

Denison Mines Corp.

(DML-TSX: C\$0.76)

BUY

September 25, 2018
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Target: C\$2.15 (from C\$1.85)

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PFS Improves Economics as ISR Prioritizes Phoenix

We recommend DML with a BUY and increase our target price to C\$2.15 from C\$1.85/sh after incorporating PFS results. Our target is now based on a 0.7x DCF multiple for Phoenix and Gryphon operations, down from a 0.9x, applied to our 10% DCF model.

The Wheeler River Pre-Feasibility Study was released overnight, with the co-development of the Gryphon and Phoenix deposits as expected. This comes shortly after DML increased its ownership in Wheeler River to 90% (see note Wheeler River Buyout...). Denison has selected the ISR mining method for the Phoenix unconformity after considering 32 different methods during 2.5 years of engineering, geological and financial work. ISR mining decision is quite interesting as the method has never been tested on these ultra-high grade uranium deposits in the Athabasca Basin. This is perhaps a transformational moment in uranium mining as it brings the lowest cost mining methods to the highest grade undeveloped deposit. Phoenix reportedly has all attributes needed for low cost ISR mining: 1) permeability in ore; 2) ability to leach and recover uranium; and 3) ability to contain mine solutions. ISR also removes the need to remove ore and waste from underground or the need for underground development; minimizes the environmental footprint and labour requirements; and eliminates the need for tailings. The result is a large reduction in capital and operating costs, and shorter timeline to production, a reprioritization of the ultra-high grade Phoenix deposit. ISR mining would be a first for Canada and for unconformity deposits. Ground freezing and horizontal directional drilling will be required to help facilitate this. The PFS also separates the two projects completely, and we now assume separate production decisions, permitting and financing requirements for each.

We expect that underground acid leaching of uranium, inside a freeze wall barrier will likely work, particularly in the early stages of each mine unit. However, typical ISR mines work because convection of oxidizing fluids evenly and systematically pass through pores of the sandstone to leach low grade uranium between the sand grains. It essentially reverses the depositional process of the uranium deposit by oxidizing uranium that was deposited (when it was chemically reduced). Fluids naturally want to take the path of least resistance from one injection hole (where acid is pumped underground) to a nearby extraction hole (also called production hole where uranium bearing fluids are pumped back to surface). Thus, fluids typically prefer to move horizontally in the same direction that both river sands were deposited. ISR mining is highly dependent on porosity, permeability and lack of structure. Thus, fluid flow within highly altered and massively uranium mineralized sandstones of the Athabasca Basin may not be as predictable.

The importance for Phoenix ISR mining to "create its own permeability as it leaches" will come to light over the long term. If we were to expect traditional ISR mining with high fluid flow rates, we would expect leaching fluids to take the path of least resistance. These pathways may have little or no uranium to leach, resulting in low recoveries. Taking the easy route, perhaps via faults, fractures or even previously leached pathways from injection hole to extraction hole, might leave portions of the uranium deposit relatively untouched. When questioned, management had this figured out. "Let it soak" was the response, essentially boxing the deposit in on all sides by impermeable basement rocks below and freeze walls on all other sides. The leaching solutions would be slowly introduced to the deposit, UO6 would be quickly leached to the point where the solution is saturated to a high concentration, which then can be pumped to surface for processing. Only portions of the deposit will be mined at a time (they call these mine units in ISR mining terminology). Time will tell the effectiveness of this solution...but its US\$250 MM price tag surely beats the traditional multi-billion dollar ultra-high grade project capital that would have otherwise been needed.

Pre-tax 8% NPV is \$1.31 B, IRR is 38.7% with initial Capex of \$322.5 MM (100%, Phoenix only). Planned production is 109.4 MM lbs U3O8 over 14 years, averaging 7.8 MM lbs pa combined at 3.5% U3O8. This represents a 275% pre-tax NPV increase over the 2016 PEA using a similar US\$44/lb U3O8 price. Economically, this is likely a vast improvement over previous mine predictions.

