

QUANTUM NUMBERS CORP.

Interim Management Discussion and Analysis

As at June 30, 2020

QUANTUM NUMBERS CORP.

1. **SCOPE OF MANAGEMENT'S FINANCIAL ANALYSIS**

The following analysis should be read in conjunction with the annual financial statements, including accompanying notes, of Quantum Numbers Corp. ("the Company") for the year ended December 31, 2019. The unaudited condensed interim financial statements for the quarter ended June 30, 2020, including comparative figures, have been prepared in accordance with IFRS applicable to the preparation of interim financial statements, including IAS 34, *Interim Financial Reporting*. All amounts are in Canadian dollars unless otherwise indicated.

1.1 **FORWARD LOOKING STATEMENTS**

The sections of this management discussion and analysis ("MD&A") on the Company's strategy and action plan, its intellectual properties, development and financial reporting reflecting management's current expectations contain "forward-looking statements." Such statements should be understood in context, particularly statements that reflect the Company's opinions, estimates and expectations about future events or results. Such forward-looking statements are subject to certain factors and involve some risks and uncertainties. There can be no assurance that such statements will prove to be accurate. Factors that could cause future results, activities and events to differ materially from those expressed or implied by such forward-looking statements include, but not limited to, possibility or not to obtain the patent, time required to obtain such patent, risks inherent in the hi-tech industry, and the time it will take for the industry to be ready to move to quantum solutions. These risks and uncertainties are described in this MD&A and also the annual information form filed on SEDAR.

1.2 **INCORPORATION, NATURE OF OPERATIONS AND GOING CONCERN**

Quantum Numbers Corp. (the "Company" or "Quantum") was incorporated under the *Business Corporations Act* of Ontario on July 19, 2007.

The head office, principal address and records office of the Company are located at 3755 E Blvd Matte, suite 201, Brossard, Québec, J4Y 2P4. The Company is a developer of a new generation of cryptographic solutions pursuant to the acquisition of intellectual property.

The business of technology involves a high degree of risk and there can be no assurance that projects under research and development will proceed through to achieve commercialization. Risks related to the value of the Company's intangible assets, completing proof of concept studies, protecting intellectual property rights, the ability of the Company to raise alternative financing, and risks inherent to new technologies, such as risk of obsolescence, slow adoption and competing technological advances. Changes in future conditions could require material impairment of assets.

These condensed interim financial statements have been prepared in accordance with International Financial Reporting Standards ("IFRS") on a going concern basis, which contemplates that the Company will be able to realize its assets and discharge its liabilities in the normal course of business. Since its incorporation, the Company has accumulated a deficit of \$6,501,556 (December 31, 2019 - \$6,224,366) and during the period ended June 30, 2020, incurred a net loss and comprehensive loss of \$277,190 (June 30, 2019 - \$361,746). The Company does not currently have available resources and liquidity to fully execute its business plan over the next 12 months and is dependent on the Company's ability to raise additional finances to fund its operations. The above factors indicate a material uncertainty that may cast a significant doubt as to the Company's ability to continue as a going concern.

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1.2 INCORPORATION, NATURE OF OPERATIONS AND GOING CONCERN (Continued)

These condensed interim financial statements have been prepared on a going-concern basis which contemplates that the Company will continue in operation in the foreseeable future and will be able to realize its assets and discharge its liabilities in the normal course of business. This assumption is based on the current net assets of the Company and management's current operating plans.

These condensed interim financial statements do not reflect the adjustments to the carrying values of assets and liabilities, the reported amounts of expenses and the classification of statement of financial position items if the going concern assumption was deemed inappropriate. Management did not take these adjustments into account as it believes in the validity of the going concern assumption.

The Company's financial year ends on December 31.

The Company intends to patent its technologies wherever it is required. In the meantime, to ensure sufficient cash flow until market readiness, the Company is looking at M&A transactions to achieve its objectives.

1.3 CHANGES IN SIGNIFICANT ACCOUNTING POLICES

These condensed interim financial statements were prepared in accordance with standard IAS 34 - Interim Financial Reporting and do not include all of the information required for a full set of financial statements prepared in accordance with International Financial Reporting Standards ("IFRS"). They, however, include specific complimentary notes in order to provide information necessary to assess the financial situation of the Company at period end since its last annual financial statements dated December 31, 2019.

At the date of authorization of these condensed interim financial statements, management believes that there are no new standards, amendments and interpretations to existing standards that have been published by the IASB, but are not yet effective, which could materially impact the Company's financial statements.

