

17 September 2021 Update / 2021年9月17日更新

ASX:LKE | FRA:LK1 | OTC:LLKKF

CLEANER LITHIUM FOR AN ELECTRIC WORLD

Steve Promnitz - Managing Director / 董事总经理

September Update / 9月更新

LAKE
RESOURCES



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General Statement and Cautionary Statement

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Forward Looking Statements

Certain statements contained in this presentation, including information as to the future financial performance of the projects, are forward-looking statements. Such forward-looking statements are necessarily based upon a number of estimates and assumptions that, while considered reasonable by Lake Resources N.L. are inherently subject to significant technical, business, economic, competitive, political and social uncertainties and contingencies; involve known and unknown risks and uncertainties and other factors that could cause actual events or results to differ materially from estimated or anticipated events or results, expressed or implied, reflected in such forward-looking statements; and may include, among other things, statements regarding targets, estimates and assumptions in respect of production and prices, operating costs and results, capital expenditures, reserves and resources and anticipated flow rates, and are or may be based on assumptions and estimates related to future technical, economic, market, political, social and other conditions and affected by the risk of further changes in government regulations, policies or legislation and that further funding may be required, but unavailable, for the ongoing development of Lake's projects. Lake Resources N.L. disclaims any intent or obligation to update 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 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. Lake does not undertake to update any forward-looking information, except in accordance with applicable securities laws.

Competent Person Statement

The information contained in this presentation relating to Exploration Results has been compiled by Mr Andrew Fulton. Mr Fulton is a Hydrogeologist and a Member of the Australian Institute of Geoscientists and the Association of Hydrogeologists. Mr Fulton has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a competent person as defined in the 2012 edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Andrew Fulton is an employee of Groundwater Exploration Services Pty Ltd and an independent consultant to Lake Resources NL. Mr Fulton consents to the inclusion in this presentation of this information in the form and context in which it appears. The information in this presentation is an accurate representation of the available data to date from initial exploration at the Kachi project and initial exploration at the Cauchari project.

World's cleanest lithium. /

世界上最清洁的锂。

Four lithium projects in
heart of the Lithium Triangle. Produces
40% of the world's lithium at lowest cost.

四个位于锂三角腹地的锂矿项目。以最低成本生产世界上40%的锂。

Large leaseholding 2,200km² (550,000 acres)

大面积租赁2200平方公里(55万英亩)

World's five largest producers all have equity
in operations in the Lithium Triangle.

世界上最大的五家生产商都在锂三角地区
开展业务。





World's cleanest lithium. /

世界上最清洁的锂。

99.97%

High Purity lithium carbonate.
Confirmed in batteries.

高纯度的碳酸锂。在电池中得到
证实。

+ Significant ESG benefits.

+ 显著的环境、社会和治理好处。

- CLEANER LITHIUM / 更清洁的锂 – Lake's 99.97% purity product - far lower impurities vs 99.5% battery grade lithium carbonate. Higher purity lithium = higher battery performance. / Lake 纯度达到 99.97% 的产品 – 与 99.5% 的电池级碳酸锂相比，杂质低得多。更高纯度的锂=更高的电池性能。
- CLEANER TECHNOLOGY / 更清洁的技术: Lilac direct lithium extraction – method common in water treatment, superior to traditional process. Supported by Bill Gates-led Breakthrough Energy Fund. / Lilac 直接提取锂的技术，水处理中常用的方法，优于传统工艺。由比尔-盖茨领导的突破性能源基金支持。
- CLEANER ENVIRONMENT / 更清洁的环境: Lithium with ESG benefits. Smaller environmental footprint - low CO₂, less water and low land use. / 具有 ESG 优势的锂。更小的环境足迹—低二氧化碳，用水量少和用地量少。
- CLEARER PATHWAY / 更明确的路径: Kachi has a demonstrated path to production; Successful pilot plant module. Large, scalable project, high margin. / Kachi 有一条已证明的生产路径；成功的试验工厂模块。大型、可扩展的项目，高利润率。

Cleaner technology /

更清洁的技术

Direct extraction - Lilac Solutions Process

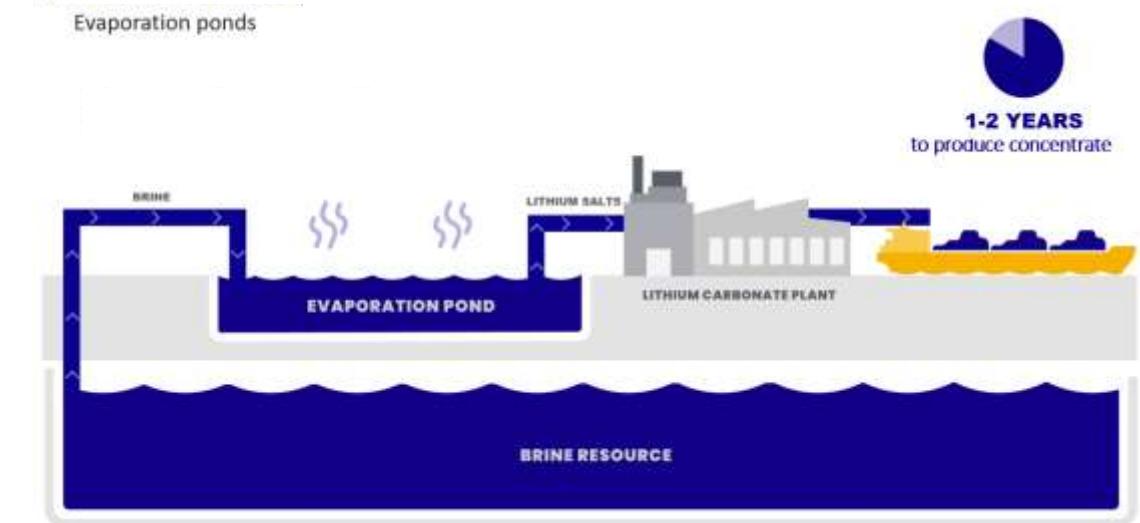
直接提取—Lilac的解决方案流程

Lilac direct extraction displaces evaporation process

Lilac直接提取取代了蒸发过程

- High purity—高纯度
- Faster process—更快的进程
- Higher recoveries—更高的回收率
- Sustainable—可持续
- Cost competitive—具有成本优势
- Scalable—可扩展的
- Proven in pilot plant—在试验工厂得到验证

1st Century technology



21st Century technology



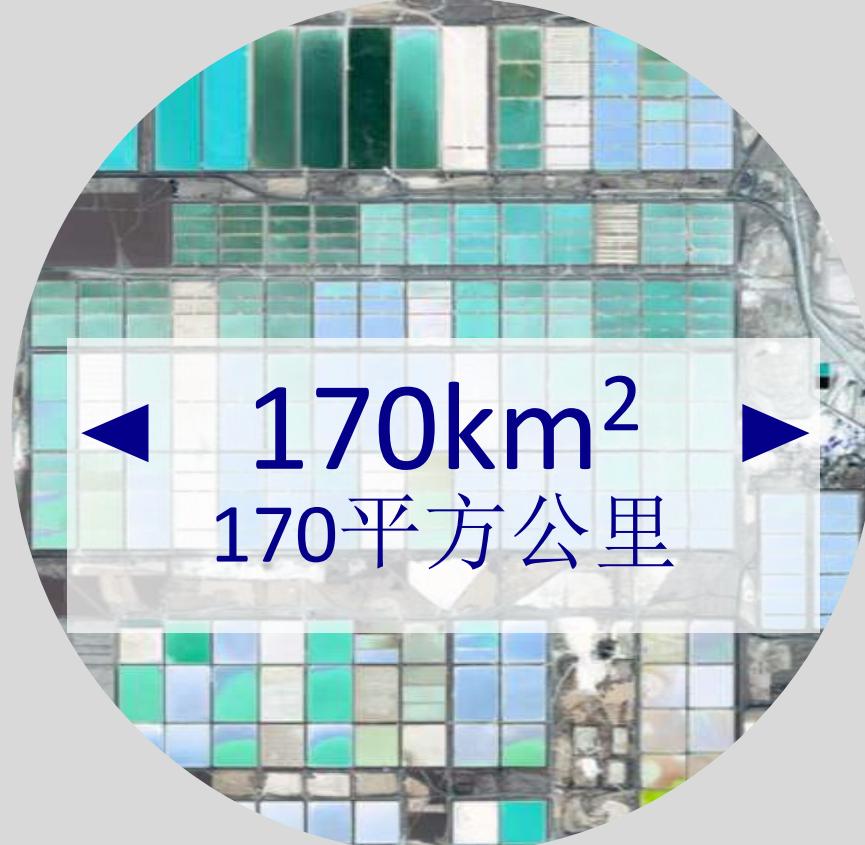
Cleaner environment / 更清洁的环境

Smaller environment footprint – Lower land use

更小的环境足迹—更少的土地使用

Atacama Projects – Brine evaporation (170km²)

