Date: 6 May 2024

ASX Code: MAN

Capital Structure
Ordinary Shares: 615,759,920
Current Share Price: 3.2c
Market Capitalisation: $19.7M
Cash: $15.0M (Mar. 2024)
EV: $4.7M
Debt: Nil

Directors

Lloyd Flint
Non-Executive Chairman
Company Secretary

James Allchurch
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Next Generation DLE provider ElectraLith produces 99.9% pure battery-grade Lithium Hydroxide from Mandrake brine

Highlights

- **Rio Tinto-backed Direct Lithium Extraction (DLE) and Refining company ElectraLith has successfully produced 99.9% pure battery-grade Lithium Hydroxide from Mandrake's 100%-owned Utah Lithium Project using it's cutting-edge DLE-R process**
- **Requiring no water or chemicals, ElectraLith's Direct Lithium Extraction and Refining (DLE-R) process has greatly enhanced the potential of the Utah Lithium Project**
- **The production of battery-grade Lithium Hydroxide direct from brine revolutionises DLE by skipping the conventional interim step of producing lithium carbonate using costly, carbon intensive converters**
- **Mandrake and ElectraLith progressing a Strategic Partnership Agreement to facilitate the construction of a DLE-R pilot facility at the Utah Lithium Project**

Mandrake Resources Limited (ASX: MAN) (Mandrake or the Company) advises that next-generation Direct Lithium Extraction (DLE) and Refining provider ElectraLith Pty Ltd (ElectraLith) has produced 99.9% pure battery grade Lithium Hydroxide directly from Mandrake's 100%-owned flagship 93,755 acre (~379km^2) Utah Lithium Project brines.

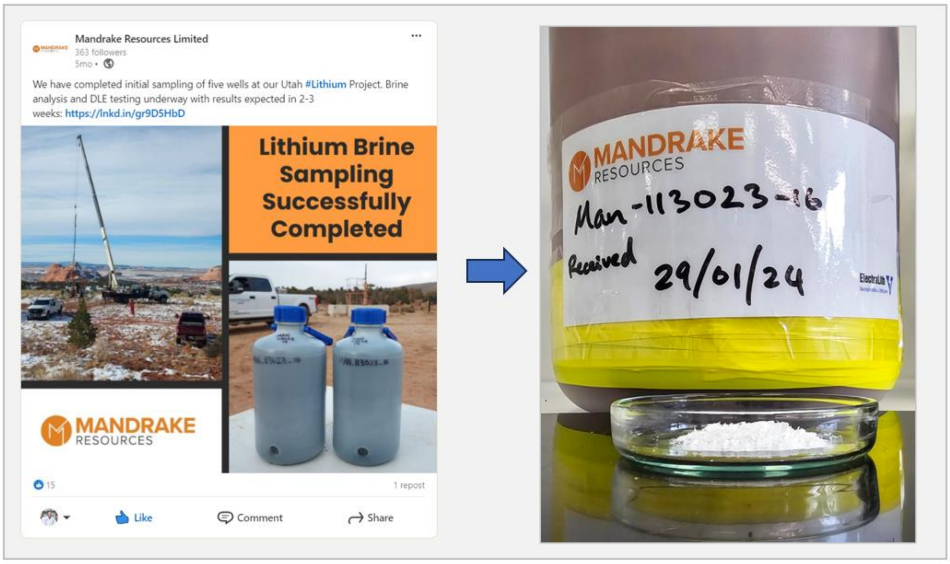

Figure 1: DLE-R - Production of Lithium Hydroxide directly from Utah Lithium Project brine

ElectraLith's DLE and Refining (DLE-R) technology processed brines in parallel from both Mandrake's Utah Lithium Project and Rio Tinto's globally significant Rincon lithium brine project in Argentina.

Spun out of Monash University and backed by Rio Tinto and IP Group Australia, ElectraLith's DLE-R is emerging as one of the cleanest, fastest, most versatile and cost-efficient methods of extracting and refining lithium. It's proprietary electro-membrane technology requires no water or chemicals and can run entirely on renewable power, making it ideal for the water and resource constrained Paradox Basin.