1.4 COMPANY OVERVIEW AND STRATEGY

On August 3, 2016, the Company entered into an Intellectual Property Assignment Agreement with Société de Commercialisation des Produits de la recherche appliquée SOCPRA Sciences et Génie SEC ("SOCPRA") and its inventors by issuing a total of 6,000,000 common shares of the Company at a fair value of \$0.05 per share, representing a total fair value of \$300,000. The Company also reimbursed \$13,838 to SOCPRA for the professional fees associated with the protection of the patent ("Acquisition").

In August 2018, the Company received from the United States Patent and Trademark (USPTO), its first patent on a portion of its application. The Company also received a notice of allowance for the second patent, which was issued on January 1, 2019. Continuation requests have been filed for both patents in order to pursue the acceptance of the claims not accepted, which is why the Company's patents are still at the patent pending stage in the United States. Both applications are still under review with the European Patent Office. The Company's first patent was granted in full from Russia in December 2018.

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1.4 COMPANY OVERVIEW AND STRATEGY (Continued)

Until the expiry of the last patent rights, the Company will pay to SOCPRA a royalty of 5% calculated on the net sales price of products sold by the Company. The royalty shall be calculated on a 12-month basis starting on the effective date and shall be paid by the Company to SOCPRA within 90 days following the expiry of each reference year. The Company may have an option to buy back the royalties in the future at terms and conditions to be agreed upon by both parties. Pursuant to the IP Agreement, if the Company did not find or develop a commercial application within three years, 50% of the intellectual property would be transferred back to SOCPRA. As the Company found a commercial application within three years, 50% of the intellectual property shall not be transferred.

The Acquisition was not considered to be a business combination and was accounted for as an asset acquisition. Total purchase price of \$300,000, finder's fees of \$30,000 and transaction costs of \$116,112, which includes the reimbursement of \$13,838 above, totalling \$446,112, were capitalized to intellectual property.

INTELLECTUAL ACTIVITIES

Since Quantum Numbers Corp. changed to quantum hi-tech Intellectual Property, the primary management objective was to strengthen the Company in the following three sectors of activities:

Technology

In order to stay focused on our primary objective, which is to make our technology accessible as rapidly as possible to potential clients and partners, and secured regarding its effectiveness and ensuring that the Intellectual Property is well protected, we are closely working with l'École de Technologie Supérieure ("ETS") in order to maximize the potential and security of our technology. We are putting in place a program to develop complementary metal-oxide semiconductor ("CMOS") implementations with ETS to ensure a greater competitiveness. Subsequent to December 31, 2019, we were awarded a subsidy from the Quantum Province of Quebec program to develop 3 different CMOS implementations.

In regards to our second technology "Method and System for creating a Random Bit Sample", this technology is a method that quantifies the randomness of our signal, a perfect complement to our first technology.

Towards the end of 2019, we decided that it would be beneficial to work on a CMOS version. The Company filed a grant form with a new Provincial Program. The grant was accepted. However, the Company does not have all the details as of yet. The Company only knows that the grant covers between 40 and 60% of the eligible expenses.

Patent

As the Company must obtain its Patent to pass the introduction level with potential clients, it was then decided to work with the Company's Patent Agent to assess the patentability of our technology. The Company received the final report that indicates that it should continue the National Phase as planned. By doing the legwork and research at the stage of the patentability report, the Company was able to respond rapidly to the European Patent Office ("EPO") investigator. Furthermore, that research also allowed us to develop a second Patent that the Company filed. Please refer below for the status.

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1.4 COMPANY OVERVIEW AND STRATEGY (Continued)

INTELLECTUAL ACTIVITIES (Continued)

Status of patents

First Request Method for generating random numbers and associated random number generator

<u>Country</u>	<u>Status</u>
United States	Patent granted. A partial Patent was granted on August 7, 2018. The second and final portion was granted on October 8, 2019.
Russia	Patent granted on January 16, 2019.
European Patent Office	EPO granted the Patent on February 2, 2020, and the dispute period for all the countries will end on November 2, 2020. We have not received any dispute as of today.
Thailand	The deadline to request an examination report is November 15, 2022.
Australia,	Granted 2020-06
Canada, Brazil, India, Indonesia, Republic of Korea, Vietnam	For all these countries, we requested the examination and we are awaiting the examiner's response.
China	The latest examiner comments were addressed on February 10, 2020. We are awaiting the examiner's response.

Second Request Method and system for generating a random bit sample

<u>Country</u>	<u>Status</u>
European Patent Office	EPO granted the Patent on October 23, 2019, and there has been no dispute from any countries which are members of the EPO.
United States	Patent granted.
All the countries where our first patent was registered, with the addition of Japan.	In early June, 2020, we registered in all the countries where our first patent was registered, with the addition of Japan. We are still waiting for each examiner's responses.