阿塔卡马盐田的项目—卤水蒸发(170平方公里)



Kachi Project – Lake/Lilac DLE (<1km²)

Kachi项目—Lake/Lilac直接提取锂的技术(<1平方公里)

<1km² wide

<1平方公里宽



Source: SQM / ALB presentations 2020; 170km² for c.80,000 tpa LCE. Lake/Lilac/Hatch estimates in PFS (excluding solar hybrid power)
资料来源: SQM / ALB 2020年的报告; 170平方公里, 约80,000吨/年LCE。PFS 中的Lake/Lilac/Hatch 估算(不包括太阳能混合动力)

Cleaner environment / 更清洁的环境

Smaller environment footprint – Lower water use

更小的环境足迹—更少的用水量

Atacama Projects – Brine evaporation

阿塔卡马盐田的项目—卤水蒸发



Kachi Project – Lake/Lilac DLE

Kachi项目—Lake/Lilac直接提取锂的技术

Brine Returned to Source

卤水返回到源头



Source: SQM / ALB presentations 2020; 170km² for c.80,000 tpa LCE. Lake/Lilac/Hatch estimates in PFS (excluding solar hybrid power)
资料来源: SQM / ALB 2020年的报告; 170 平方公里, 约80,000吨/年LCE。PFS 中的Lake/Lilac/Hatch 估算(不包括太阳能混合动力)

Cleaner environment / 更清洁的环境

Smaller carbon footprint

更小的碳足迹

Kg CO₂e/kg product / 碳足迹成果



Li Carbonate LCE

from Brine

卤水中的碳酸锂LCE



4-5

Li Carbonate LCE

from Lake/Lilac DLE

Also expected to be low

来自Lake/Lilac直接锂提取技术的碳酸锂LCE
预计也很低

Note: Hard Rock = Spodumene converted to Lithium Hydroxide as LCE in China using coal for energy; Brine evaporation in Sth America
Source: SQM presentation June 2020; Roskill Nov 2020; Lake/Lilac estimates with solar hybrid power – prelim study being undertaken
注: 硬岩=锂辉石转化为氢氧化锂LCE, 中国利用煤炭作为能源; 南美的卤水蒸发。

资料来源: SQM 2020年6月的报告; Roskill 2020年11月的报告; Lake/Lilac在太阳能混合动力下的估算—正在进行初步研究

Lake Resources Partners with Lilac Solutions - World's Cleanest Lithium by developing Kachi Project. / Lake Resources与Lilac Solutions合作 - 通过开发Kachi项目获得世界上最清洁的锂矿

- **Lilac to Earn in to Kachi Project / Lilac挣得Kachi项目的股权**

Lilac Solutions will contribute technology, engineering teams, and on-site demonstration plant, Earning in to a max 25% stake in Lake's Kachi Project - based on performance based milestones & timeline / Lilac Solutions将提供技术、工程团队和现场示范工厂。在Lake的Kachi项目中赚取最多25%的股份 - 基于业绩的里程碑和时间表

- Initial 10% - Lilac to fund at its cost the completion of testing of its technology for the Kachi Project / 最初的10% - Lilac提供资金资助完成其在Kachi项目的技术测试
- Further 10% - satisfying all agreed testing criteria using the demonstration plant at the Kachi Project / 另外10% - 利用Kachi项目的示范工厂满足所有商定的测试标准
- Final 5% - Kachi lithium product achieving the highest agreed qualification standards with certain offtakers / 最后5% - Kachi锂产品达到与某些承购商商定的最高资格标准

- **Lilac to Contribute c.US\$50 million to Kachi Project , once earn in complete / 一旦挣股完成， Lilac将为Kachi项目提供约5000万美元的资金**

Lilac to contribute pro rata to funding development of the Kachi Project, approx. US\$50m / Lilac将按比例为Kachi项目的开发提供资金，约5000万美元。

- **Lilac has major tech sector supporters – aligns breakthrough climate tech with upstream ESG lithium / Lilac拥有主要的技术领域支持者--将突破性的气候技术与上游的ESG锂资源结合起来**

Supported by Bill Gates-led Breakthrough Energy Ventures & other successful tech investors / 由比尔·盖茨领导的Breakthrough Energy Ventures和其他成功的技术投资者支持

Aligns breakthrough Climate Tech investment with upstream environmentally friendly battery materials supply. / 将突破性的气候技术投资与上游的环境友好型电池材料供应结合起来

- **Lake with Lilac – New independent clean lithium producer with scale / Lake与Lilac - 新的、独立大规模清洁锂生产商**

Clearer pathway / 更明确的路径

Simple production scale-up – Modular
简单的生产扩展—模块化

Lilac Pilot /
Demo Plant
(1-2 Modules)

Lilac试验/示范
工厂(1-2个模块)

~10tpa LCE
每年约10吨LCE
1000 hours
1000个小时



Production
Scale (PFS)
(50+ Modules)
生产规模
(PFS)(50+模块)

25,500tpa
LCE
每年25,500
吨LCE



Expansion Study*
(to Double Production to 51,000tpa)
扩建研究*(将产量翻倍至5.1万吨/年)



51,000tpa LCE
年产5.1万吨
LCE

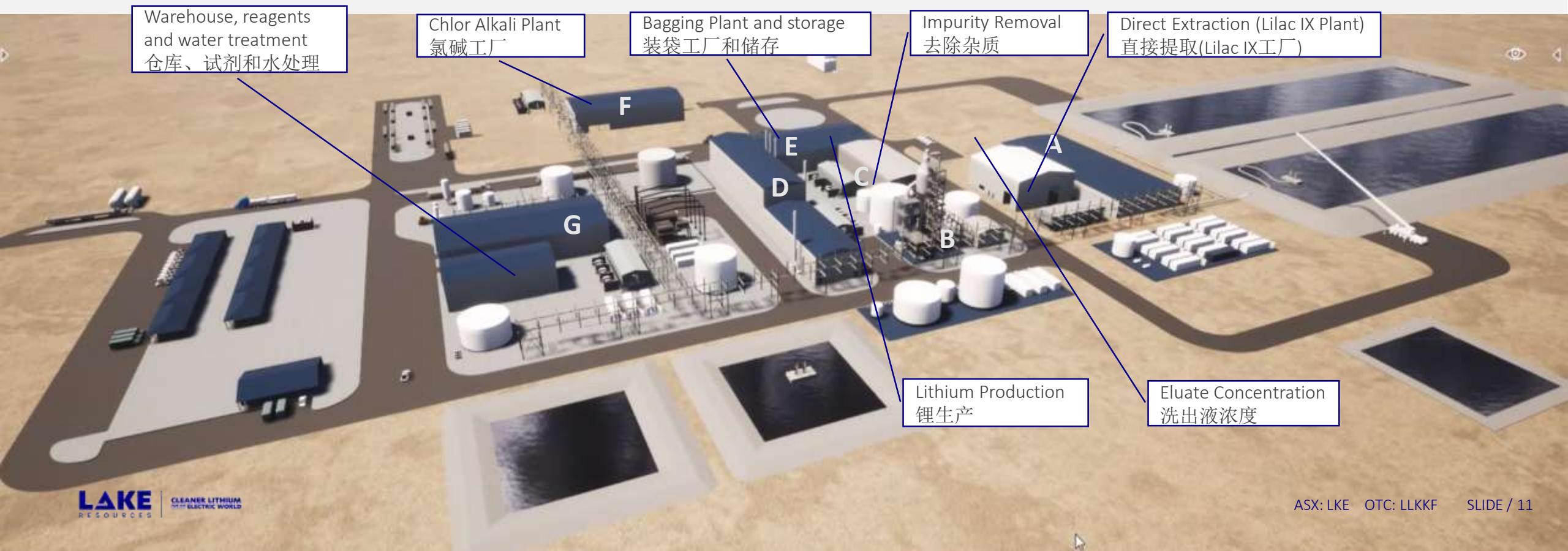
- Note: Expansion Study requires drilling (underway) to upgrade more Inferred Resources to Measured and Indicated Resources.
- 注： 扩建研究需要钻探(正在进行)，以将更多的推断资源量升级为测定和指示资源量。

