

Utah Lithium Project
November 2024



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#### **Competent Persons Statement**

The technical information in this announcement complies with the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code) and has been compiled and assessed under the supervision of Mr James Allchurch, Managing Director of Mandrake Resources. Mr Allchurch is a Member of the Australian Institute of Geoscientists. He 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 JORC Code. Mr Allchurch consents to the inclusion in this presentation of the matters based on his information in the form and context in which it appears. To the best of the Competent Person's knowledge, the information in the announcement is an accurate representation of the available data and studies.

#### Mineral Resource Estimate Compliance Statement

The Mineral Resources information contained in this ASX release is extracted from the report entitled "Maiden Inferred Resource of 3.3Mt LCE" dated 22 October 2024, available at www.mandrakeresources.com.au and www.asx.com. Mandrake confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and, in the case of Mineral Resources, that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. Mandrake confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcement.

The Company confirms that (a) it is not aware of any new information or data that materially affects the information included in the original announcements; (b) all material assumptions and technical parameters underpinning the content in the relevant announcements continue to apply and have not materially changed and (c) the form and context in which the Competent Person's findings are presented have not been materially modified from the original announcements.

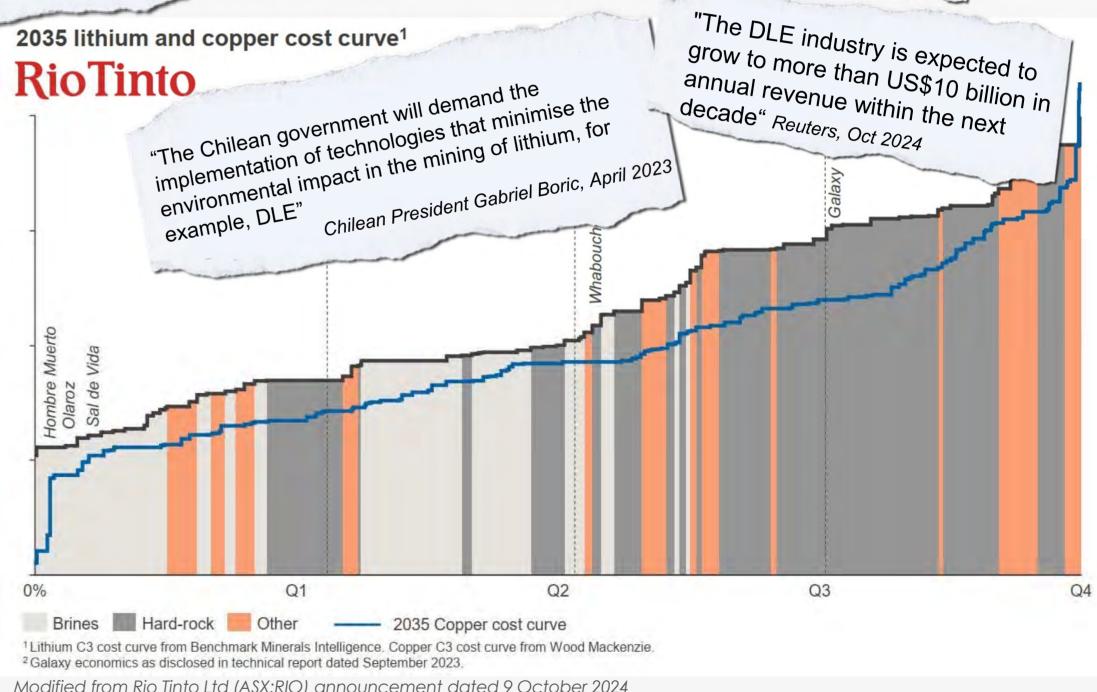
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# **Brines - The Future of Lithium**

"Rio Tinto's US\$6.7 billion buyout of Arcadium will give it a suite of lithium filtration technologies that are poised to revolutionize how the metal is produced" Reuters, Oct 2024

"DLE is actually the solution to provide the lithium that the world Jakob Stausholm (Rio CEO), Oct 2024

