

Date: 11 October 2023

ASX Code: MAN

#### Capital Structure

Ordinary Shares: 598,759,920  
Current Share Price: 3.8c  
Market Capitalisation: \$22.8M  
Cash: \$16.8M (June 2023)  
EV: \$6.0M  
Debt: Nil

#### Directors

Lloyd Flint  
Non-Executive Chairman  
Company Secretary

James Allchurch  
Managing Director

Roger Fitzhardinge  
Non-Executive Director

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## Mandrake investigates Uranium Potential of the Lisbon Valley, Utah

### Highlights

- **The Lisbon Valley, the location of Mandrake's 93,755-acre Utah Lithium Project, is the most significant uranium mining district in Utah<sup>1</sup>**
- **Lisbon Valley accounts for nearly 78 million pounds of historic U<sub>3</sub>O<sub>8</sub> production, representing 64% of all uranium ever mined in Utah<sup>1</sup> - the third largest uranium mining state in the U.S.**
- **Located 100km south of the project is the only operating conventional uranium mill in the U.S., the highly-strategic 8Mlb per annum White Mesa Mill owned by Energy Fuels Inc. (NYSE:UUUU; MC: ~US\$1.2B)**
- **Energy Fuels in the process of reopening production at two historical uranium mines on the northern boundary of Mandrake's 100%-owned Utah Lithium Project**
- **Mandrake to review historic data, well log information and existing 3D seismic to formulate uranium exploration programme**
- **Current uranium price has compelled MAN to assess uranium potential**
- **Lithium project remains key focus with permitting for the re-entry of two wells continuing to advance.**

Mandrake Resources Limited (ASX: MAN) (Mandrake or the Company) is assessing the uranium potential of its 93,755-acre Utah Lithium Project (project) located in the Lisbon Valley mining district.

Utah is the third largest uranium producing state in the US with the Lisbon Valley district by far the most important, accounting for nearly 78 million pounds of U<sub>3</sub>O<sub>8</sub> production, or 64% of the Utah's total production<sup>1</sup> and approximately 8% of total United States U<sub>3</sub>O<sub>8</sub> production between 1949 and 2019.<sup>2</sup>

Uranium and vanadium in the Lisbon Valley mining district were discovered in 1913 as outcrops of basal sandstone at the southeast end of the Lisbon Valley anticline, the dominant geologic feature in the region. Mineralisation was then identified to the north west tracing an arcuate belt 16 miles long by one mile with over 40 historical uranium mines/occurrences, of which 20 are located within Mandrake's Utah Lithium Project tenure (Figure 1).

<sup>1</sup> Mills, S.E. and Jordan, B., 2021, Uranium and vanadium resources of Utah—an update in the era of critical minerals and carbon neutrality: Utah Geological Survey Open-File Report 735

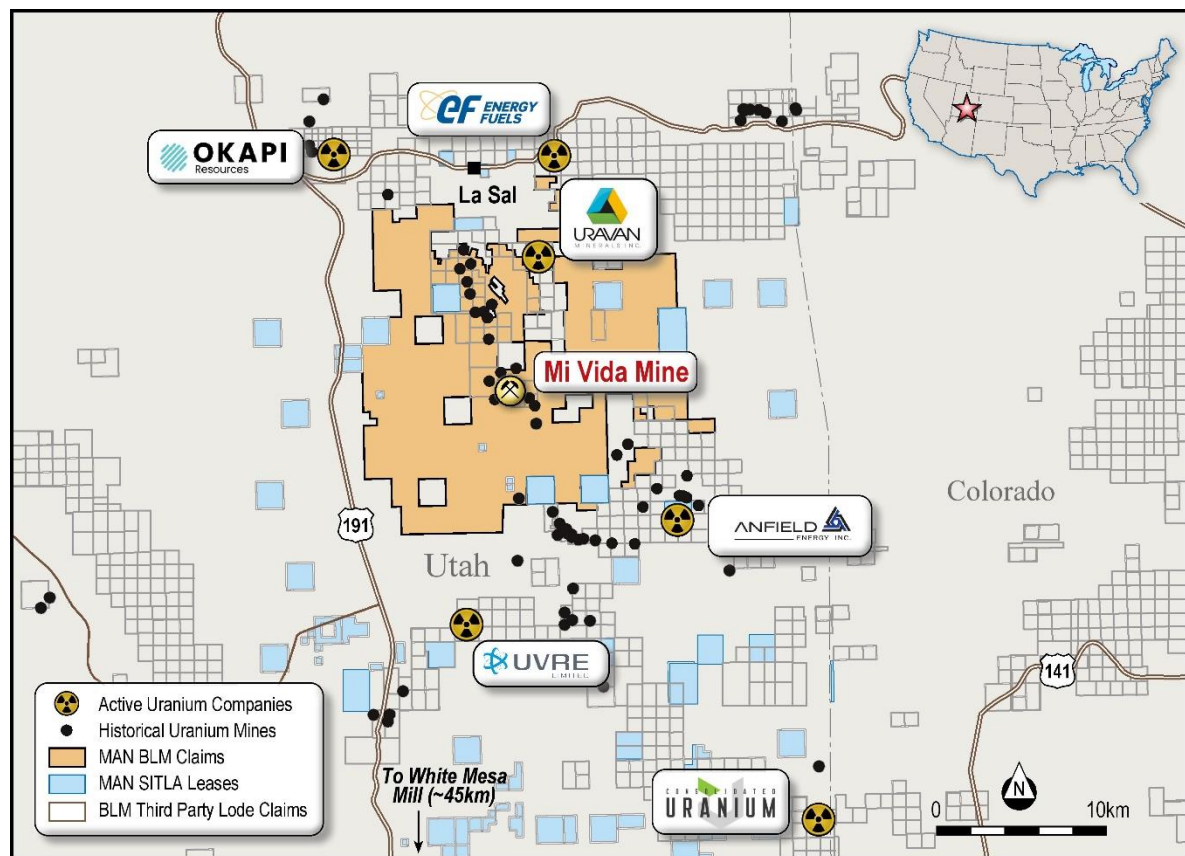
<sup>2</sup> Table 8.2 - Uranium Overview. Washington, DC: U.S. Energy Information Administration. April 2020.

