SPECTRA7

Spectra7 Microsystems Inc.

Management's Discussion & Analysis

For the Three and Six Months Ended June 30, 2020

August 28, 2020

This management's discussion and analysis ("MD&A") of financial condition and results of operations of Spectra7 Microsystems Inc. ("Spectra7" or the "Company") was prepared by management as at June 30, 2020. Throughout this MD&A, unless otherwise specified, "Spectra7", "the Company", "we", "us" or "our" refer to Spectra7 Microsystems Inc. and its subsidiaries. This MD&A should be read in conjunction with the audited consolidated financial statements of the Company and notes thereto as at December 31, 2019 (the "Annual Financial Statements") and the unaudited condensed interim consolidated financial statements for the six months ended June 30, 2020 and 2019 (the "Interim Financial Statements" and, together with the Annual Financial Statements, the "Statements"). In preparing this MD&A, we have taken into account information available to us up to August 28, 2020 unless otherwise stated.

The Interim Financial Statements have been prepared by management in accordance with International Financial Reporting Standards ("IFRS") issued by the International Accounting Standards Board ("IASB") and interpretations of the International Financial Reporting Interpretations Committee. All amounts are expressed in U.S. dollars unless otherwise noted. Other information contained in this document has also been prepared by management and is consistent with information included in the Interim Financial Statements. You will find the Financial Statements on SEDAR at www.sedar.com.

This MD&A contains commentary from the Company's management regarding the Company's strategy, operating results, financial position and outlook. Management is responsible for the accuracy, integrity, and objectivity of the MD&A, and develops, maintains and supports the necessary systems and controls to provide reasonable assurance as to the accuracy of the comments contained herein.

The Audit Committee and the Board of Directors provide an oversight role with respect to all public financial disclosures by the Company. The Board of Directors approves the Interim Financial Statements and MD&A after the completion of its review and recommendation for approval by the Audit Committee, which meets periodically to review all financial reports, prior to filing.

CAUTIONARY STATEMENT REGARDING FORWARD-LOOKING STATEMENTS

This MD&A contains certain forward-looking information and statements relating, but not limited to, the Company's future financial position and results of operations, strategies, plans, objectives, goals, targets, and future developments in the markets where the Company participates or is seeking to participate. Forward-looking information typically contains statements with words such as "consider", "anticipate", "believe", "expect", "plan", "intend", "may", "likely", or similar words suggesting future outcomes or statements regarding an outlook, or other expectations, beliefs, plans, objectives, assumptions, intentions or statements about future events or performance. Readers should be aware that these statements are subject to known and unknown risks, uncertainties and other factors that could cause actual results, performance or achievements of the Company to differ materially from those suggested by the forward- looking information and statements, some of which may be beyond the control of management.

Although the Company believes that the expectations, estimates, and projections reflected in such forward-looking information and statements are reasonable, such forward-looking information and statements involve known and unknown risks, uncertainties and other factors which may cause actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by the forward-looking information and statements. On this basis, readers are cautioned not to place undue reliance on such forward looking information and statements.

Factors which could cause actual results to differ materially from current expectations include, but are not limited to:

- the adverse impact of COVID-19 on our staffing, revenue, operations, manufacturing supply chain, project development and customer demand;

- the degree of competition in the business areas in which we operate;
- our ability to secure orders from a limited number of customers;
- our ability to make the substantial research and development investments required to remain competitive;
- our ability to charge prices that will result in favorable gross margins;
- our ability to introduce new or enhanced products on a timely basis;
- market demand and penetration of new markets for our products and services;
- our reliance on a limited number of third party manufacturers;
- the absence of long-term supply contracts with any of the Company's third-party vendors and potential disruption in supply of products or materials;
- our ability to contain and appropriately budget expenses, due to our limited operating history;
- the length of the sales cycle required to establish design wins and bring design wins to production;
- reliance on distributors;
- our ability to deliver our products in the correct product mix required by our customers and ability to control order and shipment uncertainties;
- the substantial quarterly and annual fluctuations in our operating results;
- our dependence on existing members of the senior management team;
- our ability to attract and retain qualified employees and contain payroll costs;
- unforeseen delays, expenses and damage to reputation caused by defects or bugs;
- potential claims of intellectual property infringement;
- our ability to protect our intellectual and intangible properties;
- the use of open source software;
- reliance on third parties to provide services and technology;
- going concern risk;
- impact of negative cash flow from operating activities;
- potential losses to our facilities or distribution system due to catastrophes;
- compliance with various governmental regulations and related costs of compliance;
- cyclicality in the semiconductor industry;
- conformity of the Company's products to industry standards;
- unanticipated changes in our tax rates;
- fluctuation of share price;
- decline in share price due to the absence of, or negative reports, about the business by securities or industry analysts;
- adverse international economic conditions adversely affect consumer spending;
- general political and economic conditions in the countries in which we operate;
- strain on our resources as a result of the requirements of being a public company;
- litigation risk;
- market price volatility and potential impact on share price;
- our potential need for additional financings in order to meet future capital requirements for our operations;
- our potential to breach certain covenants, representations and warranties in our loan arrangements;
- our ability to declare dividends;
- our ability to meet significant research and development milestones; and
- our ability to enter into agreements with CRX Consortium (as defined in the Company's most recent Annual Information Form) members or the adoption of interconnects that use the Company's active copper cable technology.

