

# Denison Reports Decision to Increase Anticipated ISR Mining Head Grade at Phoenix by 50%

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TORONTO, Aug. 4, 2021 - [Denison Mines Corp.](#) ("Denison" or the "Company") (TSX: DML) (NYSE American: DNN) is report positive interim results from the ongoing metallurgical test program for the planned In-Situ Recovery ("ISR") mine at the Phoenix uranium deposit ("Phoenix"), located on the Company's 90% owned Wheeler River Uranium Project ("Wheeler River" or the "Project"). Test work completed to date, has consistently supported an ISR mining uranium head-grade of in excess of the 10 grams / Litre ("g/L") assumed in the Pre-Feasibility Study ("PFS") completed for Wheeler River in 2018. Accordingly, the Company has decided to adapt its plans for the remaining metallurgical test work, including the bench-scale unit operations of the proposed process plant, to reflect a 50% increase in the head-grade of uranium bearing solution ("UBS") to be recovered from the well-field. View PDF version.

David Bronkhorst, Denison's Vice President Operations, commented, "The metallurgical testing completed to date demonstrates that uranium can be consistently recovered from Phoenix cores at levels significantly higher than the 10 g/L extraction rate assumed in the PFS - giving rise to a decision to adapt future unit operation metallurgical tests to use a UBS head-grade of 15 g/L."

A 50% increase in head-grade is expected to translate into meaningful optimization of previously estimated operating plant and processing plant designs while maintaining the same level of annual uranium production - with the potential to reduce operating costs related to on-surface processing activities, and initial capital costs associated with the processing plant.

Phoenix is expected to be mined in several phases, with Phase 1 estimated to contain 22.2 million pounds U<sub>3</sub>O<sub>8</sub> (37,240 tonnes U<sub>3</sub>O<sub>8</sub>, 27.1% U<sub>3</sub>O<sub>8</sub>, above a cut-off grade of 0.8% U<sub>3</sub>O<sub>8</sub>) in Probable mineral reserves (see Press Release dated December 1, 2020). Accordingly, the sample selection for recent metallurgical test work has favored samples representative of the mineralization in Phase 1, to allow for a greater understanding of optimal leaching conditions required in the area where first production is expected.

## Core Leach Test Results

Three core samples, representing the high-grade/low-clay characteristics of the majority of the mineralization in the Phoenix area, have been tested to date, with results summarized below in Table 1 - showing steady-state and average UBS head-grade significantly above the 10g/L level used in the PFS.

Table 1 - Summary Results from High-Grade/ Low clay Core Leach Tests			
	Sample #1	Sample #3A	Sample #3C
Sample diameter	6.1 cm	8.1 cm	7.8 cm
Sample length	19 cm	18 cm	7cm
Sample grade (U <sub>3</sub> O <sub>8</sub> )	70%	83%	83%
Clay Content	Low	Low	Low
UBS range in steady state (U)	13.5 g/L to 39.8 g/L	29g/L to 90g/L	14g/L to 74g/L
UBS average interval (U)	22g/L over 56 days	29.6 g/L over 85 days	31.1 g/L over 64 days

In addition to the high-grade/low clay characteristics of Phase 1, the Phoenix ISR operation is also expected to encounter comparatively rare and isolated areas with lower uranium grades and high clay content, which is expected to result in a

number of zones of reduced permeability. In order to understand the ISR leach dynamics in these areas, test work was initiated on samples presenting high clay characteristics (above 25% clay). Results obtained from these tests confirm that clay content can impact the natural permeability of the ore body and lead to lower UBS head-grades. Importantly, these tests confirm that permeability enhancement techniques have the potential to normalize these areas and significantly improve UBS head-grade concentrations to levels that align with core leach tests carried out using samples with higher grades and lower clay content.