- Lowest operating costs
- Smallest environmental footprint
- Low carbon intensity
- Unparalleled private and public investment in DLE – technology well advanced
- Rio Tinto have gone 'all in' on brine and DLE - Rincon Li<sub>2</sub>CO<sub>3</sub> plant expected to commence by end 2024



Modified from Rio Tinto Ltd (ASX:RIO) announcement dated 9 October 2024

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**Investor Presentation** 

# **Corporate Snapshot**

**ASX Code** 

Shares on Issue

Share price

Market Cap

LCE

MAN

624m \$0.027 \$16.8m

\$14m

3.3Mt\*

#### Overview

Enterprise Value <\$3m

\$14m in cash (September 2024)

100%-owned large-scale US lithium asset with access to historic wells

3.3 Mt of LCE Inferred Resource\* (JORC 2012)

DLE partnerships and pilot plants underway

Sampling, Resource upgrade and Scoping Study underway

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## **Board of Directors & Management**





James Allchurch Managing Director

Over 20 years' experience in mineral exploration, geotechnical assessment and mining operations. Mr Allchurch has held various Board positions over the previous 15 years and has considerable expertise in the identification and assessment of resource projects over a broad range of commodities.



Lloyd Flint Non-Executive Chairman

Chartered Accountant with over 25 years' experience in the corporate and financial services arena. He has held a number of management and senior administrative positions as well as providing corporate advisory services as a consultant to corporate clients.



Roger Fitzhardinge
Non-Executive Director

More than 20 years' experience in the exploration and mining industry. Mr Fitzhardinge was instrumental in identifying, acquiring and developing the Jaguar Nickel Sulphide Project for Centaurus Metals (ASX:CTM) propelling the company's market capitalisation more than 20 times to over \$500M.



Ricardo Garzon
Chief Operations Officer

MSc in Energy Economics and Management

+ 15 years' experience in mineral and oil and gas exploration.

Has held various Board positions including with ASX-listed Baraka Petroleum Ltd.



Jake Cammack
Exploration Manager USA

MSc in Geochemistry

Developed a Lithium brine geochemistry database from public and private sources.

Specialist in using GIS databases to identify and evaluate new prospects.



Sabina Kraushaar Geologist USA

MSc in Geology

Expertise in mapping subsurface geology utilizing Petra software.

Has consulted on numerous oil and gas projects in the Four Corners region.

## **Utah Lithium Project - Premier Position**

Commanding total acreage position of 93,755 acres (379km²)

Brines hosted by the Paradox (>1.2km thick salt/clastic) and 120m thick Leadville formations – enormous brine reservoirs

