
**MICROMEM TECHNOLOGIES INC.
MANAGEMENT'S DISCUSSION AND ANALYSIS
FOR THE FISCAL YEAR ENDED OCTOBER 31, 2019
PREPARED AS OF FEBRUARY 24, 2020**

NOTICE TO READER

The Management's Discussion and Analysis ("MD&A") report for Micromem Technologies Inc. for the fiscal year October 31, 2019, as attached, is dated as of February 24, 2020, consistent with the date of the Independent Registered Public Accounting Firm report and with the original 52-109 CEO and CFO certification filings related thereto.

/s/ Dan Amadori
Dan Amadori, CFO
February 24, 2020

/s/ Joseph Fuda
Joseph Fuda, CEO
February 24, 2020

MICROMEM TECHNOLOGIES INC.
MANAGEMENT'S DISCUSSION AND ANALYSIS
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INTRODUCTION

The following sets out the Management's Discussion and Analysis ("MD&A") of the financial position and result of operations for the fiscal year ending October 31, 2019 of Micromem Technologies Inc. (the "Company", "Micromem" or "we"). The MD&A should be read in conjunction with the Company's audited consolidated financial statements and accompanying notes for the fiscal years ending October 31, 2019 and 2018 which are prepared in accordance with International Financial Reporting Standards (IFRS) as issued by the International Accounting Standards Board. Additional information regarding the Company is available on the SEDAR website at www.sedar.com.

The Company's shares are traded on the OTCQB under the symbol MMTIF and on the Canadian Securities Exchange ("CSE") under the symbol MRM. In November 2007, the Company incorporated Micromem Applied Sensor Technologies Inc. ("MAST") for the purpose of moving forward with the planned commercialization of its technology.

Certain information provided by the Company in this MD&A and in other documents publicly filed throughout the year that are not recitation of historical facts may constitute forward-looking statements. The words "may", "would", "could", "will", "likely", "estimate", "believe", "expect", "forecast" and similar expressions are intended to identify forward-looking statements.

Readers are cautioned that such statements are only predictions and the actual events or results may differ materially. In evaluating such forward-looking statements, readers should specifically consider the various factors that could cause actual events or results to differ materially from those indicated by such forward-looking statements.

FORWARD LOOKING STATEMENTS

This MD&A contains forward-looking statements and forward looking information within the meaning of applicable Canadian securities legislation ("forward looking statements"). Any statements that express or involve discussions with respect to predictions, expectations, beliefs, plans, projections, objectives, assumptions, potentials, future events or performance (often, but not always, using words or phrases such as "believes", "expects" or "does not expect", "is expected", "anticipates" or "does not anticipate", or "intends" or stating that certain actions, events or results "may", "could", "would", "might" or "will" be taken or achieved) are not statements of historical fact, but are "forward-looking statements". Such forward-looking statements involve known and unknown risks, uncertainties and other factors that may cause the actual results, performance or achievements of the Company, or developments in the Company's business or in its industry, to differ materially from the anticipated results, performance, achievements or developments expressed or implied by such forward-looking statements. Forward-looking statements include disclosure regarding possible events, conditions or results of operations that are based on assumptions about future conditions, courses of action and consequences. Forward-looking statements may also include, without limitation, any statement relating to future events, conditions

or circumstances. The Company cautions you not to place undue reliance upon any such forward-looking statements, which speak only as of the date they are made. Forward-looking statements relate to, among other things, the successful commercialization of our technology, comments about potential future revenues, joint development agreements and expectations of signed contracts with customers, etc. A number of inherent risks, uncertainties and factors affect the operations, performance and results of the Company and its business, and could cause actual results to differ materially from current expectations of estimated or anticipated events or results. Some of these risks and uncertainties include the risk of not securing required capital in future, the risks of not successfully concluding agreements with potential partners on a timely basis and the risks associated with commercializing and bringing to market our technology. These risks are affected by certain factors that are beyond the Company's control: the existence of present and possible future government regulation, competition that exists in the Company's business, uncertainty of revenues, markets and profitability, as well as those other factors discussed in this MD&A report. This list is not exhaustive of the factors that may affect any of the Company's forward-looking statements and reference should also be made to the Company's Annual Information Form (prepared and filed in the form of a Form 20-F Annual Report pursuant to The Securities Exchange Act of 1934) for a description of risk factors.

Although the Company has attempted to identify important factors that could cause actual results to differ materially from those contained in forward-looking statements, there may be other factors that cause results not to be as anticipated, estimated or intended. There can be no assurance that such statements will prove to be accurate, as actual results and future events could differ materially from those anticipated in such statements. Accordingly, readers should not place undue reliance on forward-looking statements. The Company does not undertake to update any forward-looking statements that are incorporated by reference herein, except in accordance with applicable securities law.

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**MICROMEM TECHNOLOGIES INC.
MANAGEMENT’S DISCUSSION AND ANALYSIS
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1. OVERVIEW

Micromem is a company that develops customized, proprietary sensor-based solutions for large multinational corporations. It operates also through its wholly owned subsidiary, Micromem Applied Sensor Technologies (“MAST”). MAST has traditionally been responsible for the development of market opportunities, maintaining customer relationships and the project management of the independent engineering subcontractors that it engages once a client project has been initiated. Micromem and MAST are referred to interchangeably as “the Company” throughout this report.