Mandrake sent ElectraLith brines from the Lisbon B-912 well - one of the lower lithium concentration bulk samples from sampling activities undertaken in December 2023. The Lisbon B-912 brines contained 65.6mg/L lithium whilst the Big Indian #1 well (bulk sample sent to DLE provider Electroflow – results expected shortly) brines contained lithium concentrations of 147mg/L. Please see Mandrake's ASX release of 22 January 2024 and Table 1 attached for further details.

ElectraLith's work represents the groundbreaking production of Lithium Hydroxide direct from Mandrake's Utah Lithium Project brines. It also confirms DLE-R's ability to do so without consuming water or chemicals, greatly enhancing the potential of the Utah Lithium Project.

The ability of ElectraLith's DLE-R technology to produce battery grade Lithium Hydroxide directly from brine revolutionises DLE by completely circumventing the conventional interim steps of lithium processing, being the production of lithium chloride and lithium carbonate, which often involves the use of costly, carbon intensive converters.

The relationship between ElectraLith and Mandrake is non-exclusive, enabling Mandrake to continue exploring and assessing other competing DLE technologies. To that end, Mandrake is currently awaiting test results from bulk brine samples sent to the Bill Gates-backed US-based DLE company Electroflow (see ASX release dated 22 December 2023).

Figure 2: James Allchurch (Mandrake), Dr SJ Oosthuizen (ElectraLith) and Charles MacGill (ElectraLith) at ElectraLith's laboratory at Monash University

Managing Director James Allchurch commented:

'DLE technology is absolutely critical to the future of lithium and the broader global energy transition. Our research into this innovative technology has been comprehensive, quickly identifying ElectraLith as one of the leaders in the field. The ability for ElectraLith's DLE-R to produce Lithium Hydroxide directly from brine using limited power, no water and no chemicals is revolutionary in the DLE space, putting Mandrake's US-based brine asset in a commanding position.

I look forward to concluding a partnership agreement with ElectraLith which will facilitate the construction of a DLE-R facility at Mandrake's Utah Lithium Project.

Furthermore, the maiden Mineral Resource Estimate for the Utalh Lithium Project is well advanced, and I look forward to updating the market when complete.'

ElectraLith/Mandrake – Next Steps

ElectraLith and Mandrake are currently negotiating the terms of a Strategic Partnership Agreement that will facilitate the construction of a prototype DLE-R pilot plant for Mandrake's Utah Lithium Project.

About ElectraLith

ElectraLith Sustainable Lithium

ElectraLith is unlocking a green future with the cleanest, fastest and most efficient method of extracting and refining lithium, the primary element of a sustainable future.

Its cutting-edge DLE-R technology revolutionises Direct Lithium Extraction (DLE) and Refining processes by extracting and producing battery-grade Lithium Hydroxide in a single, scalable and modular step. As opposed to other DLE processes, DLE-R eliminates the need for water and chemicals and can run entirely on renewable energy.

ElectraLith's CEO, Charlie McGill, has an extensive background in leading businesses in the renewable energy and resources sectors. Notably, he was Chief Financial Officer (CFO) of Kidman Resources, a lithium developer, prior to its acquisition by Wesfarmers. Additionally, he served as the CFO of GB Energy, a company focused on energy storage and natural gas.

Backed by Rio Tinto, IP Group Australia and Monash University, ElectraLith is based in Melbourne Australia.

Direct Lithium Extraction

Direct Lithium Extraction (DLE) is a cutting-edge development in the realm of renewable energy. It offers an alternative approach to meeting the growing demand for lithium, which is essential for battery production in electric vehicles and energy storage systems.

Unlike traditional methods such as open-pit mining or evaporation ponds, DLE extracts lithium from brine sources more efficiently and with less environmental impact. This method is particularly advantageous because it uses less water and can tap into lower concentration lithium sources, making it a more sustainable option.

This technology is an important step forward in the energy transition, helping to facilitate the shift towards cleaner energy and transportation solutions.

