Name:



## Uranium Development & Exploration

The Athabasca Basin, Northern Saskatchewan

August 2019 | Wheeler River Site Visit



## Wheeler River Site Visit August 2019

#### Agenda:

- Arrive at Wheeler River
- Welcome to the Wheeler River Uranium Project
- Denison Mines overview
- Introductions
- Camp orientation & safety
- Depart for <u>Field Tour</u> of Stations #1-9
- Snacks / refreshments (Station #6)
- Return to camp for late lunch
- ➢ Wrap-up Q&A
- Depart Wheeler River

## Penison Mines



## Diversified Athabasca Basin Asset Base with Superior Development Leverage

#### **Strategic Project Portfolio:**

- 90% interest in Flagship Wheeler River project <sup>(1)</sup>

   largest undeveloped uranium project in
   infrastructure rich eastern Athabasca Basin
- 22.5% interest in operating McClean Lake
   Uranium Mill excess licensed capacity, +12% of global uranium production
- Interests in uranium resources at McClean Lake, Midwest, and Waterbury Lake
- ~305,000 hectares of prospective exploration ground in the Athabasca Basin
- ✓ Internal sources of cash flow from management services contract with Uranium Participation
   Corp. (TSX-U), and Denison Environmental
   Services (DES)

## Penison Mines

**NOTES:** (1) See Denison' news releases from January 17, 2017 and September 4, 2018 for additional details, as well as the Wheeler River Technical Report titled "Pre-feasibility Study Report for the Wheeler River Uranium Project, Saskatchewan, Canada" dated September 24, 2018.



## ~305,000 Hectares of Prospective Exploration & Development Ground Focused in the Infrastructure Rich Eastern Athabasca Basin



## Wheeler River Project Advancing to Permitting<sup>(1)</sup>

#### Pre-Feasibility Study Highlights<sup>(2)</sup>:

- PFS included selection of In-Situ Recovery ("ISR") mining method for Phoenix with onsite processing at Wheeler River
- Phoenix estimated to have exceptionally low operating costs for an undeveloped uranium deposit globally US\$3.33/lb U<sub>3</sub>O<sub>8</sub>
- Conventional UG Gryphon contributes additional low cost pounds – US\$11.70/lb U<sub>3</sub>O<sub>8</sub>
- 109.4M lbs U<sub>3</sub>O<sub>8</sub> Probable Reserves
- **14** year mine life (7.8m lbs U<sub>3</sub>O<sub>8</sub>/year on avg.)
- Base-case pre-tax NPV<sub>8%</sub> (100%) of **\$1.31B**
- Base-case pre-tax IRR of **38.7%**
- Initial CAPEX of **\$322.5M** (100%)

✓ Ownership<sup>(3)</sup>: 90% Denison, 10% JCU



## Penison Mines

**NOTES:** (1) See Denison's news releases from December 18, 2018 for additional details. (2) Refer to the Wheeler River Technical Report titled "Pre-feasibility Study Report for the Wheeler River Uranium Project, Saskatchewan, Canada" dated September 24, 2018; (3) See Denison's news releases from October 29, 2018

## Wheeler River PFS: 14-year mine life producing +7.5M lbs $U_3O_8$ per year on average<sup>(1)</sup>



Million Pounds U<sub>3</sub>O<sub>8</sub> Per Annum

**D**enison Mines

NOTES: (1) Refer to the Wheeler River Technical Report titled "Pre-feasibility Study Report for the Wheeler River Uranium Project, Saskatchewan, Canada" dated September 24, 2018.