In 2019 the Company had positive new developments in its business initiatives. It also experienced client driven delays in terms of its commercialization strategies for the technology applications that it continues to pursue. It continued to deal within very tight working capital constraints but has been successful in raising additional capital in 2019 and through to the date of this report. Our litigation with Steve Van Fleet, who resigned as an officer and director of the Company on August 17, 2018, continues.

Financing:

In 2019 the Company secured \$212,968 of financing from private placements (2018: \$866,200), and received proceeds of \$780,891 (2018: \$1,457,983) from the issuance of convertible debentures. It issued 82,038,962 common shares relating to the conversion by debenture holders of their debentures totaling \$1,636,825 during the year (2018: issued 16,220,951 common shares relating to conversion of debentures totaling \$1,093,842).

The Company’s convertible debt structure is complex with 3 broad categories of such debt: (i) \$CDN denominated debt with fixed conversion prices; (ii) \$US denominated debt with fixed conversion prices, and, (iii) \$US denominated debt with variable conversion prices. The term of the debt in each instance is typically between 4 months and 12 months. In 2019 the Company has repaid certain convertible loans at maturity when due as requested by the debenture holder, or converted the debenture into common shares at the request of the debenture holder, or extended the term of the debenture through negotiations with the debenture holder – in this latter case, certain terms of the loan – interest rate and/or conversion price – have, in some instances, been adjusted as part of the extension.

Under IFRS reporting, such loans require quarterly remeasurements. The application of the remeasurement methodology is very specific. This is more fully discussed in Section 2; in summary, there are several non-cash related income and expense charges that arise from such remeasurements. We recorded the following non-cash charges in the fiscal years ending October 31, 2019 and 2018 none of which impact the Company’s cash flows:

	2019	2018
Accretion expense	\$ 1,517,436	\$ 2,039,344
Loss on conversion of debentures	101,919	63,852
(Gain) loss on revaluation of derivatives	(343,436)	(1,094,718)
(Gain) loss on extinguishment of debentures	(646)	(399,191)
Net expense	\$ 1,275,273	\$ 609,287

Business Developments in 2019:

- (a) **Chevron:** In March 2019, we advanced the Chevron project to onsite field trials of the ARTRA technology. These in field trials have served to validate the technology. Chevron continues to test samples from these trials with ongoing successful results. We anticipate positive developments with respect to commercialization of this technology with Chevron as they have advised on their intent to commercialize.
- (b) **Romgaz:** We engaged in discussions with Romgaz in mid-2019 with respect to the ARTRA technology. Romgaz and Chevron have discussed the results of the Chevron field trials in November – December 2019. Romgaz has communicated that it is proceeding with purchase orders to acquire initial units of the ARTRA technology and to have the Company develop a fully integrated software analytics solution for Romgaz use and application. Pending the completion of these two initial undertakings, Romgaz has communicated their commitment to commercializing the technology with manufacturing to be completed in Romania.
- (c) **Repsol S.A.:** We have negotiated a draft final contract with Repsol relating to the RT Lube Analyzer technology. The Company intends to proceed with this project in 2020.
- (d) **Other:** In 2019 the Company evaluated other potential opportunities and participated in a number of technical trade shows across North America.

Regulatory:

In 2019, Ontario Securities Commission (“OSC”) initiated a Continuous Disclosure Review on the Company’s periodic filings. This is an ongoing OSC practice in the normal course, the previous OSC review was initiated in 2016.

The Company provided its commentaries and responses to the OSC over a period of five months. Ultimately, the OSC concluded its review; there was no requirement to revise any of the Company’s previous filings.

The Company met with representatives of the CSE in mid-2019 to apprise the CSE of the Company’s ongoing developments and go forward plans.

The Company has met all of its periodic Canadian and US based filing requirements on a timely basis in 2019.

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2. COMMENTARY ON CONVERTIBLE DEBENTURES:

This section of the report is intended to provide readers with additional information as to the nature of the reporting requirements, procedures and impact of the convertible debt financings that the Company has completed. The objective is to facilitate the reader's understanding of this complex aspect of the Company's financial statements.

(1) Overview: convertible debenture reporting

- (a) We are required under IFRS reporting standards to measure the components of our convertible debt including the debt, the derivative liability and the equity component of the face value of the debt, as appropriate, upon execution of the loan agreement with the investor.
- a) The measurement methodology that we employ is in accordance with prescribed guidelines under IFRS and International Accounting Guidelines. This methodology is either a Black Scholes pricing model or a binomial distribution measurement model, depending on which model is more suitable in each case. That determination is based on a subjective assessment by the Company.
- b) When we secure a convertible debenture from an investor, the terms which are finalized through negotiation with the investor will vary on a case by case basis in terms of the following aspects:
 - i) Term (typically 2 months to 12 months).
 - ii) Interest rate (typically 1 to 2% per month but, in some cases, between 5% - 10% per annum).
 - iii) Conversion price (which may be fixed at initiation date or fixed after 6 months based on a formulaic calculation, denominated in Canadian dollars or U.S. Dollars, the latter being the functional currency of the Company and its subsidiaries).
 - iv) The option for the Company to prepay the loan during the entire term of the loan or within an initial period of the term of the loan (typically up to 6 months).
- c) At maturity date of the debenture, the debenture holder may agree to extend the term of the loan for an additional period of time, either on the same basic terms as already exist or on renegotiated terms.

