

Action Note

Equity Research

June 4, 2020

Metals & Minerals

Denison Mines Corp.

(DML-T) C\$0.54

Denison Delivers Independent "Proof of Concept" for ISR Method

Craig Hutchison, P. Eng

Joel Brown, P.Eng. (Associate)

Event

This morning, Denison announced that the hydrogeologic model for the Phoenix deposit produced an independent "proof of concept" for the application of the in-situ recovery (ISR) mining method at Phoenix.

Impact: POSITIVE

- **Independent "Proof of Concept"** - Petrotek Corporation, the company's independent hydrogeologic quality technical specialist, designed the 2019 field test and developed the hydrogeologic model used to demonstrate the "proof of concept" for uranium extraction by ISR. The hydrogeologic model was developed based on the data collected from last year's field work including site-specific data from 19 test wells. The hydrogeologic model allowed for the simulation of the ISR wellfield including a total of 18 extraction wells and 33 injection wells across Test Area 1 & 2 of Phoenix.
- The simulation work resulted in Petrotek concluding the program demonstrated a "proof of concept" for ISR extraction of uranium from the Phoenix ore body.
- **ISR de-risking work continues with 2020 field testing** — During the summer and fall months, the company plans to collect additional hydrogeological data at Phoenix designed to further evaluate and de-risk the application of ISR mining. The work will continue within the existing Test Areas 1 & 2 and include additional pump tests, groundwater sampling, permeability analysis, and rock mechanic tests.
- **Look to optimize the process** - In addition to further validating the ISR process, Denison is looking to complete optimization work. The ultimate goal of the optimization work is to determine whether such factors as the addition of wells, variations in well spacing, and use of mechanical permeability enhancers (MaxPERF) can result in a higher annual production rate than the 6Mlbs outlined in the company's September 2018 pre-feasibility study.

TD Investment Conclusion

We are increasing our target price to \$0.80 from \$0.65 and maintain our HOLD rating. Our revised target price reflects a higher NAV multiple of 0.80x (previously 0.70x) on the back of the company's de-risking milestones of the ISR recovery method. We also recently increased our near-term uranium price forecast to reflect accelerating inventory draw-downs.

Recommendation:	HOLD
Risk:	SPECULATIVE
12-Month Target Price:	C\$0.80↑ Prior: C\$0.65
12-Month Dividend (Est.):	C\$0.00
12-Month Total Return:	48.1%

Market Data (C\$)

Current Price	C\$0.54
52-Week Range	\$0.24 - \$0.72
Mkt Cap (f.d.) (\$mm)	\$342.1
EV (\$mm)	\$345.0
Current Dividend	\$0.00
Dividend Yield	0.0%
Avg. Daily Trading Vol.	1,236,010

Financial Data (C\$)

Fiscal Y-E	December
Shares O/S (f.d.)(mm)	633.6
Float Shares (mm)	624.9
Net Debt (\$mm)	\$(4.9)
Net Debt/Total Cap	0.0%
NAVPS	\$0.96
Working Cap (\$mm)	\$8.1

Estimates (C\$)

Year	2018A	2019A	2020E	2021E
EPS (f.d.)	(0.05)	(0.03)	(0.03)	(0.01)
CFPS (f.d.)	(0.04)	(0.04)	(0.02)	(0.02)

EPS (f.d.) Quarterly Estimates (C\$)

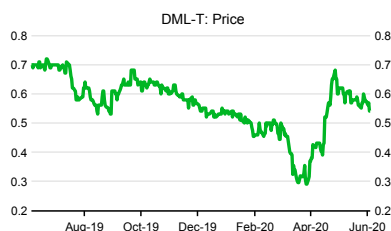
Year	2018A	2019A	2020E	2021E
Q1	(0.01)	(0.01)	(0.01)	-
Q2	(0.01)	(0.01)	(0.01)	-
Q3	(0.01)	(0.01)	(0.01)	-
Q4	(0.02)	0.00	(0.01)	-

Supplemental Data

Year	2018A	2019A	2020E	2021E
U3O8 (US\$/lb)	25	26	31	36

Note: Starting January 1, 2018, the company began reporting its financial results in CAD. 2017 financial results are presented in USD.

All figures in C\$, unless otherwise specified



Company Profile

Denison Mines Corp. has a diversified portfolio of uranium assets, including an interest in the McClean Lake milling operation; development projects; an environmental management division; and exploration properties located in Canada's Athabasca Basin.

Details

Hydrogeologic model highlights - The development of the Phoenix wellfield simulations used a 2-meter interval for overall in-situ conditions of the deposit and 5-spot well patterns placed across Test Area 1 & 2 using 10-meter spacings between wells that included 18 extraction wells and 33 injection wells.

