UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, DC 20549

FORM 10-K

(Mark One)

☒ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**
For the fiscal year ended December 31, 2021
OR

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934 FOR THE TRANSITION PERIOD FROM TO**

Commission File Number: 001-36247

Meta Materials Inc.

(Exact Name of Registrant as Specified in its Charter)

Nevada **(State or other jurisdiction of incorporation or organization)**	**74-3237581** **(I.R.S. Employer Identification No.)**
1 Research Drive **Dartmouth, Nova Scotia** **(Address of principal executive offices)**	**B2Y 4M9** **(Zip Code)**

Registrant's telephone number, including area code: (902) 482-5729

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock, par value $0.001 per share	**MMAT**	**Nasdaq Capital Market**

Securities registered pursuant to Section 12(g) of the Act: **None**

Indicate by check mark if the Registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. YES ☒ NO ☐

Indicate by check mark if the Registrant is not required to file reports pursuant to Section 13 or 15(d) of the Act. YES ☐ NO ☒

Indicate by check mark whether the Registrant: (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the Registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. YES ☒ NO ☐

Indicate by check mark whether the Registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the Registrant was required to submit such files). YES ☒ NO ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer	☒	Accelerated filer	☐
Non-accelerated filer	☐	Smaller reporting company	☐
		Emerging growth company	☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☒

Indicate by check mark whether the Registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). YES ☐ NO ☒

The aggregate market value of the voting and non-voting common equity held by non-affiliates of the Registrant, based on the closing price of the shares of common stock on June 30, 2021, was $1,523,026,255.

The number of shares of Registrant's Common Stock outstanding as of March 1, 2022 is 284,812,797.

DOCUMENTS INCORPORATED BY REFERENCE

The information called for by Part III of this Form 10-K will be included in an amendment to this Form 10-K, which will be filed within 120 days after the registrant's fiscal year ended.

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NOTE ABOUT FORWARD-LOOKING STATEMENTS

This Annual Report on Form 10-K contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. All statements contained in this Annual Report on Form 10-K other than statements of historical fact, including statements regarding the Company's future results of operations and financial position, its business strategy and plans, and its objectives for future operations, are forward-looking statements. The words "believe," "may," "will," "estimate," "continue," "anticipate," "intend," "expect," and similar expressions are intended to identify forward-looking statements. The Company has based these forward-looking statements largely on its current expectations and projections about future events and trends that it believes may affect its financial condition, results of operations, business strategy, short-term and long-term business operations and objectives, and financial needs. These forward-looking statements are subject to a number of risks, uncertainties and assumptions, including those described in Part I, Item 1A, "Risk Factors" in this Annual Report on Form 10-K. Moreover, the Company operates in a very competitive and rapidly changing environment. New risks emerge from time to time. It is not possible for management to predict all risks, nor can they assess the impact of all factors on the Company's business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statements the Company may make. In light of these risks, uncertainties and assumptions, the future events and trends discussed in this Annual Report on Form 10-K may not occur and actual results could differ materially and adversely from those anticipated or implied in the forward-looking statements.

Item 1. Business.

Business Overview

Meta Materials Inc. (the “Company” or “META” or “Resulting Issuer”) is a developer of high-performance functional materials and nanocomposites.

The Company’s registered office is located at 85 Swanson Road, Boxborough, Massachusetts 01719, and its principal executive office is located at 1 Research Drive, Halifax, Nova Scotia, Canada.

The Company has generated a portfolio of intellectual property and is now moving toward commercializing products at a performance and price point combination that has the potential to be disruptive in multiple market verticals. The Company’s platform technology includes holography, lithography, and medical wireless sensing. The underlying approach that powers the Company’s platform technologies comprises advanced materials, metamaterials and functional surfaces. These materials include structures that are patterned in ways that manipulate light, heat, and electromagnetic waves in unusual ways. The Company’s advanced structural design technologies and scalable manufacturing methods provide a path to broad commercial opportunities in aerospace and defense, automotive, energy, healthcare, consumer electronics, and data transmission.

Controlling light, heat, electricity, and radio waves have played key roles in technological advancements throughout history. Advances in electrical and electromagnetic technologies, wireless communications, lasers, and computers have all been made possible by challenging the understanding of how light and other types of energy naturally behave, and how it is possible to manipulate them.

Over the past 20 years, techniques for producing nanostructures have matured, resulting in a wide range of groundbreaking solutions that can control light, heat, and electromagnetic waves at very small scales. Some of the areas of advancement that have contributed to these techniques are photonic crystals, nanolithography, plasmonic phenomena and nanoparticle manipulation. From these advances, a new branch of material science has emerged – metamaterials. Metamaterials are composite structures, consisting of conventional materials such as metals and plastics, which are engineered by scientists to exhibit new or enhanced properties relating to reflection, refraction, diffraction, filtering, conductance and other properties that have the potential for multiple commercial applications.

A metamaterial typically consists of a multitude of structured unit nano-cells that are comprised of multiple individual elements. These are referred to as meta-atoms. The individual elements are usually arranged in periodic patterns that, together, can manipulate light, heat, or electromagnetic waves. Development strategies for metamaterials and functional surfaces focus on structures that produce unusual and exotic electromagnetic properties by manipulating light and other forms of energy in ways that have never been naturally possible. They gain their properties not as much from their composition as from their exactingly designed structures. The precise shape, geometry, size, orientation, and arrangement of these nanostructures affect the light and other electromagnetic waves to create material properties that are not easily achievable with conventional materials.