(2) Accounting measurements and periodic reporting of convertible debentures:

- a) To the extent that there is a derivative liability that arises in the initial measurement (1(a) above), we are required to revalue the derivative liability at each quarter end using prescribed Black Scholes or binomial methodology. Then, on a quarterly basis, we are required to report this gain or loss on the revaluation in our quarterly consolidated statement of income.
- b) To the extent that the face value of the loan – which is due at the maturity date – is greater than the amount that is assigned to the loan component of the total amount at inception of the loan (1(a) above), then this difference must be accreted over the term of the loan. Typically the loan term is from 2 months to 12 months. Thus, over the term of the loan, we are required to report this accretion amount as an expense in our quarterly consolidated statement of income.
- c) To the extent that a loan is converted into common shares by the debenture holder, we will close out the loan at that point, record remaining accretion expense up to the date of conversion, remeasure the derivative liability to nil and calculate a net gain or loss on conversion of the loan. The net gain or loss is reported in our consolidated statement of income.

(3) Impact on reporting:

The realities and complexities of this prescribed accounting treatment gives rise to complicated disclosures in our financial statements and footnotes:

- (a) We report substantial accretion expense in our audited financial statements.
- (b) Over time, barring significant volatility in the share price, we generally report a gain on the settlement of the derivative liability.
- (c) The calculated *effective interest rate* on debt can be substantial. To illustrate,(for example) if the reported value of the debt is a small fraction of the face value at inception and it must be accreted to face value over the term (for example 2 months) then the effective rate of interest will be as high (in these reported financials) as 6000% representing the rate that would be required to step up the reported value to the face value in the short period of the term of the loan.

It is essential, when reviewing our audited consolidated statements, to bear in mind the following:

- a) Accretion expense is a *non- cash item*.
- b) Gain on revaluation of derivatives in a *non -cash item*.
- c) Loss or gain on extinguishment of debentures *is a non -cash item*.
- d) Loss or gain on conversion of debentures to common shares is a *non -cash item*.

(4) Additional Comments:

The Company notes the following:

- i) We have had to resort to convertible debentures financing as a primary means of securing financing over the past several years in order to continue our operations.
- ii) The *actual interest expense* on our convertible debentures which is interest paid to the debenture holders, is at a coupon rate ranging between *1% and 2%* per month. The effective rate referenced above is an accounting measurement metric, not a payable obligation.
- iii) The use of convertible debentures has served to increase our outstanding number of shares over the past few years. The Company plans to deemphasize or eliminate this complex and expensive source of financing in future as it develops and grows its business and is better able to secure more conventional, lower cost financing.

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3. PROJECT UPDATES:

Since the resignation of Mr. Van Fleet in August 2018, the Company has worked diligently to establish a renewed dialogue with its active strategic partners. Its management has engaged with Chevron and Repsol as well as with its engineering and design subcontractors. It has forged a new business relationship with Romgaz, based in Romania and has engaged with additional engineering manufacturing and marketing resources to provide it with specialized expertise. The Company's CEO and CFO, under the guidance of its active board members, have assumed these responsibilities.

Update of Product Development Activity at October 31, 2019

The current status of our active development projects is as reported below:

Chevron: In 2019 we continued to engage with Chevron personnel and with our engineering subcontractor, Entanglement Technologies Inc. ("Entanglement"). We met with the Chevron team members in their Houston offices on seven occasions to continue our dialogue and measure our go forward path. We also met directly with Entanglement on three occasions for these purposes.

The field testing of the onsite pilot program was coordinated between Chevron, Entanglement and the Company and commenced in March 2019 at a California-based oil well site operated by Chevron. The initial on site testing was conducted over a period of approximately 6 weeks. Thereafter sample testing from the onsite well continued in both the Entanglement and Chevron laboratories.

Chevron has advised that the results of the testing that has been completed to date have met with their expectations and requirements and that the performance of the technology in the onsite pilot and in the subsequent lab sample testing has been validated.

We are advised by Chevron that they will adopt the technology as required in future and that they have earmarked funding for commercial units in their 2020 fiscal year budget. To date, Chevron has not released commercial orders for the technology.

In 2019, under the terms of the preexisting Joint Development Agreement with Chevron, they paid \$77,597 relating to the cost reimbursements that the Company invoiced for the ongoing pilot tests.

Repsol S.A. ("Repsol"): We have previously reported on our initial activity with this Spanish energy conglomerate in our 2018 report. The developments with Repsol in 2019 are as presented below:

- a) In Q1 2019 we submitted a proposed letter of intent ("Repsol LOI") to the Repsol engineering team with whom we have engaged since September 2018. The Repsol LOI was intended to reset the go forward product development parameters, marketing efforts

and cost sharing arrangements for this project between the Company and Repsol. The original Repsol purchase order submitted in 2017 was suspended as part of these current discussions with Repsol.