Kachi project / Kachi项目

Proposed plant design

拟议的加工厂设计

~500m / 约500米



Clearer pathway / 更明确的路径

Lake's high purity lithium tested
and proven in batteries

Lake的高纯度锂在电池中得到测试和验证

Lake's lithium carbonate demonstrated in batteries / Lake
的碳酸锂在电池中得到证明

- Lake's product - premium battery quality / Lake的产品—优质电池质量
- Performs like Tier 1 products in NMC622 batteries / 展示出NMC622电池中类似一级产品的性能
- Only 50-60% of lithium production is battery quality / 只有50-60%的锂产量能达到电池级别
- Strengthens Lake's quality benefits and assists offtake discussions / 巩固Lake的质量优势，协助承购讨论



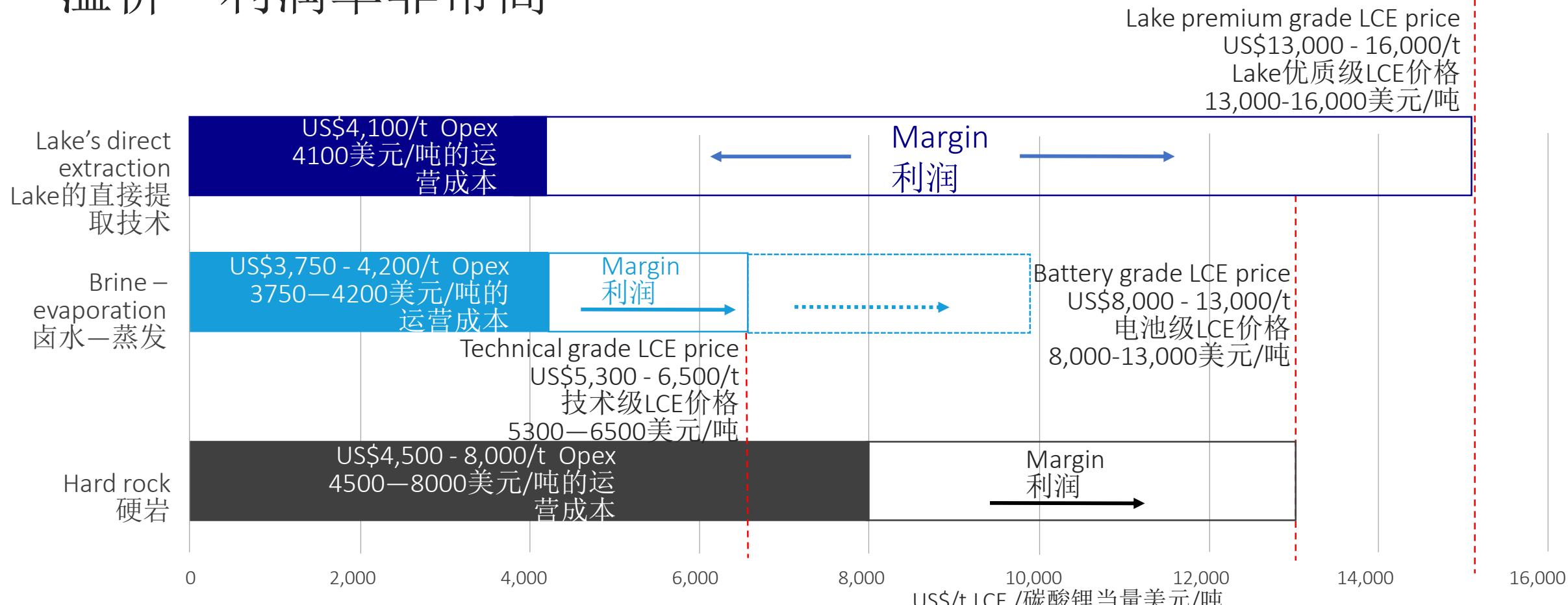
Battery technology leader / 电池技术的领导者 (ASX:NVX;
OTCQX:NVNXF)

- Clients include Panasonic, CATL, Samsung, SK, LG Chem, Bosch, Honda & Dyson / 客户包括松下、宁德时代、三星、SK、LG化学、博世、本田和戴森
- Developing latest cathode and anode technology / 开发最新的阴极和阳极技术

Direct extraction / 直接提取

Premium price – very high margin

溢价—利润率非常高



Source: Street research and LAC presentations 2020 – including Cauchari DFS numbers, Olaroz results, Thacker Pass results;

Lake/Lilac/Hatch estimates in PFS (excluding solar hybrid power), with indicative premium pricing

来源：华尔街调研和LAC公司2020年的PPT—包括Cauchari DFS数字、Olaroz结果、Thacker Pass结果；Lake/Lilac/Hatch在PFS中的估算(不包括太阳能混合动力)，有指示性的溢价

Kachi project. / Kachi项目。

Large, scalable resource / 大规模、可扩展的资源

25 years production uses 20% of resource. /

25年的生产使用了20%的资源。

- Drilling to upgrade resource for expansion; resource open laterally and at depth / 钻探以提升资源量扩大规模；资源在横向和深度上都是开放的
- Kachi lease – 740 sq km (185,000 acres) / Kachi租约—740平方公里(18.5万英亩)
- One of 10 largest brine resources globally – total JORC resource 4.4Mt LCE / 全球10大卤水资源之一—JORC总资源量440万吨LCE
- Production 25,500tpa – H1, 2024 / 产量25,500吨/年—2024年上半年
- Export Credit Agencies – indicative 10 year 70% debt funding of Kachi development / 出口信贷机构—暗示10年，为Kachi开发提供70%的债务融资



Kachi PFS metrics / Kachi PFS指标

Compelling economics / 有说服力的经济效益

Pre-Feasibility Study results / 预可行性研究的结果

Mineral Resource* (Indicated) /
矿产资源量*(指示性)

1.01Mt / 101万吨

Annual production Li₂CO₃ /
年产碳酸锂

25,500tpa / 每年
25,500吨

Annual EBITDA / 年度息税前
利润

US\$260m / 2.6
亿美元

Project life / 项目寿命

25+ years / 超过
25年

Expansion Study Underway
/ 正在进行扩建研究

51,000tpa # / 5.1万
吨/年#

CAPFX / 资本支出

US\$544m /
5.44亿

Cash cost / 现金成本

US\$4,178/t / 每
吨4178美元

Annual operating costs / 年
度运营成本

US\$107m / 1.07
亿美元

Project Finance / 项目融资

70% debt ## /
70% 债务##

Post-tax NPV8 / 税后
净现值, 折现8%

US\$1,580m ** / 15.8
亿美元**

IRR post-tax / 税后内部
收益率

35%

Note: Results based on PFS Study Assumptions (refer ASX releases 30 Apr 2020, 17 March 2021) / 注: 结果基于PFS研究假设(参考ASX发布的2020年4月30日、2021年3月17日新闻稿)

*Based on Indicated Resource 1.0Mt @290mg/L lithium / *基于指示资源量1百万吨@290毫克/升的锂

**Assuming US\$15,500/t lithium carbonate price (CIF Asia) (refer ASX release 17 March 2021) / 假设碳酸锂价格为15,500美元/吨(亚洲到岸价)(参考ASX 2021年3月17日的新闻稿)

Expansion study to double production, but not confirmed / 扩建研究将使产量翻倍, 但未得到证实

Discussions with Export Credit Agencies Underway; Indications of c. 70% debt over 8-10 years / 正在与出口信贷机构讨论; 有迹象表明, 8-10年的债务融资约为70%

Kachi Project Finance Support / Kachi项目融资支持

UK Export Finance – Export Credit Agency Support – Expression of Interest /

英国出口融资—出口信贷机构支持—意向书

Funding to ~70% of Total Required – including the Expansion

融资为所需总额的70%—包括扩建。

Project Finance / 项目融资
~70% debt## / 约
70%的债务##

CAPEX / 资本支出
US\$544m / 5.44
亿美元

Debt Duration / 债务期限
8.5 years * / 8.5
年*

Annual production Li₂CO₃ /
年产碳酸锂
25,500tpa / 每
年25,500吨

Project life / 项目寿命
25+ years / 超过
25年

Expansion Study Support /
扩建研究支持
51,000tpa # / 每
年51,000吨#

Note: Expression of Interest subject to standard project finance terms (refer ASX release 11 Aug 2021)

注：意向书受制于标准的项目融资条款(参考ASX 2021年8月11日的新闻稿)

*Post Construction / 后期建设

Expansion study to double production, but not completed / 扩建研究使产量翻倍，但尚未完成

Indicative level of support c. 70% debt over 8.5 years post construction / 暗示支持水平：建设后8.5年内
70%的债务

UK Export Finance provided Expression of Interest to support ~70% of the total finance required.