Test Area 1 extraction wells were simulated at 5 gallons per minute (“GPM”) or less, and Test Area 2 extraction wells were simulated at 7.5 GPM or less, with total extraction for the simulation at 105.5 GPM and total injection of 105.4 GPM for a nearly balanced operational flow. There was large variability in travel times from injection well to extraction well, with the average flow path travel time estimated at 55 days. Over a 180-day simulation, 80% of the injected fluids were estimated to be captured during the simulation.

Outlook

The uranium price has increased ~35% year-to-date and now appears to be stabilizing in the mid-US\$30.00/lb range. The catalyst for the upward move is mine supply cuts, principally by Cameco and Kazatomprom. On a combined basis, the two producers have reduced mine supply by 15 million-20 million pounds for 2020, and we expect that lower production this year will have a knock-on effect into 2021, although the extent of the hit to 2021 production is unclear. We estimate that 2020 primary mine supply of uranium will be ~118 million lbs, with further downside possible depending on how long the Cigar Lake operation remains on care and maintenance (we are currently assuming all of Q2/20 and Q3/20). Based on our forecasts, global uranium mine supply this year will be at its lowest point since 2008.

Uranium market in deficit. We are projecting that the uranium market will record a supply deficit of ~28 million lbs in 2020 and sustained deficits over the next several years. In our view, these deficits will be of sufficient magnitude to materially draw down surplus inventories that have been over-hanging the market. Various estimates have placed surplus uranium inventory that is readily available to the market at between 60 million-80 million lbs. Our forecast deficits would cut the surplus by >50% by YE2021.

Exhibit 1. TD Securities Uranium Supply/Demand Model

	2012	2013	2014	2015	2016	2017	2018	2019	2020E	2021E	2022E	2023E	2024E
Mine Supply - Western World (mm lbs U3O8)													
Total Mine Supply - Western World	90	93	85	106	104	100	83	85	74	82	82	86	88
Net Eastern Mine Supply (lbs U3O8)	59	60	60	57	62	54	54	55	44	49	60	60	66
Total World Mine Supply (mmlb U3O8)	150	153	145	163	166	154	138	140	118	131	142	146	154
YoY % change	5.9%	2.4%	-5.3%	12.2%	2.1%	-7.6%	-10.2%	1.7%	-15.9%	10.9%	8.6%	2.6%	5.9%
Secondary Supply													
Global underfeeding and tails re-enrichment*	5	15	20	20	18	19	18	18	16	16	15	15	14
Mixed Oxide Fuel (MOX)*	10	8	8	4	5	5	5	6	6	6	6	6	7
US government sales (DOE Proposed)*	5	8	8	7	4	3	2	2	1	0	0	0	0
Additional Russian secondary supply*	24	24	5	2	2	0	0	0	0	0	0	0	0
Other			0	0	0	0	0	0	0	0	0	0	0
Total Secondary Supply (mmlb)	43	55	41	34	29	27	24	26	24	22	21	21	21
Secondary supply as % of global reactor demand	28%	32%	26%	21%	17%	16%	14%	15%	13%	12%	12%	12%	11%
Mobilization of Commercial Inventory													
Total Supply	193	208	190	205	202	187	169	173	149	160	170	174	183
Total World Demand													
Total World Nuclear Generating Capacity (MWe) *				345,377	351,271	358,819	368,571	372,978	374,420	384,508	385,211	389,242	394,906
Uranium requirements per MWe				464	474	472	472	472	472	472	472	472	472
Uranium demand (mmlb)				160	167	169	174	176	177	181	182	184	186
First Core Requirement (2 year lead)				-	-	-	-	-	-	-	-	-	-
Total World Demand (mmlbs U3O8)	155	170	155	160	167	169	174	176	177	181	182	184	186
YoY % change	0.0%	9.7%	-8.8%	3.4%	3.9%	1.7%	2.7%	1.2%	0.4%	2.7%	0.2%	1.0%	1.5%
Supply / Demand Balance (mmlb)	38	38	35	44	35	18	-5	-3	-28	-22	-11	-10	-4
Spot Uranium Price (US\$/lb U3O8)	\$48.73	\$38.57	\$33.60	\$36.89	\$26.57	\$22.12	\$24.82	\$25.94	\$31.19	\$36.00	\$37.50	\$40.00	\$40.00

* Source: World Nuclear Association - Nuclear Fuel Report 2019-2040 Reference Case

Note - TD LT price assumption starts in 2025; a flat US\$45/lb price is assumed for 2025 and beyond.

Source: UxC, Bloomberg, TD Securities

Action Note

Equity Research

June 4, 2020

Exhibit 2. Denison's 2020 Cash Flow Outlook

Business Segment	2020 Remaining ¹ Budget C\$000
Canada Mining Segment	
Mineral Sales	\$791
Development and Operations	(\$2,565)
Mineral Property Exploration & Evaluation	(\$6,224)
	(\$7,998)
DES Segment	
DES Environmental Services	\$714
	\$714
Corporate and Other Segment	
UPC Management Services	\$1,725
Corporate Administration & Other	(\$4,268)
	(\$2,543)
Total	(\$9,827)

¹ As of March 1st.

