Minerva Intelligence Inc.

Management Discussion and Analysis
of
Financial Position and Results of Operations
for the year ended December 31, 2022

This report is dated April 28, 2023.
(The "Report Date")

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Introduction

The following information should be read in conjunction with the consolidated financial statements of Minerva Intelligence Inc. (the "Company") for the year ended December 31, 2022 and 2021.

The consolidated financial statements are prepared in accordance with International Financial Reporting Standards ("IFRS").

Note 3 to the consolidated financial statements of the Company at December 31, 2022 describes the Company's significant accounting policies, as well as new accounting pronouncements not yet effective. During the year ended December 31, 2022, the Company's critical accounting estimates and significant accounting policies have remained substantially unchanged.

All amounts presented in this document are stated in Canadian dollars, except where otherwise noted.

Forward-Looking Statements

This Management's Discussion and Analysis ("MD&A") is intended to supplement and complement the consolidated financial statements for the year ended December 31, 2022 and the consolidated financial statements of the Company for the year ended December 31, 2021, and the notes thereto (the "Financial Statements"). Readers are encouraged to review these Financial Statements in conjunction with a review of this MD&A. Certain notes to the Financial Statements are specifically referred to herein, and such notes are incorporated by reference herein. Forward-looking statements are subject to known and unknown risks, uncertainties and other factors that may cause actual results to differ materially from those implied by the forward-looking statements. These forward-looking statements are based on, but not limited to, material assumptions including: Company performance; the ability of the Company to successfully execute on its growth and new business strategies, including attracting new clients; the demand for its products continuing to increase; stable currency valuations; a sufficiently stable and healthy global economic environment; and other expectations, intentions and plans contained in this MD&A that are not historical fact. When used in this MD&A, the words "plan," "expect," "believe," and similar expressions generally identify forward-looking statements. These statements reflect current expectations. They are subject to a number of risks and uncertainties, including, but not limited to, changes in technology and general market conditions. In light of the many risks and uncertainties, readers should understand that the Company cannot offer assurance that the forward-looking statements contained in this analysis will be realized. **Readers are cautioned not to place undue reliance on these forward-looking statements, which speak only as of the date the statements were made, and readers are advised to consider such forward-looking statements in light of the risks as set forth below.**

Corporate Overview and Description of the Business

Minerva Intelligence Inc. (the "Company" or "Minerva") was incorporated on August 16, 2017 pursuant to the *Business Corporations Act* of British Columbia and was classified as a Capital Pool Company as defined in the TSX Venture Exchange ("TSX-V") Policy 2.4. On March 14, 2018, the Company completed its Initial Public Offering ("IPO") and on March 26, 2018, the Company's shares commenced trading on the TSX-V.

Minerva Intelligence (Canada) Ltd. ("Minerva Canada") was incorporated on May 17, 2017 pursuant to the Business Corporations Act of Ontario. On April 23, 2019, Minerva Canada continued its jurisdiction of incorporation from Ontario to British Columbia, to become subject to the B.C. Business Corporations Act ("BCBCA"). During the year ended December 31, 2019, the Company acquired Minerva Canada through a wholly owned subsidiary, 1198574 B.C. Ltd., which was incorporated on February 22, 2019 to facilitate this acquisition.

Minerva Intelligence Gmbh was incorporated on September 24, 2019 as the German subsidiary of the Company. Minerva Intelligence (U.S.), Inc., a currently inactive US subsidiary, was incorporated in Delaware on August 2, 2022.

The head office of the Company is located at Suite 810 - 1166 Alberni Street, Vancouver, British Columbia V6E 3Z3. The registered office of the Company is located at 2900 - 595 Burrard Street, Vancouver, B.C. V7X 1J5.

Description of the Business

Minerva is a software and data analytics company that is bringing innovative technology to the market. The Company provides decision-support tools that help our customers reach conclusions faster and with the rigour needed to trust the results. Minerva is focused on helping businesses better understand the earth and is currently pursuing climate risk identification and mitigation. Minerva's proprietary technology consists of the software and data products developed by our team of software engineers, developers and data scientists.

Minerva believes that there will be significant growth in Climate SaaS over the next decade. Given the complexity of applying climate science in commercial applications, along with limited availability of unique datasets and rapidly evolving field, it is improbable for many enterprises to invest in developing their own proprietary software. Instead, companies like Minerva Intelligence with a blend of climate science and AI expertise are poised to emerge as providers of value-added software services, delivering the necessary AI expertise and domain-specific knowledge in climate science to support a variety of industries. Minerva built the flagship product, climate85, to address the lack of consistent, nationwide climate risk datasets in Canada, and to provide businesses with the tools and knowledge necessary to manage their exposure to climate risk with confidence.

climate85

climate85 is a data and analytics platform providing access to physical climate risk information for every location in Canada. climate85 is a powerful tool that provides data and analytics to help Canadians better understand the impacts climate change is having on our homes, businesses, infrastructure and investments. climate85 uses the most advanced scientific techniques to forecast Climate Change impacts on our natural systems and economy, providing an extensive database of spatial layers as well as analytical tools to our prospective customers. climate85 has tools and functionalities designed for banks and financial institutions, REITS, Insurers and underwriters, physical infrastructure owners, engineers, scientists and governments.

Worldwide, regulatory bodies are starting to provide guidance to businesses on how to provide climate risk disclosure in the context of ESG reporting. The EU is taking the lead and, since April 2019, has initiated the Non-Financial Reporting Directive ("NFRD"), which obligates companies to disclose climate-related information. This obligation applies to listed companies, banks, and insurance companies. Since 2021, the Corporate Sustainability Reporting Directive ("CSRD") extends the NFRD to cover all large companies and all companies listed on regulated markets. These new standards entered into force January 2023, with all large companies and all listed companies now having to comply with the updated rules concerning environmental risks (including climate risk).