Market

For the past two years, QNC focused its resources in developing its key IP position to align a successful venture in the emerging Quantum Random Number Generator market. The National Institute of Standards and Technology Post Quantum Cryptography Standards Committee is still working on related protocols and we're convinced to have the right attributes to fulfill the future requirements for target markets and being a key player with a highly competitive solution.

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1.4 COMPANY OVERVIEW AND STRATEGY (Continued)

INTELLECTUAL ACTIVITIES (Continued)

Market (Continued)

Subsequent to December 31, 2019, the outbreak of the novel strain of coronavirus had the effect of postponing the GSMA MW indefinitely. This attendance to this conference is key to assess our position and initiate early adopter agreements with target markets. For the moment, we are monitoring the situation and will resume as soon as the conference states its position.

Since March 2018, we have not seen any transaction of significant value in our market. In summary, we work closely with the ETS with respect to the technology and adaptation to the needs of potential clients. After reaching some milestones on that front, we will be able to propose a specific solution to potential niche clients.

In addition, since March 3, 2020, SK Telecom has been cooperating with companies including Telecom Italia, Telefonica and Ericsson on GSMA's new work item 'Quantum Computing, Networking and Security'. They are currently studying the future perspectives for quantum technology for mobile operators, and are at the stage, to plan to publish a white paper within this year to position quantum technology for future usage in 5G networks. These early developments are promising and we are monitoring the developments to align with our solution at the right time and the right market.

1.5 HIGHLIGHTS

As at June 30, 2020, the Company had a working capital of \$25,101 compared to a working capital of \$251,199 on December 31, 2019.

1.6 INTELLECTUAL PROPERTY

The carrying amount can be analyzed as follows:

	Balance as at December 31 2019	Additions	Balance as at June 30 2020
	\$	\$	\$
Cost			
Acquisition of SOCPRA license	446,112	-	446,112
Development costs	199,967	-	199,967
	<u>646,079</u>	<u>-</u>	<u>646,079</u>
Accumulated amortization			
Amortization	5,194	11,092	16,286
	<u>640,885</u>	<u>110,092</u>	<u>629,793</u>

In October of 2019, when available for use, the Company has commenced amortizing the license on a twenty-year basis. No amortization was taken on the development costs as these assets are not yet available for use.

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1.7 SELECTED FINANCIAL INFORMATION AND OPERATING RESULTS

	Three-month periods ended June 30		Six-month periods ended June 30	
	2020	2019	2020	2019
	\$	\$	\$	\$
Expenses				
Salaries	53,865	80,670	138,863	165,556
Development costs	22,155	24,167	52,376	46,433
Professional fees	24,817	21,097	34,636	29,083
Filing and listing fees	5,254	3,001	14,422	9,195
Amortization	5,546	-	11,092	-
Travel expenses	-	23,809	8,085	65,951
Insurance	3,818	3,423	7,241	6,818
Net loss and comprehensive loss for the period	(119,342)	(176,690)	(277,190)	(361,746)
Basic and diluted loss per share	(0.002)	(0.003)	(0.005)	(0.006)
Weighted average number of common shares outstanding	60,527,838	60,527,838	60,527,838	60,527,838

1.8 BALANCE SHEET

	June 30, 2020	December 31, 2019
	\$	\$
Total assets	727,284	939,821
Total liabilities	111,440	46,787
Total equity	615,844	893,034

1.9 SUMMARY OF QUARTER RESULTS

The following table sets forth selected quarterly financial information for each of the eight most recently completed quarters.

Three-month period ended	Net loss and comprehensive loss for the period	Basic and diluted loss per share
	\$	\$
June 30, 2020	(119,342)	(0.002)
March 31, 2020	(157,848)	(0.003)
December 31, 2019	(161,265)	(0.003)
September 30, 2019	(140,307)	(0.002)
June 30, 2019	(176,690)	(0.003)
March 31, 2019	(185,056)	(0.003)
December 31, 2018	(215,707)	(0.004)
September 30, 2018	(204,071)	(0.003)

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1.10 FINANCIAL SITUATION

LIQUIDITY

As of June 30, 2020, the Company had a working capital of \$25,101 compared to a working capital of \$251,199 on December 31, 2019. The decrease results mainly from operating expenses incurred.

CASH FLOWS

Company's operating activities used \$156,596 in the three-month period ended June 30, 2020 compared to \$186,678 for the same period in 2019. The decrease in cash flows used results mainly from the decrease in operating expenses.