- b) In mid-2019, we began negotiations with the Repsol team towards a final development contract. The discussions remain open at the date of this report.

The underlying technology for the Repsol initiative has been referenced in our 2018 report as the RT Lube Analyzer. The initial development completed on this technology between 2016-2018 was undertaken by the Company and its engineering subcontractor, SBM Microsystems. In 2019 we moved the project to an engineering and manufacturing entity in Toronto Canada.

The Company intends to proceed with this project in 2020 pending finalization of the final development contract. A visit to the Repsol offices in Spain is intended for this purpose in calendar 2020.

Romgaz: Romgaz is the state-controlled gas company in Romania. We initiated a dialogue with the senior management team at Romgaz in May 2019. The opportunity developed as a result of the progress that we had experienced with our Chevron initiative which, by that point, had advanced to the onsite pilot program referenced above.

We continued our initial discussions with Romgaz thereafter and, in October 2019, we announced that the Company had executed a letter of intent (“LOI”) with Romgaz which afforded the Company the opportunity to sell the ARTRA technology units to Romgaz and to develop a robust analytics solution for the technology. The key conditions to progressing this LOI were twofold:

- a) Romgaz would continue with their due diligence on the ARTRA technology, and
- b) Manufacturing of the commercial units in future would be completed, with the Company’s input, in Romania.

Discussions and negotiations with Romgaz continued after the execution of the LOI. These discussions involved Chevron whom the Company introduced to Romgaz as part of the Romgaz due diligence process.

In December 2019 Romgaz put forward a series of questions to Chevron relating to the Chevron experience with the ARTRA technology and the testing that Chevron had conducted in 2019. The dialogue that the Company coordinated between Romgaz and Chevron was very positive and the specifics of those discussions were approved by both parties and posted to the Micromem website on December 20, 2019.

The Company is now anticipating a series of purchase orders from Romgaz with respect to:

- a. The purchase of initial units of the existing ARTRA technology for training and education purposes, and,
- b. A proposal by Micromem to deliver a comprehensive analytics solution to Romgaz for the technology, and,

- c. *Pending satisfactory completion of b. above*, a purchase order for commercial orders for the technology which is to be manufactured in Romania.

Based on the above sequence of events, the Company anticipates that it will report commercial revenues related to Romgaz in 2020.

Other Developments:

- a) In last year's report, we discussed the Company's participation in March 2018 in a conference in Dubai .Mr. Van Fleet represented the Company at the conference; subsequently he prepared a significant number of proposals for various companies in North America and abroad with respect to the ARTRA technology which was showcased at the Dubai conference.

Since Mr. Van Fleet's resignation in August 2018, we have pursued many of the proposals submitted by Mr. Van Fleet to these prospective customers. As of this date, there have been no commercial opportunities identified by the Company in these follow up efforts which the Company has undertaken.

- b) In last year's report we indicated that the Company was engaged in dialogue with an established private company that has engineering and manufacturing capabilities and commercial revenues in North America. In 2019 we actively pursued those discussions and those discussions continue at the date of this report. In addition, we have been provided guidance in terms of product development and commercial roll out strategies. We anticipate that a formal working relationship may materialize in 2020.

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4. DISCUSSION OF OPERATING RESULTS:

(a) Financial Position as at October 31, 2019:

	October 31, 2019	October 31, 2018
	('\$000)	('\$000)
Cash	46	207
Deposits and other receivables	15	99
	<u>61</u>	<u>306</u>
Property and equipment, net	3	9
Patents, net	20	396
	<u>84</u>	<u>711</u>
Bridge loans	2,599	2,477
Accounts payable and accrued liabilities	997	1,007
Derivative liability	766	650
	<u>4,362</u>	<u>4,134</u>
Shareholders' Equity		
Share capital	84,154	82,283
Equity component of bridge loans	50	70
Contributed surplus	27,758	27,631
Deficit	(116,240)	(113,407)
	<u>(4,278)</u>	<u>(3,423)</u>
	<u>84</u>	<u>711</u>

Commentary:

1. The Company's working capital deficiency is (\$4,301,324) at October 31, 2019 (2018: deficiency of \$3,828,503)
2. In 2019 the Company evaluated its patent portfolio and its go forward strategy for its intellectual property portfolio. It decided that it would suspend its provisional patent filings in jurisdictions outside the United States where it has been issued several patents. For financial reporting purposes the Company has recorded an impairment reserve of \$223,143 in 2019 and reflects a value of \$20,000 as its patent asset at October 31, 2019. The Company believes that its patents are a valuable asset to be exploited in future through the pursuit of licensing agreements with potential strategic partners.
3. The Company continued to secure additional financing in 2019 through convertible bridge loans. Given the terms of the bridge loans, the Company has measured, as

appropriate, the prescribed accounting treatment for these bridge loans and the related derivatives. These loans were typically of a short-term nature and, in many cases, renewed on multiple occasions; the related financial reporting has become progressively more complex. Refer to Section 3 of this report for additional commentary.