• Phoenix would produce 6 MM lbs pa over 10 years. Capex is C\$322.5 MM (US\$248.1 MM). Ultra-low Opex of US\$3.33/lb or US\$8.90/lb all-in excluding royalties and taxes could make this one of the lowest cost mines in the world. We estimate total cash costs of US\$11.04/lb, including SK royalties. The PFS states a Pre-tax 8% NPV is \$930.4 MM with 43.3% IRR and 21mo payback. Indicated resources are 70.2 MM lbs at 19.14% U3O8.

• Gryphon would produce a 7.6 MM lbs pa average over 6.5 years via a 600 tpa operation. Capex is estimated at \$623.1 MM (US\$479.3MM). Opex is US\$11.21/lb or US\$22.82/lb all in. We estimate a total cash cost of US\$23.40/lb. PFS states a Pre-tax 8% NPV is \$560.6 MM with 23.3% IRR and ~37mo payback. Indicated resources are 61.9 MM lbs at 1.7% U3O8.

Economic at current spot. Conservative (UxC) price assumptions were used, including US\$29 to US\$45/lb for Phoenix and US\$50/lb for Gryphon. Current spot is US\$27.35/lb. CEO David Cates goes as far as saying that a production decision might not even need to be supported by long term contracts. We estimate a long term uranium price forecast of US\$60/lb U3O8 by 2022.

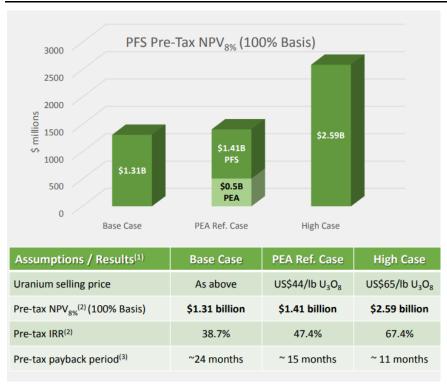
Phoenix ISR plant required at site. Early test work suggests high recoveries, high uranium concentrations in leach solutions, low impurities and no need for ion exchange (IX) or solvent extraction (SX) circuits or tailings ponds. This is due to direct ISR leach of 10 g/L at a deposit wide flow rate of 132 gpm (500 L/min). One example of an ISR producer in the USA currently has 2400 gpm flow rates and much more diluted uranium concentrations of 30-35 mg/L. That plant is designed for 6,000 gpm flow rates and 87mg/L. Phoenix's ISR mining would be somewhat different than conventional ISR where homogenous leaching is required at high flow rates. DML plans are to "let it soak" at flow rates only 6% of typical operations. Mineralization is expected to preferentially leach very quickly. ISR wells will be separated by 10m, whereas DML has witnessed cross-connection of fluids within 25m spacing. Zero solution discharge also means no need for tailings or deep disposal wells.

Gryphon underground operations remain. We see fewer changes for the nearby Gryphon basement hosted deposit. Gryphon can be mined via conventional longhole stoping methods, with processing to toll milled at Denison's 22.5% owned McClean Lake Mill, with start-up due in 2030. McClean mill already processes ~12% of global uranium production (from Cigar Lake). However, a toll milling agreement with McClean Lake JV must be arranged. The mill itself would require expansion of the leach circuit, more filtration to help the current CCD (counter-current decantation) circuit, and expansion of acid plant. Also needed would be improvements to the highway to provide more direct access to mill from the Wheeler River property.

Aggressive development timeline. Should PFS results entice the DML Board to move forward, funds will be required to initiate the EA process and the FS in parallel. FS test work would include natural groundwater pump tests within the deposit, and longer term pilot testing in the lab, focusing on met work and many-month column tests to improve the flowsheet. DML's timeline suggests permitting is completed by 2021/22, and Phoenix construction begins in 2021 for 2024 ramp up; followed by Gryphon construction by 2026 and ramp-up by 2030. Higher cost Gryphon can be partially funded from Phoenix CF.