In the U.S., major regulatory bodies such as the Securities & Exchange Commission, the Federal Reserve banks, and the Treasury Department, who traditionally avoid mandating disclosure rules for publicly traded corporations, are considering and will likely adopt measures to support ESG, especially with respect to climate issues. Canada is also moving forward with the Canadian Security Administrators ("CSA"), providing guidance on climate risk disclosure, and also recently announcing a requirement for crown corporations' annual reports to comply with the Task Force for Climate-related Financial Disclosures ("TCFD") in the coming years.

In the opinion of Management, these new regulations and guidelines represent a significant potential market opportunity for Minerva, as traditional businesses lack the necessary climate risk data and knowledge to properly assess and disclose the climate-related risks relevant to their operations. A recent industry report[1] has revealed that voluntary adoption of climate risk disclosures ahead of the coming regulatory changes is on the rise. Minerva has developed unique expertise in physical climate risk under its previous GAIA brand demonstration products and Management believes Minerva is well-positioned. Minerva has also recently completed consulting projects for the Government of Canada to organize national-scale flood hazard data and hydrological network, expanding its data modeling knowledge and capabilities. In 2021 Minerva began development of the Canadian Coastal Zone Information System, a tool that will help Canadian businesses and government bodies better understand and access coastal climate hazard information. climate85 is built on the expertise and datasets we have amassed over the past four years of designing industry standards that underpin climate hazard modelling, risk assessments and regulation.

Climate reporting regulations and climate science is a rapidly evolving field and Management expects climate85 to require continued research and development to meet the market needs. Concurrent to the research and development of the product Minerva is conducting stakeholder engagement and market research to guide future developments. The platform is accessible on a SaaS-based model to general users, while climate85 datasets are made available through API to more sophisticated users.

Future Applications

Minerva believes that there are opportunities in other industries affected by climate risk as government and other regulators mandate companies across the globe to evaluate and disclose their climate risks. These industries include but are not limited to, agriculture, carbon credit trading, forestry, real estate, insurance, engineering and banking.

Minerva's proprietary software is applicable to a wide range of problem domains and industries; far too many for Minerva to pursue on its own. In this regard, Minerva is actively identifying partners and developing relationships with external organizations who could benefit from using Minerva's tools while building applications in a variety of industries. Minerva sees this opportunity to license its tools for the development of new applications as a potentially much larger market than climate risk disclosures are on its own.

This strategy will allow Minerva's unique software tools to see their full potential in a wide array of applications and markets. While management intends to pursue this strategy, there is no assurance that additional products will be developed and marketed through the means of software licensing.

Operations

Minerva conducts its operations using a combination of full and part-time employees, supplemented by independent contractors where additional part-time, short-term, or specialized services are required. The R & D development team is based at the Company's principal operating office in Vancouver, British Columbia. Minerva itself is not materially directly affected by climate risks, as our operations are largely diversified and are therefore somewhat independent of our tangible assets and physical office. However, Minerva has been affected by the downturn in technology markets and has restructured staffing levels to reflect current operations.

Marketing Plans and Strategies

Minerva's software and data products are being marketed to pre-qualified leads around the world using Minerva's existing database of industry contacts, as well as those identified via industry events, publications, thought

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[1] PwC Canada. (2023). *2023 Canadian ESG Reporting Insights*. https://www.pwc.com/ca/en/today-s-issues/environmental-social-and-governance/esg-reporting-insights.html

leadership pieces, and intelligence initiatives. Minerva is seeking partnerships with businesses and organizations to bring its service offerings to new markets.

The Company also uses key leading industry tools such as HubSpot CRM, ZoomInfo, and LinkedIn, for example, to assist with our growth, insights and projections. Minerva's efforts include direct digital marketing, content marketing and advertising, conference attendance, trade publications, media engagement, and active communication with various media outlets.

The Company continues to expand its network and establish mutually beneficial strategic relationships which will also allow Minerva to expand by future acquisition and/or partnership opportunities, including new technologies that may complement its business.

Intellectual Property

In accordance with industry practice, Minerva protects its proprietary rights through a combination of copyright, trade-mark, trade secret laws and contractual provisions. The source code for its Software is protected under Canadian and applicable international copyright laws. Minerva licenses its Software pursuant to agreements that impose restrictions on customers' ability to use the technology, such as prohibiting reverse engineering, limiting the use of software copies and restricting access and use of source code. Minerva also seeks to avoid disclosure of intellectual property and proprietary information by requiring employees and consultants to execute non-disclosure and assignment of intellectual property agreements. Such agreements require employees and consultants to assign to Minerva all intellectual property developed in the course of their employment or engagement. Minerva utilizes non-disclosure agreements to govern interaction with business partners and prospective business partners and other relationships where disclosure of proprietary information may be necessary. The Company has applied for one patent on its intellectual property related to diagnosticity.

Changes in Operations and Activities during the Period

On October 20, 2021, the Company entered into a five-year lease for new office premises, comprising 1,957 square feet, at rates varying from $31 to $33 per square foot. The lease was to commence on February 1, 2022. Due to permitting delays for required construction, the effective date of the lease was May 1, 2022.

On February 10, 2022, the Company announced the appointment of Dr. David Poole to its Board of Directors. Mr. Poole replaced Mr. Clinton Smyth, who agreed to step down as a director, but who remains as an active consultant to the Company.

On March 1, 2022 the Company announced a major milestone with the signing of its first recurring annual licensed SaaS customer, Jaguar Mining (TSX:JAG), for its AI software DRIVER.