Source: Company, TD Securities Inc.

Exhibit 3. Wheeler River Assumptions

		Sep-2018 PFS	TDS
Ownership	%	90.0%	90%
Total Tonnes in the DCF	ktonnes	1,398	1,398
Total Resources Used in DCF, U3O8	mmlb	109.4	109.2
Life of Mine	years	14	13
Production Start-Up		2024	2025
Assumed LT Price, U3O8	US\$/lb	65.00	45.00
Assumed LT CAD/USD Exchange Rate		0.77	0.82
Average Head Grade	%	3.5%	3.5%
Average Recovery	%	100%	97%
Total U3O8 Production (100% basis)	mmlb	109.4	106.0
Annual Avg. Production (100% basis)	mmlb	7.8	8.2
Initial Capex (100% basis)	C\$ mm	323	350
Sustaining Capex & Closure Costs (100%)	C\$ mm	809	887
Total Capex (100% basis)	C\$ mm	1,132	1,237
Total Operating Costs (100% basis)	C\$ mm		1,294
Average Annual Operating Costs	US\$/lb		9.53
Average Annual Operating Costs	C\$/lb		11.62
Post Tax NPV-8% (90%)*	C\$ mm	755.9	523.4
NPV-10% (90%)	C\$ mm		388.3
NPV-11% (90%)	C\$ mm		340.7

* At fiscal 2021. TDS Discounted to 2020

Source: Company, TD Securities Inc.

Action Note

Equity Research

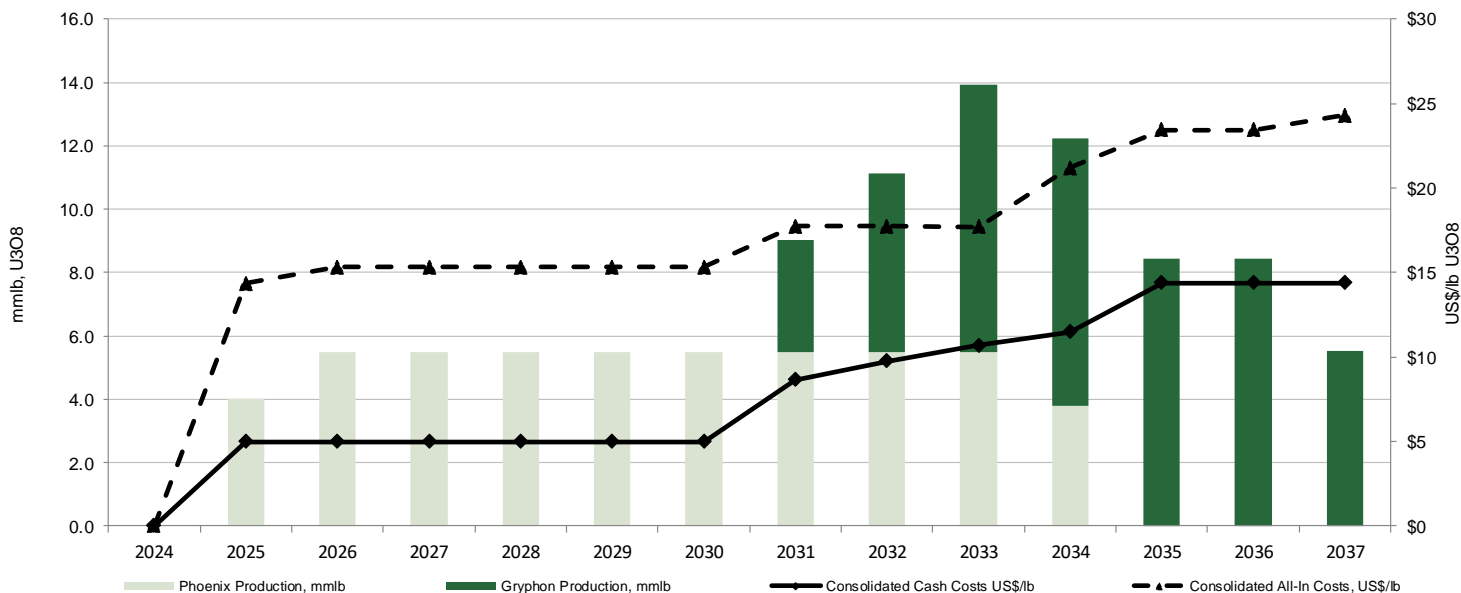
June 4, 2020

Exhibit 4. Wheeler River Project Schedule

Description	2019 - 2021	2022	2023	2024	2025	2026	2027	2028	2029	2030-2033	2034	2035	2036	2037	2038-2039	2040-2043
Environmental Assessment	█															
Phoenix Feasibility Study and Detail Engineering	█	█														
Gryphon Feasibility Study and Detail Engineering			█	█	█	█	█	█	█							
Phoenix Construction		█	█	█												
Phoenix ISR Production				█	█	█	█	█	█	█	█	█	█			
Phoenix Restoration												█	█	█	█	█
Gryphon Construction						█	█	█	█							
Gryphon Production									█	█	█	█	█	█		
Gryphon Restoration and Site Closure															█	█

Source: Company

Exhibit 5. Wheeler River Production and Cost Profile



Source: Company, TD Securities Inc.