Permitting required. While CNSC doesn't have a regulatory framework in place that is directly geared to ISR mining, management expects Environmental Assessment to take 3-4 years. Regulators are apparently encouraged by the lack of tailings and discharge at Phoenix. While acid leaching isn't yet used in the USA, it is used in Kazakhstan, Australia and elsewhere. The freeze wall is expected to keep all mine fluids within the confines of the deposit. We see this as a potential sticking point, and at the very least might slow down permitting. DML does have significant experience permitting uranium mines and mills. Pump tests can be complete following a simple Saskatchewan permitting application. Gryphon permitting might be easier due to plans for off-site processing at an existing uranium mill.

Figure 1: Wheeler River PFS and PEA comparison and sensitivity. Base case assumes uranium sales prices of US\$29-45/lb U3O8 for Phoenix and US\$44/lb



Source: Company Reports

Figure 2: Overview of the ISR mining process. 1) Leaching solutions are pumped into a permeable deposit via injection wells; 2) leaching solution dissolves uranium; 3) uranium-loaded solution is pumped to surface via extraction (or recovery) wells; 4) uranium-loaded solution is sent to processing plant for precipitation; 5) leaching solution is recharged and returned to the well field for further production.

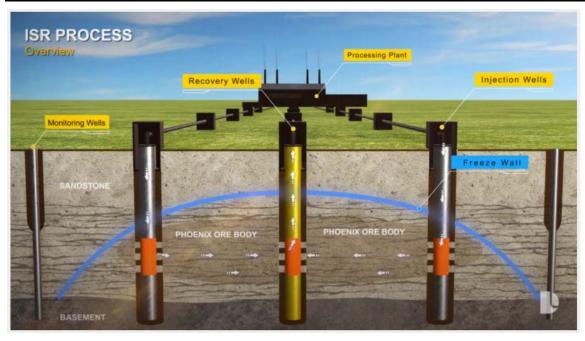
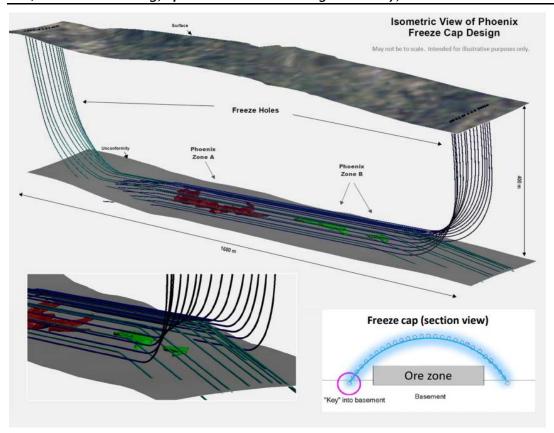


Figure 3: Freeze walls and cap replicate a confining layer required for ISR mining. The 10m thick freeze wall will ensure that leaching solutions will not leak from the mine unit (monitor wells around the deposit will help confirm this). Horizontal drilling, often used in the oil and gas industry, will be used to install the freeze wall.



Source: Company Reports

Figure 4: Phoenix Mine - proposed ISR wellfield and mine infrastructure layout.

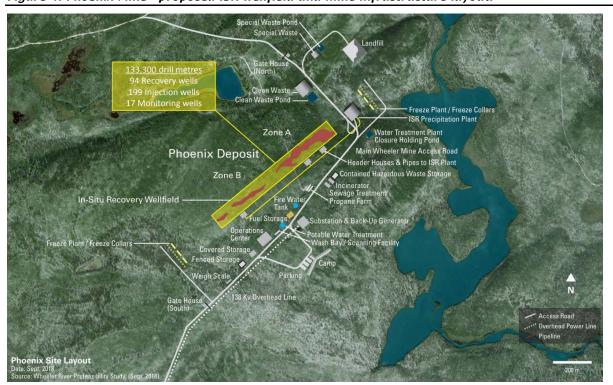


Figure 5: Phoenix - select financial and operational highlights.