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# Phoenix ISR Operation: Potential to be one of the lowest cost uranium mining operations



Sample of global production costs<sup>(1)</sup>

#### **D**enison Mines

**NOTES:** (1) Chart data, including all-in costs, have been derived from UxC's estimates of Worldwide Production Costs as of August 2019. Phoenix and Gryphon costs are per Denison's Pre-Feasibility Study for the project, available at <u>www.denisonmines.com</u> or on SEDAR and EDGAR

## Wheeler River Site Visit Introductions

#### Management & Technical Team:

- David Cates President & CEO
- Mac McDonald VP Finance & CFO
- Tim Gabruch VP Commercial
- Dale Verran VP Exploration
- Chad Sorba Technical Services Manager
- Carolanne Inglis-McQuay CSR Manager
- Pam Bennett Environment Manager
- Jared Orynik Project Manager, Project Dev.
- Clark Gamelin Project Manager, Exploration
- Shae Frosst Corp. Dev. & IR Manager



#### **D**enison Mines

## Wheeler River Site Visit: Safety and site orientation



Side by side ATVs:	Wear seatbelts, maintain safe speeds, beware of oncoming traffic and surroundings.
Wildlife:	Stay calm, slowly back away to vehicle, follow your Denison host
Rough terrain:	Tripping hazards, uneven surfaces
UV exposure:	Wear hat, apply sunscreen, stay hydrated
Radiation safety:	Time, Distance, Shielding ALARA (As Low As Reasonably Achievable) PPE (Personal Protective Equipment) Personal Decontamination

IMPORTANT: During the visit, the project site will be active. Accordingly, there are hazards that you may need to be made aware of during the field tour. Always listen to and follow instructions from your Denison hosts during the visit.

## Wheeler River 2019 Field Tour



## Station #1 – Gate House

Future home of the Phoenix ISR uranium mining operation

#### **Site Location**

 35 km north-northeast of the Key Lake mill and 35 km southwest of the McArthur River uranium mine in the southeastern portion of the Athabasca Basin region

#### **Existing Regional Infrastructure**

- Highway 914 eastern edge of property
- Provincial power grid SaskPower transmission line along Highway 914

#### **Planned Site Infrastructure**

- ~7km site road connection to Highway
   914 outlined in Project Description
- Powerline connection to SaskPower transmission line
- Airstrip (1600 m length) and associated site road to allow for transport of staff



## **Station #1 – Gate House** Future home of the Phoenix ISR uranium mining operation



#### **Evolution of Site Design**

- Site infrastructure design from PFS (September, 2018) shown opposite
- Updated site infrastructure design submitted for the Project Description shown on next page
- Ongoing efforts to optimize site layout to minimize capital expenditure requirements and impacts to the environment

## Penison Mines

## **Station #1 – Gate House** Future home of the Phoenix ISR uranium mining operation



#### **Key Site Elements:**

- ~150 person camp facility
- Site operations centre
- ISR wellfield
- Freeze plants
- Processing plant / WTP
- Potential WTP holding ponds and treated effluent discharge point
- Warehousing and fuel storage facilities
- Back-up power generators
- Wash bay, scanning and weight scale facilities
- Potable and waste water treatment / storage

## **P**enison Mines

## **Station #2 – Phoenix Camp** Designing a home away from home



#### Preliminary Camp Design Features:

- ✓ ~150-person capacity
- $\checkmark~$  Pre-fabricated design
- ✓ Single-occupancy units
- ✓ Kitchen & recreation facilities
- ✓ Situated within walking distance to work sites
- Common areas for relaxing, using the computer, doing laundry
- Layout to promote healthy lifestyle and enjoyment of the surrounding setting (lake view, fishing, etc.)

## **D**enison Mines

## **Station #2 – Phoenix Camp** Building a local workforce

# Potential employment opportunities associated with ISR mining operation:

- Targeted to Wheeler Partner Communities
- Up to 300 jobs during ~2 years of construction
- Approximately 100 jobs during operation of the planned ISR mining operation
- Opportunities similar to other uranium mining operations (processing plant, camp, security and EH&S roles)
- Various unique opportunities specific to an ISR mining operation, which will require diploma or technical certification available in Saskatchewan. Examples:
  - ✓ Process Operation Technician (SIIT in Meadow Lake)
  - ✓ Chemical Technology (Sask Polytechnic)
- In-house training programs can be developed once operations begin
- ISR mining positions are all surface-based
- Expected to operate as a fly-in / fly-out operation from planned Wheeler River airstrip