Valuation

Denison is trading at 0.56x our 11%NAVPS estimate of \$0.96 (previously \$0.92) versus the base metal developers in our coverage universe at 0.64x. Our higher NAVPS estimate reflects the company's Q1/20 balance sheet and adjustments to the current share count.

Denison is currently trading at an EV/lb of US\$1.53 based on its total resources. This compares to its peer average currently trading at an EV/lb multiple of US\$1.80.

Action Note

Equity Research

June 4, 2020

Exhibit 6. Uranium Company Comparisons (EV/lb ratios)

	3-Jun-20	Corporate Resources ¹					EV/Res		
		Share	EV	2P	M+I	Global	EV/2P	EV/M&I	EV/All
Ticker	Price (C\$)	(US\$mm)	(Mlbs)	(Mlbs)	Resources	(Mlbs)	(US\$/lb)	(US\$/lb)	(US\$/lb)
Cameco Corp.	CCO	14.35	4,041.4	461.2	885.2	1,059.9	8.76	4.57	3.81
Denison Mines Corp.	DML	0.54	240.7	98.6	144.2	156.9	2.44	1.67	1.53
Fission Uranium Corp.	FCU	0.33	115.4	-	87.8	140.6	n/a	1.31	0.82
NexGen Energy Ltd.	NXE	1.88	594.9	234.1	256.6	348.3	2.54	2.32	1.71
UEX Corp.	UEX	0.15	42.4	-	69.8	86.4	n/a	0.61	0.49
Uranium Energy Corp.	UEC	1.35	193.4	-	58.4	103.9	n/a	3.31	1.86
Ur-Energy Corp.	URE	0.77	98.6	-	32.9	41.2	n/a	3.00	2.40
Median							2.54	2.32	1.71
Average							4.58	2.40	1.80

1: Resources are shown inclusive of reserves; M&I+I includes historical resource estimates.

Source: Company, CapIQ, TD Securities Inc.

Justification of Target Price

Our \$0.80 target price (\$0.65 previously) is based on 0.80x our 11%NAVPS estimate (0.70x previously) weighted 100% using a 0.73 Canadian dollar/U.S. dollar exchange ratio. Our revised target price reflects a higher NAV multiple on the back of the company's de-risking milestones of the ISR recovery method.

Key Risks to Target Price

Relative to the other companies in our equity coverage universe, we believe that an investment in Denison Mines is subject to a SPECULATIVE level of risk. Our recommendation is subject to forecast, financial, technical, political, and deposit-size risks. These include risks related to uranium prices; fuel cost; the governing fiscal and legislative regimes in the countries it operates in; the timing of key developments; market conditions; capital and operating costs; foreign exchange rates; resources; access to capital; operating parameters; permitting; environment; indigenous people; and staffing and key personnel retention. Denison's assets could be negatively affected by the ongoing restrictions to travel, social-distancing measures, and other challenges related to the COVID-19 pandemic.

Action Note

Equity Research

June 4, 2020

Exhibit 7. Company Snapshot

Financial Data	2018A*	2019A	2020E	2021E
Average share price (C\$)	0.67	0.59	0.42	0.56
Wt. Avg. S/O (mm)	562.9	592.6	600.5	604.9
EPS (f.d.) (C\$/sh)	(0.05)	(0.03)	(0.03)	(0.01)
CFPS bf WC (C\$/sh)	(0.04)	(0.04)	(0.02)	(0.02)

Income Statement (C\$mm)	2018A*	2019A	2020E	2021E
Revenues	15.6	15.5	15.3	16.1
Operating Costs	15.9	14.4	12.8	12.1
Royalty	0.0	0.0	0.0	0.0
Depreciation	3.7	3.7	4.8	4.0
Exploration	15.5	15.2	7.7	9.0
Reclamation	0.0	0.0	0.0	0.0
G & A	5.4	2.6	3.1	3.1
Interest Expense	3.7	4.1	1.1	0.0
Realized Hedge Gain (loss)	0.0	0.0	0.0	0.0
UnRealized Hedge Gain (loss)	0.0	0.0	0.0	0.0
Other	(13.5)	1.0	(3.7)	0.0
EBITDA	(29.8)	(10.7)	(10.6)	(8.0)
EBIT	(33.5)	(14.4)	(15.4)	(12.0)
EBT	(37.2)	(18.5)	(16.4)	(12.0)
Taxes (recovery)	(8.3)	(5.4)	(1.6)	(3.6)
Effective tax rate	na	na	na	na
Minority interest	-	-	-	-
Reported net earnings	(33.8)	(18.1)	(16.1)	(8.4)
Adjusted net earnings	(27.7)	(18.1)	(16.1)	(8.4)
EPS Reported (C\$/sh.)	(0.06)	(0.03)	(0.03)	(0.01)
EPS (Adjusted) (C\$/sh.)	(0.05)	(0.03)	(0.03)	(0.01)