Phoenix Operation	PFS Result ⁽¹⁾				
Mine life	10 years (6.0 million lbs U ₃ O ₈ per year on average)				
Average cash operating costs	\$4.33 (US\$3.3	33) per lb U ₃ O ₈			
Initial capital costs (100% basis)	\$322.5 million				
Operating margin ⁽⁴⁾	89.0% at US\$29/lb U_3O_8				
All-in cost ⁽²⁾	\$11.57 (US\$8.90) per lb U_3O_8				
Assumptions / Results	Base Case	High Case			
Uranium selling price	UxC Spot Price ⁽³⁾	US\$65/lb U ₃ O ₈			
Operating margin ⁽⁴⁾	91.4%	95.0%			
Pre-tax NPV _{8%} ⁽⁵⁾ (100%)	\$930.4 million	\$1.91 billion			
Pre-tax IRR ⁽⁵⁾	43.3%	71.5%			
Pre-tax payback period ⁽⁶⁾	~ 21 months	~ 11 months			

Source: Company Reports

Figure 6: Gryphon - conventional underground mining infrastructure.

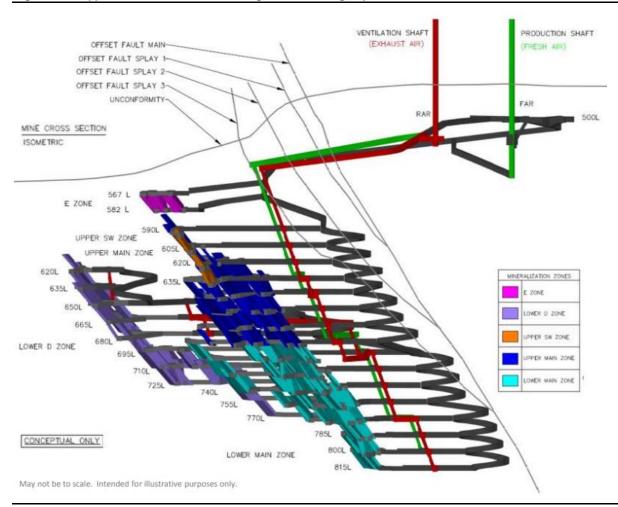


Figure 7: Gryphon - select financial and operational highlights.

Gryphon Operation	PFS Result ⁽¹⁾				
Mine life	6.5 years (7.6 million lbs U_3O_8 per year on average)				
Average cash operating costs	\$15.21 (US\$11.70) per lb U ₃ O ₈				
Initial capital costs (100% basis)	\$623.1 million				
Operating margin ⁽³⁾	77.0% at US\$50/lb U ₃ O ₈				
All-in cost ⁽²⁾	\$29.67 (US\$22.82) per lb U ₃ O ₈				
Assumptions / Results	Base Case	High Case			
Uranium selling price	US\$50/lb U ₃ O ₈	US\$65/lb U ₃ O ₈			
Operating margin ⁽³⁾	77.0%	82.3%			

Assumptions / ResultsBase CaseHigh CaseUranium selling priceUS\$50/lb U_3O_8 US\$65/lb U_3O_8 Operating margin(3)77.0%82.3%Pre-tax NPV $_{8\%}^{(4)}$ (100%)\$560.6 million\$998.8 millionPre-tax IRR(4)23.2%31.0%Pre-tax payback period(5)~ 37 months~ 31 months

Source: Company Reports

Figure 8: Wheeler River project reserves and post-tax financial results.

Reserves(1, 2, 3, 6, 7)

Deposit	Class.	Tonnes	Grade	Lbs U ₃ O ₈	Denison (63.3%)	Denison (90%)
Phoenix ⁽⁴⁾	Probable	141,000	19.1% U ₃ O ₈	59.7M	37.8M	53.7M
Gryphon ⁽⁵⁾	Probable	1,257,000	$1.8\%~{\rm U_3O_8}$	49.7M	31.5M	44.7M
Total	Probable	1,398,000	3.5%	109.4M	69.3M	98.4M