The balance reported as bridge loans at October 31, 2019 is \$2,599,074 (2018: \$2,476,571) and the related derivative liability balance is \$765,425 (2018: \$650,116). The Company reports accretion expense on these debentures of \$1,517,436 (2018: \$2,039,344), a loss on the conversion of bridge loans to share capital of \$101,919 (2018: \$63,852), a gain on the revaluation of the underlying derivative liabilities of \$343,436 (2018: \$1,094,718) and a gain on extinguishment of convertible debentures of \$646 (2018: \$399,191). Management generally employs a Black Scholes valuation model, although for certain of the loan transactions contracted for, it uses a binomial measurement model for those specific loans.

Management acknowledges that the cost of financing to the Company is significant; interest on the bridge loans is substantial. In 2019 we reported \$496,172 of interest expense (2018: \$504,778).

4. During the 2019 and 2018 fiscal years, the Company secured funding from various sources, the significant components include:

	2019	2018
i) Private placements of shares for cash consideration	\$ 212,968	\$ 866,200
ii) Bridge loan financing	780,891	1,457,983
iii) Bridge loan settlements for share consideration	1,636,825	1,205,130
iv) Cost reimbursement provided by development partners	77,597	738,983
	\$ 2,708,281	\$ 4,268,296

5. Operating Results:

The following table summarizes the Company's operating results for the years ended October 31, 2019 and 2018:

Discussion of Operating Results

	Years ended October 31,	
	2019 (\$000)	2018 (\$000)
Administration	197	306
Interest expense	497	505
Accretion expense	1,518	2,039
Financing costs	72	40
Professional fees and salaries	442	747
Stock-based compensation	-	141
Development expense (recovery)	(42)	(130)
Travel and entertainment	52	101
Foreign exchange loss (gain)	(41)	(118)
Amortization of property and equipment	3	4
Amortization of patents	153	157
Impairment of patents	224	-
Loss on conversion of debentures	102	64
(Gain) loss on revaluation of derivatives	(343)	(1,095)
(Gain) loss on extinguishment of debt	(1)	(399)
Net expenses	2,833	2,362
Net comprehensive income (loss)	(2,833)	(2,362)
Income (loss per share)	(0.01)	(0.01)

Fiscal 2019 Compared to Fiscal 2018

- a) Administration costs were \$197,208 in 2019 versus \$305,338 in 2018. These costs include: rent and occupancy costs of \$64,647 (2018: \$70,674, the Company reported sublet income for a portion of its office space in 2019); office insurance costs of \$26,812 (2018: \$117,615; the Company did not renew its D&O insurance coverage in 2019 which accounts for the difference); investor relations, listings and filing fees of \$49,029 (2018: \$53,113); and other general and administrative expenses of \$56,720 (2018: \$63,936).
- b) Professional and other fees and salaries costs were \$441,981 in 2019 versus \$747,280 in 2018. The components of these total costs included legal and audit related expenses of

\$157,354(2018:\$165,685) 3rd party consulting fees of \$53,845 (2018: \$316,815), staff salaries and benefits of \$230,782 (2018: \$264,780); there were nil fees paid to the CFO (2018: \$49,220) and nil fees paid to Steve Van Fleet (2018; expense of \$186,059)The Company has disputed fees charged by Mr. Van Fleet in 2018 – refer also to Section 7(c) of this report).

The CFO has received no compensation from the Company since March 2018. The CEO of the Company has received \$4,682 of salary in 2019 which amount is reports in staff salaries and benefits; he received no compensation in 2018. These reductions in expenses were part of a broad effort to reduce the Company’s operating expenses after the resignation of Mr. Van Fleet in August 2018.

- c) Travel and entertainment expenses were \$52,568 in 2019 (\$101, 496 in 2018; including travel expenses reported by Mr. Van Fleet between November 2017 – August 2018 prior to his resignation). We limited travel expenses in 2019 as part of the broad effort to reduce the Company’s operating expenses.
- d) Development cost recoveries represent development costs incurred less costs reimbursed by our development partners which are paid at milestone dates under our joint development contracts. We received a net recovery of \$41,546 (2018: \$130,069). The Company incurred development costs on its Chevron contract in 2019 and 2018; it also incurred development costs relating to Repsol in 2018.
- e) There were no stock options grants awarded in 2019. In 2018 the Company granted 2.2 million options to directors, officers, employees, and consultants; the related expense of \$140,612 was calculated using the Black Scholes option-pricing model.
- f) Interest expense was \$496,172 in 2019 versus \$504,778 in 2018. *This represents the actual interest expense obligations incurred by the Company based on the stated interest rates on the convertible debenture notes.*
- g) Amortization expense was \$156,137 in 2019 consisting of \$152,962 relating to patents and \$3,175 relating to Capital Assets (2018: \$160,882 consisting of \$156,960 relating to patents and \$3,922 relating to Capital Assets). In 2019 the Company recorded an impairment reserve of \$223,143 on its patent portfolio based on its assessment of the net present value of the portfolio as of October 31, 2019. (2018: nil)
- h) Financing costs were \$72,476 in 2019 versus \$40,414 in 2018. These expenses relate to costs associated with the convertible debenture financings which the Company completed in 2019 and 2018. The Company utilized convertible debenture financing to a greater extent in 2019.
- i) The gain on foreign exchange reported in 2019 was \$40,548 versus \$117,779 in 2018. This included the exchange relating to the translation of \$CDN denominated transactions during the year and to Canadian denominated assets and liabilities at fiscal quarter and year ends. It also included the foreign exchange relating to the initiation, renewal, conversion and repayment of convertible debentures transactions during the fiscal years. The Canadian dollar has declined from 0.7905 at October 31, 2017 to 0.7601 at October 31, 2018 to 0.7509 at October 31, 2019 relative to the US dollar. We relied to a greater extent