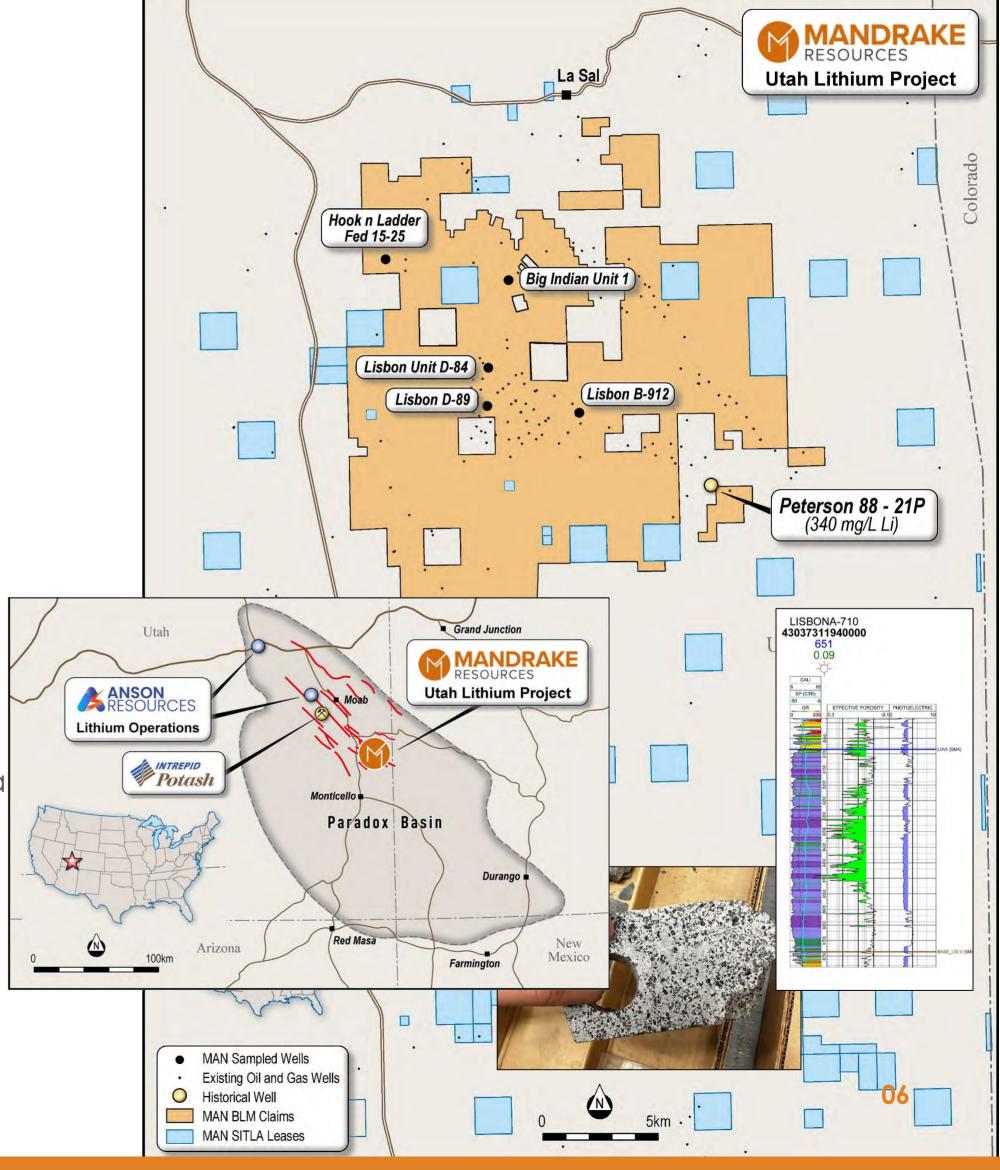
Legacy oil and gas data enables strong geological understanding (over 150 well logs, 3D seismic, bottom hole pressures, drill cores)

Outstanding infrastructure with nearby rail, road, power and water infrastructure in the heart of the US

Over 8Mlbs uranium, 55Mbbls of oil and extensive Cu mining (still in operation) in the immediate area – legacy mining district

60km to the northwest, Anson Resources (ASN; MC\$100M) have a Mineral Resource of 1.5Mt of LCE at 112mg/L Li

<u>Utah is ranked 1st in the Fraser Institute's Global Investment</u> <u>Attractiveness Index (2023)</u>



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## Large-Scale US Lithium Resource