Indicative Denison post-tax results

Financial Results	Denison (63.3%)	Denison (90%)
Initial capital costs	\$204.1 million	\$290.3 million
Base case post-tax IRR ⁽⁸⁾	31.8%	32.7%
Base case post-tax NPV _{8%} ⁽⁸⁾	\$506.4 million	\$755.9 million
Base case post-tax payback period ⁽⁹⁾	~ 27 months	~ 26 months
High case post-tax IRR(8)	53.9%	55.7%
High case post-tax NPV _{8%} ⁽⁸⁾	\$1.01 billion	\$1.48 billion
High case post-tax payback period ⁽⁹⁾	~ 12 months	~12 months

Denison Mines Corp.					
Rating	BUY	C\$ Target	\$2.15	Shares O/S (MM)	559.1
		C\$ Close	\$0.75	Fully Diluted Shares (MM)	634.8
David A. Talbot, Director, Mining Resear	ch	12-month return	187%	Basic Mkt. Capitalization (\$MM)	C\$ 396.95
dtalbot@viiicapital.com				Enterprise Value (\$MM)	C\$ 361.15

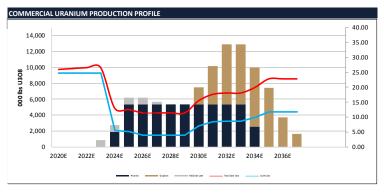
PRODUCTION ESTIMAT	TES (000 lbs)				
Year-end Dec.	2020E	2021E	2022E	2023E	2024E
McClean Lake	849	849	849	316	0
Phoenix	0	0	0	0	1,890
Gryphon	0	0	0	0	0
TOTAL	849	849	849	316	1.890

TOTAL CASH COST ESTIMATES (excl. non-cash) (US\$/lb)					
Year-end Dec.	2020E	2021E	2022E	2023E	2024E
McClean Lake	26.0	26.3	26.6	26.6	0.0
Phoenix	0.0	0.0	0.0	0.0	13.0
Gryphon	0.0	0.0	0.0	0.0	13.0
Wt. Avg. Total Cash Costs	26.0	26.3	26.6	26.6	13.0

		Tonnes	Grade	Cont U3O8 (MM lbs)	
	Ownership	MMt	% U3O8	100% Basis	DML Share
Proven and Probable Resen	ves				
McClean Lake	22.5%	-	0.38%	0.8	0.2
Phoenix	90.0%	0.14	19.10%	59.7	53.7
Gryphon	90.0%	1.26	1.8%	50	44.7
Total Reserves		1.40	3.54%	110.2	98.6
Measured and Indicated Re	sources				
Wheeler River	90%	0.17	19.13%	132.1	118.9
McClean Lake	23%	0.37	2.23%	18.0	4.1
Midwest	25%	1.01	2.28%	50.7	12.8
J Zone	65%	0.29	2.00%	12.8	8.4
Total Measured and Indicat	ed Resources	1.8	3.75%	213.6	144.1
Inferred Resources					
Wheeler River	90%	0.08	1.67%	3.0	2.7
McClean Lake	23%	0.51	0.68%	7.6	1.7
Midwest	25%	0.85	0.98%	9.6	2.4
Total Inferred Resources		1.4	0.91%	20.2	6.8
TOTAL RESOURCES		4.7	2.81%	233.8	150.9
Current Per Pound Metrics		DML	Developer Peers	Prem./Disc.	
EV/lb (US\$)		\$2.44	\$0.73	232%	
Mkt Cap/lb (US\$)		\$2.63	0.91	190%	

NET ASSET VALUE (C\$) (10% DCF)	NAV (\$ MM)	/Share	% NAV
Assets:			
McClean Lake (22.5%) & Toll Mill Fee	93.8	0.17	7%
Phoenix	392.6	0.71	28%
Gryphon	132.3	0.24	9%
Un-mined Resources & McClean Mill	345.0	0.62	24%
Balance Sheet & Other Items:			
Cash & Investments	2.3	0.00	0%
Debt	7.7	0.01	1%
Exploration, G&A, and Other	440.3	0.79	31%
Total	1,414	2.55	100%
Eight Capital DCF Target Multiple		0.90x/0.70x	
Share Price Target	C\$	2.15	