## Penison Mines



## Station #3 – ISR Wellfield

Bringing the world's lowest cost uranium mining method to the jurisdiction hosting the world's highest-grade uranium deposits



#### ISR Mining Process<sup>(1)</sup>:

- Mining solution (also known as "lixiviant") is pumped through a permeable orebody via injection well;
- Lixiviant dissolves the uranium as it travels through the orebody;
- Uranium rich mining solution (also known as uranium bearing solution or "UBS") is pumped back to surface via recovery well;
- 4. UBS is sent to a processing plant on surface for chemical separation of the uranium and reconditioning of lixiviant;
- 5. Lixiviant is returned back to well field for further production

## Penison Mines

## Station #3 – ISR Wellfield

## Phoenix Geology: Unique uranium deposit with exceptionally high grades

#### Highlights<sup>(1)</sup>:

- Mineralization is situated at or immediately above the unconformity ("UC")
- Two distinct ore zones Phoenix A + B
- Approximately 400 m below surface
- World's highest-grade undeveloped uranium deposit
- Indicated Mineral Resources 70.2 M lbs U<sub>3</sub>O<sub>8</sub> (166,000 tonnes at **19.1% U<sub>3</sub>O<sub>8</sub>**)
  - Includes 59.9 M lbs U<sub>3</sub>O<sub>8</sub> estimated for Phoenix Zone A High-Grade Core (62,900 tonnes at 43.2% U<sub>3</sub>O<sub>8</sub>)
- Inferred Mineral Resources 1.1 M lbs U<sub>3</sub>O<sub>8</sub> (9,000 tonnes at 5.8% U<sub>3</sub>O<sub>8</sub>)
- Cut-off grade of 0.8%  $U_3O_8$
- ✓ Geological setting expected to be amenable to ISR mining, with ~90% of the mineral resource (contained metal) hosted in sandstone

## Penison Mines

**NOTES:** (1) Refer to the Wheeler River Technical Report titled "Pre-feasibility Study Report for the Wheeler River Uranium Project, Saskatchewan, Canada" dated September 24, 2018 for further details regarding the mineral resources estimated for the Phoenix deposit.



## **Station #3 – ISR Wellfield** First of its kind ISR Field Test in the Athabasca Basin

#### **ISR Field Test Objectives:**

- In-situ field work is necessary to increase the confidence / reduce the risks associated with application of the ISR mining method at Phoenix
  - ✓ Data required for detailed hydrogeological modelling
  - Forms the basis for ISR wellfield and freeze dome design necessary for the FS and to support the EIA process.
- Phoenix deposit divided into four (4) representative test areas
  - Intended to cover each of the various fluid flow domains expected within the deposit
  - ✓ Test areas expected to cover ~65% of the Indicated Mineral Resources estimated for the Phoenix deposit



# Station #3 – ISR Wellfield

First of its kind ISR Field Test in the Athabasca Basin



#### Summer 2019 ISR Field Test:

- Designed to acquire data from Test Areas 1 and Test Area 2
- In-situ testing in the orebody, and surrounding areas, using water to evaluate hydraulic conditions
- 29 wells (17 Phoenix wells + 12 regional wells) installed to allow for preliminary testing
- Existing exploration holes used for installation of near vertical wells, where possible
- One large-diameter well (commercial-scale) planned for each Test Area following preliminary evaluations
- Possible evaluation of certain permeability enhancement techniques

## **D**enison Mines

## Station #4 – ISR Processing Plant

## Phoenix PFS Test Work<sup>(1)</sup>: Confirms suitability of ISR mining method

Field and laboratory work included drill hole injection, permeability, metallurgical leach, agitated leach and column testing