This announcement has been authorised for release by the Board of Mandrake Resources.

Competent Persons Statement

The information related in this announcement 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 information 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 announcement of the matters based on his information in the form and context in which it appears.

MANDRAKE RESOURCES

JORC Code, 2012 Edition – Table 1 report template

Section 1 Sampling Techniques and Data

(Criteria in this section apply to all succeeding sections.)

Criteria	JORC Code explanation	Commentary
Sampling techniques	• Nature and quality of sampling (eg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling. • Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used. • Aspects of the determination of mineralisation that are Material to the Public Report. • In cases where 'industry standard' work has been done this would be relatively simple (eg 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (eg submarine nodules) may warrant disclosure of detailed information.	• A ball-valve bailer, capable of storing up to 3.4 L of liquid, attached to a wireline truck was used to retrieve samples from the formations of interest using existing perforations in historical shut-in oil and gas wells. • A mixture of brine and minor volumes of hydrocarbon liquids retrieved from the bailer were poured into a clean bucket and then into a 2,000 mL separator funnel to separate hydrocarbons from water. After 5-10 minutes of allowing for hydrocarbon/brine separation, a 200-300 mL aliquot of the brine was captured from the separation funnels to be analysed with an AquaTroll 500 water multimeter. The Aqua Troll was factory calibrated upon shipment and re-calibrated upon arrival for high conductivity brines (~100,000 µs/cm). After 30-40 minutes of allowing for hydrocarbon/brine separation, the brine separated was collected in a HDPE sampling bottle with minimal headspace and transported in a cooler on ice. • Sampling equipment (e.g. bucket, beakers, separation funnels, etc.) was thoroughly cleaned with soap and water and rinsed 3x - 4x with distilled water between sample points. • The sample retrieval method used only samples accumulated fluids in the immediate wellbore and is not always an accurate representation of the native brines in the adjacent targeted geological formations. In this case, it is possible that Mandrake will carry out a future brine sampling campaign that improves sample confidence by using a swabbing rig that allows for larger

Criteria	JORC Code explanation	Commentary
		volumes of liquid to be obtained from the stratigraphic formations. • Historical wells may not be optimally perforated to target fluids associated with the highest lithium-brine units. In this case, it is possible that Mandrake will carry out a future brine sampling program that isolates stratigraphic zones of interest using packers and establishes new perforations to enhance the pumping of lithium-enriched brine to the surface.
Drilling techniques	• Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).	• Mandrake has yet to conduct any drilling at the Utah Lithium Project. • The historical oil and gas company owned wells were drilled using conventional oil and gas drill rigs that drill vertical well bores.
Drill sample recovery	• Method of recording and assessing core and chip sample recoveries and results assessed. • Measures taken to maximise sample recovery and ensure representative nature of the samples. • Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.	• Sample size is constrained by the capacity of the bailer and reduced by its oil/water saturation. • Measurements of the original liquids recovered from the bailer, oil saturation and final sample collected were recorded. • Actions were taken to extract brine from each sample and separate-out any minor liquid hydrocarbons that were retrieved from the original mixed-liquids in the bailer. • To the best of Mandrake's knowledge, no relationship exists between the oil saturation and the concentrations of other elements in the brines.
Logging	• Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.	• Electric Conductivity, Temperature and pH were recorded in the field using an AquaTroll 500 instrument. • Petrophysical well logs associated with the historical wells include gamma-ray, neutron density, resistivity, sonic, and mud logs.