英国出口金融公司提供了意向书，以支持所需总资金的约70%。

- Subject to standard project finance terms, including DFS, ESIA and offtake / 受制于标准的项目融资条款，包括DFS、ESIA和承购
- Support for expansion to 51,000 tpa / 支持年产量扩大到51,000吨
- 8.5 year debt funding post construction / 建设后8.5年的债务融资
- Significantly lower cost of capital than traditional debt financing / 与传统的债务融资相比资本成本大大降低
- Reflects ESG benefits of project / 反映了项目的ESG效益

Kachi Project Status / Kachi项目状态

Finance Indicatively in Place – Targeting FID mid next year

融资象征性到位—目标是明年年中的FID

Major Resource / 主要资源
(2018)
20% utilised in 25 yrs
production / 在25年的生产中
使用了20%

**High Purity Li₂CO₃ / 高纯度
碳酸锂(2020)**
Tested NMC622 by
Novonix – Respected / 由
令人尊敬的Novonix在
NMC622电池中测试

**Project Finance Support /
项目融资支持**
~70% debt## Lower
cost, long duration / 约
70%的债务##，成本
低、期限长

**Robust PFS / 强大的预可行
性研究(2020)**
High cashflow
c.US\$200m/yr free cashflow /
高现金流：每年2亿美元的自由现金流

**Major ESG Benefits /
主要的ESG好处**
Low CO₂ & H₂O in
demand by EV's / 电动汽车对
二氧化碳和水的需求低

**Equity Finance in train / 股
权融资准备到位**
Target A\$60m late Oct'21
by option convert / 目标是
2021年10月底的6000万澳
元期权转换

**DFS and ESIA Underway / 正
在进行DFS和ESIA**
End Q1,2022
targeted completion / 目
标是在2022年第一
季度末完成

**Support for Expansion / 支
持扩建**
~70% debt## indicative only
/ 约70%的债务##，只是
象征性的

**Pilot and Demo Plant in train /
试验和示范工厂准备就绪**
Successful testing
targeted on site end 2021 /
2021年年底在现场成功
测试

Expansion Target / 扩建目标
51,000 tpa LCE# targeted
post initial production / 年产
51,000吨LCE#，目标初始
生产后

Production Target / 生产目标
25,500 tpa LCE
targeted H1 2023 / 目标是
2023年上半年实现年产
25,500吨LCE

Note: 注释:

Expansion study to double production, but not completed / 扩建研究使产量翻倍，但尚未完成

Indicative level of support from Export Credit Agencies c. 70% debt over 8.5 years post construction
出口信贷机构的暗示支持水平：建设后8.5年内70%的债务