- **Excellent Recoveries:** High rates of recovery in extraction (+90%) and processing (98.5%)
- **High Grade:** Agitated leach and column tests returned uranium concentrations of 12 to 20 grams per litre (g/L) significantly higher than conventional low-grade ISR operations
- High uranium concentrations in the mining solution, plus low level of impurities (deleterious elements), allows for **direct** precipitation of uranium

 ✓ No need for ion exchange or solvent extraction circuits = reduced costs



#### **D**enison Mines

**NOTES:** (1) Refer to the Wheeler River Technical Report titled "Pre-feasibility Study Report for the Wheeler River Uranium Project, Saskatchewan, Canada" dated September 24, 2018.

## **Station #4 – ISR Processing Plant** On-site processing to Yellowcake Uranium

#### **On-Site Processing Plant**<sup>(1)</sup>

- Annual production between 6 and 12 million lbs U<sub>3</sub>O<sub>8</sub> depending on uranium concentrations from wellfield (10 g/L → 6M lbs U<sub>3</sub>O<sub>8</sub> / year)
- No crushing or grinding circuits required results in small footprint
- Low impurity solution allows for direct precipitation and eliminates need for ion exchange or solvent extraction
- Potential for closed loop system that recycles mining solution back to ISR wellfield with little to no discharge of effluents
- Drying/calcining to be done on-site in preparation for market
- Plant to be powered by provincial power grid



#### Penison Mines

**NOTES:** (1) Indicative design only. Refer to the Wheeler River Technical Report titled "Pre-feasibility Study Report for the Wheeler River Uranium Project, Saskatchewan, Canada" dated September 24, 2018.

## Station #5 - Freeze Plant & Collars

Novel concept to contain lixiviant, using established technology



### Artificial freeze cap replicates confining layer typically required for ISR mining operations<sup>(1)</sup>

- Parallel cased holes drilled from surface and anchored into impermeable basement rock surrounding the Phoenix deposit
- Circulation of low-temperature brine solution through cased pipes will freeze groundwater in sandstone surrounding the deposit
- 10 metre thick freeze wall, together with basement rocks will encapsulate Phoenix deposit
- ✓ Eliminates common environmental concerns with ISR mining and facilitates controlled reclamation

#### Penison Mines

**NOTES:** (1) Refer to the Wheeler River Technical Report titled "Pre-feasibility Study Report for the Wheeler River Uranium Project, Saskatchewan, Canada" dated September 24, 2018.

Environmental benefits of ISR mining



### Advantages of ISR mining compared to existing uranium mining in Canada:

- ✓ Small surface footprint
- $\checkmark$  Lower water consumption
- $\checkmark$  Lower energy consumption
- ✓ Potentially near zero CO<sub>2</sub> emissions
- Small volume (potentially zero) treated effluent released to surface water bodies
- ✓ Potential for lower radiation doses to workers
- $\checkmark$  No tailings production
- Very small volumes of clean waste rock (sandstone core from wellfield development)

## Penison Mines

# Environmental baseline studies

# Foundation of the environmental impact assessment

- Environmental baseline studies provide an understanding of current or existing conditions
- Overlay the proposed Project with the existing environment
- Identify where Project activities or components could interact with the environment
- ✓ Having a robust baseline dataset allows
   Denison to more accurately predict
   potential environmental effects



**D**enison Mines

The environmental impact assessment process

environmentProvincialpublic and technical experts to:DenisonFederalAquatic environmentTechnical> Identify Valued Componentssubmits draftgovernmentsGroundwaterProposal and Federal> Predict project life-cycle interactions with environmentPredict project life-cycle interactions with environmentImpactreview andAir qualityProjectList potential effects of the Project on the environmentList potential effects of the Project on the environmentFederal (FIS)provide	n Federal Iraft governments ental and the public t review and ent provide comments on Final EIS approved by Provincial and Federal governments + Proceed to next steps*
geochemistry       > Indigenous land use         2012 - Present       > Propose monitoring programs to demonstrate compliance with regulations and predictions         2019-2020       > Denison	020 Denison revises