We caution that this list is not exhaustive of all possible factors. For a detailed description of risk factors associated with the Company, refer to the "Risk Factors" section of the Company's Annual Information Form filed on SEDAR on April 30, 2020 which is available on SEDAR at www.sedar.com.

The forward-looking information and statements in this MD&A are, unless otherwise indicated, stated as of the date hereof and are presented for the purpose of assisting investors and others in understanding our financial position and results of operations as well as our objectives and strategic priorities, and may not be appropriate for other purposes. The Company does not undertake any obligation to update publicly or to revise any forward-looking information and statements, whether as a result of new information, future events or otherwise, except as required by law.

OVERVIEW OF THE COMPANY

Background

The Company is a high performance analog semiconductor company targeting large, high growth markets in virtual reality ("VR"), augmented reality ("AR"), data centers, and consumer connectivity. The Company was incorporated on October 12, 2010 as a capital pool company named "Chrysalis Capital VIII Corporation" ("Chrysalis") pursuant to the filing of articles of incorporation under the *"Canada Business Corporations Act"*. The articles of incorporation of the Company were amended by the filing of articles of amendment dated April 19, 2011 to remove certain provisions. On February 5, 2013, the Company's articles were amended to consolidate its common shares by a ratio of 3.86364:1 and to change its name to "Spectra7 Microsystems Inc.".

On February 5, 2013, the Company, then named Chrysalis Capital VIII Corporation, completed a reverse takeover transaction whereby Chrysalis acquired all of the issued and outstanding shares of Spectra7 Microsystems Corp. (formerly Fresco Microchip Inc.) ("Fresco"), a company incorporated in Ontario, and Spectra7 Microsystems (Ireland) Limited (formerly RedMere Technology Limited) ("RedMere"), a company incorporated in Ireland. As a result of such transaction, which constituted the Company's qualifying transaction under the policies of the TSX Venture Exchange (the "TSXV"), the former shareholders of Fresco acquired control of the Company (the "Qualifying Transaction"). From February 19, 2013 until July 22, 2015, the common shares of the Company were listed for trading on the TSXV under the symbol "SEV". From July 23, 2015 to May 21, 2020, the common shares were listed for trading on the Toronto Stock Exchange (the "TSX") under the symbol "SEV". As of May 22, 2020, the common shares were again listed for trading on the TSXV under the symbol "SEV".

The registered office of the Company is located at 181 Bay Street, Suite 1800, Toronto, Ontario Canada, M5J 2T9 and its head office is in San Jose, California. The Company also has a design center in Cork, Ireland and a sales office in Dongguan, China. The Company is currently a reporting issuer in each of the provinces of Canada, excluding Québec.

Products

The Company's family of products features a patented signal processing technology used in the design of "active" cables and specialty interconnects which enable longer, thinner and lighter interconnects for VR, AR, in data centers, and for consumer connectivity products. The Company holds approximately 55 patents relating to its products.

Virtual Reality (VR)

The Company's next-generation VR products include the VR7050 which the Company believes to be the industry's first chip capable of enabling lightweight, ultra-thin active interconnects for gesture recognition and motion control backhaul. When used in conjunction with Spectra7's VR7100 high speed video chip, the chipset delivers ultra-high bandwidth data, video, audio and power in a unified, ultra-light, super-thin wearable interconnect while achieving the low latency for a truly immersive VR experience.

Augmented Reality (AR)

The Company has also developed AR products that provide similar benefit to the VR Products on thinner, shorter 'wearable' interconnects.

AR-Connect™ is an AR interconnect product line that is powered by the Company's patented wearable network signal processing technology. The Company believes its patented AR-Connect™ is the industry's first integrated cable, connector and embedded chipset product line for AR vision systems and wearable computing devices. AR-Connect™ enables AR glasses to connect to a smart phone, proprietary processing device or a desktop GPU/laptop processing unit, with a single unified and ultra-thin link.

DreamWeVR™

DreamWeVR™ is an extensive product line targeted at next generation 4K Ultra-HD and 5K resolution VR and AR platforms for gaming, health care, architecture and business telepresence applications. The product line includes four new chips (VR8181, VR8050, VR8200 and VR8300) featuring SpectraLinear™ technology, new VR-specific connectors and three new head-mounted display ("HMD") interconnect configurations to support high-bandwidth (up to 50Gbps), near-zero latency VR HMDs and AR glasses with reduced weight and complexity.

Data Centers

GaugeChanger™ is an innovative and disruptive silicon technology that allows copper to extend much longer lengths without the cost and power penalty of optics that are used in data centers today. It works equally well at 25 Gbps NRZ and 50 Gbps PAM-4 enabling new connector standards of 100, 200 and 400 Gbps.

At present, optics are the primary alternative for data centers seeking high speed, at lengths longer than a few meters. GaugeChanger™, however, extends the life of copper with interconnects that are as fast and as thin as fiber, but at dramatically lower cost and power consumption.