As outlined in Table 2, below, sample 2A failed to produce an acceptable "steady-state" UBS head grade. Sample 2B was taken from the same drill hole and presented similar mineralogical characteristics as Sample 2A; however, Sample 2B was treated with the MaxPERF permeability enhancement tool. As is evident from the achievement of a peak UBS head-grade of 76.0 g/L and an average UBS head-grade of 24.9 g/L obtained over 28 days of steady state, the preliminary leaching results from Sample 2B confirm both the utility of permeability enhancement in normalizing the natural permeability in high clay zones and the appropriateness of the decision to increase the overall UBS head-grade assumption for Phoenix.

	Sample #2A	Sample #2B <sup>(1)</sup>
Sample diameter	61mm	61mm
Sample length	12cm	10cm
Sample grade (U <sub>3</sub> O <sub>8</sub> )	28%	28%
Clay Content	High	High
Permeability Enhancement	No	Yes
UBS range in steady state (U)	N/a	5.8g/L to 76.0 g/L
UBS average interval (U)	3.8g/L over 1 day	24.9 g/L over 28 days

Notes: (1) Core test is still in progress. Results are as of August 3, 2021.

#### Column Leach Tests

Various column leach tests have recently been completed using core samples from Phoenix. The primary purpose of the column leach tests was to recover sufficient volumes of UBS to facilitate bench-scale tests of the unit operations outlined in the design for the Phoenix processing plant. Over 900 litres of UBS were produced from 64 Kilograms ("kg") of Phoenix core samples. Combined results from the four column leach tests are highly positive, with calculated UBS head-grade from the four column leach tests averaging 19g/L, which further supports the decision to increase the overall UBS head-grade assumption for Phoenix.

While not the primary purpose of the column leach tests, average reagent addition rates from the column leach tests (1.0 kg U<sub>3</sub>O<sub>8</sub> and 1.2 kg oxidant / kg U<sub>3</sub>O<sub>8</sub>) have also provided useful information that is supportive of the values published in the design.

The laboratory work for the 2021 Metallurgical Program is being carried out at the Saskatchewan Research Council ("SRC") Mineral Processing and Geoanalytical Laboratories, in Saskatoon, under the supervision of Mr. Chuck Edwards (P.Eng.).

#### About Phoenix Phase 1

Phase 1 of Phoenix is estimated to contain approximately 22.2 million pounds U<sub>3</sub>O<sub>8</sub> (37,242 tonnes at 27.1% U<sub>3</sub>O<sub>8</sub>, above a cut-off grade of 0.8% U<sub>3</sub>O<sub>8</sub>) in Probable mineral reserves. Based on current designs, the Company estimates approximately 6.7 million pounds U<sub>3</sub>O<sub>8</sub> (7,717 tonnes at 39.2% U<sub>3</sub>O<sub>8</sub>, above a cut-off grade of 0.8% U<sub>3</sub>O<sub>8</sub>) in Probable mineral reserves are contained within the expected operating perimeter of the Test Pattern (see Figure 1). These estimates are derived as a direct subset of the estimates reported in the Technical Report titled "Pre-feasibility Study for the Wheeler River Uranium Project, Saskatchewan, Canada" dated October 30, 2018 with an effective date of September 24, 2018 (the "PFS Report"). The key assumptions, parameters and estimates used to estimate the mineral reserves herein remain unchanged.

## About Wheeler River

Wheeler River is the largest undeveloped uranium project in the infrastructure rich eastern portion of the Athabasca Basin in northern Saskatchewan - including combined Indicated Mineral Resources of 132.1 million pounds U<sub>3</sub>O<sub>8</sub> (1,809,000 tonnes at an average grade of 3.3% U<sub>3</sub>O<sub>8</sub>), plus combined Inferred Mineral Resources of 3.0 million pounds U<sub>3</sub>O<sub>8</sub> (82,000 tonnes at a grade of 1.7% U<sub>3</sub>O<sub>8</sub>). The project is host to the high-grade Phoenix and Gryphon uranium deposits, discovered by Denison in 2011 and 2014, respectively, and is a joint venture between Denison (90% owner and operator) and JCU (Canada) Exploration Company Limited (10%).