Mandrake sampling returned exceptional lithium concentrations up to 147mg/L Li

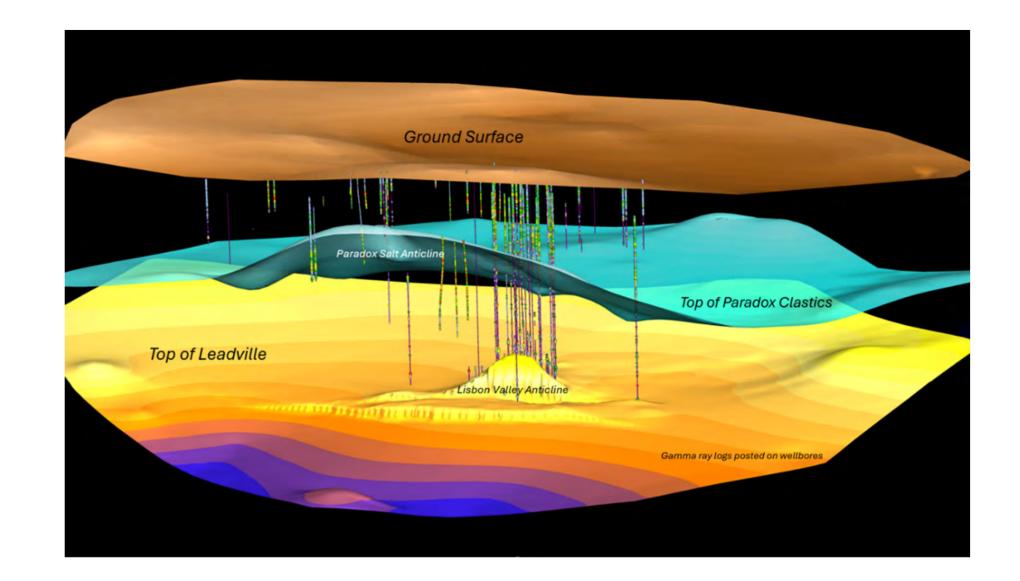
# 3.3 Mt Lithium Carbonate Equivalent (LCE) JORC 2012 Inferred Resource\*

Sampling lithium brines from existing wells is a significant cost saving to drilling

Outstanding bromine and potassium (potash) values up to 3,480mg/L and 33,600mg/L respectively representing potentially valuable by-products

7,247 million cubic metres of brine

✓ 3.3 million tonnes of LCE\*



Maiden JORC Inferred Resource Summary for the Utah Lithium Project

Resource Category	Formation	Brine Volume (billion m³)	LCE (Mt)	
Inferred	Paradox Clastics A, B & C	2.5	1.5	
	Leadville	4.2	1.6	
	McCracken	0.5	0.2	
	Totals	7.22	3.3	

<sup>&</sup>lt;sup>1</sup> Conversion factor of 5.323 used to convert lithium tonnes to lithium carbonate equivalent (LCE) tonnes

There may be minor discrepancies in the above table due to rounding

<sup>&</sup>lt;sup>2</sup> Assumes production from all formations

# Further Resource Upside



3.3Mt LCE Resource\* based on Mandrake wireline sampling and existing oil and gas operations data – no previous lithium work

#### **Next Steps**

Re-enter existing wells targeting reservoirs with historic high concentrations of Li that were not accessed (perforated) by the oil companies – huge lithium concentration upside

Pump testing from forthcoming re-entries will trigger an upgrade to Indicated Resources and provide porosity and permeability information likely resulting in Resource size upside

Upcoming production of large brine volumes from re-entry of existing wells will supply two pilot-scale DLE processing facilities

Maiden JORC Inferred Resource for the Utah Lithium Project

Resource Category	Formation	Rock Volume (km³)	Brine Volume (billion m³)	Average Porosity (%)	Avg Li (mg/L)	Elemental Li (t) <sup>2</sup>	LCE (Mt)1,2
Inferred	Leadville	46.6	4.2	9	73	306,000	1.63
	McCracken	9.3	0.5	5	73	35,000	0.19
	Plastic Clastic Zone A	11.3	1.2	11	112	137,000	0.73
	Plastic Clastic Zone B	5.9	0.7	12	142	100,000	0.53
	Plastic Clastic Zone C	5.3	0.6	12	69	44,000	0.24
	Totals	78.4	7.22	9.64	863	622,000	3.31

<sup>&</sup>lt;sup>1</sup> Conversion factor of 5.323 used to convert lithium tonnes to lithium carbonate equivalent (LCE) tonnes

"Further potential upside to the Resource grade, scale and confidence on the back of forthcoming well re-entry operations"

<sup>&</sup>lt;sup>2</sup> Assumes comingled production from all formations

<sup>3</sup> Brine volume weighted average lithium concentration

<sup>&</sup>lt;sup>4</sup> Brine volume weighted average porosity

There may be minor discrepancies in the above table due to rounding

### **Proven Lithium Production**

Two DLE partners have produced battery-grade Lithium Hydroxide directly from Mandrake brine