Project Production Timeline / 项目生产时间轴



Corporate snapshot / 公司概况

Funded to FID / 资助到FID

Share price / 股价

A\$0.53 / US\$0.39 /
\$0.53 澳元 \$0.39 美元

16 Sept 2021 (10 day VWAP) / 2021年9月16日 (10天成交量加权平均价)

52 week high \$0.68c, low \$0.05c / 52周最高\$0.68, 最低\$0.05

Shares on issue / 发行股票总数
1.105bn / 11.05亿股

Market capitalisation / 市值

A\$585m / 5.85亿澳元

US\$425m / 4.25亿美元

Institutional Investors / 机构投资者

Ausbil, Acorn

+ Institutional investors USA, EU

+ 美国、欧盟的机构投资者

Cash

30 June 2021 / 2021年6月30日

A\$26m / 2600万澳元

US\$19.2m / 1920万美元

Target A\$60m Oct'21 option conversion / \$0.60
是21年10月的6000万澳元期权转换

Debt / 债务

Zero / 零

Unlisted Options / 未上市期权

53.0m / 5300万

30c options, March 2023 expiry

30c期权, 2023年3月到期

109.6m / 1.096亿

35c options, 15 Oct 2021 expiry

35c期权, 2021年10月15日到期

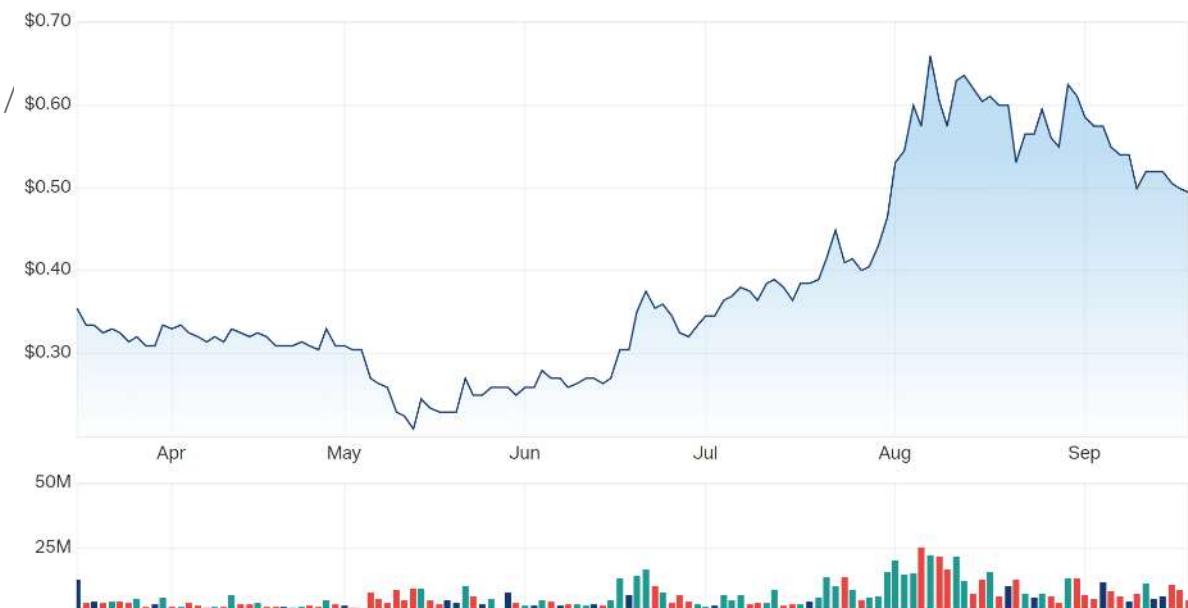
35.0m / 3500万

55c options, Dec 2024 expiry

55c期权, 2024年12月到期

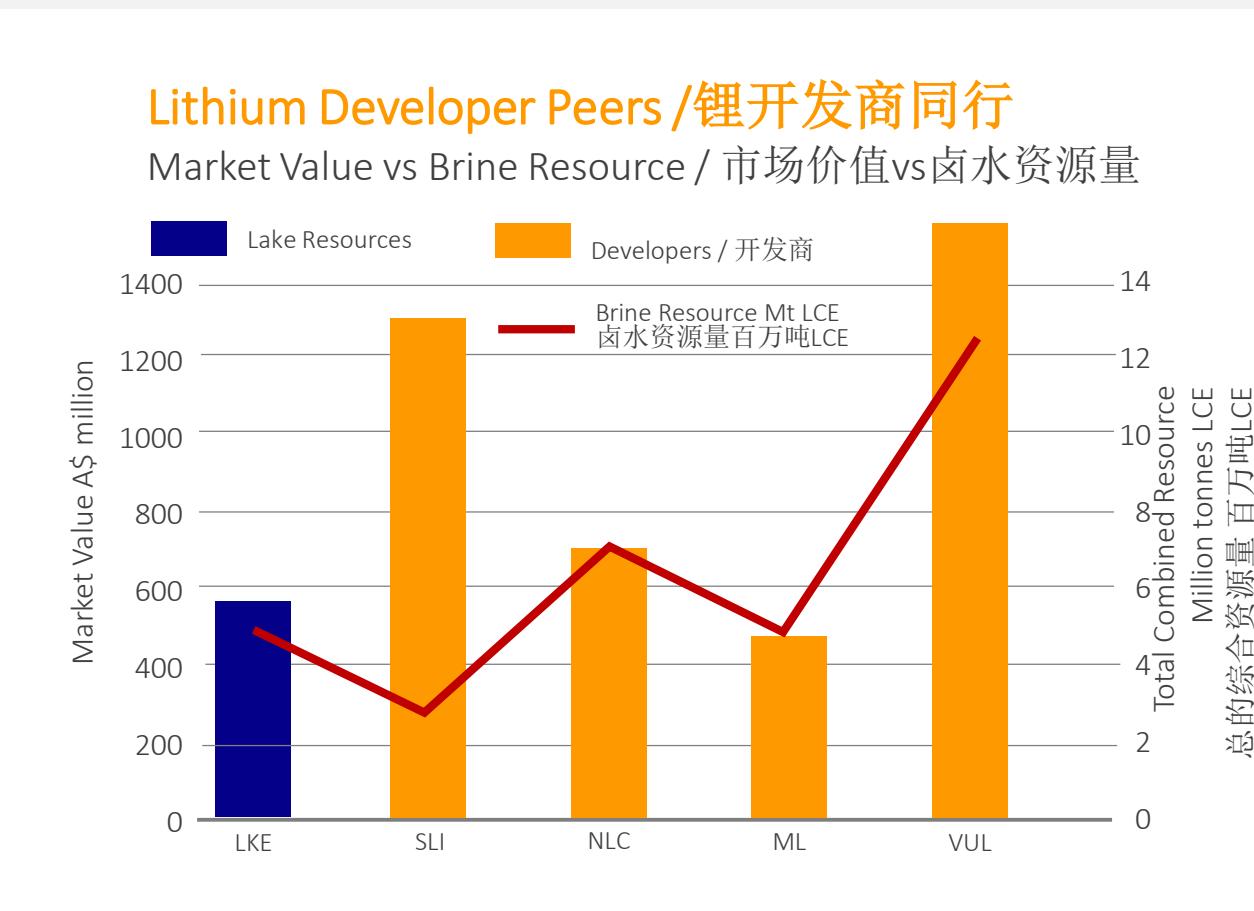
Half year share price chart / 半年股价图

LKE Chart



Significant Upside / 巨大的上升空间

- Lake Trading 25% NPV8 (w/o expansion) vs Peers 50-100+% NPV8 / Lake的股价相当于净现值(折现8%)的25%(不考虑扩建), 同行基本上是净现值(折现8%)后的50-100%以上
- Lake Market Value A\$580m vs DLE Peers at A\$1300m (SLI.NYSE) / 与其他直接提取锂的同行相比, Lake 的市值为5.8亿澳元, 其他为13亿澳元(SLI.NYSE)
- Research with price targets \$0.98-\$1.89 per share (Roth Capital, Lodge, Orior Capital) / 机构目标价为每股\$0.98-\$1.89(Roth Capital、Lodge、Orior Capital)



Cauchari project / Cauchari项目

Identical lithium brines as adjoining Ganfeng/ Lithium Americas development / 与毗邻的赣锋锂业 /Lithium Americas开发的是相同的锂卤水

Lake's brines being tested for direct lithium extraction / 正在对Lake的卤水进行直接提取锂的测试

Scoping study and resource drilling planned for 2021/22 / 计划在2021/22年进行范围界定研究和资源钻探

Other Lake projects adjoin Olaroz production area / 其他Lake项目与Olaroz生产区相邻

Ganfeng/LAC Resource – 23Mt LCE @ 581mg/L lithium
赣锋/LAC资源量—2300万吨 LCE @ 581毫克/升锂

Orocobre Resource – 6.3Mt @ 476mg/L Li
Orocobre资源量—630万吨， 476毫克/升锂

**Lake – 506m Brine zone /
Lake—506米卤水区
421- 540mg/L lithium (102-608m)
421-540毫克/升锂 (102-608米)**

Source: LKE; Orocobre (AAL) announcements 5/3/2018, 10/01/2019, 7/03/19, 24/04/19.
资料来源: LKE; Orocobre(AAL)2018年3月5日、2019年1月10日、2019年3月7日、
2019年4月24日公告。

Leadership / 领导层

Board has extensive background in resources sector,
backed by experienced on-site team in Argentina. /
董事会在资源领域有深厚的背景，在阿根廷有经验丰富的现场
团队的支持。



Steve Promnitz

CEO & MANAGING DIRECTOR
首席执行官兼董事总经理

Extensive project management experience in South America – geologist and finance experience – with major companies (Rio, Citi) and mid-tiers.

在南美洲有丰富的项目管理经验，地质学家和财务经验，在大公司(力拓、花旗)和中等规模的公司任职过。

Stu Crow

CHAIRMAN NON-EXEC
董事会非执行主席

More than 25 years of experience (numerous public companies) and in financial services.
超过25年的经验(众多上市公司)和金融服务。

Dr Nicholas Lindsay

EXEC TECHNICAL DIRECTOR
执行技术董事

30 years of experience in Argentina/Chile/Peru (PhD in Metallurgy & Materials Engineering); Major companies (Anglo) and taken companies through development in South America. / 在阿根廷/智利/秘鲁有30年的经验(冶金和材料工程博士)；大公司(Anglo)并带领公司在南美进行开发。

Dr Robert Trzebski

NON-EXEC DIRECTOR
非执行董事

International mining executive; 30 years experience in operational, commercial and technical roles in global mining incl. Argentina. Extensive global contacts. Chief Operating Officer of Austmine. Director Austral Gold. / 国际矿业高管；在全球采矿行业，包括阿根廷的运营、商业和技术岗位上有30年经验。拥有广泛的全球联系，是Austmine首席运营官和Austral Gold董事。

Sra Amalia Saenz

NON-EXEC DIRECTOR
非执行董事

Experienced energy/natural resources lawyer based in Buenos Aires, Argentina. Partner at law firm, Zang, Bergel & Viñes. Previously worked as Legal Manager in Central Asia and United Kingdom. / 经验丰富的能源/自然资源律师，常驻阿根廷布宜诺斯艾利斯。是Zang, Bergel & Viñes律师事务所的合伙人。曾在中亚和英国担任法务经理。

CLEANER LITHIUM FOR AN ELECTRIC WORLD / 电动世界中更清洁的锂

- World's highest purity lithium / 世界上纯度最高的锂
- Technology led direct extraction / 直接提取技术
- Major ESG benefits / 主要的ESG好处

Steve Promnitz

Managing Director / 董事总经理

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+61 2 9188 7864

lakeresources.com.au



Appendices / 附录

Market needs 10x to 18x more lithium production by 2030. /

到2030年，市场需要增加10倍至18倍的锂产量。

- Lithium added to critical raw materials list for the first time in 2020 / 2020年首次将锂列入关键原材料清单
- Lithium-ion batteries represent one of the 21st Century's largest growth areas / 锂离子电池是21世纪最大的增长领域之一
- Lake's world's purest lithium is exactly what an electric world wants / Lake生产的世界上最纯净的锂正好是电动世界所需要的