USB 3.2 consumer interconnects

The Company's active VR8050 and VR8051 chips are the industry's first for ultra-thin implementations of USB 3.2 consumer interconnects, reducing the conductor cross section by up to 90% compared to passive cable implementations. Applications for this interconnect implemented with the new Type-C connector include ultra-thin laptops, tablets, mobile devices, solid state disks and wearable computing devices. The resulting ultra-thin cable enabled by this new Spectra7 technology allows the cable to transfer data at supercomputer speeds (up to 10 times faster) with a plug shell or over-mold and cable strain relief dimension that is thinner than the mobile device itself, a critical dimension when implementing Type-C connectors in tablets and smart phones, and up to 90% lighter than passive cable conductors that would need to be much larger in diameter.

Overall Financial Performance

Net loss for the six months ended June 30, 2020 was $3.6 million compared to a net loss of $5.6 million in the same period in the prior year. Revenue for the six month period ended June 30, 2020 decreased by 84% compared to the same period in the prior year. The decreased revenue was driven primarily by the impact of COVID-19. In the period ended June 30, 2020, Spectra7 experienced significant staffing issues, customer disruptions, and supply chain challenges caused by the spread of COVID-19 and associated shut downs that are impacting overall revenues in the near term. In response to the material revenue impact, the Company significantly reduced operating expenses, including implementation of employee furloughs. The Company continues to pursue the best available paths to manage operational risk and preserve capital during this time. In the second quarter of 2020 revenue started to increase, and on June 3, 2020 the Company announced that cable assembly customers have ordered over $1.0 million in Spectra7 products in the second quarter to support ramping demand from Hyperscaler Data Center Operators both in China and the US.

Gross margin percentage for the six month period ended June 30, 2020 remained consistent from the same period in 2019. Expenditures during the six month period ended June 30, 2020 are approximately $3.8 million representing a decrease of 45% from the same period in 2019, due to employee furloughs as a result of COVID-19. This lead to reductions in research and development, sales and marketing and general and administrative expenditures with an increase in other income.

Key Customers

During the three and six month periods ended June 30, 2020, the Company derived approximately 100% and 99% of its revenue from two customers (three and six months ended June 30, 2019 – 98% and 90% from three customers), respectively.

Selected Financial Information

The table below sets forth certain key financial results for the three and six month periods ended June 30, 2020 and 2019.

	Three Months Ended June 30, *(In thousands, except for loss per share)*				**Six Months Ended June 30, *(In thousands, except for loss per share)***			
	2020	**2019**	**Change**		**2020**	**2019**	**Change**	
	$	**$**	**$**	**%**	**$**	**$**	**$**	**%**
Revenue	257	966	(709)	(73%)	373	2,347	(1,974)	(84%)
Cost of sales	114	433	(319)	(74%)	167	1,060	(893)	(84%)
Gross margin	143	533	(390)	(73%)	206	1,287	(1,081)	(84%)
Expenses	1,817	3,272	(1,455)	(44%)	3,763	6,876	(3,113)	(45%)
Net loss	(1,674)	(2,739)	1,065	(39%)	(3,557)	(5,589)	2,032	(36%)
Other comprehensive loss	(316)	(98)	(218)	222%	563	(226)	789	(349%)
Total comprehensive loss	(1,990)	(2,837)	847	(30%)	(2,994)	(5,815)	2,821	(49%)
Basic and diluted loss per share	(0.00)	(0.01)			(0.01)	(0.02)		
Weighted average number of shares outstanding	525,184	239,193			477,415	237,529		

	As at *(In thousands)*			
	June 30, 2020	**December 31, 2019**	**Change**	
	$	**$**	**$**	**%**
Total assets	1,631	2,992	(1,361)	(45%)
Total liabilities	14,294	14,815	(521)	(4%)
Shareholders’ equity	(12,663)	(11,823)	(840)	7%
Total liabilities and shareholders’ equity	1,631	2,992	(1,361)	(45%)

Revenue and Gross Margin

The table below sets forth the details of revenue and gross margin for the three and six month periods ended June 30, 2020 and 2019:

	Three Months Ended June 30, (In thousands)				Six Months Ended June 30, (In thousands)			
	2020	**2019**	**Change**		**2020**	**2019**	**Change**	
	$	**$**	**$**	**%**	**$**	**$**	**$**	**%**
Revenue	257	966	(709)	(73%)	373	2,347	(1,974)	(84%)
Cost of sales	114	433	(319)	(74%)	167	1,060	(893)	(84%)
Gross margin	143	533	(390)	(73%)	206	1,287	(1,081)	(84%)
Gross margin %	*56%*	*55%*	*1%*		*55%*	*55%*	*0%*	

Revenue for the three and six months ended June 30, 2020 decreased by $0.7 million and $2.0 million respectively, representing a decrease of 73% and 84% over the same periods in the previous year reflecting the affect of COVID-19 on the local and global economies and the operations of the Company.

Gross margin percentage for the three and six months ended June 30, 2020 increased 1% and remained consistent at 55% , compared to the same periods in 2019.

Gross margin is a non-IFRS measure that does not have a standardized meaning prescribed by IFRS. Gross margin provides additional information to readers of the MD&A and Interim Financial Statements to enhance their understanding of the Company's financial performance. Gross margin comprises of revenue less cost of sales.