Long Term Uranium Price	ong Term Uranium Price Assumption (US\$/lb)					
Target (C\$/share)	40	50	60	70	80	
0% Discount	1.54	2.17	2.80	3.41	4.02	
5% Discount	1.33	1.71	2.07	2.43	2.79	
10% Discount	1.23	1.47	1.70	1.93	2.16	
15% Discount	1.18	1.35	1.51	1.66	1.81	



BALANCE SHEET (US\$ MM)				
Year-end December	2016A	2017A	2018E	Q2/18A
Assets:				
Cash & ST Investments	11.84	1.93	8.06	29.11
Other Current Assets	5.28	37.24	37.24	7.49
Current Assets	17.11	39.17	45.30	36.59
Mineral Properties	187.98	198.48	198.48	247.83
Other non-current Assets	12.33	21.45	21.45	24.27
Total Assets	217.42	259.10	265.23	308.69
Liabilities:				
Current Liabilities	7.84	11.00	10.40	9.30
Long-term Debt	0.00	0.00	16.02	0.00
Other non-current Liabilities	36.87	65.12	41.18	81.76
Total Liabilities	44.71	76.12	67.60	91.05
Capital Stock	1,194.94	1,151.93	1,167.93	1,310.47
Retained Earnings	(1022.23)	(967.98)	(970.30)	(1092.41)
Total Shareholder Equity	172.71	183.95	197.63	218.07

INCOME STATEMENT (US\$ MM	1			
Year-end December	2016A	2017A	2018E	Q2/18A
Total Revenue:	14.7	11.1	13.2	7.7
% Uranium	0%	0%	0%	0%
% Other	100%	100%	100%	100%
Operating Costs	5.6	10.6	0.0	7.5
G&A	4.4	5.9	4.5	3.7
Exploration	11.2	12.8	11.0	10.1
Depreciation	0.0	0.0	0.0	0.0
Other	9.0	(1.0)	0.0	(0.9)
EBITDA	(15.5)	(17.2)	(2.3)	(12.8)
EBIT	(15.5)	(17.2)	(2.3)	(12.8)
Interest Expense	(0.8)	0.9	0.0	(1.7)
EBT	(16.3)	(16.4)	(2.3)	(14.5)
Taxes	4.1	3.6	0.0	0.0
Equity Earnings	0.0	(0.5)	0.0	0.2
Other	(5.8)	(0.1)	0.0	0.0
Net Income (Reported)	(18.0)	(13.3)	(2.3)	(14.2)
Net Income (Adjusted)	(17.2)	(13.3)	(2.3)	(14.5)
EPS (Reported) \$/sh	(0.03)	(0.03)	0.00	(0.02)
EPS (Adjusted) \$/sh	(0.03)	(0.02)	(0.00)	(0.03)
Average Shares (MM)	526.7	555.3	579.9	559.2

Year-end December	2016A	2017A	2018E	Q2/18A
Net Income (Reported)	(18.0)	(13.3)	(2.3)	(14.2)
Depreciation	0.0	0.0	0.0	0.0
Working Capital Changes	1.1	(1.2)	0.0	0.0
Other	8.7	26.8	0.0	4.0
Operating Cash Flow	(8.1)	12.4	(2.3)	(10.3)
Operating Cash Flow/sh (\$/sh)	(0.02)	0.02	0.00	(0.02)
Capital Expenditures	(1.3)	(0.8)	0.0	0.0
Acquisitions	(0.5)	(29.9)	0.0	0.0
Other	7.6	(5.7)	(1.7)	35.7
Investing Cash Flow	5.8	(36.5)	(1.7)	35.7
Common Share Dividends	0.0	0.0	0.0	0.0
Equity financing	8.8	14.0	16.0	0.0
Debt Issue	0.0	0.0	0.0	0.0
Debt Repayment	0.0	(0.3)	(5.8)	0.0
Other	0.0	0.1	0.0	0.0
Financing Cash Flow	8.8	13.7	10.2	0.0
Net Change in Cash	6.8	(9.9)	6.1	25.5
Cash Balance	11.8	1.9	8.1	29.1
Free Cash Flow	(9.4)	11.5	(2.3)	(10.3)