On April 07, 2022 the Company announced that it had qualified for trading on the OTCQB Venture Market in the United States operated by the OTC Markets Group Inc. The Company's common shares trade on the OTCQB under the symbol "MVAIF". The Company also announced that it had entered into an agreement with Morgan Knowles to provide the Company with investor relations services, particularly with developing and managing a comprehensive investor relations and corporate communications program.

On May 11, 2022 the Company announced that DRIVER has been transformed from an internal tool for geological consulting projects into a first-of-its-kind, highly scalable cloud-based SaaS product, which was available for license on an annual recurring basis, allowing Minerva to build and maintain customer relationships as well as a reliable revenue stream. Minerva offers three license levels for end-user clients of varying size, as well as an upgradable limited-term Proof-of-Concept (POC) license. Minerva announced that in April a total of three licenses were signed.

On May 24, 2022 the Company announced the launch of climate85, a data and analytics platform to access physical climate risk information at every location in Canada. Minerva launched climate85 based on the product developments and market research the Company has completed with its Climate Risk team under the GAIA Brand. More information on climate85 can be found on the climate85 webpage: climate85.com

On September 2, 2022 the Company announced the launch of the first pan-Canadian API (application programming interface) for climate risk data. The climate85 API provides access to leading climate risk information forecasting for heat, humidex, precipitation and wind until the year 2100. climate85 is the first comprehensive climate risk dataset for Canada. Minerva and the climate85 team expect to expand the API data coverage outside of Canada in 2023. The climate85 climate risk datasets have been created using the foremost scientific methodologies and are based on a curated set of global climate models paired with Canadian historic climate data. The API offers 36 datasets that cover a range of climate change scenarios and time horizons. The datasets are currently available for public access on a limited basis. Commercial and bulk users can reach out to the climate85 team for more information on API licensing.

On September 12, 2022 the Company announced a new release of the DRIVER software. The updated DRIVER software improved the integration of the machine learning-based grade directionality analysis toolkit with existing deposit frameworks. DRIVER's proprietary geostatistical algorithm increased significantly in speed and accuracy at which it automatically finds local 3D grade trends in unprocessed drilling information. In addition, the changes expanded the potential applications of software to a wider range of mineral deposit styles at different stages of development.

On December 9, 2022, the Company announced the sale of the geology division, including the DRIVER software platform to Bentley Systems, for Seequent, The Bentley Subsurface Company for $1 million CAD. As a result of the transaction, the Company recognized a gain of $954,691. Upon completion of the transaction, the operations of the geology division were classified as a discontinued operation in the consolidated statement of loss and comprehensive loss for the years ended December 31, 2022 and 2021.

The results of the discontinued operations were as follows:

		2022		2021
Sales	$	216,663	$	780,620
Expenses				
Advertising and promotion	$	160,597	$	47,019
Consulting - Product development		5,175		181,098
Salaries and wages		1,288,976		1,197,250
Share-based compensation		19,495		53,188
Software application subscriptions		125,228		-
		(1,599,471)		(1,478,555)
Operating loss		(1,382,808)		(697,935)
Gain on disposal of discontinued operation		954,691		-
Loss from discontinued operations	$	(428,117)	$	(697,935)

The gain on disposal of the discontinued operation was determined as follows:

Cash consideration:	$	1,000,000
Bank charges		(17)
		999,983
Net assets disposed of:		
Intangible assets		(45,292)
Gain on disposal of geology division	**$**	**954,691**

Pursuant to the agreement related to the sale of the geology division, the Company recorded a gain of $150,436 related to client deposits retained under the agreement, and a loss of $48,430 related to accounts receivable which were deemed uncollectable as of December 31, 2022.

On March 30, 2023 the Company announced that climate85 has launched a wildfire risk score that is the first publicly available wildfire risk score dataset in Canada. The climate85 wildfire risk score dataset delivers both yearly and 30-year aggregate probabilities of wildfire ignition and spreading for any location in Canada. The 30-year aggregate probability also allows for a clear evaluation of the likelihood of a property being impacted by a wildfire, expressed as a percentage probability (ranging from 0-100%) and a risk score that ranges from minor (less than 1%) to extreme (greater than 26%). Canada's First Comprehensive Wildfire Risk Map (CNW Group/Minerva Intelligence Inc.) Based on the dataset, the Company analyzed all properties in Canada and estimated that roughly 300,000 buildings are exposed to a high wildfire risk, with a 14% or greater probability of being affected over a 30-year period. Furthermore, over one million properties carry a minor risk (i.e., greater than 1%) of being impacted by wildfires during the typical mortgage term, potentially putting homeowners at risk of losing their property. climate85 uses a state-of-art, peer-reviewed and globally recognized methodology to ensure the best possible data quality of this datasets. This approach incorporates a variety of data sources, such as historical weather patterns, national fire-fuel maps, digital elevation models, and prevailing wind patterns, to pinpoint areas where fires may occur and spread. By analyzing the locations of more than 400,000 historical fires and running over 400 million simulations, Minerva has created a probability map of wildfire risk scores that spans across Canada. The wildfire risk score dataset provided by climate85 is currently the only publicly accessible pan-Canadian map of its kind. This risk score is a valuable addition to the suite of climate85 climate risk datasets, which already includes extreme heat, precipitation, humidex, and wind data. Furthermore, flood data will be added to this collection soon. These datasets are available through the climate85 API and address lookup toolbar for every location in Canada. Users can effortlessly search for a specific address or coordinates to obtain trustworthy, cutting-edge information on their exposure to wildfire, extreme heat, humidex precipitation, and wind risk. The address lookup functionality makes it easy for non-technical individuals to gain an understanding of climate risks on their property, anyone can look up a limited number of addresses for free. Commercial options are available for bulk lookup of addresses to gather insights on hundreds or thousands of properties and locations simultaneously through the climate85 API.