Revenues By Metal (C\$mm)	2018A*	2019A	2020E	2021E
Uranium/Tolling	4.2	4.2	4.2	5.8
Vanadium	0.0	0.0	0.0	0.0

Cash Flow Statement (C\$mm)	2018A*	2019A	2020E	2021E
Operating CF bf. ch. in WC	(21.3)	(21.1)	(12.7)	(10.3)
CF from operating activities	(21.0)	(18.8)	(11.2)	(10.3)
CF from financing activities	4.5	4.7	12.2	0.0
CF from investing activities	36.0	(0.9)	(0.6)	0.0
CAPEX	(1.6)	(0.9)	(0.0)	0.0
CFPS bf. ch. in WC (C\$/sh)	(0.04)	(0.04)	(0.02)	(0.02)

Balance Sheet (C\$mm)	2018A*	2019A	2020E	2021E
Cash	23.2	8.2	8.6	(1.7)
Current assets	31.7	16.5	24.9	14.6
Total assets	312.2	300.0	292.1	277.8
Current liabilities	12.5	14.9	13.1	13.1
Long term debt	0.0	0.0	0.0	0.0
Total liabilities	89.9	89.8	85.1	79.3
Non Controlling Interest	0.0	0.0	0.0	0.0
Working Capital	19.2	1.6	11.7	1.5
Shareholders' equity	222.2	210.1	206.9	198.5

*Historic financial results (prior to January 1, 2018) are presented in U.S. dollars.



Realized Metal Prices & Costs	2018A*	2019A	2020E	2021E
Uranium, U3O8 (US\$/lb)	24.86	25.94	31.19	36.00
Forex CAD to USD	0.77	0.75	0.72	0.73

Production and Sales	2018A*	2019A	2020E	2021E
Total U3O8 Production (000' lbs)	0	0	0	0

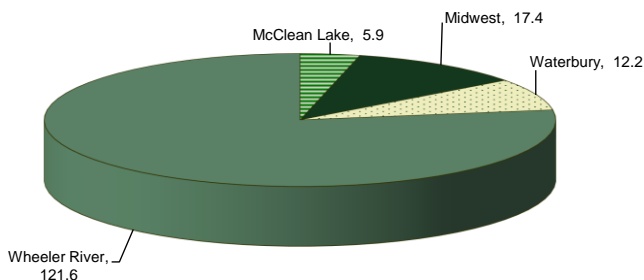
NAV Analysis	10% Discount		11% Discount	
	US\$mm	US\$/sh	US\$mm	US\$/sh
Mining Assets				
McClellan Mill Complex (22.5%)	68.5	0.11	68.5	0.11
Athabasca Basin Resources (22.5% to 60%)	173.8	0.27	173.8	0.27
Phoenix (90%)	381.0	0.60	340.7	0.54
Gryphon (90%)	7.3	0.01	0.0	0.00
Hook-Carter Property	4.1	0.01	4.1	0.01
Total Project NAV	634.7	1.00	587.1	0.93
Other Tangible Assets				
Investment - GoviEx	8.6	0.01	8.6	0.01
Skyharbour Resources	1.0	0.00	1.0	0.00
Corporate Adjustments				
Working Capital	8.1	0.01	8.1	0.01
Long Term Debt	0.0	-	0.0	-
In the Money Options/Warrants	0.0	-	0.0	-
Estimated Working Capital Additions	4.8	0.01	4.8	0.01
Estimated Debt Additions	0.0	-	0.0	-
Total Net Asset Value US\$/sh.	479.7	0.76	445.0	0.70
Total Net Asset Value C\$/sh.		1.04		0.96

Asset	Tonnes	Grade	Interest	Contained
	kt	%	%	mmb
McClellan Lake - Athabasca Basin	977	1.24	22.5	6
Midwest Deposit -Athabasca Basin	1865	1.68	25.17	17
Wheeler River - Athabasca	1891	3.24	90.0	122
Waterbury - Athabasca	291	1.50	65.9	12
Total Resources (all categories, M+I+I)	5,025	2.17		157

US\$ EV/lb Athabasca Basin and categories (M+I+I) **\$1.53**

Resources

Resources by Asset (mm lb U3O8)



Source: Company, TD Securities Inc.