The most significant uranium mine in the district is the Mi Vida mine which returned average ore grades of 3,700 ppm  $U_3O_8$  and 1.4%  $V_2O_5$  and was the catalyst for the 1953 to 1961 uranium boom in the region.<sup>3</sup>

Declining uranium prices in the early 1980s forced many of the mines to close, however exploration activity has since ramped up in the region, attracting a host of uranium juniors (see Figure 1) as well as larger players such as Energy Fuels Inc. (NYSE:UUUU ~ US\$1.2B market cap) and Consolidated Uranium Inc. (TSX-V:CUR ~CAD\$200M market cap).

Energy Fuels operates the White Mesa Mill which is the only fully licensed and operational conventional uranium-vanadium mill in the US with a licensed capacity of over 8 million pounds of  $U_3O_8$  per year.

Energy Fuels is currently in the process of restarting production at two historical mines in the La Sal district, immediately to the north of the Utah Lithium Project (Fig 1). Resources at La Sal are quoted at 4.3Mlb of  $U_3O_8$  and 17.8Mlb of  $V_2O_5$  from 0.8Mt of material with grades of 0.26%  $U_3O_8$  and 1.08  $V_2O_5$ <sup>4</sup>.



**Figure 1: Utah Lithium Project – Location of Uranium mines and explorers**

Anfield Energy Inc. (TSX.V:AEC ~CAD\$65M market cap) recently completed a Preliminary Economic Assessment for The Shootaring Canyon Mill and the Velvet-Wood and Slick Rock Uranium Projects which may represent a step forward for the restart of operations located immediately south of the Company's Utah Lithium Project.

<sup>3</sup> Chenoweth (1990) Lisbon Valley, Utah's Premier Uranium Area, A Summary of Exploration and Ore Production, Utah Geological and Mineral Survey, Open-file report 188

<sup>4</sup> <https://www.energyfuels.com/la-sal-complex>

A meteoric increase in the spot price of uranium to over US\$70 per pound has compelled Mandrake to assess the potential of the historically significant uranium precinct within the Lisbon Valley, co-located as it is with the Company's Utah Lithium Project. Mandrake remains on-track and fully committed to the lithium brine project and expects to release an update on well-access developments shortly.

### **Uranium Work Plan**

Mandrake has commenced a detailed historical and geological review of the Lisbon Valley focussing on uranium.

The historical well logs already compiled into a database by Mandrake include intersections of known uranium host rocks with, in most instances, gamma logs that potentially indicate the presence of uranium. This dataset will be important in determining the potential distribution of uranium.

Likewise, the 3D seismic acquired by Mandrake will be instrumental in determining the lateral continuity of potential uranium-bearing sediments and can assist in uranium targeting and mapping.

Guided by the above information, Mandrake are planning exploration activities focused on the identification and mapping of outcrop and the identification of areas prospective for uranium mineralization.

The uranium review currently being undertaken by Mandrake will inform the decision to amend existing tenure to accommodate for uranium exploration and future production.