Rio Tinto-backed Direct Lithium Extraction (DLE) and Refining company ElectraLith successfully produced 99.9% pure batterygrade Lithium Hydroxide

US-based, Bill Gates Breakthrough Energy Fellows-funded Electroflow Technologies produced outstanding repeatable recoveries of 98% pure battery-grade Lithium Hydroxide

Production of battery-grade Lithium Hydroxide direct from brine revolutionises DLE

Both ElectraLith and Electroflow to set up pilot plants to process Mandrake brines at their own cost







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### US – The Place to be for Lithium



# The IRA impact: US gigafactory capacity pipeline overtakes Europe for first time

#### Oil Majors enter the Lithium brine scene

Utilising in-house know-how to position themselves

#### **E**xonMobil

- US\$100 Million purchase of oilfield brines
- First lithium well drilled (January 2024)
- 100k ton lithium supply to SK (June 2024)



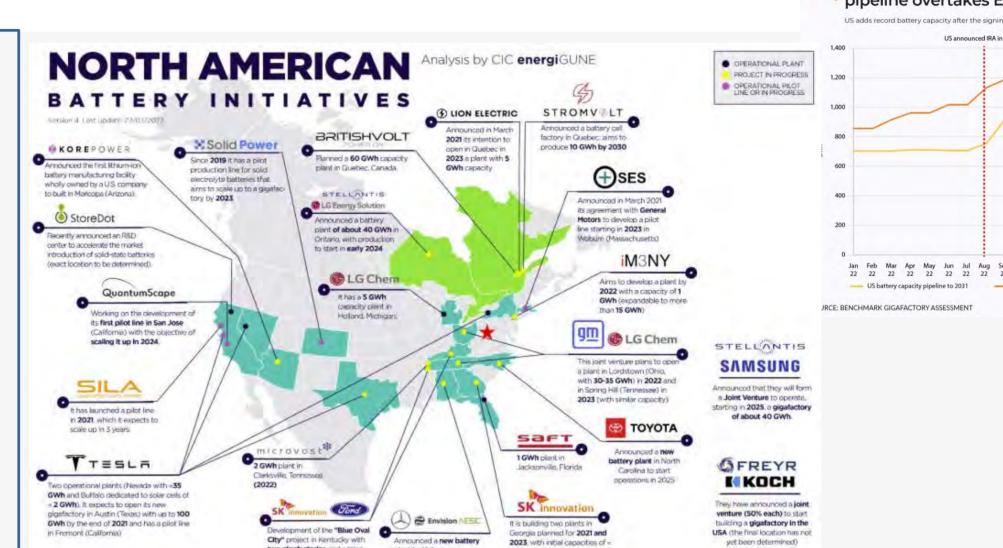
- US\$70 Million into Standard Lithium (May 2024)



- Occidental and Berkshire Hathaway Energy form a JV to commercialize TerraLithium (May 2024)

# Imperial

- Imperial Oil expands E3 Lithium's Alberta project (May 2024)



Inflation Reduction Act 2022 (IRA) – US\$391 billion for energy security and climate change

Lithium Americas Closes \$2.26 Billion U.S. Department of Energy DOE Loan
October 2024

# Funding from the US Department of Energy



**US\$1 Million grant awarded** by US Department of Energy (DOE) to a consortium of Mandrake, Idaho National Laboratories (INL), National Renewable Energy Laboratory (NREL) and University of Utah

Partnering with INL, NREL and the University of Utah will give Mandrake access to the foremost U.S. scientists and sophisticated U.S.-funded laboratories – cash to part fund forthcoming re-entry activities

Three additional DOE applications for further funding currently undergoing preparation (1) or undergoing evaluation by DOE (2).







#### **Near-Term Newsflow**

Re-entry of existing wells targeting lithium prospective reservoirs

Upgrade to Indicated Resource on back of pump testing

Increase in Resource Size

Direct lithium extraction (DLE) pilot plant processing results

Additional government funding (US govt grant/ loan)

**Scoping Studies** 

