many elements such as lithium, uranium and rare earths.

The low carbonate grade quoted is also due to inefficient product washing which was reported to not have fully removed the sodium sulphate from the lithium carbonate precipitate. Similarly, there was a large amount of calcium carbonate that would have to be removed using ion exchange techniques which would be utilised during the next stage of testwork on the Bland materials.

Alvarröes Extraction and Grade: The Alvarröes testwork results were quite limited due to analytical data being that was incomplete and/or unavailable. Most of the testwork centred about assessing the floatability of the samples provided. The mineralogy was lepidolite and phosphate based micas. However, in some samples there was a significant amount of kaolin materials which, when washed out would allow far better recovery and grade to the concentrate. This washing step would be quite simple.

The leach extraction the one sample with analytical results available was good at 90%. Lepidico states that this could increase by the optimum use of leach reagents as well as removing kaolin prior to leaching. RWN concurs with these statements.

The limited Alvarröes testwork was conducted on materials that are relatively low grade. Lepidico has an agreement with the owners of the Alvarröes assets which states that the grade of feedstock would be much higher which, in turn, allows for better stage extractions/recoveries and concentrate grades.

Other Mica Hosted Lithium Deposits: As a general statement RWN considers that the L-Max® technology has the capability of leaching lithium from lepidolite and other mica types of lithium deposits. There will be differences in efficiencies of extraction and quality of the finished product. These differences can be mitigated to the most part by better impurity removal which would include better and more efficient liquid-solid separations such as washing the pulps on filters as well as removing easily removed diluent minerals such a kaolin. All potential deposits would have to be tested and the process optimised to suit the specific deposit and ore type.

RWN Observations and Conclusions: *RWN notes that the testwork programmes on other materials than the Avalon samples was somewhat limited. The two main samples, Bland and Alvarröes, did show some encouraging results, especially Bland. Reasons were proposed regarding some of the poorer results and RWN accepts these reasons as logical and supported by experience with other testwork programmes related to flotation, leaching and hydrometallurgical recovery of economical minerals and compounds.*

QUESTION 2

> *Explain the adjustments required to the processing design to accommodate differing plant feed sources, including any resulting adjustments to capital and operating expenditure requirements;*

In the event that different plant feed sources are utilised, with potentially lower recoverability than that of Lepidicoôs current expectations, there are two likely scenarios, as follows:

1. Lepidico expected the Kenora plant to maintain production of 3.0ktpa battery grade lithium carbonate by increasing (or decreasing) the throughput of the plant feedstock.

Adjustments to Design: As noted above there are many approaches to address the differing plant feed sources. During testwork the technical personnel involved will assess the mineralogy to determine the degree of occurrence for the lithium minerals and the ore specific characteristics such as phosphates or micas or other types. The non-lithium bearing minerals are also important to characterise. Once this is determined then there could be means of removing unwanted detrimental minerals using techniques such as scrubbing, screening, washing and flotation as well as the use of magnetic, gravitational and electrostatic characteristics. In the normal course of events the metallurgist will look at these techniques to remove some of the unwanted gangue materials.

Similarly once the leaching tests are conducted a number of physical characteristics are investigated to determine how fine the feed stock has to be ground to allow sufficient ñliberationò of the lithium minerals to allow maximum acid leach extraction. Parameters such as fineness of grind, pulp slurry density, leach time and reagent addition rate and type of leaching reagent.

Once the lithium is solubilised into solution recovering it from that leachate requires a number of steps to both purify the liquor and then to increase the amount of the dissolved lithium to a final product which will also require steps to ensure production of ñbattery gradeò lithium.

Battery Grade lithium product is defined as 99.5% lithium carbonate; lithium carbonate is 18.8% lithium. Hence, a battery grade lithium product has to contain more than 18.7% lithium. In order to improve the lithium quality in a L-Max® technology product the most likely requirement would be to improve the washing of the lithium carbonate precipitate. This can be accomplished with more stages of ñwashingò or more efficient counter-current washing.