on \$CDN denominated convertible debenture financing in 2018 giving rise to a larger exchange gain in 2018 versus 2019.

- j) The other expenses reported relate to the convertible debentures. These expenses are all non-cash expenses and compare as follows:

	2019	2018	Changes
Accretion expense	\$ 1,517,436	\$ 2,039,344	\$ 521,908
Loss on conversion of debentures	101,919	63,852	(38,067)
(Gain) loss on revaluation of derivatives	(343,436)	(1,094,718)	(751,282)
(Gain) loss on extinguishment of debentures	(646)	(399,191)	(398,545)
Net expense	\$ 1,275,273	\$ 609,287	\$ (665,986)

In 2019, the renewal terms at maturity date of the debentures which were renewed were typically for a shorter duration. This gave rise to generally lower accretion expense recorded over the term of the renewed debentures and lower offsetting gains reported on the revalued derivatives and the gains on extinguishment of such debt at renewal date; typically these variables move in opposite directions.

C. Unaudited Quarterly Financial Information – Summary

Three months ended (unaudited)	Revenues	Expenses	Income (loss) in period	Loss per share
	\$	\$	\$	\$
January 31, 2018	-	2,291,691	(2,291,691)	(0.01)
April 30, 2018	-	(207,605)	207,605	-
July 31, 2018	-	(22,711)	22,711	-
October 31, 2018	-	331,264	(331,264)	-
January 31, 2019	-	1,110,303	(1,110,303)	-
April 30, 2019	-	48,088	(48,088)	-
July 31, 2019	-	554,533	(554,533)	-
October 31, 2019	-	1,119,940	(1,119,940)	-

Three months ended (unaudited)	Working capital (deficiency)	Capital assets at NBV	Other Assets	Total Assets	Shareholders' equity (deficit)
	\$	\$	\$	\$	\$
January 31, 2018	(3,619,741)	8,968	451,454	566,763	(5,382,493)
April 30, 2018	(3,551,233)	8,117	438,725	597,983	(4,805,909)
July 31, 2018	(3,639,419)	7,275	427,179	605,309	(4,088,047)
October 31, 2018	(3,828,503)	9,228	396,105	710,737	(3,423,170)
January 31, 2019	(4,488,643)	8,434	364,296	473,177	(4,115,813)
April 30, 2019	(4,158,247)	7,639	326,358	379,334	(3,824,250)
July 31, 2019	(4,189,540)	6,847	149,177	189,025	(4,033,516)
October 31, 2019	(4,301,324)	2,677	20,000	83,484	(4,278,647)

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5. RISKS AND UNCERTAINTIES

There are a number of risks which may individually or in the aggregate affect the long-term commercial success of the Company, both known and unknown. An investment in the Company should be considered speculative due to the nature of the Company's activities and its current stage of development.

Stage of Development of Technology:

The Company has made strides in advancing its technology and in developing a product portfolio and in engaging customers in joint development projects. There remains the risk that the Company must successfully complete development work on these products to have available commercially viable products which can be licensed or sold.

Customers' Willingness to Purchase:

We have entered into joint development agreements whereby our prototype products are being subjected to rigorous testing by our partners. We expect to be successful in completing remaining development work on our product portfolio. If we are successful in doing so, our partners will then have to decide the extent to which they will adopt our technology for future use for their applications. The future revenue streams for the Company are dependent upon the rate of adoption by our customers and their willingness to do so.

Patent Portfolio:

The Company has spent time and effort and incurred significant costs with respect to the maintenance and development of our intellectual property portfolio. In 2019 it decided to abandon certain provisional patent filings in international jurisdictions which it believes does not impact on the core patent technology that the Company maintains. Given the nature of IP development, the Company is subject to continuing risks that our patents could be successfully challenged and that our patent pending files may not ultimately be granted full patent status. While we continue to make specific efforts to broaden our IP claims, this is an ongoing process and requires continued effort and vigilance. The Company does not have extensive in-house resources so as to manage its IP portfolio in this environment and has traditionally relied heavily on its patent attorneys for these services.

Financing:

The Company has successfully raised funding over the past several years to continue to support its development initiatives and fund the Company's corporate structure and overheads. The Company must continue to source financing in order to continue to support its business initiatives.