Minerva is seeking partnerships with businesses and organizations to customize its climate risk scores to the different specific industry needs. With state-of-the-art climate science and deep expertise in AI, Minerva's data analytics can be used to address a range of climate-related challenges, including physical climate risk assessments, ESG reporting, insurance underwriting, asset management, financial risk modeling, and climate-resilient engineering design. By partnering with Minerva, companies can gain a competitive advantage by harnessing the latest technology and data-driven insights to inform strategic decision-making and mitigate the risks of climate change.

Results of Operations

Results for the year ended December 31, 2022

During the years ended December 31, 2022 and 2021, the Company recorded revenues in continuing and discontinued operations as follows:

	Year ended December 31, 2022	2021
Revenue		
Continuing operations		
Consulting	$ 104,892	$ 268,679
Discontinued operations (note 15)		
Consulting	-	780,620
SaaS	216,663	-
	$ 321,555	$ 1,049,299

	Year ended December 31, 2022	2021
Revenue		
Canada	$ 249,205	$ 759,889
United States	-	277,094
Other	72,350	12,316
	$ 321,555	$ 1,049,299

Expenses from continuing operations for the year were $2,223,281 (2021: $2,397,536), and the comprehensive loss for the period was $2,479,745 (2021: $2,838,645).

The most significant elements of the Company's expenses from continuing operations are:

- Advertising and promotion of $198,717 (2021: $250,999) reflects the expensing of certain prepaid amounts for IR contracts which terminated in Q1 and Q2, temporarily increased in in-house marketing personnel, and general corporate IR activities;
- Amortization of $147,704 (2021: $194,390) was lower as depreciable assets were reduced, having reached the end of their lives;
- Consulting – Corporate development of $nil (2021: $29,000) was due to the use of outside advisors for certain non-core activities related to corporate structuring and financing in 2021;
- Consulting – Product development of $140,089 (2021: $48,883) shows the use of outside consultants in specific areas to develop specific products and product inputs where that capability was not in-house. Certain projects, require additional temporary resources that reasonably would not be brought in-house on a permanent basis. Expenses were reduced this year as product development reached maturity;
- Directors' fees of $115,500 (2021: $101,710) are paid to independent directors only and reflect the composition and level of fees paid to those directors;
- General and administrative expenses of $183,229 (2021: $129,937) reflect the operations of the Company and include the cost of diverse items such as insurance, internet and telephone and other general office expenses.

During the year, the Company paid higher month-to-month rent on its former leased office space due to the delays encountered with the new leased office, as well as moving expenses;

- Outsourced services expense of $16,320 (2021: $51,690) consists of the cost of third-party service providers which were contracted and directly related to a specific project based on their expertise;
- Professional fees were $135,325 (2021: $120,642) consisting of legal, accounting, tax and other professional advisory expenses. Expenses vary due to the level of corporate activities and the timing of billing by professional advisors;
- Regulatory and filing fees of $63,315 (2021: $nil) consist of the renewal of annual TSXV listing fees, as well as the cost of obtaining a quotation on the OTCBB and being accepted for the DTC. While certain listing fees will reoccur annually, the fees were much higher due to making the initial applications;
- Research and development expenses of $18,750 were incurred in 2021. There were no similar expenses in 2022;
- Salaries and wages of $1,049,464 (2021: $1,041,451) varied slightly as there was some staff turnover, subsequent replacements of staff at varying salaries and, due to significant restructuring and the sale of the geology division, severance costs. Subsequent to the year end, staffing expenses are reduced considerably;
- Share-based compensation of $39,655 (2021: $162,756) results from the timing of the grant and vesting of options, including previously issued options, the options granted in the second quarter of 2022 and the market price of the Company's shares among other factors;
- Software application subscriptions of $53,669 (2021: $183,464) reflect the pricing and timing of licensed software renewals used by the Company;
- Transfer agent fees of $17,330 (2021: $44,675) are incurred as a result of administering a public Company, holding annual general meetings and making appropriate filings. The higher transfer agent fees in 2021 is partially attributable to share offerings closed in that year;
- Travel of $62,964 (2021: $19,189) reflects the restart of meetings with clients, potential funders and strategic partners, and attendance at trade shows, compared to the levels of previous years with restricted or no travel permitted;
- A foreign exchange gain of $7,523 (2021: loss of $12,004) was recorded, reflecting normal variations in exchange rates. Future results will be subject to fluctuation based on balances held and converted to Canadian funds;
- Interest expense of $11,124 (2021: $1,713) was incurred with respect to the lease liability;
- Interest income of $319 (2021: $1,864) was nominal due to reduced investments in term deposits and reduced interest rates;
- A loss on disposal of assets of $10,164 was recorded in the period (2021 - $nil) as the Company started to dispose of redundant furniture in preparation for the move, as well as some older computer equipment;
- A loss on the write off or intangible assets of $21,799 was recorded related to the impairment of the software remaining after the sale of the geology division (2021 - $nil);
- A loss of $48,430 (2021 - $nil) was recorded with respect to accounts receivable deemed uncollectible after the sale of the geology division; and
- A gain of $150,436 (2021 - $nil) was recorded with respect to deposits retained as a result of the sale of the geology division.

The loss from discontinued operations, which included the discontinued operations income noted above, was recorded as $428,117 in 2022 and $697,935 in 2021. The 2022 results include the gain on the disposal of the geology division of $954,691.

Quarterly Summary

The following table summarizes selected financial information of the Company for the periods available.