Criteria	JORC Code explanation	Commentary
	• Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography. • The total length and percentage of the relevant intersections logged.	• The petrophysical logs provide information such that geologists can make stratigraphic formation picks to define the down-well lithology of each well. These interpreted lithological logs are used to prepare cross-sections to map the reservoir and to target future well locations.
Sub-sampling techniques and sample preparation	• If core, whether cut or sawn and whether quarter, half or all core taken. • If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry. • For all sample types, the nature, quality and appropriateness of the sample preparation technique. • Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples. • Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling. • Whether sample sizes are appropriate to the grain size of the material being sampled.	• No sub-sampling techniques were applied. • Sample collection and preparation followed the protocols of the NELAC accredited laboratories used. • A blind synthetic standard was provided every 20-30 samples or at the beginning and end of a set of samples. Blind blanks (distilled water) are provided every 50-60 samples or at the beginning of each set of samples and a check lab was used for every second sample. • The contracted labs reported the following methodologies for sample analysis: o Sample Digestion: EPA 200.2 o Anions: EPA M300.0, EPA 300.0, SM2320B, SM4500S2-D, SM2310BSM, SM D516 o Cations: EPA M200.7 & EPA 200.7 o Volatile Organic Compounds (Hydrocarbons): EPA M8015D, EPA M8260C/D, and EPA M3520C
Quality of assay data and laboratory tests	• The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total. • For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc. • Nature of quality control procedures adopted (eg standards, blanks, duplicates, external laboratory checks)	• Reported analytes typically include, for example, cation and anion data along with a limited number of trace elements. • Assay procedures are considered appropriate. • Quality control procedures included the inclusion of standards and duplicates and the use of external laboratory checks. • Often the laboratory names are not reported, and hence there is no way to evaluate laboratory certificates or make statements on the independence and

Criteria	JORC Code explanation	Commentary
	and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.	accreditation of the individual laboratories used in the historical brine analytical work.
Verification of sampling and assaying	• The verification of significant intersections by either independent or alternative company personnel. • The use of twinned holes. • Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols. • Discuss any adjustment to assay data.	• Lithological intersections not assessed as bailed sampling was performed on formation brines. • Documentation of primary field data detailed above was conducted under standard operating procedures.
Location of data points	• Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation. • Specification of the grid system used. • Quality and adequacy of topographic control.	• Well locations are identifiable in the field. • The longitude and latitude locations of the oil and gas wells provided by the oil and gas companies are recorded in government databases.
Data spacing and distribution	• Data spacing for reporting of Exploration Results. • Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied. • Whether sample compositing has been applied.	• Data spacing and distribution is insufficient to establish the degree of geological and grade continuity appropriate for a potential future Mineral Resource or Ore Reserve. • No compositing was applied to the brine data.
Orientation of data in relation to geological structure	• Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type. • If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.	• The effect of structures in the concentration of different elements in the brines is not fully understood. • Seismic interpretation has been undertaken by Mandrake to evaluate geological structures but further work is still required. • The location of the historical oil and gas wells sampled is presented with reference to the main known structures in the images in the body of the announcement.
Sample security	• The measures taken to ensure sample security.	• Samples were kept and safely stored by Mandrake's personnel while at the field and shipped by registered courier to the laboratories and DLE providers.

Criteria	JORC Code explanation	Commentary
Audits or reviews	• The results of any audits or reviews of sampling techniques and data.	• No audits/reviews of the data have been undertaken at this stage.

Section 2 Reporting of Exploration Results

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

Criteria	JORC Code explanation	Commentary

Mineral tenement and land tenure status	• *Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.*
	• *The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.*
		• The Utah Lithium Project is located approx. 60km SSE of the City of Moab, in the State of Utah in the United States.
		• The total land position is 93,755 acres and includes:
		  o 34,670 acres within an Other Business Agreement (OBA) with the Utah State Government's School and Institutional Trust Lands Administration (SITLA).
		  o The remaining land position of approximately 59,085 acres is comprised of over 2,950 staked Bureau of Land Management (BLM) placer claims.
		• Mandrake has potash rights over SITLA tenure only.
		• All the land tenure / staked BLM claims are 100% owned by Mandrake's US subsidiary (Mandrake Lithium USA Inc.) or held in trust by Mandrake's commissioned landman, in which the deeds are awaiting transfer to Mandrake Lithium USA Inc.

Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties.*	• Historical exploration work has been performed by oil and gas companies who have completed hydrocarbon-specific exploration and production activities over the last 80 years across the lease and claim areas. • Individual wells within oilfields continue to produce in the Paradox Basin and within the boundaries of the Utah Lithium Project.
Geology	• *Deposit type, geological setting and style of mineralisation.*	• The Project is in the north-central portion of the Paradox Basin. • Structurally, Mandrake's Project occurs on the southern margin of the "Paradox fold and fault belt", which consists

Criteria	JORC Code explanation	Commentary
		of a series of roughly parallel, northwest-trending faults, northwest striking diapiric salt-cored anticlines and synclines in the northern part of the Paradox Basin. • Currently, Mandrake's lithium-brine geological target units are defined by the Devonian McCracken sandstone, the Mississippian Leadville-Ouray Limestone Formation (Leadville Limestone) and the Pennsylvanian Paradox Member of the Hermosa Formation. • The Leadville Limestone comprises massive to thinly laminated, gray, buff, and yellow limestone that were deposited in intertidal to subtidal environments. • The Paradox Basin can be defined by the maximum extent of halite and potash salts in the Middle Pennsylvanian Paradox Formation and is composed of halite interbedded with gypsum, shale, sandstone, and dolomite deposited intermittently in a closed marine depositional environment.
Drill hole Information	• *A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes:* o *easting and northing of the drill hole collar* o *elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar* o *dip and azimuth of the hole* o *down hole length and interception depth* o *hole length.* • *If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.*	• Mandrake has yet to conduct drilling at the Utah Lithium Project. • The historical oil and gas wells were drilled vertically.

Well	Long/Lat	Sample Depth (ft)	Li (mg/L)
Big Indian #1	38.239428/ 109.275236	6,150	147
Big Indian #1	38.239428/ 109.275236	7,560	140
Lisbon B-912	38.186416/ 109.240868	8,480	65.6
Lisbon D-89	38.189514/ 109.288069	7,680	38.4
Lisbon D-84	38.204969/ 109.286034	8,560	59

Criteria	JORC Code explanation	Commentary
		Hook n Ladder Fed 15-25 | 38.245936/ 109.336416 | 6,800 | 18.5
Data aggregation methods	• *In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (eg cutting of high grades) and cut-off grades are usually Material and should be stated.* • *Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.* • *The assumptions used for any reporting of metal equivalent values should be clearly stated.*	• No weighting or cut-off grades have been applied. • No metal equivalent values have been reported.
Relationship between mineralisation widths and intercept lengths	• *These relationships are particularly important in the reporting of Exploration Results.* • *If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.* • *If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (eg 'down hole length, true width not known').*	• Mandrake has yet to conduct drilling at the Utah Lithium Project. • The oil and gas fluids (hydrocarbons and brine) are produced from large, confined aquifer/reservoir deposits; hence, the brine samples – as fluid media – represent samples from a larger pool of fluids. Accordingly, it is accurate to state that brine data do not have common solid mineral deposit sample intervals or intercepts. Hence downhole lengths and true widths are not applicable to this type of deposit.
Diagrams	• *Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.*	• Historical well collar locations and appropriate lithium-brine information are presented within the figures, tables, and text contents of this announcement.
Balanced reporting	• *Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.*	• All results are reported in Table 1. The dataset is too sparse to evaluate grade variations.
Other substantive	• *Other exploration data, if meaningful and material, should be reported including (but not limited to): geological*	• Based on the Mandrake's current knowledge of the project, all meaningful information has been provided.

Criteria	JORC Code explanation	Commentary
exploration data	*observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.*	
Further work	• *The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling).* • *Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.*	• Planning of a swabbing campaign to allow for the sampling of more representative native and uncompromised brines further away from the historical oil and gas well bores is currently underway. • Permitting has been received which allows Mandrake to make new perforations in the historical oil and gas wells that target the lithological units most prospective to host lithium rich brines • Direct Lithium Extraction (DLE) test work to verify that lithium can be extracted from deep-seated brine underlying the Utah Lithium Project, is currently being undertaken by two independent DLE providers. • Work is underway to produce a lithium brine Mineral Resource in accordance with JORC (2012).