Battery mega-factory growth / 大型电池工厂的增长

225 battery factories planned for 2030 /

计划在2030年建225家电池工厂

151 operating by end 2021 /

到2021年底，运营中的电池工厂有151家



Source: Benchmark Mineral Intelligence

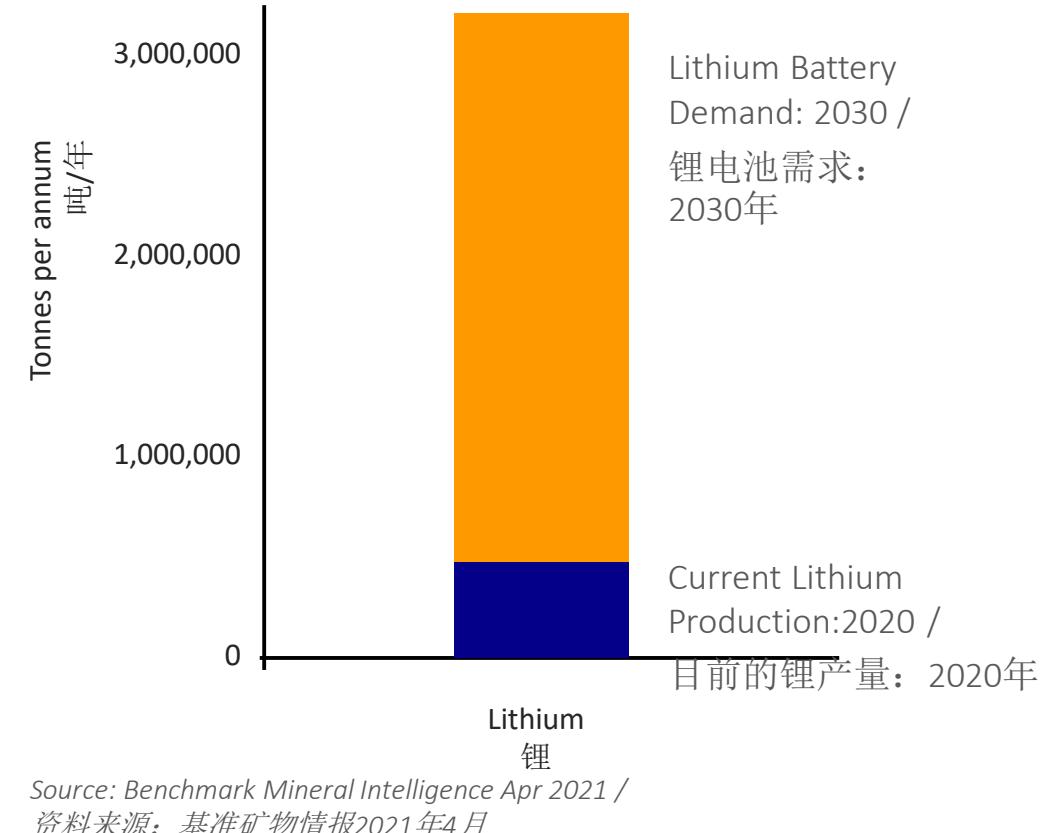
资源：基准矿物情报

Underinvestment in new supply. Price moving up. / 对新供应的投资不足。价格正在上涨。

- Lithium carbonate prices have doubled over past year / 碳酸锂价格在过去一年中翻了一番
- 8 to 18 times more lithium production needed by 2030 to satisfy demand / 到2030年锂的产量需要增加8到18倍才能满足需求
- Need 5 companies the size of SQM each year for the next 10 years / 未来10年，每年需要5家像SQM这样规模的公司

Lithium battery demand / 锂电池需求

225 Megafactories operating at 100% capacity (4.2 TWh) /
225家大型电池工厂以100%的产能运行(4.2太瓦时)



Sustainable lithium / 可持续的锂

Lake / Lilac DLE method

Lake/Lilac的直接提取锂方法

- Low CO₂ footprint / 二氧化碳足迹小
- Low water usage / 用水量少
- Low land use / 土地使用量少

Bloomberg Green
Energy & Science

Bill Gates-Led Fund Invests in Making Lithium Mining More Sustainable

Lilac Solutions has developed a process for extracting lithium that drastically cuts water use.

By Akshat Rathi
February 20, 2020, 4:00 PM GMT+11

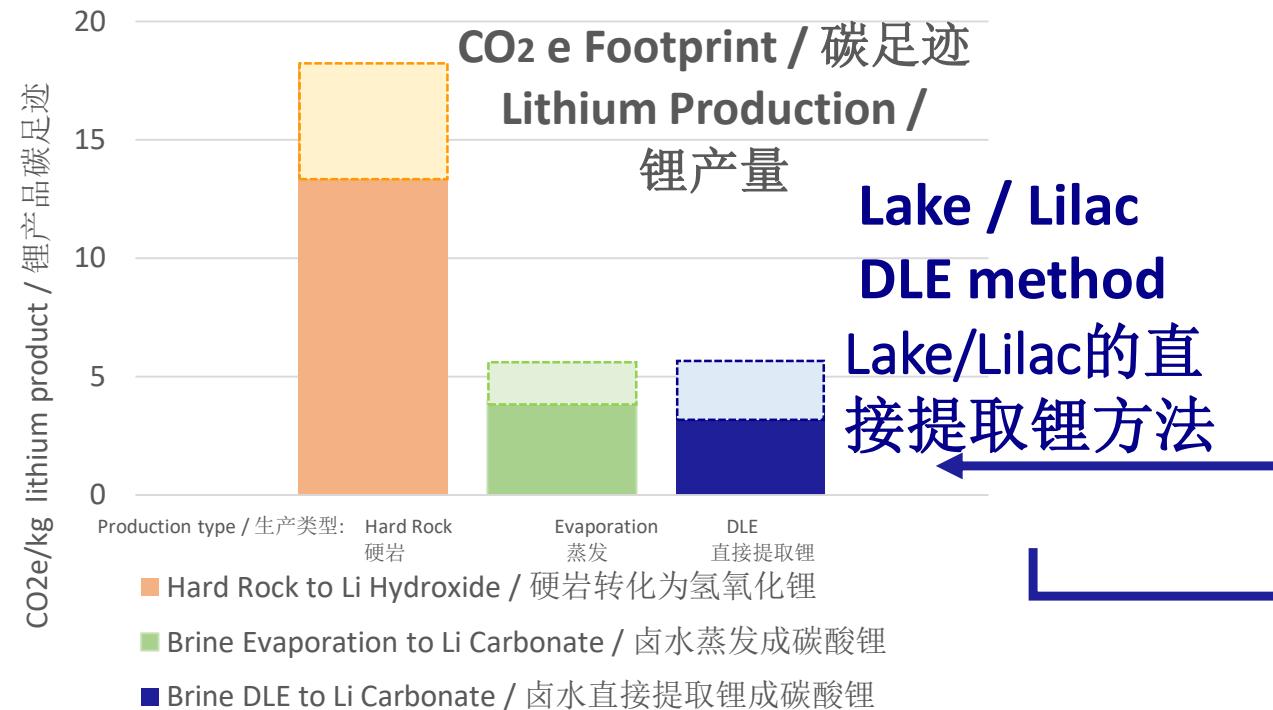
ESG Sustainable ESG可持续 Development Goals 开发目标



Note: Hard Rock = Spodumene converted to Lithium Hydroxide as LCE in China using coal for energy; Brine evaporation in Sth America /
注：硬岩=在中国利用煤炭作为能源，将锂辉石转化为氢氧化锂的LCE；南美的盐田卤水蒸发。

Source: SQM presentation June 2020; Roskill presentation November 2020; / 资料来源：SQM 2020年6月的报告；Roskill 2020年11月的报告；

Lake/Lilac estimates based on PFS with solar hybrid power power – prelim study being undertaken / Lake/Lilac的估算基于太阳能混合动力的PFS—正在进行初步研究



Mineral Resource (JORC Code 2012 / 矿产资源量(澳大利亚矿产资源和矿石储量报告规范2012)

Kachi Project / Kachi项目

Lithium carbonate equivalent (LCE)

碳酸锂当量(LCE)

Indicated / 指示资源量

1.0Mt

100万吨

Inferred / 推断资源量

3.4Mt

340万吨

Total Resource / 总资源量

4.4Mt

440万吨

Lake Lithium Carbonate
High Purity / Lake碳酸锂高纯度

Chemical Component	Actual (wt%)	Target
Lithium (Li)	99.9	99.5 Min
Sodium (Na)	0.024	0.025 Max
Magnesium (Mg)	<0.001	0.008 Max
Calcium (Ca)	0.0046	0.005 Max
Iron (Fe)	<0.001	0.001 Max
Silicon (Si)	<0.001	0.003 Max
Boron (B)	<0.001	0.005 Max

Source: LKE announcement 20/10/2020

资料来源: LKE 2020年10月20日公告

KACHI LITHIUM BRINE PROJECT Kachi锂盐水项目		MINERAL RESOURCE ESTIMATE 矿产资源量估测			
JORC Code 2012 Edition / JORC准则2012版	Indicated / 指示	Inferred / 推断	Total Resource / 总资源量		
Area, km ² / 面积, 平方公里	17.1	158.3	175.4		
Aquifer volume, km ³ / 含水层体积, 立方千米	6	41	47		
Brine volume, km ³ / 卤水体积, 立方千米	0.65	3.2	3.8		
Mean drainable porosity % / 平均可排泄孔隙率%	10.9	7.5	7.9		
Element / 元素	Li	K	Li	K	Li
Weighted mean concentration, mg/L 加权平均浓度, 毫克/升	289	5,880	209	4,180	211
Resource, tonnes / 资源量, 吨	188,000	3,500,000	638,000	12,500,000	826,000
Lithium Carbonate Equivalent / 碳酸锂当量 (LCE), tonnes / 吨	1,005,000		3,394,000		4,400,000
Potassium Chloride, tonnes / 氯化钾, 吨	6,705,000		24,000,000		30,700,000