Community Engagement and Indigenous Consultation (ongoing throughout)

\*Following final EIS approval, next steps involve commencement of detailed engineering, licensing, permitting, approvals to operate, and ultimately construction

Committed to collaborative engagement with all interested parties



# **Project design informed by collaborative engagement:**

- Evaluation of alternative mining methods for the Phoenix deposit (ISR mining method)
- Selection of preferred route for the site access road and power line from existing provincial highway and transmission line
- ✓ Selection of preferred location for possible effluent discharge to surface water bodies

Committed to collaborative engagement with all interested parties



#### **Denison's Approach:**

- 1. Present meaningful and relevant information in culturally appropriate format and language
- Incorporate comments and recommendations into project decisions to minimize project impacts
- 3. Engage interested parties in a variety of ways and in a manner that respects local traditions, culture, timeframes and decision making processes
- Provide frequent feedback, monitoring and evaluation related to the project and engagement activities

Respect for Indigenous communities and knowledge

#### **Denison's Guiding Principles:**

- We acknowledge and respect that we are working within Treaty 10 and the traditional territory of the English River First Nation and the Métis
- We wish to share the land together and work in partnership, to return maximum benefits from the Project to the communities
- We aim to ensure Indigenous Knowledge is deeply respected by our Company and within the environmental assessment process
- We understand the importance of protecting the area in which we are working the land, the water, the animals, the air, the history
- We have designed the Project to have minimal adverse impacts to Indigenous and Treaty Rights, as well as to the environment



## **Station #7 – Gryphon Deposit Turnoff** Gryphon uranium deposit

#### **Highlights**:

- Basement-hosted, high-grade uranium deposit amenable to conventional underground mining methods
- Not currently approved for advancement, given market conditions – potential to be developed as uranium prices and demand rise in future
- Development expected to make use of existing infrastructure to provide additional low-cost uranium production
- Cash flow from Phoenix operation may be available to fund development



## **Station #7 – Gryphon Deposit Turnoff** Gryphon uranium deposit

Surface Topography SW NE Athabasca Gryphon Deposit Schematic Cross-Section E Series Sandstone ub-Athabasc -5401 A Series Lenses **D** Series Unconformity Lenses C Series **B** Series Lenses Lenses **Open** Basal Pegmatit ower Grap Open

#### Gryphon Geology & Estimated Mineral Resources

- 'Ingress-style' deposit occurring dominantly within crystalline basement rocks below the sub-Athabasca unconformity
- Consists of numerous stacked lenses of mineralization which are parallel to the dominant foliation and fault structures
- Indicated Mineral Resources 61.9 Mlbs  $U_3O_8$  (1,643,000 tonnes at 1.7%  $U_3O_8$ )
- Inferred Mineral Resources 1.9 Mlbs  $U_3O_8$  (73,000 tonnes at 1.2%  $U_3O_8$ )
- Cut-off grade of 0.2%  $U_3O_8$
- Deposit remains open for resource expansion down-plunge and within certain areas along strike to northeast

## Penison Mines

**NOTES:** (1) Refer to the Wheeler River Technical Report titled "Pre-feasibility Study Report for the Wheeler River Uranium Project, Saskatchewan, Canada" dated September 24, 2018 for further details regarding the mineral resources estimated for the Gryphon deposit.