### **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.

**This announcement has been authorised for release by the Board of 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
<b>Sampling techniques</b>	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.</li> <li>• Aspects of the determination of mineralisation that are Material to the Public Report.</li> <li>• 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.</li> </ul>	<ul style="list-style-type: none"> <li>• Mandrake has yet to conduct uranium exploration work at the Project. Mandrake has not yet collected any samples or drilled any wells and so is currently relying on other companies and historical reports to assess the Project.</li> <li>• Historical grades quoted are based on public literature, with the most relevant information sourced from files of the U.S. Atomic Energy Commission (AEC) and more specifically from the AEC annual production records for the years 1948 to 1970.</li> <li>• Precise details of sampling techniques were not provided.</li> </ul>
<b>Drilling techniques</b>	<ul style="list-style-type: none"> <li>• 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).</li> </ul>	<ul style="list-style-type: none"> <li>• Mandrake has yet to conduct uranium exploration work at the Project including any drilling.</li> </ul>
<b>Drill sample recovery</b>	<ul style="list-style-type: none"> <li>• Method of recording and assessing core and chip sample recoveries and results assessed.</li> <li>• Measures taken to maximise sample recovery and ensure representative nature of the samples.</li> </ul>	<ul style="list-style-type: none"> <li>• Mandrake has yet to conduct uranium exploration work at the Project.</li> <li>• Drilling results are not included in this announcement.</li> </ul>

Criteria	JORC Code explanation	Commentary
	<ul style="list-style-type: none"> <li>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.</li> </ul>	
<b>Logging</b>	<ul style="list-style-type: none"> <li>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.</li> <li>Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.</li> <li>The total length and percentage of the relevant intersections logged.</li> </ul>	<ul style="list-style-type: none"> <li>Mandrake has yet to conduct uranium exploration work at the Project.</li> <li>No results of logging are included in this announcement.</li> </ul>
<b>Sub-sampling techniques and sample preparation</b>	<ul style="list-style-type: none"> <li>If core, whether cut or sawn and whether quarter, half or all core taken.</li> <li>If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.</li> <li>For all sample types, the nature, quality and appropriateness of the sample preparation technique.</li> <li>Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.</li> <li>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.</li> <li>Whether sample sizes are appropriate to the grain size of the material being sampled.</li> </ul>	<ul style="list-style-type: none"> <li>Mandrake has yet to conduct uranium exploration work at the Project.</li> <li>Specific sampling techniques, sample preparation of assays, and Quality Control/Quality Assurance procedures related to all historical values quoted are unknown.</li> </ul>
<b>Quality of assay data and laboratory tests</b>	<ul style="list-style-type: none"> <li>The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.</li> <li>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.</li> <li>Nature of quality control procedures adopted (eg standards, blanks, duplicates, external laboratory checks) and whether</li> </ul>	<ul style="list-style-type: none"> <li>Mandrake has yet to conduct uranium exploration work at the Project.</li> <li>Reported mineral grades relate to ore production deliveries.</li> <li>Precise analytical procedures are unknown.</li> </ul>

Criteria	JORC Code explanation	Commentary
	acceptable levels of accuracy (ie lack of bias) and precision have been established.	
<b>Verification of sampling and assaying</b>	<ul style="list-style-type: none"> <li>The verification of significant intersections by either independent or alternative company personnel.</li> <li>The use of twinned holes.</li> <li>Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.</li> <li>Discuss any adjustment to assay data.</li> </ul>	<ul style="list-style-type: none"> <li>Mandrake has yet to conduct uranium exploration work at the Project.</li> </ul>
<b>Location of data points</b>	<ul style="list-style-type: none"> <li>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.</li> <li>Specification of the grid system used.</li> <li>Quality and adequacy of topographic control.</li> </ul>	<ul style="list-style-type: none"> <li>Mandrake has yet to conduct uranium exploration work at the Project.</li> <li>The longitude and latitude of the historical mines are recorded in government databases.</li> <li>Locations of historical mines are also easily identifiable in the field. Mandrake has verified the location of the most significant mines (Mi Vida and Little Beaver) on the ground.</li> </ul>
<b>Data spacing and distribution</b>	<ul style="list-style-type: none"> <li>Data spacing for reporting of Exploration Results.</li> <li>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.</li> <li>Whether sample compositing has been applied.</li> </ul>	<ul style="list-style-type: none"> <li>Mandrake has yet to conduct uranium exploration work at the Project.</li> <li>Data spacing and distribution is likely insufficient to establish the degree of geological and grade continuity appropriate for a potential future Mineral Resource or Ore Reserve.</li> <li>It is not known if compositing was applied to the historical reported data.</li> </ul>
<b>Orientation of data in relation to</b>	<ul style="list-style-type: none"> <li>Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.</li> </ul>	<ul style="list-style-type: none"> <li>Mandrake has yet to conduct uranium exploration work at the Project.</li> </ul>