	Fiscal 2022			
	12/31/2022	**9/30/2022**	**6/30/2022**	**3/31/2022**
	Q4	**Q3**	**Q2**	**Q1**
	(Unaudited)	**(Unaudited)**	**(Unaudited)**	**(Unaudited)**
	$	$	$	$
Revenue	(169,356)	89,422	61,704	123,122
Operating expenses	(974,451)	888,821	(1,075,299)	(1,062,352)
Other items	59,582	12,725	(772)	(4,774)
Operating loss	718,867	(812,124)	(1,014,367)	(944,004)
Discontinued operations	(428,117)	-	-	-
Comprehensive income (loss)	290,750	(812,124)	(1,014,367)	(944,004)
Current Assets	1,228,426	1,019,923	1,795,252	2,614,002
Total Assets	1,519,864	1,427,015	2,240,608	2,781,622
Total Liabilities	474,686	672,798	674,267	259,006
Shareholders' Equity	1,045,178	754,217	1,566,341	2,522,616

	Fiscal 2021			
	12/31/2021	**9/30/2021**	**6/30/2021**	**3/31/2021**
	Q4	**Q3**	**Q2**	**Q1**
	(Unaudited)	**(Unaudited)**	**(Unaudited)**	**(Unaudited)**
	$	$	$	$
Revenue	148,866	78,685	269,351	552,397
Operating expenses	(1,089,552)	(800,858)	(967,730)	(1,017,951)
Other items	(5,984)	9,390	(12,620)	(2,639)
Net Income (Loss)	(946,670)	(712,783)	(710,999)	(468,193)
Current Assets	3,537,006	4,248,692	715,562	1,381,076
Total Assets	3,736,260	4,500,763	1,011,259	1,721,844
Total Liabilities	270,487	283,863	348,331	352,693
Shareholders' Equity	3,465,773	4,216,900	662,928	1,369,151

Selected Annual Information

	Year ended December 31, 2022 (Audited) $	2021 (Audited) $	2020 (Audited) $
Revenue	104,892	1,049,299	340,584
Operating expenses	(2,223,281)	(3,876,091)	(3,329,438)
Other items	66,761	(11,853)	215,057
Operating loss	(2,051,628)	(2,838,645)	(2,773,797)
Discontinued operations	(428,117)	-	-
Comprehensive loss	(2,479,745)	(2,838,645)	(2,773,797)
Current assets	1,228,426	3,537,006	1,482,200
Total assets	1,519,864	3,736,260	1,866,288
Total liabilities	474,686	270,487	364,517
Shareholders equity	1,045,178	3,465,773	1,501,771

Financing Activities

During the year ended December 31, 2022, there were no share issuances.

During the year ended December 31, 2021, the Company completed the following share transactions:

- 29,966,332 units were issued pursuant to a private placement at price of $0.15 per unit for gross proceeds of $4,494,950. Each unit comprised one common share of the Company and one-half common share purchase warrant of the Company. Each full warrant is exercisable at a price of $0.25 per share for a period of 24 months until September 17, 2023. Commissions of $205,772 were paid, and 1,371,813 broker warrants were issued exercisable at a price of $0.25 per share until September 17, 2023, which were valued at $152,477 using the Black-Scholes option pricing model;
- 966,700 units were issued pursuant to a non-brokered private placement at price of $0.15 per unit for gross proceeds of $145,005. Each unit comprised one common share of the Company and one common share purchase warrant of the Company. Each warrant is exercisable at a price of $0.20 per share for a period of 24 months until February 17, 2023; and
- 1,200,000 units were issued pursuant to a non-brokered private placement at a price of $0.15 per unit, for gross proceeds of $180,000. Each unit comprised one common share of the Company and one common share purchase warrant of the Company. Each warrant is exercisable at a price of $0.20 per share for a period of 24 months until March 24, 2023.

As of December 31, 2022, the Company had 76,958,037 shares issued and outstanding (2021 - 76,958,037).

Liquidity and Capital Resources

The Company's aggregate operating, investing and financing activities for the year ended December 31, 2022 resulted in a cash decrease of $2,037,200 (2021 - an increase of $1,817,881). As at December 31, 2022, the Company's cash balance was $1,140,192 (2021 - $3,177,392), and the Company had working capital of $894,508 (2021 - $3,266,519).

During the year ended December 31, 2022, the Company paid $33,951 to acquire furniture and equipment, and $16,586 for leasehold improvements (2021 - $9,953). $nil (2021 - $397) was received related to the sale of redundant furniture and equipment in the year.

No other material capital expenditures were incurred.

Transactions with Related Parties

Related parties include key management personnel, who are those persons having authority and responsibility for planning, directing and controlling the activities of the Company as a whole. The Company has determined that key management personnel consist of executive and non-executive members of the Company's Board of Directors and corporate officers. The remuneration of key management personnel during the periods ended December 31, 2022 and 2021 was as follows:

	Year ended December 31, 2022	Year ended December 31, 2021
Directors' fees	$ 115,500	$ 101,710
Salaries and wages	755,526	681,754
Professional fees & Consulting	70,500	56,000
Share-based compensation	50,143	138,446
	$ 991,669	$ 977,910

Amounts due to related parties at December 31, 2022 and 2021 are unsecured, interest free and due on demand. As at December 31, 2022, accounts payable and accrued liabilities include $23,625 (2021 - $nil) owing to the Chief Software Architect of the Company, and $42,000 (2021 - $10,500) owing to directors for directors' fees.

Directors' fees are paid to the independent directors. Salaries and wages are paid to the senior executives of the Company, comprising the Chief Executive Officer, President, Chief Operating Officer, Chief Financial Officer, and Chief Technology Officer. Professional and consulting fees are paid to the Chief Software Architect and other contractors formerly related as directors or officers. Share-based compensation reflects the cost of options granted to any and/or all of the above.

Off Balance Sheet Arrangements

To the best of management's knowledge, there are no off-balance sheet arrangements that have, or are reasonably likely to have, a current or future effect on the results of operations or financial condition of the Company.