The Company's financing activities generated \$40,000 in the three-month period ended June 30, 2020 and compared to \$nil for the same period in 2019. The increase in cash flows results from the Government Small Business Emergency Account loan.

RESULTS OF OPERATION

The main expenses for the three-month and six-month period ended June 30, 2020 were salaries for amount of \$53,865 and \$138,863, development costs for an amount of \$22,155 and \$52,376, professional fees for an amount of \$24,817 and \$34,636, filing and listing fees for an amount of \$5,254 and \$14,422 and amortization for an amount of \$5,546 and \$11,092.

The main expenses for the three-month and six-month period ended June 30, 2019 were salaries for amount of \$80,670 and \$165,556, travel expenses for an amount of \$23,809 and \$65,951, development costs for an amount of \$24,167 and \$46,433, professional fees for an amount of \$21,097 and \$29,083, share-based payments for an amount of \$15,000 and \$20,074 and filing and listing fees for an amount of \$3,001 and \$9,195.

1.11 POST-REPORTING DATE EVENT

On July 8, 2020, Mr. Marc Rousseau was appointed as CEO of the Company following the resignation of Mr. Jean Charles Phaneuf as Chief Executive Officer and Director of the Company. Mr. Rousseau is a Director of the Company since September 6, 2017.

On August 1, 2020, Mr. Pierre-Paul Samson was appointed as Chairman of the Board. Mr. Samson is a Director of the Company since September 6, 2017.

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1.12 STOCK OPTIONS

The Company's share options are as follows for the reporting periods:

	June 30, 2020		December 31, 2019	
	Number of options	Weighted average exercise price \$	Number of options	Weighted average exercise price \$
Balance outstanding, beginning of year	4,250,000	0.20	4,480,000	0.20
Granted	-	-	150,000	0.15
Expired	-	-	(380,000)	(0.12)
Balance outstanding, end of year	<u>4,250,000</u>	0.20	<u>4,250,000</u>	0.20
Balance exercisable, end of year	<u>4,250,000</u>	0.20	<u>4,250,000</u>	0.20

The weighted average remaining contractual life for options outstanding at June 30, 2020 is 4.19 (2019 - 6.29) years.

The Company recognized an amount of \$nil (2019 - \$20,074) for the period ended June 30, 2020.

The weighted average fair value of the granted options was determined using the Black-Scholes option pricing model and based on the following weighted average assumptions:

	2020	2019
Average share price at date of grant	-	\$0.31
Dividends yield	-	-
Expected weighted volatility	-	125%
Risk-free interest rate	-	1.39%
Expected average life	-	10 years
Average exercise price at date of grant	-	\$0.30

Outstanding and exercisable options are as follows:

Expiry Date	Exercise Price \$	Number of shares		Remaining life (years)
		Outstanding	Exercisable	
November 22, 2021	0.10	700,000	700,000	1.40
April 1, 2022	0.15	150,000	150,000	1.75
December 8, 2022	0.12	1,400,000	1,400,000	2.44
January 26, 2027	0.30	<u>2,000,000</u>	<u>2,000,000</u>	6.57
		<u>4,250,000</u>	<u>4,250,000</u>	

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1.13 OUTSTANDING SHARE DATA

	<u>August 28, 2020</u>
Common shares	60,527,838
Stock options	<u>4,250,000</u>
	<u>64,777,838</u>

1.14 INTELLECTUAL PROPERTY

“Our technology involves detailed proprietary and engineering knowledge and specific customer adoption criteria. If the Company is not able to effectively protect its intellectual property or cater to specific customer adoption criteria, our business may suffer a material negative impact and could fail.”

The success of our company will be dependent on our ability to successfully develop; qualify under current regulations and protect our technologies by way of patents and trademarks. The Company has its Patent Pending in Canada, United States, European Union and in 10 other countries. If we are unable to secure trademarks and patent protection for our intellectual property in the future, or that protection is inadequate for future products, our business may be materially adversely affected.

Further, there is no assurance that our technology does not or will not infringe upon patents, copyrights or other intellectual property rights held by third parties. The Company has mandated its Patent Agent to perform an exhaustive analysis of the Patent and Patent Pending deposited prior to ours, findings should be available very shortly, but all efforts are being made to obtain it sooner. However, we may become subject to legal proceedings and claims from time to time relating to the intellectual property of others in the ordinary course of our business. If we are found to have violated the intellectual property rights of others, we may be enjoined from using such intellectual property, and we may incur licensing fees or be forced to develop alternatives. In addition, we may incur substantial expenses and diversion of management time in defending against these third-party infringement claims, regardless of their merit. Successful infringement or licensing claims against us may result in substantial monetary liabilities, which may materially and adversely disrupt our business.