Criteria	JORC Code explanation	Commentary
<b>geological structure</b>	<ul style="list-style-type: none"> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>Further work is required by Mandrake to evaluate details of the Project's geology.</li> </ul>
<b>Sample security</b>	<ul style="list-style-type: none"> <li>The measures taken to ensure sample security.</li> </ul>	<ul style="list-style-type: none"> <li>Sample security procedures (if any) as conducted by the historical mines are unknown.</li> </ul>
<b>Audits or reviews</b>	<ul style="list-style-type: none"> <li>The results of any audits or reviews of sampling techniques and data.</li> </ul>	<ul style="list-style-type: none"> <li>No audits/reviews have been undertaken on the historical values reported.</li> </ul>

## Section 2 Reporting of Exploration Results

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

Criteria	JORC Code explanation	Commentary
<b>Mineral tenement and land tenure status</b>	<ul style="list-style-type: none"> <li>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.</li> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>The Project is located approx. 60km SSE of Moab, Utah United States.</li> <li>Mandrake does not currently have any uranium or vanadium rights over the area of the project.</li> <li>Mandrake has staked over 2,950 placer claims with the U.S. Bureau of Land Management (BLM) over the area of the Project. The claims cover a total area of 59,085 acres.</li> <li>Mandrake holds an Other Business Agreement (OBA) with the Utah State Government's School and Institutional Trust Lands Administration (SITLA) over 34,670 acres. The OBA does not currently include uranium or vanadium.</li> <li>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.</li> </ul>
<b>Exploration done by other parties</b>	<ul style="list-style-type: none"> <li>Acknowledgment and appraisal of exploration by other parties.</li> </ul>	<ul style="list-style-type: none"> <li>Mandrake has yet to conduct uranium exploration work at the Project.</li> <li>Currently, all exploration work reported in this announcement has been performed by other companies who have completed exploration and production activities that date back to the early 1900's.</li> </ul>

Criteria	JORC Code explanation	Commentary
<b>Geology</b>	<ul style="list-style-type: none"> <li>Deposit type, geological setting and style of mineralisation.</li> </ul>	<ul style="list-style-type: none"> <li>The Project is in the north-central portion of the Paradox Basin.</li> <li>Uranium and vanadium deposits are known to occur in the Chinle, Morrison and Cutler formations in the flanks of the Lisbon Valley anticline.</li> <li>All deposits are irregular, amoeba-shaped masses that are concordant with the bedding of the host rocks.</li> </ul>
<b>Drill hole Information</b>	<ul style="list-style-type: none"> <li>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:               <ul style="list-style-type: none"> <li>easting and northing of the drill hole collar</li> <li>elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar</li> <li>dip and azimuth of the hole</li> <li>down hole length and interception depth</li> <li>hole length.</li> </ul> </li> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>Mandrake has yet to conduct uranium exploration work at the Project.</li> <li>No drill hole information is reported.</li> </ul>
<b>Data aggregation methods</b>	<ul style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>The assumptions used for any reporting of metal equivalent values should be clearly stated.</li> </ul>	<ul style="list-style-type: none"> <li>The historical information has been sourced from public reports.</li> <li>No length weighting or cut-off grades have been applied.</li> <li>No metal equivalent values have been reported.</li> </ul>
<b>Relationship between</b>	<ul style="list-style-type: none"> <li>These relationships are particularly important in the reporting of Exploration Results.</li> </ul>	<ul style="list-style-type: none"> <li>Mandrake has yet to conduct uranium exploration work at the Project.</li> </ul>



Criteria	JORC Code explanation	Commentary
<b>mineralisation widths and intercept lengths</b>	<ul style="list-style-type: none"> <li>If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.</li> <li>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').</li> </ul>	<ul style="list-style-type: none"> <li>No drilling results are being reported.</li> </ul>
<b>Diagrams</b>	<ul style="list-style-type: none"> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>Location of historical mines are presented within the figures and text contents of this announcement.</li> <li>No discoveries are reported.</li> </ul>
<b>Balanced reporting</b>	<ul style="list-style-type: none"> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>Mandrake has yet to conduct uranium exploration work at the Project.</li> <li>No exploration results are reported.</li> </ul>
<b>Other substantive exploration data</b>	<ul style="list-style-type: none"> <li>Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.</li> </ul>	<ul style="list-style-type: none"> <li>Based on Mandrake's current knowledge of the project, all meaningful information has been provided.</li> </ul>
<b>Further work</b>	<ul style="list-style-type: none"> <li>The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling).</li> <li>Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.</li> </ul>	<ul style="list-style-type: none"> <li>Mandrake plans to collect and review data available from government agencies, the existing 3D seismic dataset and geophysical logs from historical oil and gas wells in the region to select specific areas of interest which will be assessed in the field.</li> </ul>