Critical Accounting Estimates

The preparation of the consolidated financial statements requires management to make judgments and estimates and form assumptions that affect the reported amounts of assets and liabilities at the date of the consolidated financial statements and reported amounts of expenses and gains or losses during the reporting period. On an ongoing basis, management evaluates its judgments and estimates in relation to assets, liabilities, revenue and expenses, gains and losses. Management uses historical experience and various other factors it believes to be reasonable under the given circumstances as the basis for its judgments and estimates. Actual outcomes may differ from these estimates under different assumptions and conditions.

Estimates and assumptions that have the most significant effect on the amounts recognized in the consolidated financial statements include:

Share-based Payment Transactions

The Company measures the cost of equity-settled transactions by reference to the fair value of the equity instruments at the date at which they are granted. Estimating fair value for share-based payment transactions requires determining the most appropriate valuation model, which is dependent on the terms and conditions of the grant. This estimate also requires determining the most appropriate inputs to the valuation model including the expected life of the stock options, volatility and dividend yield and making assumptions about them.

Economic recoverability and probability of future economic benefits of intangible assets and amortization

Management has determined that intangible asset costs incurred which were capitalized have future economic benefits and will be economically recoverable. Management uses several criteria in its assessments of economic recoverability and probability of future economic benefits including anticipated cash flows and estimated economic life. The amortization expense related to intangible assets has been determined using estimates relating to the useful life of the intangible assets.

Determination of functional currency

The functional currency of the Company is the currency of the primary economic environment in which it operates. Determination of the functional currency may involve certain judgments to determine the primary economic environment. The functional currency may change if there is a change in events and conditions which determine the primary economic environment.

Discontinued operation

The Company uses its judgment to determine whether a component of the Company that has been disposed of meets the criteria of a discontinued operation. The key area that involves management judgment in this determination is whether the component represents a separate major line of business or geographical area of operation.

Changes in Accounting Policies

The accounting policies applied in the consolidated financial statements are the same as and unchanged from those applied in the Company's annual audited financial statements for the years ended December 31, 2022 and 2021. The reader is referred to those notes for a detailed discussion of the Company's accounting policies.

Financial Instruments

The Company is exposed to various financial risks resulting from its operations. The Company's management manages financial risks. The Company has not entered into financial instruments agreements, including derivative financial instruments for speculative purposes. The Company's main financial risk exposures and its financial policies are as follows:

Credit risk

Credit risk is the risk that one party to a financial instrument will cause a financial loss for the other party by failing to discharge an obligation. The Company's cash and accounts receivable are exposed to credit risk, with the carrying values being the Company's maximum exposure. The Company's cash consists of deposit accounts with chartered banks. The Company's accounts receivable consists of contract payments due from governments and companies, with the carrying amounts also being the Company's maximum exposure. Management believes the Company's exposure to credit risk is not material. The Company's exposure to and management of credit risk has not changed materially from that of the prior year.

Liquidity risk

Liquidity risk is the risk that the Company will encounter difficulty in meeting obligations associated with financial liabilities. The Company's accounts payable and accrued liabilities are all current and due within 90 days of the consolidated statement of financial position date. The Company seeks to ensure that it has sufficient capital to meet short-term financial obligations after taking into account its operating obligations and cash on hand. The Company's exposure to and management of credit risk has not changed materially from that of the prior year.

Market risk

Market risk is the risk of loss that may arise from changes in market factors such as interest rates, foreign exchange rates, and equity prices.

Interest rate risk

Interest rate risk is the risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in market interest rates. The Company maintains certain cash balances in term deposits which renew periodically, and which rates reflect the market at the time of renewal. Management believes that the interest rate risk on these investments is nominal. The Company is not exposed to any other material interest rate risk aside from the term deposits noted. The Company's exposure to and management of interest rate risk has not changed materially from that of the prior year.

Foreign exchange risk

Foreign exchange risk is the risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in foreign exchange rates. The Company is exposed to foreign exchange risk as it engages in transactions in other foreign currencies, from time to time. As at December 31, 2022, the carrying values of the financial assets and liabilities denominated in US dollars were converted to CAD at a rate of 1.3541 (2021 - 1.2678) and Euros converted to CAD at the rate of 1.4487 (2021 - 1.4391). A 10% change in the foreign exchange rate would have an impact on profit and loss of $8,452 (2021 - $9,586):

	December 31, 2022	December 31, 2021
Cash (US dollar)	$ 80,239	$ 92,206
Cash (Euros)	4,775	5,785
Amounts receivable (US dollar)	-	38,034
Accounts payable and deposits (US dollar)	-	(39,714)
Accounts payable (Euros)	(494)	(450)
Total	$ 84,520	$ 95,861
10% change in the exchange rate impact	$ 8,452	$ 9,586

Price risk

Equity price risk is defined as the potential adverse impact on the Company's earnings due to movements in individual equity prices or general movements in the level of the stock market. The Company does not have any financial instruments which are exposed to this risk.

Outstanding Share Data

As at December 31, 2022 and the date of this MD&A the following table summarizes the outstanding share capital of the Company:

	December 31, 2022	**Report Date**
Common Shares	76,958,037	76,958,037
Stock Options	4,492,625	2,620,625
Warrants	17,149,166	14,983,166
Total, Fully Diluted	**98,599,828**	**94,561,828**

Subsequent to the yearend, 1,872,000 options exercisable at prices ranging from $0.07 to $0.30 expired. 787,125 exercisable at $0.07 expired due to reaching the end of their term, and 1,084,875 expired due to their being held by previous employees. 2,166,000 warrants also expired unexercised as follows:

Expiry Date	**Outstanding**	**Exercise Price $**
2023-01-19	966,000	0.20
2023-02-17	1,200,000	0.20
	2,166,000	$ 0.20

Risks and Uncertainties

An investment in the Company's common shares should be considered highly speculative due to the nature of the Company's business and the present stage of its development. In evaluating the Company and its business, the Reader should carefully consider the following risk factors in addition to the other information contained in this MD&A. These risk factors are not a definitive list of all risk factors associated with the Company. It is believed that these are the factors that could cause actual results to be different from expected and historical results. Investors should not rely upon forward-looking statements as a prediction of future results.