## **Station #8 - Hot Shack**

Supportive permeability test work & metallurgical sampling

# Summer 2019 ISR Field Program designed to facilitate various additional test work:

- Hydraulic conductivity tests (packer testing)
- Downhole geophysics (nuclear magnetic resonance and neutron), where borehole conditions allow.
- Additional mineralized core samples from the orebody, obtained from new drill holes or by wedging from existing boreholes, expected to be subject to the following:
  - Detailed onsite geological and geotechnical (structural & hydrogeological) logging
  - Permeability (permeameter) testing
- Specialized sample collection procedures in place and on-going to allow for metallurgical testing of undisturbed core in future metallurgical test programs



## Station #9 – Core Yard

Considerable exploration potential remains at Wheeler River

#### **Recent Exploration at Wheeler River:**

• Targeting under or un-explored areas

1990

- Multiple historic intercepts that warrant follow-up
- Focused on the discovery of additional high-grade deposits with the potential to form satellite ISR operations
- Winter 2019 exploration program included 7,434 metres in 14 holes; summer 2019 program ongoing



## Penison Mines

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es Dr 30,000 Denison Mines

Cameco

SMDC

AGIP

NOTES: Historic intercepts of uranium mineralization at Wheeler River are publically disclosed on the Company's website at www.denisonmines.com and/or on SEDAR (at www.sedar.com) and/or in the mineral assessment files in the Saskatchewan Mineral Assessment Database. https://www.saskatchewan.ca/business/agriculture-natural-resources-and-industry/mineral-exploration-andmining/saskatchewan-geological-survey/saskatchewan-mineral-assessment-database-smad

## Appendix: Pre-Feasibility Study (PFS) Economics



## Wheeler River PFS: Uranium price assumptions, and sensitivities



Assumptions / Results <sup>(1)</sup>	Base Case	PEA Ref. Case	High Case
Uranium selling price	As above	US\$44/lb U <sub>3</sub> O <sub>8</sub>	US\$65/lb U <sub>3</sub> O <sub>8</sub>
Pre-tax NPV <sub>8%</sub> <sup>(2)</sup> (100% Basis)	\$1.31 billion	\$1.41 billion	\$2.59 billion
Pre-tax IRR <sup>(2)</sup>	38.7%	47.4%	67.4%
Pre-tax payback period <sup>(3)</sup>	~24 months	~ 15 months	~ 11 months

#### **Base Case Price Assumptions:**

- Phoenix Operation:
  - > ~US\$29/lb U<sub>3</sub>O<sub>8</sub> to US\$45/lb U<sub>3</sub>O<sub>8</sub>
  - UxC Spot price forecast
  - ➤ "Composite Midpoint" scenario
  - Stated in "constant" 2018 dollars
- Gryphon Operation:
  - >US\$50/lb U $_{3}O_{8}$  fixed price

#### **Comparison to 2016 PEA**

- 2016 PEA provided pre-tax project NPV<sub>8%</sub> of \$513 million at fixed uranium price of US\$44/lb U<sub>3</sub>O<sub>8</sub>
  - PFS equivalent NPV<sub>8%</sub> at US\$44/lb
     U<sub>3</sub>O<sub>8</sub> (\$1.4 billion) represents +275%
     of pre-tax project NPV from PEA

## **D**enison Mines

**NOTES:** (1) Refer to the Wheeler River Technical Report titled "Pre-feasibility Study Report for the Wheeler River Uranium Project, Saskatchewan, Canada" dated September 24, 2018; (2) NPV and IRR are calculated to the start of pre-production activities for the applicable operation; (3) Payback period is stated as number of years to pay-back from the start of commercial production.

## Phoenix Operation: ISR mining method delivers industry leading cost per pound $U_3O_8$

Phoenix Operation	PFS R	PFS Result <sup>(1)</sup>		
Mine life	<b>10 years</b> (6.0 million lbs U	<b>10 years</b> (6.0 million lbs U <sub>3</sub> O <sub>8</sub> per year on average)		
Average cash operating costs	\$4.33 (US\$3.3	33) per lb U <sub>3</sub> O <sub>8</sub>		
Initial capital costs (100% basis)	\$322.5	\$322.5 million		
Operating margin <sup>(4)</sup>	<b>89.0%</b> at US	<b>89.0%</b> at US\$29/lb U <sub>3</sub> O <sub>8</sub>		
All-in cost <sup>(2)</sup>	\$11.57 (US\$8.90) per lb U <sub>3</sub> O <sub>8</sub>			
Assumptions / Results	Base Case	High Case		
Uranium selling price	UxC Spot Price <sup>(3)</sup>	US\$65/lb U <sub>3</sub> O <sub>8</sub>		
Operating margin <sup>(4)</sup>	91.4%	95.0%		
Pre-tax NPV <sub>8%</sub> <sup>(5)</sup> (100%)	\$930.4 million	\$1.91 billion		
Pre-tax IRR <sup>(5)</sup>	43.3%	71.5%		