“The Company may be unable to secure or maintain regulatory qualifications for its Technology.”

The Company may be unable to secure or maintain regulatory qualifications for its products for some sector of our market. This would limit the ability of the Company to procure patent or other intellectual property protection for its technology and to license or enforce such patents if any.

1.15 RISK AND UNCERTAINTIES

Since March 31, 2020, the outbreak of the novel strain of coronavirus, has resulted in governments worldwide enacting emergency measures to combat the spread of the virus. These measures, which include the implementation of travel bans, self-imposed quarantine periods and social distancing, have caused material disruption to businesses globally resulting in an economic slowdown. Global equity markets have experienced significant volatility and weakness. Governments and central banks have reacted with significant monetary and fiscal interventions designed to stabilize economic conditions. The duration and impact of the COVID-19 outbreak is unknown, as is the efficacy of the government and central bank interventions. It is not possible for QNC to reliably estimate the length and severity of these developments and the impact on the financial results and condition of the Company at this time.

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1.15 **RISK AND UNCERTAINTIES (Continued)**

Despite these global setbacks, QNC forged ahead with the development of its prototype. In partnership with l'ETS and l'Université de Sherbrooke, our QNRG testing cycles has successfully produced an operational prototype that can achieve 300 Mbps of random bits with only the digital components limiting the throughput. At this point in time, the current prototype is designed and assembled on standard PCB technology using commercially available and off-the-shelf components, as well as quantum tunneling junctions fabricated using standard clean room techniques on a silicon substrate at Université de Sherbrooke. Following months of testing and development, the purely random quantum signal is clearly observable, and its significance is proven and quantifiable. Although the performance of this prototype is conservative, it does make a conclusive and relevant case for its use with Mobile, 5G and IOT applications. The next R&D cycle will aim to further test and prove its scalability and application for Enterprise Cloud and Bitcoin technologies.

The next step will be to proceed with integrating the entire design into an integrated chip using standard CMOS technology. Moving forward, QNC will mandate a selected private sector firm to speed up this next R&D phase, which is scheduled to begin at the end of September 2020.

Other risk factors are discussed in detail in the Company's Financial Statements and MD&A contained in the annual report for the year ended December 31, 2019.

1.16 **EVALUATION OF INTERNAL CONTROL OVER FINANCIAL REPORTING**

Management maintains a system of internal control over financial reporting to provide reasonable assurance that assets are safeguarded from any loss or unauthorized use and that financial information is reliable and available in a timely manner. They have also designed or had designed internal controls over financial reporting to provide reasonable assurance that financial reporting is reliable and that the financial statements are designed to report financial information in accordance with IFRS.

There were no important changes in the internal control over financial reporting during the six-month period ended June 30, 2020, that had or could reasonably be expected to materially affect the internal control over financial reporting ("ICFR").

1.17 **RELATED PARTY TRANSACTIONS**

The Company's related parties include companies under common control and joint key management, as described below.

Unless otherwise stated, none of the transactions incorporate special terms and conditions and no guarantees were given or received. Outstanding balances are usually settled in cash.

1.17.1 **Transactions with key management**

The key management of the Company are the members of senior management and the Board. The remuneration for the period of key management include the following expenses:

	<u>2020</u>	<u>2019</u>
	\$	\$
Consulting fees	-	3,200
Salaries	132,000	165,555
Share-based payments	-	5,074
	<u>132,000</u>	<u>173,829</u>

1.17 RELATED PARTY TRANSACTIONS (Continued)

1.17.1 Transactions with key management

An amount of \$nil (2019 - \$1,800) is due to senior management for unpaid consulting fees and is included in accounts payable and accrued liabilities.

An amount of \$nil (2019 - \$6,000) is due to directors for unpaid salaries and is included in accounts payable and accrued liabilities.

1.18 ADDITIONAL INFORMATION AND CONTINUOUS DISCLOSURE

This MD&A is dated November 21, 2019 and complies with Canadian Securities Administrators' *Regulation 51-102 respecting continuous disclosure obligations, c. V-1.1, r. 24*. The purpose of this MD&A is to help the reader understand and assess the material changes and trends in the Company's results and financial position. It presents Management's perspective on the Company's current and past activities and financial results, as well as an outlook of activities planned for the coming months. The Company regularly discloses additional information through press releases and other reports filed on the Company (www.quantumnumberscorp.com), and SEDAR (www.sedar.com) websites.

(s) Marc Rousseau, Chief Executive Officer

(s) Pierre Miron, Chief Financial Officer

Montreal (Quebec), August 28, 2020