Business Model

The industry in which the Company operates is characterized by evolving industry conditions and standards, and changing user and client demands. Any evaluation of the Company's business and its prospects must be considered in light of these factors and the risks and uncertainties often encountered by companies in an evolving industry.

Some of these risks and uncertainties relate to the Company's ability to maintain and expand client relationships and respond effectively to competition and potential negative effects of competition on profit margins. If the Company is unable to address these risks, its business, results of operations and prospects could suffer.

Significant future capital requirements, future financing risk and dilution

No assurances can be provided that the Company's financial resources will be sufficient for its future needs. Revenues from current operations are insufficient to meet the Company's expected capital requirements. As such, the Company may be required to undertake future financings which may be in the form of a sale of equity or debt secured by assets. No assurances can be made that the Company will be able to complete any financing arrangements or that the Company will be able to obtain the capital that it requires. In addition, the Company cannot provide any assurances that any future financings will be obtained on terms that are commercially favourable to the Company.

Any such sale of Company shares, or other securities will lead to further dilution of the equity ownership of existing shareholders. Additionally, options and warrants or other conversion rights issued or granted by the Company may adversely affect future equity offerings, and the exercise of those options and warrants may have an adverse effect on the value of the Company shares. If any such options, warrants or conversion rights are exercised at a price below the then current market price, if any, then (i) the market price of the Company shares could decrease, and (ii) shareholders may experience dilution of his or her investment. The issuance of Company shares in the future will result in a reduction of the book value and market price of the then outstanding Company shares. If any such additional Company shares are issued such issuances will result in a reduction in the proportionate ownership and voting power of all current shareholders. Further, such issuance may result in a change of control of the Company.

A prolonged decline in the price of the Company shares could result in a reduction in the liquidity of the Company shares and a reduction in the Company's ability to raise capital. As a significant portion of the Company's operations will probably be financed through the sale of equity securities a decline in the price of the Company shares could be especially detrimental to liquidity.

Technological Change

The Company operates in a business environment that is entirely dependent on technology. As such, technological change will impact the ability of the Company to expand and grow its business and will also affect the costs and expenses incurred by the Company, including capital requirements. The artificial intelligence market continues to experience rapid technological change. There is a risk that new technologies and standards may render the Company's software applications obsolete. The Company may be required to invest significant capital in new technology and software development to remain competitive. Failure to do so may adversely affect demand for the Company's products and services.

Share price volatility and liquidity

There is a limited market for the Company's shares, and the trading price may increase or decrease in response to a number of events and factors, both known and unknown. In addition, the market price of the Company shares will be affected by many variables not directly related to the Company's success and will therefore not be within the Company's control, including other developments that affect the market for all software and/or AI sector securities, the breadth of the public market for the common shares, and the attractiveness of alternative investments. The effect of these and other factors could cause the Company's share price to be volatile in the future.

The market price for the Company shares may also be affected by the Company's ability to meet or exceed expectations of analysts or investors. Any failure to meet these expectations, even if minor, may have a material adverse effect on the market price of the Company shares.

Regulatory requirements

The Company may be affected in varying degrees by government policies and regulations. Changes in government, regulations and policies and practices, beyond the control of the Company, could have an adverse impact on its future cash flows, earnings, results of operations and financial condition.

Limited Operating History

Minerva is in the early stage of development and has a limited history of operations. The Company will be subject to many risks common to start-up enterprises and its viability must be viewed against the background of the risks, expenses and problems frequently encountered by companies in the early stages of development in new and rapidly evolving markets such as the AI industry. This includes under-capitalization, cash shortages, limitations with respect to personnel, lack of revenues and financial and other resources. There is no assurance that the Company will develop its business profitably, and the likelihood of success of the Company must be considered in light of its early stage of operations. There is no assurance that the Company will be successful in achieving a return on shareholders' investment.

Management of Growth

The Company may be subject to growth-related risks including pressure on its internal systems and controls. The Company's ability to manage its growth effectively will require it to continue to implement and improve its operational and financial systems and to expand, train and manage its employee base. The inability of the Company to deal with this growth could have a material adverse impact on its business, operations and prospects. While management believes that the Company has made the necessary investments in infrastructure to process anticipated volume increases in the short term, the Company anticipates it may experience growth in the number of its employees and the scope of its operating and financial systems, resulting in increased responsibilities for the Company's personnel, the hiring of additional personnel and, in general, higher levels of operating expenses. In order to manage its current operations and any future growth effectively, the Company will also need to continue to implement and improve its operational, financial and management information systems and to hire, train, motivate, manage and retain its employees. There can be no assurance that the Company will be able to manage such growth effectively, that its management, personnel or systems will be adequate to support the Company's operations or that the Company will be able to achieve the increased levels of revenue commensurate with the levels of operating expenses associated with this growth.

Negative cash flow and absence of profits

Minerva has not earned any profits to date and there is no assurance that it will earn any profits in the future, or that profitability, if achieved, will be sustained. The success of the Company will ultimately depend on its ability to generate revenues from operations. There is no assurance that any future revenues will be sufficient to generate the required funds to develop the Company's business.