VALUATION DATA					
Year-end December	2016A	2017A	2018E	Q2/18A	
P/E P/CF					
P/CF		37.50x	#DIV/0!		
EV/EBITDA					
FCF Yield		3.20%			

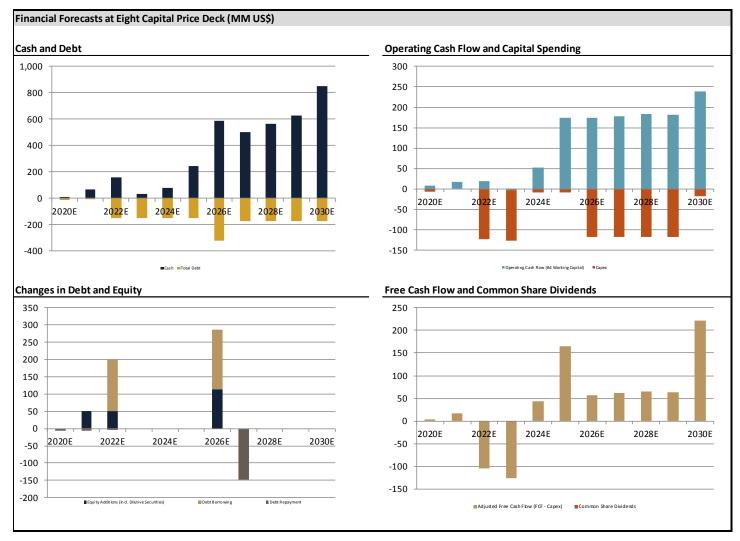
INPUT PRICES				
Year-end December	2016A	2017A	2018E	Q2/18A
Eight Capital Spot Uranium (US\$/I	26.4	23.2	29.0	29.0
Uranium Realized Price (US\$/lb)	0.0	0.0	0.0	0.0
Exchange (US\$/C\$)	0.76	0.77	0.77	0.80

Denison Mines Corp.

Net Asset Valuation at Eight Capital Price Deck (C\$)

Target Setting NAV			
Discount Rate (10%	(\$MM)	(\$/Share)	
	94	0.17	
	393	0.71	
	132	0.24	
	619	1.11	
	2	0.00	
	8	0.01	
	345	0.62	
10%	440	0.79	
	795	1.43	
	1,414	2.55	
		0.75	
		0.29x	
	Discount Rate (10%	Discount Rate (10% (\$MM) 94 393 132 619 2 8 345 10% 440 795	

NAV at Various Discount Rates					
(0%	5%		15%	
(\$MM)	(\$/Share)	(\$MM)	(\$/Share)	(\$MM)	(\$/Share)
138	0.25	112	0.20	80	0.14
1,282	2.31	703	1.27	221	0.40
891	1.60	359	0.65	36	0.06
2,312	4.16	1,175	0.20	337	0.14
2	0.00	2	0.00	2	0.00
8	0.01	8	0.01	8	0.01
345	0.62	345	0.62	345	0.62
977	1.76	654	1.18	298	0.54
1332	2.40	1009	1.82	653	1.18
3,644	6.56	2,184	2.02	990	1.32
	0.75		0.75		0.75
Laranananananananananananananananananana	0.11x	******	0.37x		0.57x



Source: Company Reports, FactSet, Eight Capital

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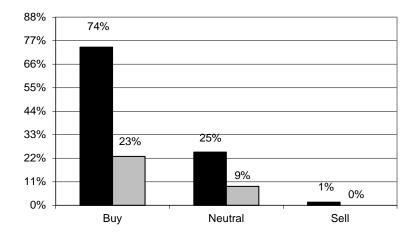
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