Pre-tax payback period<sup>(6)</sup>

## **P**enison Mines

**NOTES:** (1) Refer to the Wheeler River Technical Report titled "Pre-feasibility Study Report for the Wheeler River Uranium Project, Saskatchewan, Canada" dated September 24, 2018; (2) All-in cost is estimated on a pre-tax basis and includes all project operating costs and capital costs, divided by the estimated number of total pounds  $U_3O_8$  to be produced; (3) Spot Price is based on the "Composite Midpoint" spot price scenario from UxC's UMO; (4) Operating profit margin is calculated as uranium revenue less operating costs, divided by uranium revenue. Operating costs exclude all royalties, surcharges and income taxes; (5) NPV and IRR are calculated to the start of pre-production activities for the Phoenix operation in 2021; (6) Payback period is stated as number of years to pay-back from the start of uranium production.

~ 21 months

~ 11 months

## Gryphon Operation: Additional low-cost production with conventional UG mining

Gryphon Operation	PFS Result <sup>(1)</sup>		
Mine life	<b>6.5 years</b> (7.6 million lbs U <sub>3</sub> O <sub>8</sub> per year on average)		
Average cash operating costs	\$15.21 (US\$11.70) per lb U <sub>3</sub> O <sub>8</sub>		
Initial capital costs (100% basis)	\$623.1 million		
Operating margin <sup>(3)</sup>	<b>77.0%</b> at US\$50/lb U <sub>3</sub> O <sub>8</sub>		
All-in cost <sup>(2)</sup>	\$29.67 (US\$22.82) per lb U <sub>3</sub> O <sub>8</sub>		

Assumptions / Results	Base Case	High Case
Uranium selling price	US\$50/lb U <sub>3</sub> O <sub>8</sub>	US\$65/lb U <sub>3</sub> O <sub>8</sub>
Operating margin <sup>(3)</sup>	77.0%	82.3%
Pre-tax NPV <sub>8%</sub> <sup>(4)</sup> (100%)	\$560.6 million	\$998.8 million
Pre-tax IRR <sup>(4)</sup>	23.2%	31.0%
Pre-tax payback period <sup>(5)</sup>	~ 37 months	~ 31 months



**NOTES:** (1) Refer to the Wheeler River Technical Report titled "Pre-feasibility Study Report for the Wheeler River Uranium Project, Saskatchewan, Canada" dated September 24, 2018; (2) All-in cost is estimated on a pre-tax basis and includes all project operating costs and capital costs, divided by the estimated total number of pounds  $U_3O_8$  to be produced; (3) Operating profit margin is calculated as uranium revenue less operating costs, divided by uranium revenue. Operating costs exclude all royalties, surcharges and income taxes; (4) NPV and IRR are calculated to the start of pre-production activities for the Gryphon operation in 2026; (5) Payback period is stated as number of years to pay-back from the start of uranium production.