Competitors:

The Company is subject to competition from other entities that may have greater financial resources and more in-house technical expertise.

Management Structure:

The Company is highly dependent on the services of a small number of senior management team members. If one of these individuals were unavailable, the Company could encounter a difficult transition process.

Outstanding Lawsuit:

The Company is engaged in a lawsuit with Mr. Steven Van Fleet who, until his resignation on August 17, 2018, served as a director of the Company and as the President of the Company's wholly-owned subsidiary, MAST, Inc. This matter is discussed further in Section 7 (c) - Contingencies – in this report. The outcome of this lawsuit has not been determined at this stage.

Foreign Currency Exposure:

The Company expects to sell its products and license technologies in the United States, in Canada and abroad. It has raised financing in both \$CDN and \$USD. The Company has not hedged its foreign currency exposure. Foreign currency fluctuations present an ongoing risk to the business.

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6. GOING CONCERN

The consolidated financial statements have been prepared on the “going concern” basis, which presumes that the Company will be able to realize its assets and discharge its liabilities in the normal course of business for the foreseeable future.

There are material uncertainties related to conditions and events that cast significant doubt about the Company’s ability to continue as a going concern for a reasonable period of time in future. During the year ended October 31, 2019 the Company reported a net loss and comprehensive loss of \$2,832,864 (2018 - \$2,362,239; 2017 - \$4,346,200) and negative cash flow from operations of \$982,437 (2018 - \$1,339,309; 2017 - \$2,055,242). The Company’s working capital deficiency as at October 31, 2019 is \$4,301,324 (2018 – \$3,828,503).

The Company’s future success depends on the profitable commercialization of its proprietary magnetic sensor technology. There is no assurance that the Company will be successful in the profitable commercialization of its technology. Based upon its current operating and financial plans, management of the Company believes that it will have sufficient access to financial resources to fund the Company’s planned operations through fiscal 2020 and beyond; however, the ability of the Company to continue as a going concern is dependent on its ability to secure additional financing and/or to profitably commercialize its technology. The financial statements do not include any adjustments to reflect the possible future effects on the recoverability and classification of assets or the amounts and classifications of liabilities that may result from the possible inability of the Company to continue as a going concern.

If the “going concern” assumption was not appropriate for these consolidated financial statements, then adjustments would be necessary to the carrying value of assets and liabilities, the reported expenses and the balance sheet classifications used; in such cases, these adjustments would be material.

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7. OTHER MATTERS

(a) Critical Accounting Policies:

The accounting policies the Company believes are critical to the financial reporting process include foreign currency translation, financial instruments, compound and hybrid financial instruments, derivative liabilities, conversion features of bridge loans, patents, impairment of long-term assets, deferred development costs, revenue recognition, stock-based compensation and income taxes. These critical accounting policies are set forth in Note 4 to our consolidated financial statements as of October 31, 2019.

(b) Commitments:

The Company has extended its lease for premises through July 2022. The lease term is for 5 years and stipulates base monthly rental expenses of \$4,005 CDN. Lease commitments are as follows – commitments less than one year of \$48,060 CDN, years 2-5: \$84,105 CDN.

(c) Contingencies:

Legal Matters:

The Company has agreed to indemnify its directors and officers and certain of its employees in accordance with the Company's by-laws. The Company maintains insurance policies that may provide coverage against certain claims.

On October 7, 2018, the former President of MAST, Mr. Steven Van Fleet, filed a lawsuit against Micromem and MAST in New York State Supreme Court, Dutchess County. In the action, Mr. Van Fleet is seeking payment of \$214,574 plus interest relating to alleged remuneration and expense reimbursements due to him prior to his resignation as an officer and director of Micromem and MAST on August 17, 2018. The Company answered the complaint December 7, 2018 by denying the material allegations in Mr. Van Fleet's claims. In addition, the Company interposed 7 counterclaims against Mr. Van Fleet seeking, among other things: (i) damages of not less than \$2.75 million, (ii) specific performance to compel Mr. Van Fleet to comply with his contractual obligations which were required for the period of time that he served as an officer and director through to his resignation date; (iii) repayment of certain salary and expenses paid to Mr. Van Fleet; (iv) a direction for Mr. Van Fleet to turn over all Company property in his possession or control; and (v) an accounting to determine all money and property belonging to the Company and/or MAST. On January 24, 2019, the Company amended its original answer and counterclaims to include, among other things, a demand for additional damages. On February 8, 2019 Mr. Van Fleet, through his counsel, replied to and denied the material allegations in Micromem's counterclaims. The Company reports an accrual of \$205,788 at October 31, 2019 with respect to alleged remuneration and expense reimbursements claimed by Mr. Van Fleet but, nonetheless, has

denied the allegations in Mr. Van Fleet's claims. The matter is currently at the pretrial stage pending discoveries; this matter remains as a contingency at February 24, 2020.

In addition to the above, the Company may be subject to litigation, claims and governmental and regulatory proceedings arising in the ordinary course of business. In such cases, the Company accrues a loss contingency for these matters when it is probable that a loss has been incurred and the amount of the loss can be reasonably estimated.