Expenses

The tables below set forth the details of expenses for the three and six month periods ended June 30, 2020 and 2019:

	Three Months Ended June 30, (In thousands)			
	2020	**2019**	**Change**	
	$	**$**	**$**	**%**
Research and development, net of investment tax credits and including amortization of licenses	1,006	1,167	(161)	(14%)
Sales and marketing	116	529	(413)	(78%)
General and administrative	454	618	(164)	(27%)
Depreciation of right-of-use assets	74	80	(6)	(8%)
Depreciation of property and equipment	77	95	(18)	(19%)
Share-based compensation	107	320	(213)	(67%)
Interest on lease obligation of right-of-use assets	7	28	(21)	(75%)
Accretion expense	540	448	92	21%
Other income	(570)	-	(570)	100%
Foreign exchange loss (gain)	6	(13)	19	146%
	1,817	3,272	(1,455)	(44%)

	Six Months Ended June 30, *(In thousands)*			
	2020	**2019**	**Change**	
	$	**$**	**$**	**%**
Research and development, net of investment tax credits and including amortization of licenses	1,757	2,559	(802)	(31%)
Sales and marketing	246	1,008	(762)	(76%)
General and administrative	727	1,355	(628)	(46%)
Depreciation of right-of-use assets	160	159	1	0.63%
Depreciation of property and equipment	159	214	(55)	(26%)
Share-based compensation	264	655	(391)	(60%)
Interest on lease obligation of right-of-use assets	21	58	(37)	(64%)
Accretion expense	1,040	881	159	18%
Other income	(570)	-	(570)	100%
Foreign exchange loss (gain)	(42)	(13)	(29)	223%
	3,762	6,876	(3,114)	(45%)

Research and Development

Research and development expenses consist of salaries and related expenses, design software tool costs, travel, consumable materials used in product development, such as experimental wafers, non-production tape-out costs, technical services costs and contracted technical personnel.

Research and development expenses for the three and six month periods ended June 30, 2020 decreased by 14% and 31% respectively compared to the same periods the previous year driven by decreased personnel expenses from employee furloughs as a result of COVID-19 and lower development expenses.

The Company is eligible for Irish refundable Scientific Research and Experimental Development ("SR&ED") investment tax credits for certain eligible expenditures incurred in Ireland. These tax refunds are netted against the Company's research and development expenses.

Sales and Marketing

Sales and marketing expenses consist primarily of salaries and related expenses, travel and the cost of trade shows, product promotion, customer technical support and market research.

Sales and marketing expenditures for the three and six month periods ended June 30, 2020 decreased by 78% and 76% respectively compared to the same periods the previous year. The decrease was driven by decreased personnel expenses from employee furloughs as a result of COVID-19.

General and Administrative

General and administrative expenses relate to finance and administration and consist of salaries and related expenses, legal and audit fees, insurance, expenses related to public reporting and compliance, travel and other corporate expenses.

General and administrative expenses for the three and six month periods ended June 30, 2020 decreased by 27% and 46% respectively as compared to the same periods the previous year. The decrease is primarily driven by decreased personnel expenses from employee furloughs as a result of COVID-19.

Depreciation of Right-of-use Assets

The Company's right-of-use assets recognized on adoption of IFRS 16 on January 1, 2019 are amortized over their remaining lease term. Depreciation of right-of-use assets for the three and six month periods ended June 30, 2020 compared to the same periods the previous year decreased by 8% and increased by 0.63% respectively.

Depreciation of Property and Equipment

Depreciation of property and equipment for the three and six month periods ended June 30, 2020 compared to the same periods the previous year decreased by 19% and 26% respectively. The lower depreciation expense is due to fewer capital investments made in 2019 and 2020.

Share-based Compensation

Share-based compensation recognizes the expense associated with the fair value of stock options and restricted share units ("RSUs") granted to employees, officers, directors and consultants which are estimated at the date of grant using the Black Scholes option pricing model and recognized over the period in which the options vest.

Share-based compensation expense for the three and six months ended June 30, 2020 decreased by 67% and 60% respectively over the same periods the previous year due to the cancellation of options and RSUs resulting from employee terminations during the three and six months ended June 30, 2020.

Accretion Expense

Accretion expense represents the change in the stated value of the Convertible Debentures (as defined below) measured at amortized cost and also includes interest expense for the period. The Convertible Debentures are carried at amortized cost at an effective interest rate of 18.79%. Under the effective interest rate method, the accretion becomes higher as maturity approaches.

Other Income

Under the terms of the Paycheck Protection Program ("PPP") formed under the Coronavirus Aid, Relief, and Economic Security Act ("CARES Act"), the Company received approval and grant from a US based bank and the U.S. Small Business Administration for $776,085 at an interest rate of 1.0% per annum and maturing in 24 months. Payments will not be due by the Company during the initial six-month period and, commencing one month after such six-month period, the Company shall be responsible for monthly payments of principal and interest in equal amounts until the maturity date.

Under the CARES Act, the Company is eligible for forgiveness of both the principal and accrued interest to the extent that the grant is used to cover eligible payroll, mortgage interest, rent and utility costs over a 24-week period following receipt of the grant and so long as the Company retains its employees and maintains their levels of compensation. No more than 40% of the funds may be allocated to non-payroll costs.