## Wheeler River PFS<sup>(1)</sup>: Statement of Reserves and Denison indicative post-tax results

#### **Reserves**<sup>(2, 3, 4, 7, 8)</sup>

Deposit	Class.	Tonnes	Grade	Lbs U <sub>3</sub> O <sub>8</sub>	Denison (90%)
Phoenix <sup>(5)</sup>	Probable	141,000	19.1% U <sub>3</sub> O <sub>8</sub>	59.7M	53.7M
Gryphon <sup>(6)</sup>	Probable	1,257,000	1.8% U <sub>3</sub> O <sub>8</sub>	49.7M	44.7M
Total	Probable	1,398,000	3.5%	109.4M	98.4M

#### **Indicative Denison post-tax results**

Financial Results	Denison (90%)		
Initial capital costs	\$290.3 million		
Base case post-tax IRR <sup>(9)</sup>	32.7%		
Base case post-tax NPV <sub>8%</sub> <sup>(9)</sup>	\$755.9 million		
Base case post-tax payback period <sup>(10)</sup>	~ 26 months		
High case post-tax IRR <sup>(9)</sup>	55.7%		
High case post-tax NPV <sub>8%</sub> <sup>(9)</sup>	\$1.48 billion		
High case post-tax payback period <sup>(10)</sup>	~12 months		



**NOTES:** (1) Refer to the Wheeler River Technical Report titled "Pre-feasibility Study Report for the Wheeler River Uranium Project, Saskatchewan, Canada" dated September 24, 2018; (2) Reserve statement is as of September 24, 2018; (3) CIM definitions (2014) were followed for classification of mineral reserves; (4) Mineral resources are inclusive of reserves; (5) Mineral reserves for the Phoenix deposit are reported at the mineral resource cut-off grade of 0.8% U<sub>3</sub>O<sub>8</sub>. The mineral reserves are based on the block model generated for the May 28, 2014 mineral resource estimate. A mining recovery factor of 85% has been applied to the mineral resource above the cut-off grade; (6) Mineral reserves for the Gryphon deposit are estimated at a cut-off grade of 0.58% U<sub>3</sub>O<sub>8</sub> using a long-term uranium price of USD\$40/lb, and a USD\$/CAD\$ exchange rate of 0.80. The mineral reserves are based on the block model generated for the January 30, 2018 mineral resource estimate. The cut-off grade is based on an operating cost of CAD\$574/tonne, milling recovery of 97%, and 7.25% fee for Saskatchewan royalties. Mineral reserves include for diluting material and mining losses; (7) Mineral reserves are stated at a processing plant feed reference point; (8) Numbers may not add due to rounding; (9) NPV and IRR are calculated to the start of pre-production for the Phoenix operation in 2021; (10) Payback period is stated as number of months to pay-back from the start of uranium production.


## Appendix: Wheeler River 2019 Field Tour Maps



# **Wheeler River Field Tour**

- #1 Gate House
- #2 Phoenix Camp
- #3 ISR Wellfield
- #4 ISR Processing Plant
- #5 Freeze Plant & Collars
- #6 Environment & Community

Landfill Clean Waste Rock Pond Clean Waste Rock Pad

Gate House (North)

WTP Holding Pond Waste Pond Waste Pad Processing Plant and Water Treatment Plant

Freeze Plant Freeze Collars

6

Pumphouse

Treated Effluent **Discharge** Point

Temporary Hazardous Waste Storage

Incinerator Sewage Treatment Propane Farm Fire Water Tank **Fuel Storage** 

Substation & Back-up Generator Potable Water Treatment Wash Bay / Scanning Facility

Camp / Parking

In Situ Recovery Wellfield Uranium Deposit **Overhead Powerline** Pipeline 43

500m

Access Road

Freeze Plant / Freeze Collars Fenced Storage

**Operations** Center

Covered Storage Weigh Scale

Gate House (South) Project Description Site Infrastructure Layout

#### **Wheeler River Field Tour**

- #1 Gate House
- #2 Phoenix Camp
- #3 ISR Wellfield
- #4 ISR Processing Plant
- #5 Freeze Plant & Collars
- #6 Environment & Community
- #7 Gryphon Deposit Turnoff
- #8 Hot Shack

Tool 80000

#9 – Core Yard / Exploration

**Gryphon Deposit** 

V Phoenix Deposit

Property Boundary

2

1 km

kilometres Scale, 1.23,440 N

89 Wheeler Camp