Action Note

Equity Research

June 4, 2020

TD Securities Equity Research Disclosures

Company	Ticker	Disclosures
Denison Mines Corp.	DML-T	1, 2, 4

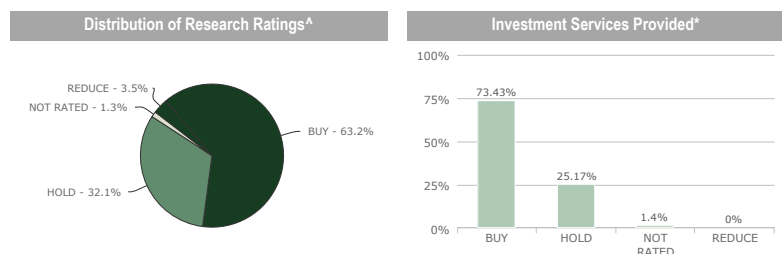
1. TD Securities Inc., TD Securities (USA) LLC or an affiliated company has managed or co-managed a public offering of securities within the last 12 months with respect to the subject company.
2. TD Securities Inc., TD Securities (USA) LLC or an affiliated company has received compensation for investment banking services within the last 12 months with respect to the subject company.
3. TD Securities Inc., TD Securities (USA) LLC or an affiliated company expects to receive compensation for investment banking services within the next three months with respect to the subject company.
4. TD Securities Inc. or TD Securities (USA) LLC has provided investment banking services within the last 12 months with respect to the subject company.
5. A long position in the securities of the subject company is held by the research analyst, by a member of the research analyst's household, or in an account over which the research analyst has discretion or control.
6. A short position in the securities of the subject company is held by the research analyst, by a member of the research analyst's household, or in an account over which the research analyst has discretion or control.
7. A long position in the derivative securities of the subject company is held by the research analyst, by a member of the research analyst's household, or in an account over which the research analyst has discretion or control.
8. A short position in the derivative securities of the subject company is held by the research analyst, by a member of the research analyst's household, or in an account over which the research analyst has discretion or control.
9. TD Securities Inc. and/or an affiliated company is a market maker, or is associated with the specialist that makes a market, in the securities of the subject company.
10. TD Securities Inc. and/or affiliated companies own 1% or more of the equity securities of the subject company.
11. A partner, director or officer of TD Securities Inc. or TD Securities (USA) LLC, or a research analyst involved in the preparation of this report has, during the preceding 12 months, provided services to the subject company for remuneration.
12. This security has Subordinate voting shares.
13. This security has Restricted voting shares.
14. This security has Non-voting shares.
15. This security has Variable voting shares.
16. This security has Limited voting shares.

Additional Important Disclosures

We visited Denison Mine's Wheeler River mine in northern Saskatchewan on August 27, 2019. The Wheeler River mine accounts for 75% of our NAV estimate. The company provided local transportation and meals during this site visit.

Price Graphs

Full disclosures for all companies covered by TD Securities can be viewed at <https://www.tdsresearch.com/equities/welcome.important.disclosure.action> by TD Securities' institutional equity clients.



Current as of: June 4, 2020

[^] Percentage of subject companies under each rating category: BUY (covering ACTION LIST BUY, BUY and SPECULATIVE BUY ratings), HOLD, and REDUCE (covering TENDER and REDUCE ratings) and NOT RATED (covering UNDER REVIEW, SUSPENDED, and NOT RATED).

^{*} Percentage of subject companies within each of the four categories (BUY, HOLD, REDUCE, and NOT RATED) for which TD Securities Inc. has provided investment banking services within the last 12 months.

Definition of Research Ratings

ACTION LIST BUY: The stock's total return is expected to exceed a minimum of 15% (with higher thresholds for less liquid, more risky securities) over the next 12 months and it is a top pick in the Analyst's sector.

Action Note

Equity Research

June 4, 2020

BUY: The stock's total return is expected to exceed a minimum of 10% (with higher thresholds for less liquid, more risky securities) over the next 12 months.

SPECULATIVE BUY: The stock's total return is expected to exceed a minimum of 30% over the next 12 months (with higher thresholds for less liquid securities); however, there is material event risk associated with the investment that could result in a significant loss.

HOLD: The stock's total return is expected to be between 0% and 10%, (with higher thresholds for less liquid, more risky securities) over the next 12 months.

TENDER: Investors are advised to tender their shares to a specific offer for the company's securities or to support a proposed combination reflecting our view that a superior offer is not forthcoming.

REDUCE: The stock's total return is expected to be negative over the next 12 months.

SUSPENDED: Due to evolving circumstances, we can no longer generate what we consider a defensible target price and rating at the current time.

UNDER REVIEW: Our rating is under review pending additional information and/or analysis. The prior rating should not be relied on.

NOT RATED: We do not currently produce a recommendation and a target price on this security.

Risk ratings are relative to other companies in the TD Securities Equity Research coverage universe. In order of increasing risk, our risk ratings are LOW, MEDIUM, HIGH, and SPECULATIVE. These risk ratings are not meant to be compared to ratings on other securities and asset classes outside our Equity Research coverage universe.