The Company intends to use the funds for the purposes set out in the CARES Act and the Paycheck Protection Program Flexibility Act and apply for forgiveness of the grant either on the maturity date or prior to the maturity date if all the grant has been used by the Company. As at June 30, 2020, the Company reasonably expects that it will meet the terms of forgiveness under the CARES Act and on this basis, the Company considers the funds to be in the form of a government grant.

Foreign Exchange Loss

The loss or gain on foreign exchange is caused by changes in the value of the Canadian dollar, Euro and Chinese Yuan relative to the US dollar, the amount of exposed assets and liabilities such as cash, accounts receivables and accounts payable and the difference in exchange rate at the time expenses in Canadian dollars, Euros and Chinese Yuan are booked and paid. Gains occur when the non-US currency strengthens and the Company holds exposed net assets in those funds or when the non-US currency weakens and the Company holds net exposed liabilities.

Conversely, losses occur when the non-US currency weakens and the Company holds net exposed assets in those funds or when the non-US strengthens and the Company holds net exposed liabilities.

Net Loss and Other Comprehensive Loss

Net loss for the three and six months ended June 30, 2020 were $1.7 million and $3.6 million compared to a net loss of $2.7 million and $5.6 million, respectively in the same periods in the prior year. The decrease in net loss is attributed to lower revenue, offset by lower operating costs during the three and six months ended June 30, 2020. Other comprehensive loss relates to the unrealized foreign currency effect of translating the Company, whose functional currency is Canadian dollars, to US dollars for financial reporting purposes.

The operating results of Spectra7 Microsystems Corp., and Si Bai Ke Te (Dongguan) Electronics Trading Co. Ltd, both wholly-owned subsidiaries of the Company, are translated from their functional currencies of Canadian Dollars (CDN) and Chinese Yuan Renminbi (CNY), respectively, into the Company's presentation currency of USD at the end of each reporting period, with the difference being recorded in other comprehensive income. During the three and six month periods ended June 30, 2020, the Company recorded an other comprehensive loss of $0.3 million and gain of $0.6 million respectively (June 30, 2019: other comprehensive loss of $0.1 million and $0.2 million respectively) related to unrealized foreign currency translation, which arose to the significant change in the USD exchange rate to CDN and CNY.

Loss per Share

Basic earnings and loss per share is calculated by dividing the profit and loss attributable to common shares of the Company by the weighted average number of common shares outstanding during the period. Diluted earnings and loss per share is calculated by adjusting the earnings and number of shares for the effects of dilutive options and other potentially dilutive securities. The weighted average number of common shares used as the denominator in calculating diluted loss per share excludes un-issued shares related to warrants, restricted share units and employee stock options, as they are anti-dilutive.

Basic and diluted loss per share for the three and six month periods ended June 30, 2020 was $0.00 and $0.01 respectively as compared to $0.01 and $0.02 for the same periods in 2019.

Summary of Quarterly Data

The table below sets forth selected financial data for the most recent eight quarters ended June 30, 2020.

(In thousands, except for loss per share)

	Fiscal 2018		Fiscal 2019				Fiscal 2020	
	Sept 30	**Dec 31**	**Mar 31**	**Jun 30**	**Sept 30**	**Dec 31**	**Mar 31**	**Jun 30**
	$	**$**	**$**	**$**	**$**	**$**	**$**	**$**
Revenue	1,052	1,441	1,381	966	1,370	928	116	257
Cost of sales	521	672	627	433	555	457	53	114
Gross margin	531	769	754	533	815	471	63	143
Expenses	3,494	5,325	3,604	3,272	3,561	3,178	1,944	1,817
Net loss	(2,963)	(4,556)	(2,850)	(2,739)	(2,746)	(2,707)	(1,881)	(1,674)
Other comprehensive (loss) gain	(15)	678	(128)	(98)	143	(171)	879	(316)
Total comprehensive loss	(2,978)	(3,878)	(2,978)	(2,837)	(2,603)	(2,878)	(1,002)	(1,990)
Loss per share								
Basic and Dilutive	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)

Revenues in the consumer semiconductor industry are subject to seasonality driven by consumer purchasing cycles and manufacturers unique product development cycles.

Historically, the Company's operating results have fluctuated on a quarterly basis and management believes they will continue to fluctuate. If anticipated sales and shipments in any quarter do not occur as and when expected, expenses and inventory levels can be disproportionately high and operating results for that quarter and future quarters may be adversely affected. In addition, because of historical variations in the operating results, the limited operating history of the Company and the rapid evolving nature of the business, period to period comparisons of the Company's operating results, including gross margin and operating expenses as a percentage of total revenue, are not necessarily meaningful and should not be relied upon as indication of future performance.

Issued and Outstanding Share Capital

The Company's authorized capital consists of an unlimited number of common shares, of which 573,778,687 common shares are issued and outstanding as of the date of this MD&A.