Protection of intellectual property rights

The future success of the Company's business will be dependent upon the intellectual property rights surrounding certain technology held by Minerva, including trade secrets, know-how and technological innovation. The Company's failure to protect its intellectual property could harm its ability to compete effectively. The Company is highly dependent on its ability to protect its proprietary technology. It intends to protect its rights vigorously; however, there can be no assurance that these measures will, in all cases, be successful. Enforcement of its intellectual property rights may be difficult. Also, competitors could independently develop technologies that are perceived to be substantially equivalent or superior to the Company's technologies. The Company may be subject to claims of intellectual property infringement. Other companies may claim that Minerva infringes their intellectual property, which could materially increase costs and materially harm the Company's ability to generate future revenue and profits. Although the Company does not believe that its products infringe on the rights of third parties, third parties may assert infringement claims against it in the future. Although most of Minerva's technology is proprietary in nature, it does rely to a limited extent on third party software.

Reliance on computer systems

The Company's information technology and internal infrastructure is susceptible to damage from computer viruses, unauthorized access, natural disasters, terrorism, war and telecommunication and electrical failures. Significant disruption to the availability of information technology and internal infrastructure could cause delays in research and development work. The Company would incur liability and development of products would be delayed if any disruption or security breach were to result in a loss of, or damage to, the Company's data. Additionally, the Company may rely on cloud service providers. Any outages or changes related to these cloud services and service providers may cause disruption to development and services at the Company.

Reliance on customers and financial markets

The Company's sales to date have been to certain government agencies and departments, and consulting client companies. The sales to government have been as a result of the Company successfully entering into competitive bidding situations, often with partner companies. The sales to companies have been as a result of marketing efforts to such companies. There is no assurance that the Company will continue to be successful in competing for government contracts, or that company clients will continue with their exploration and development programs should market conditions become adverse.

Product liability exposure

The Company faces an inherent business risk of exposure to product liability and other claims in the event that the development or use of its technology or prospective products is alleged to have resulted in adverse effects. While the Company has taken, and will continue to take, what it believes are appropriate precautions, there can be no assurance that it will avoid significant liability exposure. A product liability claim could have a material adverse effect on the Company's business, financial condition and results of operations.

Management experience and dependence on key personnel and employees

The Company's success is currently largely dependent on the performance of the Company's directors and officers. The experience of these individuals is a factor which will contribute to the Company's continued success and growth. The Company will initially be relying on its board members and executive officers, as well as independent consultants and advisors, for most aspects of its business. The amount of time and expertise expended on the Company's affairs by each of the Company's management team and the Company's directors will vary according to the Company's needs. The loss of any of these individuals could have a material detrimental impact on the Company's business. The Company does not intend to acquire any key man insurance policies and there is, therefore, a risk that the death or departure of any key member of management, a director, or employee or consultant, could have a material adverse effect on the Company's business, operations and financial condition. Investors who are not prepared to rely on the Company's management team should not invest in the Company's securities. The management of the Company has limited history of past performance in managing a software and AI company, and the past performances of management in other positions are no indication of their ability to successfully manage the Company. If the experience of management is inadequate or unsuitable to manage the Company, the operations of the Company may be adversely affected.

Competition

The Company will face competition from other companies, some of which can be expected to have longer operating histories and more financial resources and experience than the Company. Increased competition by larger and better financed competitors could materially and adversely affect the business, financial condition and results of operations of the Company. There are other entities investing in the AI technology space and the Company expects this sector to grow. These companies may have an advantage and may have developed a more efficient operational or investment model. The Company may not have sufficient resources to continue on a competitive basis which could materially and adversely affect the business, financial condition and results of operations of the Company. To remain competitive, the Company will continue to invest in software development. Should competitors introduce new services/software embodying new technologies, the Company's technology may become obsolete and require substantial resources to compete successfully in the market for software and technology services.

Exchange Rate

The reporting and functional currency of the Company is the Canadian Dollar. A significant portion of the Company's anticipated future revenues and expenses may be in foreign currencies, such as the United States Dollar or the Euro. Future fluctuations in the value of the Canadian Dollar relative to these currencies will likely have a material impact on the Company's overall financial results. Appreciation of the Canadian dollar will potentially affect revenues and expenses.

Conflicts of interest

Certain of the Company's directors and officers are, and may continue to be, involved in the AI industry through their direct and indirect participation in corporations, partnerships or joint ventures which are potential competitors of the Company. Situations may arise in connection with potential acquisitions or opportunities where the other interests of these directors and officers may conflict with the Company's interests. Directors and officers of the Company with conflicts of interest will be subject to and must follow the procedures set out in applicable corporate and securities legislation, regulations, rules and policies.

Employee recruitment

Recruiting and retaining qualified personnel is critical to the success of the Company. The number of persons skilled in software development (and AI in particular) and marketing is limited and competition for such persons is intense. As the Company's business activity grows, the Company will require additional key executive, technical, operational, and administrative personnel. There can be no assurance that the Company will be successful in attracting, training and retaining qualified personnel. If the Company is not successful in attracting and training qualified personnel, the efficiency of its operations could be affected, which could have a material adverse effect on the Company's results of operations and profitability.

Uninsured or uninsurable risks

The Company insures its operations in accordance with technology industry practice. However, given the novelty of the proposed business, such insurance may not be available, uneconomical for the Company, or the nature or level may be insufficient to provide adequate insurance cover. The Company may become subject to liability for hazards against which the Company cannot insure or against which the Company may elect not to insure because of high premium costs or for other reasons. The payment of any such liabilities would reduce or eliminate the funds available for operations. Payments of liabilities for which the Company does not carry insurance may have a material adverse effect on the Company's results of operations and financial position.

Litigation

The Company may become party to litigation from time to time in the ordinary course of business which could adversely affect its business. Should any litigation in which the Company becomes involved be determined against the Company such a decision could adversely affect the Company's ability to continue operating and the market price for the common shares and could use significant resources. Even if the Company is involved in litigation and wins, litigation can redirect significant resources. Litigation may also create a negative perception of the Company's brand.

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