Lithium is converted to lithium carbonate (Li₂CO₃) with a conversion factor of 5.32 / 将锂转化为碳酸锂(Li₂CO₃), 转换系数为5.32

Potassium is converted to potassium chloride (KCl) with a conversion factor of 1.91 / 钾转换为氯化钾(KCl), 转换系数为1.91

Source: LKE announcement 27/11/2018

资料来源: LKE 2018年11月27日公告

JORC Code 2012

JORC准则2012

Appendix 1 - Kachi Project

附录1—Kachi项目

Criteria		Section 3 – Sampling Techniques and Data		
Sampling techniques		<ul style="list-style-type: none"> Brine samples were taken from the diamond drill hole with a bottom of core spear point during advance and using a straddle packer device to obtain representative samples of the formation fluid by pumping a volume of fluid from the isolated interval, to minimize the possibility of contamination during drilling fluid when taking the sample. Low pressure air-flush tests are used as well. The fluid used for drilling is brine sourced from the drill hole and the return from drillholes passes back into the reservoir due to live fluid circulation. The core sample was collected in a clean plastic bottle (1 litre) and filled to the top to minimize air space within the bottle. A duplicate was collected at the same time for storage and submission of duplicates to the laboratory. Each bottle was labeled and marked with the sample number. A core tube in the hole was recovered in 3.3-m length core runs in core split tubes to minimize sample disturbance. Drill core was undertaken to obtain representative samples of the sediments that host brine. Diamond drilling with an interval (tripax) tube was used for drilling. The drilling produced cores with variable core recovery, associated with uncontaminated material, as particularly sandy intervals. Recovery of core samples in these intervals is more difficult with diamond drilling, as this material can be washed from the core barrel during drilling. Rotary drilling has used 6.5" and 10" micro bits and has produced drill chips. Brine has been used as drilling fluid for lubrication during drilling. 		
Drilling techniques		<ul style="list-style-type: none"> Drill core was recovered in 3.3-m length intervals in the drilling triple (tripax) tubes. Appropriate additives were used for hole stability to maximize core recovery. The core recoveries were measured from the core, and compared to the length of each run to calculate the recovery. Chip samples are collected for each metre drilled and stored in segmented plastic bottles for rotary drill holes. Brine samples were collected at discrete depths during the drilling using a double packer over 1 m intervals to isolate intervals of the sediments and obtain samples from arbitrary sites from the borehole. As the bore (interval) samples are taken from intervals off the bore hole (and not from the core core), they are largely independent of the quality (recoverability) of the core samples. However, the permeability of the lithologies where samples are taken is related to the rate and potentially lithium grade of brine inflow. 		
Core recovery		<ul style="list-style-type: none"> Brine, clay, salt, and cemented rock types was recovered in a triple tube diamond core drill tube, or in chip samples from open-hole holes, and examined for geologic logging by a geologist and a photo-taken for reference. Geological logs are logged by a senior geologist who also supervised taking of samples for laboratory analysis, as well as additional physical property testing. Coring is both qualitative and quantitative in nature. The relative proportions of different lithologies which have a direct bearing on the overall porosity, contained and potentially extractable brine are noted, as are more qualitative characteristics such as the sedimentary facies and their relationships. When cores are split for sampling they are photographed. 		
Rock sampling techniques and sample preparation		<ul style="list-style-type: none"> Brine samples were collected by packer and spear sampling methods, over a metre. Low pressure air-flush tests are used as well to purge test interval and gauge potential yields. The brine sample was collected in one litre sample bottles, rinsed and filled with brine. The first bottle was labeled and marked with the sample number. 		
Assay of brine and spent drilling fluids		<ul style="list-style-type: none"> Brine samples were collected in the laboratory. The 303 Laboratory in Buenos Aires has also been used for both primary and check samples. They also analyzed blank control samples and standards in the analysis chain. The Alex Stewart/Nordlab SA laboratory and the 303 laboratory are ISO 17025 and ISO 17020 certified, and are specialized in the chemical analysis of brines and mineral salts, with experience in this field. This includes the oversight of the experienced Alex Stewart Argentine S.A. laboratory in Mendoza, Argentina, which has been operating for a considerable period. The quality control and analytical work was carried out at the Alex Stewart/Nordlab SA laboratory or SGS laboratories in Argentina, as well as at the SGS laboratory in Chile, subject to those employed by IMO certified laboratories specializing in analysis of brines and minerals salts. 		
Verification of sampling and sampling distribution		<ul style="list-style-type: none"> Field duplicates, standards and blanks will be used to monitor potential contamination of samples and the repeatability of analysis. Accuracy, the closeness of measurements to the "true" or accepted value, will be monitored by the insertion of standards, or reference samples, and by check analysis at an independent (or unique) laboratory. Duplicate samples in the analysis chain were submitted to Alex Stewart/Nordlab SA or SGS laboratories as unique samples (blind duplicates) during the process. Stable Blank samples (distilled water) were used to evaluate potential sample contamination and will be inserted in future to measure any potential cross contamination. Samples were analysed for conductivity using a hand-held Hanna pH/EC multiprobe. Regular calibration using standard buffers is being undertaken. 		
Location of data points		<ul style="list-style-type: none"> The diamond drill hole sample sites and rotary drill hole sites were located with a hand-held GPS. The properties are located at the junction of the Argentine POSCAR grid system Zone 2 and Zone 3 (UTM 19) and WGS84 Zone 19 south. 		
Depth spacing and distribution		<ul style="list-style-type: none"> Brine samples were collected over 1m intervals every 6 m intervals within brine producing aquifers, where this was possible. 		
Orientation of data in relation to geological structure		<ul style="list-style-type: none"> The salt lake (soil) deposits that contain lithium-bearing brines generally have sub-horizontal beds and lenses that contain sand, gravel, silt, clay and clay. The vertical diamond drill holes will provide a better understanding of the stratigraphy and the nature of the sub-surface brine bearing aquifers. 		
Sample security		<ul style="list-style-type: none"> Samples were transported to the Alex Stewart/Nordlab SA laboratory or SGS laboratory for chemical analysis in sealed 1 litre rigid plastic bottles with sample numbers clearly identified. Samples were transported by a trusted member of the team. The samples were moved from the drillhole sample site to secure storage at the camp on a daily basis. All brine sample bottles sent to the laboratory are marked with a unique label not related to the location. 		
Review (and Audit)		<ul style="list-style-type: none"> No audit of data has been conducted to date. However, the CP has been onsite periodically during the programme. The review included drilling practice, geological logging, sampling methodologies for water quality analysis and, physical property testing from drill core, QA/QC control measures and data management. The practices being undertaken were ascertained to be appropriate. 		
Section 4 – Mineral Tenure and Land Tenure Status		<p>The Kachi Lithium Brine project is located approximately 300km south-southwest of Uyuni (Potosí) and 100km from the lithium operation and other south of Andes de la Sierra in Catamarca province of north western Argentina, at an elevation of approximately 3,000m asl.</p> <p>The project comprises approximately 70,482 Ha in thirty seven mineral leases (mines) of which five leases (5,445 Ha) are granted for drilling, twenty two leases are granted for initial exploration (45,528 Ha) and ten leases (15,685 Ha) are applications pending granting.</p> <p>The tenements are believed to be in good standing, with statutory payments completed to relevant government departments.</p>		
Exploration by other parties		<p>MarIP Mines Ltd conducted sparse near-surface pit sampling of groundwater at depths less than 1m during 2009.</p> <p>Samples were taken from each hole and analysed at Alex Stewart laboratories in Mendoza Argentina. Results were reported in an RI-45-101 report by J. Bosch in December 2009 for MarIP Mines Ltd.</p> <p>MRC Metals Inc commenced exploration in adjacent leases under option. Two diamond drillholes intersected lithium bearing brines. The initial drillhole intersected brines from 172-198m and below with best results to date of 13m at 223 mg/L lithium, reported in December 2007. The second hole, drilled to 400 meters in mid 2010, became blocked at 100 meters and could not be sampled. A VTS ground geophysical survey was completed prior to drilling. An RI-45-101 report was released in February 2011.</p> <p>No other exploration results were able to be located.</p>		
Drill holes		<ul style="list-style-type: none"> The known sediments within the soil cover of salt/harsh, clay, sand and salt horizons, accumulated as the salt from terrestrial sedimentation and evaporation of brines. Brines within the Salt Lake are formed by solar concentration, interpreted to be combined with warm geothermal fluids, with brines hosted within sedimentary units. Geology was recorded during the diamond drilling and from chip samples in rotary drill holes. 		