At the annual and special meeting of holders of common shares (the "Shareholders") held on June 15, 2017, Shareholders approved amendments to both the Company's stock option plan (the "Stock Option Plan") and the RSU plan (the "RSU Plan") to provide that the combined maximum number of common shares reserved for issuance under both the Stock Option Plan and the RSU Plan, inclusive of existing stock options and RSUs, shall not exceed 29,450,000 common shares. At the annual and special meeting of shareholders in June 2019, shareholders approved amendments to both the Stock Option Plan and the RSU Plan to provide that the combined maximum number of common shares reserved for issuance under both the Stock Option Plan and the RSU Plan, inclusive of existing stock options and RSUs, shall not exceed 47,838,517, representing approximately 8% of the issued and outstanding common shares as of the date of this MD&A.

The combined aggregate number of common shares reserved under the Stock Option Plan and the RSU Plan at June 30, 2020 was 46,359,622 common shares (December 31, 2019 - 39,332,300 common shares).

Since June 30, 2020, 7,633,616 RSUs were forfeited and 1,300,000 RSUs were issued while 7,850,000 stock options were issued and 1,117,933 stock options were forfeited. As of the date of this MD&A, options to purchase an aggregate of up to 18,019,205 common shares and 28,738,868 RSUs are outstanding, representing an aggregate of 46,758,073 common shares available for grant or award under the Stock Option Plan and/or the RSU Plan. 20,420,746 common shares have been issued under the RSU Plan.

As of the date of this MD&A, the Company has outstanding warrants to purchase (a) up to 2,205,010 common shares at an exercise price of CDN $0.30 per common share until February 24, 2022, (b) up to 22,182,975 common shares at an exercise price of CDN $0.50 per common share until January 9, 2021, (c), up to 14,665,282 common shares at an exercise price of CDN $0.1575 per common share until July 6, 2023, (d), up to 17,653,165 common shares at an exercise price of CDN $0.225 per common share until October 30, 2023, (e) up to 79,215,781 common shares at an exercise price of CDN $0.08 per common share until August 21, 2024, (f) 12,565,531 common shares at an exercise price of CDN $0.05 per common share until August 21, 2024, and (g) 10,523,452 common shares at an exercise at an exercise prive of CDN $0.05 per common share until July 15, 2025.

Convertible Debt and Equity Financings

On January 9, 2018, the Company closed a bought deal offering of 15,315 units (the "Convertible Debt Units") of the Company at a price of CDN $1,000 per Convertible Debt Unit for aggregate gross proceeds of $12.3 million (CDN $15.3 million) (the "January 2018 Offering"). Each Convertible Debt Unit issued pursuant to the January 2018 Offering consists of one 7.0% senior unsecured convertible debenture of the Company (each, a "Convertible Debenture") and 1,425 common share purchase warrants (each, a "January 2018 Warrant"). The principal amount of each Convertible Debenture is convertible into common shares at the option of the holder at any time prior to the close of business on the last business day immediately preceding the maturity date of January 9, 2021, at a conversion price of CDN $0.35 per share, subject to adjustment upon certain customary events. Holders converting their Convertible Debentures will receive accrued and unpaid interest thereon for the period from and including the date of the latest interest payment date to, but excluding, the date of conversion. Each January 2018 Warrant will entitle the holder to acquire one common share at a price of CDN $0.50 per share until January

9, 2021, subject to adjustment upon certain customary events. As of the date of this MD&A, CDN $ 2.54 million principal amount of the Convertible Debentures have been converted to 7,257,141 common shares.

On January 11, 2018, the Company closed a private placement for 252 Convertible Debt Units pursuant to the January 2018 Offering for aggregate gross proceeds of CDN $0.252 million.

On March 10, 2020, the Company announced a non-brokered private placement of up to 100,000,000 common shares in the capital of the Company ("Common Shares") at a price of CDN $0.015 per Common Share for gross proceeds of up to $1,087,132 (CDN $1,500,000), (the "March Private Placement"). The first tranche of the March Private Placement closed on March 10, 2020 and consisted of the issuance of 80,798,400 Common Shares for aggregate gross proceeds of $882,657 (CDN $1,211,976).

On April 20, 2020, the Company completed a second tranche of the March Private Placement, which consisted of the issuance of 19,201,598 Common Shares for aggregate gross proceeds of $219,687 (CDN $288,024).

On May 22, 2020, the Company issued an aggregate of 42,000,000 Common Shares to directors of the Company at a deemed issuance price of CDN $0.025 per Common Share to settle in full $750,000 owing to certain directors of the Company pursuant to outstanding promissory notes, net of the effect of foreign exchange rate.

On July 15, 2020, the Company closed the first tranche of a CDN $1,000,000 non-brokered private placement (the "July Private Placement") of up to 40,000,000 units ("Units"). The first tranche of the July Private Placement consisted of the issuance of 21,046,904 Units at a price of CDN $0.025 per Unit for gross proceeds of $388,778 (CDN $526,173). Each Unit consists of one Common Share and one-half of one common share purchase warrant (each whole warrant, a "July 2020 Warrant") with each July 2020 Warrant being exercisable into one Common Share at an exercise price of CDN $0.05 for a period of five years from the date of issuance, subject to adjustment upon certain customary events. On August 25, 2020, the Company announced that it expects to complete the second and final tranche of the July Private Placement on or before September 25, 2020.

Liquidity and Capital Resources

Historically, the Company has funded its operations from the sale of equity securities and from debt financing.