A PFS was completed for Wheeler River in late 2018, considering the potential economic merit of developing the Phoenix deposit as an ISR operation and the Gryphon deposit as a conventional underground mining operation. Taken together, the project is estimated to have mine production of 109.4 million pounds U<sub>3</sub>O<sub>8</sub> over a 14-year mine life, with a base case pre-tax NPV of \$3.1 billion (8% discount rate), Internal Rate of Return ("IRR") of 38.7%, and initial pre-production capital expenditures of \$322.5 million. The Phoenix ISR operation is estimated to have a stand-alone base case pre-tax NPV of \$930.4 million (8% discount rate), IRR of 43.3%, initial pre-production capital expenditures of \$322.5 million, and industry leading average operating costs of US\$1.5/lb U<sub>3</sub>O<sub>8</sub>. The PFS is prepared on a project (100% ownership) and pre-tax basis, as each of the partners to the Wheeler River Joint Venture are subject to different tax and other obligations.

Further details regarding the PFS, including additional scientific and technical information, as well as after-tax results at Denison's ownership interest, are described in greater detail in the PFS Report. A copy of the PFS report is available on the company website and under its profile on SEDAR at [www.sedar.com](http://www.sedar.com) and on EDGAR at [www.sec.gov/edgar.shtml](http://www.sec.gov/edgar.shtml).

Denison suspended certain activities at Wheeler River during 2020, including the EA process, which is on the critical path to achieving the project development schedule outlined in the PFS. While the EA process has resumed, the Company is not currently able to estimate the impact to the project development schedule outlined in the PFS, and users are cautioned against relying on estimates provided therein regarding the start of pre-production activities in 2021 and first production in 2024.

## About Denison

Denison is a uranium exploration and development company with interests focused in the Athabasca Basin region of northern Saskatchewan, Canada. The Company has an effective 95% interest in its flagship Wheeler River Uranium Project, the largest undeveloped uranium project in the infrastructure rich eastern portion of the Athabasca Basin region of northern Saskatchewan. Denison's interests in Saskatchewan also include a 22.5% ownership interest in the McClean Lake joint venture ("MLJV"), which includes several uranium deposits and the McClean Lake uranium mill that is contracted to process the Cigar Lake mine under a toll milling agreement, plus a 25.17% interest in the Midwest Main and Midwest A deposits, a 66.90% interest in the Tthe Heldeth Túé ("THT," formerly J Zone) and Huskie deposits on the Waterbury Lake property. Midwest Main, Midwest A, THT and Huskie are located within 20 kilometres of the McClean Lake mill.

Through its 50% ownership of JCU (Canada) Exploration Company, Limited ("JCU"), Denison also holds interests in various uranium project joint ventures in Canada, including the Millennium project (JCU 30.099%), the Kiggavik project (JCU 33.4508%) and Christie Lake (JCU 34.4508%).

Denison is also engaged in mine decommissioning and environmental services through its Closed Mines group (formerly Environmental Services), which manages Denison's Elliot Lake reclamation projects and provides post-closure mine care and maintenance services to a variety of industry and government clients.

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## Qualified Persons

The technical information contained in this release has been reviewed and approved by Mr. David Bronkhorst, P.Eng, D.Eng, Vice President, Operations, who is a Qualified Person in accordance with the requirements of NI 43-101.

## Cautionary Statement Regarding Forward-Looking Statements

Certain information contained in this news release constitutes 'forward-looking information', within the meaning of the a

United States and Canadian legislation, concerning the business, operations and financial performance and condition of Denison Mines Corp.

Generally, these forward-looking statements can be identified by the use of forward-looking terminology such as 'plans', 'budget', 'scheduled', 'estimates', 'forecasts', 'intends', 'anticipates', or 'believes', or the negatives and/or variations of such terms and phrases, or state that certain actions, events or results 'may', 'could', 'would', 'might' or 'will be taken', 'occur', 'be achieved', or 'has the potential to'.