Capital and Operating Cost Impacts: Capital cost implications would be difficult to provide with any degree of confidence until the individual process improvement is known.

Capital Cost Needs

Increased Grinding: RWN suggests that if some changes to the ore grinding circuit are required generally, as a result of the need for a finer grind, there may be a minor increase in equipment costs. The leach feed preparation section of the capital cost estimate for the Kenora plant is 4.2% of the total capital expenditure. The extra grinding equipment is unlikely to cost more than a further 1% or about $500k. This is an estimate and a more detailed analysis would be required to provide meaningful cost increases.

Increased Leaching Requirements: the main changes to leaching from a capital cost aspect would be extra time which would necessitate extra leach tank volumes either by more tanks or, more likely, by the use of larger tanks. If the leach capacity had to increase by a very large 20% the extra capital for leaching would be about 700k.

Increased Washing Requirements: the main problems relating to the various washing steps relate to efficiency and the need for counter-current washing which was not undertaken during the Blanda and Alvarroes testwork. However, the Kenora plant has been set up to allow for the optimum washing and RWN does not expect any capital changes would be necessary to be capable of processing materials that require more washing.

Overall Capital Costs Increase; Based on the discussion above, RWN considers it unlikely that capital costs would increase more than 10% overall.

Operating Cost Needs

Increased Grinding: RWN suggests that if more grinding is required then there will be more operating costs with the need for extra power input and more wear consumables cost. The overall operating costs have been estimated at US$1,130/tonne feed material with only US$482/t related to overall plant consumables, reagents and other processing costs. RWN estimates that power costs would increase by about 10% and wear materials about 10%. Because these details are not readily available RWN suggest an overall increase of US$50/t would be a prudent estimate of extra costs. This equates to an overall 4% increase in operating costs for the more difficult grinding materials.

Increased Leaching Requirements: the same argument for leaching requirements exists as for the grinding costs. The 4% estimate noted above incorporates the leaching costs as well.

Increased Washing Requirements: the extra washing would not incur any significant extra operating costs. The extra costs would be due to extra pumping costs which would be very minor.

Overall Capital Costs Increase; Based on the discussion above, RWN considers the operating cost increases due to harder to treat material would be unlikely to increase by more than 5% overall.

2. Lepidico expects to maintain the same throughput of the Kenora plant feedstock, which may consequently decrease (or increase) the amount of battery grade lithium carbonate produced.

In this scenario, any increases (or decreases) in capital costs and operating costs would not be material.

QUESTION 3

Explain the impact on production rates resulting from any reduction in recovery rates (and by-products as applicable)

If the recovery rate drops then, in order to maintain a fixed lithium carbonate production rate the amount of material treated will have to increase by the same proportion.

For example; if recoveries dropped from the Avalon material recovery of about a 5 percentage point drop then treatment rates would have to increase by about the same proportion. The plant is set up to treat 29ktpa of Avalon concentrate at a grade of almost 2% Li. Assuming the feedstock from the other deposit is of a similar grade in order to maintain the same 3,000t production of battery grade lithium carbonate and extra 1,500tpa annum of material would have to be treated in the Kenora L-Max® technology plant. This is a very small amount and most likely could be managed with the existing plant as constructed. Operating costs might increase slightly but not that noticeably. The costs estimates in the PFS have been quoted to an accuracy of -20% +30% which is well in excess of any minor increase as discussed below.

It should also be noted that if the feed grade is less than that assumed for the Avalon/Kenora plant then there will be a similar commensurate change in the material treated in order to maintain a constant production rate. The plant operators would only be in a position to undertake these processing improvements once commissioning and ramp-up periods have been completed and the operators have gained a good working knowledge of the plant and the material being treated.

RW Nice

R.W. NICE
Consulting Metallurgical Engineer