The Company's objectives are to grow revenue by expanding its product lines and entering new markets, to finance investment in research and development and to ensure that capital resources are readily available to meet obligations as they become due. Liquidity risk arises when the Company is challenged to fund its on-going operations through working capital or either the sale of equity or bank loans.

The Company may face challenges in generating sufficient amounts of cash and cash equivalents in the short-term and potentially beyond due to such factors as:

- challenges in the supply chain whereby lead times to secure components can run between 8-20 weeks and often require the Company to prepay or make deposits to secure the components;
- delays in the development of new products which can delay market entry dates;
- acceptance of new products in the market and sales volatility as a result of transitions to new product lines;
- lower than expected adoption of the products of our end customers in newer markets could impact the orders received by the Company and its revenue outlook;
- payments of accrued interest due on the conversions by the holders of the Convertible Debentures to common shares;
- semi-annual interest payments which commenced on June 30, 2018 and end on December 31, 2020, including a semi-annual interest payment due on June 30, 2020 of approximately $0.3 million which the Company paid on July 15, 2020, and a semi-annual interest payment due on December 30, 2020 of approximately $0.4 million; and
- repayment of the outstanding Convertible Debentures on January 9, 2021.

The following table summarizes the working capital and cash as at June 30, 2020 and December 31, 2019:

	As at (In thousands)			
	June 30 2020	December 31, 2019	Change	
	$	$	$	%
Current assets	878	1,433	(555)	(39%)
Current liabilities	14,294	14,517	(223)	(2%)
Working capital deficiency	(13,416)	(13,084)	(332)	3%
Cash	183	71	112	158%

As of June 30, 2020, the Company had a working capital deficiency of $13.4 million, compared to a working capital deficiency of $13.1 million as at December 31, 2019. Current assets at June 30, 2020 were lower with an increase in cash balance. Current liabilities decreased due to payments made on the convertible debt offset by higher payables. The current liabilities include a balance of $1.2 million related to accrued executive payroll and bonuses.

The Company is dependent on the growth in revenue over the next year to fund future operations. Should expected revenues not materialize, the Company may require further sale of debt or equity securities, additional bank financing or other sources of funds in order to meet its obligations. See the section “Risk Factors” section of the Company’s most recent Annual Information Form.

The Company is actively considering different financing options to provide additional capital for the Company to meet its business objectives. Although the Company has, in the past, been successful in obtaining financing, there are inherent risks related to the Company’s ability to raise capital in the future and there is no assurance that the Company will be able to continue to do so in the future on similar terms as past financings, or at all.

The following table summarizes the cash inflows and outflows by activity for the periods indicated:

	Three Months Ended June 30, 2020 (In thousands)				Six Months Ended June 30, 2020 (In thousands)			
	2020	2019	Change		2020	2019	Change	
	$	$	$	%	$	$	$	%
Cash generated by (used in)								
Operating activities	207	(1,634)	1,841	(113%)	(350)	(2,135)	1,785	(84%)
Financing activities	(32)	1,590	(1,622)	(102%)	386	1,443	(1,057)	(73%)
Investing activities	(3)	(6)	3	(50%)	(2)	(6)	4	(67%)
Effect of exchange rate changes	(9)	138	(147)	(105%)	79	84	(5)	(6%)
Increase in cash	163	88	75	85%	113	(614)	727	(118%)

Operating Activities

Cash used in operating activities in the three and six month periods ended June 30, 2020 compared to the same periods in 2019 increased by $2 million and increased by $2 million, respectively as the Company paid down its accounts payable balance with the proceeds raised in the March Private Placement and the Payroll Protection Program grant.

Without external sources of financing, the viability of the Company as an operating business is dependent on its ability to generate positive cash flows from operating activities in the short and long-term.

Financing Activities

Net cash inflow from financing activities was lower by $2 million and $1 million, respectively, during the three and six months ended June 30, 2020 as compared to the same periods in 2019. In the six months ended June 2019, the Company raised $1.6 million from a public offering while there was not similar financing activity in the comparable period for 2020.

Investing Activities

The Company did not invest in any laboratory and manufacturing equipment during the three and six month periods ended June 30, 2020.

Off-Balance Sheet Arrangements

The Company currently has no off-balance sheet arrangements.

Transactions Between Related Parties

The Company transacts with key individuals from management and its directors who have authority and responsibility to plan, direct and control the activities of the Company. The nature of these dealings was in the form of payments for services rendered in their capacity as employees and as directors of the Company.

The Company's key management personnel are comprised of the Board of Directors and current and former members of the executive team of the Company.

Key management personnel compensation is comprised of the following:

	Three Months Ended June 30		**Six Months Ended June 30,**	
	2020	2019	**2020**	2019
	$	$	**$**	$
Salaries, fees and short-term benefits	**114,505**	472,188	**1,303,543**	944,376
Share-based benefits	**110,804**	253,741	**251,126**	504,072
Total	**225,309**	725,929	**1,554,669**	1,448,448

The issuance of Common Shares and July 2020 Warrants to insiders of the Company in the March Private Placement, the May Private Placement, and the July Private Placement are considered to be "related party transactions" as defined under "Multilateral Instrument 61-101 – Protection of Minority Security Holders in Special Transactions" ("MI 61-101"). However, the Company relied on exemptions from the formal valuation and minority shareholder approval requirements provided under MI 61-101 on the basis that the aggregate value of the Common Shares and July 2020 Warrants does not exceed 25% of the fair market value of the Company's market capitalization.