Overall Risk Rating in order of increasing risk: Low (6.6% of coverage universe), Medium (38.5%), High (46.4%), Speculative (8.5%)

Research Dissemination Policy

TD Securities makes its research products available in electronic and/or printed formats. If there are any subsequent material changes to the reports it publishes, TD Securities will as soon as practicable distribute such reports with the relevant changes to its institutional clients who are entitled to receive them. Entitled institutional clients may also receive our research via third-party platforms including, but not limited to, Bloomberg, FactSet, Refinitiv, and S&P Capital IQ. All research is available by password to entitled institutional clients at <https://www.tdsresearch.com/equities>. TD Securities may also update proprietary models; these models may be obtained by entitled institutional clients by contacting the research analyst directly. There is no planned frequency of updates to these models.

Analyst Certification

Each analyst of TD Securities Inc. whose name appears on page 1 of this research report hereby certifies that (i) the recommendations and opinions expressed in the research report accurately reflect the research analyst's personal views about any and all of the securities or issuers discussed herein that are within the analyst's coverage universe and (ii) no part of the research analyst's compensation was, is, or will be, directly or indirectly, related to the provision of specific recommendations or views expressed by the research analyst in the research report.

Disclaimer

This material is for general informational purposes only and is not investment advice nor does it constitute an offer, recommendation or solicitation to buy or sell a particular financial instrument. It does not have regard to the specific investment objectives, financial situation, risk profile or the particular needs of any specific person who may receive this material. No representation is made that the information contained herein is accurate in all material respects, complete or up to date, nor that it has been independently verified by TD Securities. Recipients of this analysis or report are to contact the representative in their local jurisdiction with regards to any matters or questions arising from, or in connection with, the analysis or report.

Historic information regarding performance is not indicative of future results and investors should understand that statements regarding future prospects may not be realized. All investments entail risk, including potential loss of principal invested. Performance analysis is based on certain assumptions, the results of which may vary significantly depending on the modelling inputs assumed. This material, including all opinions, estimates and other information, constitute TD Securities' judgment as of the date hereof and is subject to change without notice. The price, value of and income from any of the securities mentioned in this material can fall as well as rise. Any market valuations contained herein are indicative values as of the time and date indicated. Such market valuations are believed to be reliable, but TD Securities does not warrant their completeness or accuracy. Different prices and/or valuations may be available elsewhere and TD Securities suggests that valuations from other sources be obtained for comparison purposes. Any price or valuation constitutes TD Securities' judgment and is subject to change without notice. Actual quotations could differ subject to market conditions and other factors.

TD Securities disclaims any and all liability relating to the information herein, including without limitation any express or implied representations or warranties for, statements contained in, and omissions from, the information. TD Securities is not liable for any errors or omissions in such information or for any loss or damage suffered, directly or indirectly, from the use of this information. TD Securities may have effected or may effect transactions for its own account in the securities described herein. No proposed customer or counterparty relationship is intended or implied between TD Securities and a recipient of this document.

TD Securities makes no representation as to any tax, accounting, legal or regulatory issues. Investors should seek their own legal, financial and tax advice regarding the appropriateness of investing in any securities or pursuing any strategies discussed herein. Investors should also carefully consider any risks involved. Any transaction entered into is in reliance only upon the investor's judgment as to financial, suitability and risk criteria. TD Securities does not hold itself out to be an advisor in these circumstances, nor do any of its representatives have the authority to do so.

The information contained herein is not intended for distribution to, or use by, any person in any jurisdiction where such distribution or use would be contrary to applicable law or regulation or which would subject TD Securities to additional licensing or registration requirements. It may not be copied, reproduced, posted, transmitted or redistributed in any form without the prior written consent of TD Securities.

If you would like to unsubscribe from our email distribution lists at any time, please contact your TD Securities Sales Contact. If you are located in Europe, Asia, Australia or New Zealand you may also unsubscribe by emailing us at Privacy.EAP@tdsecurities.com.

You can access our Privacy Policy here (http://www.tdsecurities.com/tds/content/AU_PrivacyPage).

Australia: If you receive this document and you are domiciled in Australia, please note that this report is intended to be issued for general information purposes only and distributed through the Toronto Dominion Australia Limited ("TDAL"). TDAL does not hold itself out to be providing financial advice in these circumstances. TD Securities is a trademark and represents certain investment dealing and advisory activities of Toronto-Dominion Bank and its subsidiaries, including TDAL. The Toronto-Dominion Bank is not an authorized deposit-taking or financial services institution in Australia. TDAL is a holder of an Australian Financial Services License (404698) and is regulated by the Australian Securities and Investments Commission.

Action Note

Equity Research

June 4, 2020

Canada: Canadian clients wishing to effect transactions in any security discussed herein should do so through a qualified salesperson of TD Securities or TD Securities Inc. TD Securities Inc. is a member of the Canadian Investor Protection Fund.