Drill hole references		<p>33 drill holes completed, totaling 3100 metres with varying depths up to 400 metres.</p> <p>Lithological data was collected from the holes as they were drilled and drill cores or chip samples were salvaged. Detailed geological logging is ongoing.</p> <p>All drill holes are vertical, 10°-90° azimuth 0 degrees.</p> <p>Core averages have been provided where multiple sampling occurs in the same sampling interval.</p>		
Geological interpretation		<ul style="list-style-type: none"> A drill hole location plan is presented showing the locations of the drill platforms. Individual drill locations are provided in Table L. 		
Unknown ownership, other subsidence indicators etc.		<ul style="list-style-type: none"> Brine assay results are available from 35 drill holes from the drilling to date, reported here. There is no other substantive exploration data available regarding the project. 		
Further work		<ul style="list-style-type: none"> Further water well drilling is planned to expand the resource and test pumping rates. 		
Criteria		<p>Section 5 – Estimation and Reporting of Mineral Resources</p>		
Definition required		<ul style="list-style-type: none"> Data was transferred directly from laboratory spreadsheets to the database. Data was checked for transcription errors once in the database to ensure coordinates, assay values, and lithological codes were correct. Data was plotted to check the spatial location and relationship to adjoining sample points. Duplicates and outliers have been identified in the assay process. Brine assays and porosity test work have been analyzed and compared with other publicly available information for reasonableness. Comparison of original and current densities were made to ensure no lack of integrity. 		
Site visits		<ul style="list-style-type: none"> The Competent Person visited the site multiple times during the drilling and sampling program. Some improvements to procedures were made during work by the Competent Person. 		
Geological framework		<ul style="list-style-type: none"> The geological model is continuing to develop. There is a high level of confidence in the interpretation of the exploration results to date. There are relatively uniform classic sedimentary rocks. Any alternative interpretations are restricted to smaller scale variations in sedimentology, related to changes in grain size and fine mineral in units. Data used in the interpretation includes rotary and diamond drilling methods. Drilling depth and geology encountered has been used to conceptualize hydrogeography. Sedimentary processes affect the continuity of geology, whereas the concentration of lithium and potassium and other elements in the brine is related to water inflow, evaporation and brine evolution in the Salt Lake. 		
Assumptions		<ul style="list-style-type: none"> The lateral extent of the resource has been defined by the boundaries of the Company's properties. The brine reservoir is approximately covers 375 km². The top of the model coincides with the topography obtained from the Shuttle Radar Topography Mission (SRTM). The original elevations were locally adjusted for each borehole collar with the most accurate coordinates available. The base of the resource is limited to a 400 m depth. The basement rocks underlying the Salt Lake sediments have been intersected in drilling. The resource is defined to a depth of 400 m below surface, with the exploration target immediately defining beyond the valid extent of the resource. 		
Estimation and reporting techniques		<ul style="list-style-type: none"> No grade cutting or capping was applied to the model. No assumptions were made about correlation between variables. Lithium and potassium were assumed independently. The geological interpretation was used to define each geological unit and the property limit was used to enclose the required resources. 		
Assumptions		<ul style="list-style-type: none"> Moisture content of the cores was not measured. Density measurements were made to determine the porosity of the cores. Tonnages are estimated as elemental lithium and potassium observed in brine. No cut-off grade has been applied. 		
Cut-off parameters				
Mineral Resource		<p>The resource has been quoted in terms of brine volumes, concentration of dissolved elements, contained lithium and potassium and their products lithium carbonate and potassium chloride.</p> <p>Assumptions of brine factors have been applied through the use of the specific yield factor, density in brine, salinity, and porosity. These are used to convert the mass of brine to mass of lithium and potassium. Dissolved ion losses over time and rapidly there are lithium and potassium losses. In both the storage ponds and processing plant, in brine extraction operations. However, potential losses will be estimated in the groundwater model simulating brine extraction.</p> <p>The conceptual mining method is recovering brine from the Salt Lake via a network of wells, the established aquifer on brine lithium and potassium brine projects.</p> <p>Established aquifer on brine lithium and potassium brine projects.</p> <p>Extractable resources and potential extraction rates.</p> <p>Established aquifer on brine lithium and potassium brine projects.</p> <p>Established aquifer on brine lithium and potassium brine projects.</p> <p>Uranium carbonate is larger as the commercial aquifer.</p> <p>It would be obtained by the brines being subjected to direct lithium extraction (ionic exchange and reverse osmosis) to produce a high grade Li chloride (30,000 to 60,000 mg/L lithium), which is processed in a conventional lithium carbonate plant by reaction with sodium carbonate: $\text{Li} + \text{Na}_2\text{CO}_3 \rightarrow \text{Li}_2\text{CO}_3 + \text{Na}_2\text{Li}$.</p> <p>Precipitation has been undertaken by Lake Resources, which is an expert laboratory in the treatment of brines by ion exchange.</p> <p>Brine tests include short and long-term tests using ion exchange resins and brine from brackish aquifer to establish recovery, leaching consumption, and engineering parameters used in the PFS.</p> <p>Analysis of solutions by ICP and included the use of standards.</p> <p>The longevity of the ion exchange media has been tested over 1200 cycles, or 1st results.</p> <p>Lithium carbonate of high purity and low impurities has been produced which can be considered equivalent to analytical test work to bring forward our the brine following initial test work.</p> <p>On the plant-scale tests work has been conducted using brine from the Salt Lake using Lake Solutions ion exchange short extraction method. 20,000 litres of brine to the brine being processed by the first stage concentrated lithium carbonate brine.</p> <p>Haze Research Inc. has demonstrated the conversion of lithium chloride from the pilot module test larger volumes of high purity lithium carbonate with purity >99.9% with very low levels of impurities.</p> <p>Haze processed the brine from brine to produce the lithium carbonate sample using reduction of brine through evaporation, treatment with sodium hydroxide and sodium citrate, precipitate removal and calcination.</p> <p>Due to the high purity of the lithium carbonate, the lithium is reported at 100% versus the sum of impurities. XRF-AES and ICP-AES assist from the Haze Research lab were used to assist importation. Titration-LiCl/LiOH titration with HCl was performed for total lithium, ratio of dilution and resulted in a range of 185.2 wt-% to 100.3 wt-%. This is the accepted assay technique for larger lithium carbonate samples.</p> <p>On the plant-scale, or the processing and analysis with industry standards, Dr Nick Whiteman was consulted and reviewed the protocols and calculations of assay.</p> <p>This work is yet to be integrated into the Resource model.</p> <p>Assists of a lithium operation at the Kachi project would include surface infrastructure from the installation of extraction/processing facilities and associated infrastructure, acquisition of various salt tolling arrangements and extraction from brine and Fresh water aquifers rapidly.</p> <p>Environmental management plan for the production of evaporation salt, salt lakes, and brackish.</p> <p>Consultation with communities in the area of influence of the project.</p> <p>Environmental impact studies on-going.</p> <p>Geological framework of the area of the resource assessment. The included determining my density and porosity density as well as field measurements of brine density. Note that no mining is to be carried out as it is to be extracted by pumping and consequently no rents are accrued.</p> <p>My lith density is against the ultimate resource because resources are defined by volume, rather than by tonnes.</p> <p>Water density is against the ultimate resource because resources are defined by volume, rather than by tonnes.</p> <p>In the view of the Competent Person the resource classification is believed to adequately reflect the available data and is consistent with the suggestion of Houlihan et al., 2001.</p> <p>The indicated resource reflects the higher confidence at the brine sampling in the rotary-drilling and lower quality geological control from the drill cuttings.</p> <p>The inferred resource underlying the Measured and/or Indicated resource reflects the limited drilling to this depth together with the geophysics through the property.</p> <p>In the view of the Competent Person the resource classification is believed to adequately reflect the available data and is consistent with the suggestion of Houlihan et al., 2001.</p> <p>The Mineral Resource was estimated by the Competent Person.</p> <p>An independent estimate of the resource was completed using a nearest neighbour estimate and the comparison of the results with the ordinary logging estimate is below 0.3% for measured resources and below 2% for inferred resources which is considered to be acceptable.</p> <p>Univariate statistics for global estimation bias, visual inspection against samples as joints and sections, search plots in the north, south and vertical directions to detect any spatial bias shows a good agreement between the samples and the ordinary kriging estimates.</p>		