Critical Accounting Estimates

The Company's significant accounting policies and accounting estimates under IFRS are contained in the Financial Statements (see Note 3 to the Annual Financial Statements). Certain of these policies involve critical accounting estimates as they require us to make particularly subjective or complex judgments about matters that are inherently uncertain and because of the likelihood that materially different amounts could be reported under different conditions or using different assumptions.

Changes in Accounting Policies

The Statements are prepared in accordance with IFRS. The Company adopted and implemented IFRS 16 Leases on January 1, 2019. In January 2020, the IASB issued amendments to IAS 1, Presentation of Financial Statements ("IAS 1") to clarify the requirements for classifying liabilities as current or non-current. The amendments are effective for annual periods beginning on or after January 1, 2022. The Company is currently assessing the impact of the amendment to IAS 1 to the Company's consolidated financial statements.

Financial Instruments and Risk Management

The Company may be exposed to risks of varying degrees of significance that affect its ability to achieve its strategic objectives. The main objectives of the Company's risk processes are to ensure that the risks are properly identified and that the capital base is adequate in relation to those risks. The principal risks to which the Company is exposed to are as follows:

Fair value

The fair value of cash and cash equivalents, trade and other receivables, investment tax credits, trade and other payables, obligations under finance lease, lease obligations, promissory notes to related parties, and license liabilities approximate their carrying values due to their immediate or short-term maturity.

Foreign currency risk

The Company's revenues and cost of sales are denominated in United States dollars. The Company incurs expenses in United States dollars, Euros, Canadian dollars and Chinese Yuan. The Company has historically raised capital denominated in Canadian dollars. The term loan and Loan Facility were in United States dollars. The Company is therefore exposed to gains or losses due to fluctuations in foreign currency exchange rates. Management actively monitors the movement in foreign exchange rates and their potential impact on the Company's financial results but does not actively hedge it's foreign currency risk.

Interest rate risk

Interest rate risk is the risk that the fair value of future cash flows of a financial instrument will fluctuate due to changes in market interest rates. Interest rate risk associated with the Company's Convertible Debentures arises from fluctuations in interest rates and the degree of volatility of these rates. The Convertible Debentures provides for an annual rate of 7%. The Company does not use derivative financial instruments to reduce its exposure to interest rate risk.

Credit risk

Credit risk is the risk of loss associated with counterparty's inability to fulfill its payment obligations. The Company's credit risk is primarily attributable to trade and other receivables and money held in the Company's bank accounts. The Company mitigates this risk by monitoring the credit worthiness of its customers and only dealing with creditworthy counterparties.

Liquidity risk

The Company's objective in managing liquidity risk is to maintain sufficient readily available reserves in order to meet its liquidity requirements at any point in time. The Company achieves this by maintaining sufficient cash, managing cash from operations and if required through financing activities.

Disclosure Controls and Procedures

In accordance with the requirements of National Instrument 52-109‑*Certification of Disclosure in Issuers' Annual and Interim Filings* ("NI 52-109"), the Company's management, including the Chief Executive Officer ("CEO") and the Chief Financial Officer ("CFO"), have evaluated the effectiveness of the Company's disclosure controls and procedures. Based upon the results of the evaluation, the Company's CEO and CFO have concluded that as at June 30, 2020, the Company's disclosure controls and procedures to provide reasonable assurance that the information required to be disclosed by the Company in reports it files is recorded, processed, summarized and reported within the appropriate time periods and forms were effective.

Internal Control over Financial Reporting

Internal control over financial reporting ("ICFR") is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with applicable IFRS. Internal control over financial reporting should include those policies and procedures that establish the following:

- maintenance of records in reasonable detail, that accurately and fairly reflect the transactions and dispositions of assets;
- reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with applicable IFRS;
- receipts and expenditures are only being made in accordance with authorizations of management or the Board of Directors; and
- reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of the Company's assets that could have a material effect on the financial instruments.

During the six months ended June 30, 2020, the Company did not make any significant changes to its internal controls over financial reporting that would have materially affected, or reasonably likely to materially affect, its internal controls over financial reporting.

Limitations of Disclosure Controls and Procedures and Internal Control over Financial Reporting

The Company's management, including the CEO and CFO, believe that due to inherent limitations, any disclosure controls and procedures or internal control over financial reporting, no matter how well designed and operated, can provide only reasonable, not absolute, assurance of achieving the desired control objectives. Further, the design of a control system must reflect the fact that there are resource constraints, and the benefits of controls must be considered relative to their costs. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that any design will not succeed in achieving its stated goals under all potential future conditions. Accordingly, because of the inherent limitations in a cost effective control system, misstatements due to error or fraud may occur and not be detected. Additionally, management is required to use judgment in evaluating controls and procedures.

Additional Information

Additional information relating to the Company can be found on SEDAR at www.sedar.com.

Approval

The Board of Directors of the Company has approved the disclosure contained in this MD&A.