China, India and South Korea: Insofar as the document is received by any persons in the People's Republic of China ("PRC"), India and South Korea, it is intended only to be issued to persons who have the relevant qualifications to engage in the investment activity mentioned in this document. The recipient is responsible for obtaining all relevant government regulatory approvals/licenses themselves, and represents and warrants to TD Bank that the recipient's investments in those securities do not violate any law or regulation, including, but not limited to, any relevant foreign exchange regulations and/or overseas investment regulations. The Toronto-Dominion Bank has a representative office in Shanghai, Mumbai and Seoul which should be contacted for any general enquiry related to The Toronto-Dominion Bank or its business. However, neither any of the Toronto-Dominion Bank offshore branches/subsidiaries nor its representative offices are permitted to conduct business within the borders of the PRC, India and South Korea. In locations in Asia where the Bank does not hold licenses to conduct business in financial services, it is not our intention to, and the information contained in this document should not be construed as, conducting any regulated financial activity, including dealing in, or the provision of advice in relation to, any regulated instrument or product. This publication is for general information only, without addressing any particular needs of any individual or entity, and should not be relied upon without obtaining specific advice in the context of specific circumstances.

Hong Kong SAR (China): This document, which is intended to be issued in Hong Kong SAR (China) ("Hong Kong") only to Professional Investors within the meaning of the Securities and Futures Ordinance (the "SFO") and the Securities and Futures (Professional Investor) Rules made under the SFO, has been distributed through Toronto-Dominion Bank, Hong Kong Branch, which is regulated by the Hong Kong Monetary Authority.

Japan: For Japanese residents, please note that if you have received this document from Toronto-Dominion Bank entities based outside Japan, it is being provided to qualified financial institutions ("QFI") only under a relevant exemption to the Financial Instruments and Exchange Act.

If you have received this document from TD Securities (Japan) Co., Ltd., it is being provided only to institutional investors. TD Securities (Japan) Co., Ltd. is regulated by the Financial Services Agency of Japan and is distributing this document in Japan as a Type 1 Financial Instruments Business Operator registered with the Kanto Local Finance Bureau under registration number, Kinsho 2992, and a member of Japan Securities Dealers Association.

New Zealand: The Toronto-Dominion Bank is not a "registered bank" in New Zealand under the Reserve Bank Act 1989.

Singapore: This report is distributed in Singapore by The Toronto-Dominion Bank, Singapore Branch, and recipients in Singapore of this report are to contact The Toronto-Dominion Bank, Singapore Branch in respect of any matters arising from, or in connection with, this report. The Toronto-Dominion Bank, Singapore Branch is regulated by the Monetary Authority of Singapore. Where this report is issued or promulgated in Singapore, it is only intended for distribution to a person who is an accredited investor, expert investor or institutional investor as defined in the Securities and Futures Act (Cap. 289), or the Securities and Futures (Prescribed Specific Classes of Investors) Regulations 2005, or the Securities and Futures (Classes of Investors) Regulations 2018 issued by the Monetary Authority of Singapore.

United Kingdom and Europe: This document is prepared, issued or approved for issuance in the UK and Europe by TD Securities Limited in respect of investment business as agent and introducer for TD Bank. The Toronto-Dominion Bank is authorised by the Prudential Regulation Authority and subject to regulation by the Financial Conduct Authority and limited regulation by the Prudential Regulation Authority. TD Securities Limited is authorised and regulated by the Financial Conduct Authority. Insofar as the document is issued in or to the United Kingdom or Europe, it is intended only to be issued to persons who (i) are persons falling within Article 19(5) ("Investment professional") of the Financial Services and Markets Act 2000 (Financial Promotion) Order 2005 (as amended, the "Financial Promotion Order"), (ii) are persons falling within Article 49(2)(a) to (d) ("High net worth companies, unincorporated associations, etc.") of the Financial Promotion Order, or (iii) are persons to whom an invitation or inducement to engage in investment activity (within the meaning of section 21 of the Financial Services and Markets Act 2000) in connection with the issue or sale of any securities may otherwise lawfully be communicated or caused to be communicated. European clients wishing to effect transactions in any security discussed herein should do so through a qualified salesperson of TD Securities Limited. Insofar as the information in this report is issued in the U.K. and Europe, it has been issued with the prior approval of TD Securities Limited.

United States: U.S. clients wishing to effect transactions in any security discussed herein must do so through a registered representative of TD Securities (USA) LLC.

TD Securities is a trademark of TD Bank and represents TD Securities Inc., TD Securities (USA) LLC and TD Securities Limited and certain investment and corporate banking activities of TD Bank and its subsidiaries.

© Copyright 2020 The Toronto-Dominion Bank. All rights reserved.

Full disclosures for all companies covered by TD Securities can be viewed at <https://www.tdsresearch.com/equities/welcome.important.disclosure.action>