In particular, this news release contains forward-looking information pertaining to the following: the planned scope, elements and objectives of the 2021 ISR field programs, including the results of the column leach tests, including head grade and real-time results and estimates; other evaluation activities, including plans for future lixiviant tests and those activities connected with the leach process; the results of the PFS and expectations with respect thereto; expectations with respect to phased development and estimates of reserves in each such phase; other development and expansion plans and objectives, including plans for a feasibility study; and expectations regarding its joint venture ownership interests and the continuity of its agreements with its partners.

Forward looking statements are based on the opinions and estimates of management as of the date such statements are made and they are subject to known and unknown risks, uncertainties and other factors that may cause the actual results, level of performance or achievements of Denison to be materially different from those expressed or implied by such forward-looking statements. For example, the modelling and assumptions upon which the work plans are based may not be maintained or may be tested or be representative of actual conditions within the Phoenix deposit. In addition, Denison may decide or otherwise be required to discontinue its field test activities or other testing, evaluation and development work at Wheeler River if it is unable to maintain or otherwise secure the necessary resources (such as testing facilities, capital funding, regulatory approvals, etc.) or if operations are otherwise affected by COVID-19 and its potentially far-reaching impacts. Denison believes that the expectations reflected in this forward-looking information are reasonable but no assurance can be given that these expectations will be met, accurate and results may differ materially from those anticipated in this forward-looking information. For a discussion of the risks and other factors that could influence forward-looking events, please refer to the factors discussed in Denison's Annual Information Form dated March 26, 2021 or subsequent quarterly financial reports under the heading 'Risk Factors'. These risks are not, and should not be construed as being exhaustive.

Accordingly, readers should not place undue reliance on forward-looking statements. The forward-looking information contained in this news release is expressly qualified by this cautionary statement. Any forward-looking information and the assumptions and estimates with respect thereto speaks only as of the date of this news release. Denison does not undertake any obligation to publish or revise any forward-looking information after the date of this news release to conform such information to actual results or changes in Denison's expectations except as otherwise required by applicable legislation.

**Cautionary Note to United States Investors Concerning Estimates of Measured, Indicated and Inferred Mineral Resources and Probable Mineral Reserves:** This press release may use the terms 'measured', 'indicated' and 'inferred' mineral resources and 'probable mineral reserves'. United States investors are advised that while such terms have been prepared in accordance with the definition standards on mineral resources and reserves of the Canadian Institute of Mining, Metallurgy and Petroleum referred to in Canadian National Instrument 43-101 Disclosure Standards ('NI 43-101') and are recognized and required by Canadian regulations, these terms are not defined in the Securities Industry Guide 7 under the United States Securities Act and, until recently, have not been permitted to be used in reports filed in registration statements filed with the United States Securities and Exchange Commission ('SEC'). 'Inferred mineral resources' represent a great amount of uncertainty as to their existence, and as to their economic and legal feasibility. It cannot be assumed that any part of an inferred mineral resource will ever be upgraded to a higher category. Under Canadian rules, estimates of mineral resources may not form the basis of feasibility or other economic studies. United States investors are cautioned not to assume that all or any part of measured or indicated mineral resources will ever be converted into mineral reserves. United States investors are also cautioned not to assume that all or any part of an inferred mineral resource exists, or is economically mineable. In addition, the terms "mineral reserve", "proven mineral reserve" and "probable mineral reserve" for the purposes of NI 43-101 differ from the definitions and allowable usage in Industry Guide 7. Effective February 2019, the SEC adopted amendments to its disclosure rules to modernize the mineral property disclosure requirements for issuers whose securities are registered with the SEC under the Exchange Act and as a result, the SEC now recognizes estimates of "measured mineral resources", "indicated mineral resources" and "inferred mineral resources". In addition, the SEC has amended its definitions of "proven mineral reserves" and "probable mineral reserves" to be substantially similar to the corresponding definitions under the CIM Standards, under NI 43-101. However, information regarding mineral resources or mineral reserves in Denison's disclosure may not be comparable to similar

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