(d) Off-Balance Sheet Arrangements:

At October 31, 2019, the Company has no off-balance sheet financial commitments and does not anticipate entering into any contracts of such nature other than the addition of new operating leases for equipment and premises as may be required in the normal course of business.

(e) Share Capital

At October 31, 2019 the Company reports 346,952,721 common shares outstanding (2018: 259,602,699). Additionally, the Company has 5,730,000 stock options outstanding with a weighted average exercise price of \$0.25 per share (2018: 6,250,000 options outstanding with a weighted average exercise price of \$0.29 per share).

(f) Management and Board of Directors

At our last Annual Meeting of Shareholders held on July 21, 2017, Joseph Fuda, David Sharpless, Steven Van Fleet, Oliver Nepomuceno, Larry Blue, Alex Dey, and Brian Von Herzen were re-elected to serve on our Board of Directors. Joseph Fuda and Dan Amadori continue to serve as officers of the Company. Steven Van Fleet resigned as an officer and director of the Company on August 17, 2018. As of October 31, 2018 the Company is engaged in a lawsuit with Mr. Van Fleet, as outlined in Section 7(c) above.

David Sharpless resigned as a director of the Company on March 30, 2018, after 18 years of service, to pursue other business interests. Mr. Sharpless served as Chair of the Audit Committee until his resignation; he was replaced by Mr. Alex Dey who assumed the role of Chair of the Audit Committee at that time.

Larry Blue resigned as a director of the Company on September 30, 2017, after 12 years of service to the Company, to pursue other business interests.

Our management team and directors, along with their 2019 remuneration, is presented as below:

		2019 remuneration		
		Cash	Options	Total
Individual	Position			
Joseph Fuda	President, Director	4,684	-	4,684
Oliver Nepomuceno	Director	-	-	-
Alex Dey	Director	-	-	-
Brian Von Herzen	Director	-	-	-
Dan Amadori	CFO	-	-	-

(g) Transactions with Related Parties

The Company reports the following related party transactions:

(a) Key management compensation

Key management personnel are persons responsible for planning, directing and controlling activities of the Company, including officers and directors. Compensation paid or payable to these individuals (or companies controlled by such individuals) is summarized as:

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	2019	2018	2017
Professional, other fees and salaries	\$ 4,684	\$ 235,297	\$ 667,725
Stock based compensation	-	44,740	382,531
	<u>\$ 4,684</u>	<u>\$ 280,037</u>	<u>\$ 1,050,256</u>

In 2019, these parties were awarded a total of \$nil options (2018 - 700,000 options at an exercise price of \$0.10; 2017 1,950,000 options at exercise price of \$0.25).

(b) Trade payables and other liabilities

At October 31, 2019 and 2018 the Company reports in trade payables a balance owing to the former President of MAST of \$193,174 which amount represents alleged outstanding wages payable, see Note 18(b) to the consolidated financial statements.

As at October 31, 2019 and 2018 the Company includes \$167,000 in trade payables owing to a company whose major shareholder is a director of the Company and who has also previously served as its Chief Technology Officer. This individual was elected as a director on February 19, 2014. The balance reported relates to alleged services provided in 2015; there have been no invoices submitted by this related party after October 31, 2015.

(d) Convertible debentures

In May 2019, an officer of the Company subscribed for a short-term loan of \$15,000 CDN (\$11,450 USD). At October 31, 2019, \$10,000 CDN (\$7,582 USD) in loan principal remains outstanding.

In January 2018, an officer of the Company subscribed for a convertible debenture of \$150,000 CDN (\$114,138 USD). At October 31, 2019, \$52,319 CDN (\$39,756 USD) (October 31, 2018 - \$ 100,862 CDN, \$76,713 USD) in loan principal remains outstanding.

(g) **Liquidity and Capital Resources:**

Liquidity:

We currently report negative cash flow from operations. This result will only change once we are generating sufficient revenue from either license fees, royalties or the sale of products utilizing our technology. In 2019 and subsequent to the end of the fiscal year, the Company continued to raise additional financing.

We currently have no lines of credit in place. We must continue to obtain financing from investors or from clients in support of our development projects.

We have granted to our directors, officers and employees options to purchase shares at prices that are at or above market price on the date of grant. At October 31, 2019 there are 5,730,000 options outstanding at an average exercise price of \$0.25 per share.

Capital Resources: We have no commitments for capital expenditures as of October 31, 2019.

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8. SUBSEQUENT EVENTS

Subsequent to October 31, 2019:

- 1) The Company secured, in aggregate, \$411,891 in convertible debentures with terms of 6 to 12 months. These loans have conversion features which become effective after initiation date.
- 2) The Company repaid \$122,764 CDN and \$80,000 USD in convertible debentures and \$179,370 of convertible debentures were converted into 15,927,765 common shares.
- 3) The Company extended convertible debentures that were within 4 months of maturity date from October 31, 2019. Extension terms ranged from 2 to 6 months.
- 4) The Company secured private placements with investors consisting of common shares with no warrants pursuant to prospectus and registration exemptions set forth in applicable securities law. The Company realizing net proceeds of \$402,161 and issued a total of 10,008,491 common shares.