The Company has many product concepts currently in various stages of development with multiple potential customers in diverse market verticals. The Company’s business model is to co-develop innovative products or applications with industry leaders that add value. This approach enables the Company to understand market dynamics and ensure the relevance and need for its products.

Holography Technology

Holography is a technique where collimated visible wavelength lasers are used to directly write an interference pattern inside the volume of light-sensitive material (photopolymer) in order to produce highly transparent optical filters and holographic optical elements. For some product lines that require large surface areas, this is combined with a proprietary scanning technique, where the lasers, optically or mechanically, directly write nano-patterns to cover large surface areas with nanometer accuracy.

META's principal products that employ holography technology are its metaAIR® laser glare protection eyewear, metaAIR® laser glare protection films for law enforcement and holoOPTIX™ notch filters. META co-developed its metaAIR® laser glare protection eyewear product with Airbus S.A.S. It has been engineered to provide laser glare protection for pilots, military and law enforcement using META's holography technology. metaAIR® is a holographic optical filter developed using nano-patterned designs that block and deflect specific colors or wavelengths of light. META launched metaAIR® with strategic and exclusive distribution partner, Satair, a wholly owned Airbus company and started producing and selling metaAIR® in April 2019. The scale-up and specification for the raw photopolymer material used to produce the eyewear was successfully finalized in late 2019 and commercialized in 2020. META launched its laser glare protection films for law enforcement use in late 2020. These films are designed to be applied to face shields and helmet visors providing the wearer with the same type of laser glare eye protection afforded to pilots by metaAIR® glasses while preserving peripheral vision critical to law enforcement duties. HoloOPTIX™ notch filters are optical filters that selectively reject a portion of the spectrum, while transmitting all other wavelengths. They are used in applications where it is necessary to block light from a laser, as in machine vision applications and in confocal or multi-photon microscopy, laser-based fluorescence instrumentation, or other life science applications. HoloOPTIX™ notch filters were commercially launched by the Company in November 2020.

META has additional products in development that utilize its proprietary holography technology. Included in the holoOPTIX ™ family of products are holographic optical elements ("HOEs"). HOEs are a core component in the display of augmented reality smart glasses products, as well as (in their larger version) in Heads-Up Displays ("HUDs"), in automobiles and aircraft.

Lithography Technology

Lithography is a process commonly used in the fabrication of integrated circuits, in which a light-sensitive polymer (photoresist), is exposed and developed to form 3D relief images on the substrate, typically a silicon wafer of up to 300mm (11.8 inches) in diameter. In order to meet the performance, fabrication-speed, and/or cost criteria required for many potential applications that require large area and low cost nanopatterning, the Company has developed a new nanolithography method called "Rolling Mask" lithography (registered trademark RML®), which combines the best features of photolithography, soft lithography and roll-to-plate/roll-to-roll printing capability technologies. Rolling Mask Lithography utilizes a proprietary UV light exposure method where a master pattern is provided in the form of a cylindrical mask. These master patterns are designed by the Company and over the years they have become part of a growing library of patterns, enriching the intellectual property ("IP") of the Company. The nanostructured pattern on the mask is then rolled over a flat surface area writing a nano-pattern into the volume of a photoresist, creating patterned grooves, metal is then evaporated and fills the patterned grooves. The excess metal is then removed by a known post-process called lift-off. The result is an invisible conductive metal mesh-patterned surface (registered trademark NANOWEB®) that can be fabricated onto any glass or plastic transparent surface in order to offer high transparency, high conductivity and low haze smart materials.

The Company's current principal prototype product in lithography technology is its transparent conductive film, NANOWEB®. The lithography division operates out of the Company's wholly owned U.S. subsidiary, Metamaterial Technologies USA Inc. ("MTI US"). MTI US can produce meter-long samples of NANOWEB®, at a small volumes scale, for industry customers/partners. Throughout 2020 and 2021, the Company has been ordering and upgrading its equipment at its California facility to efficiently supply NANOWEB® samples in larger volumes. The Company has recently installed its first roll-to-roll, NANOWEB® pilot scale production line at its Pleasanton, California facility. The line is configured for 300mm-wide rolls of substrate. All the equipment passed factory acceptance tests prior to delivery and installation, and the line is currently being optimized.

There are six NANOWEB®-enabled products and applications that are currently in early stages of development including:

- NANOWEB® for Transparent EMI Shielding
- NANOWEB® for Transparent Antennas
- NANOWEB® for 5G signal enhancement
- NANOWEB® for Touch Screen Sensors
- NANOWEB® for Solar cells
- NANOWEB® for Transparent Heating to de-ice and de-fog

More details of these products and applications can be found in META's EDGAR filings and on META's website at www.metamaterial.com.

The Company has entered into a collaboration agreement with Crossover Solutions Inc. to commercialize the NANOWEB® enabled products and applications for the automotive industry and with ADI Technologies to help secure contracts with the US Department of Defense.

Nano-optic structures and color-shifting foils - the Company recently acquired Nanotech Security Corp. "Nanotech" which specializes in designing, originating, recombining, and mass-producing nanotechnology-based films with application for a wide variety of products and markets. Nanotech develops and produces nano-optic structures and color-shifting foils used in authentication and brand protection applications across a wide range of markets including banknotes, secure government documents, and commercial branding. The Company's nano-optic security technology platforms include:

- *KolourOptik®*, a patented visual technology that is exclusive to the government and banknote market and combines sub-wavelength nanostructures and microstructures to create modern overt security features with a unique and customizable optical effect. KolourOptik® pure plasmonic color pixels produce full color, 3D depth, and movement used in security stripes and threads that are nearly impossible to replicate.
- *LiveOptik™*, a patented visual technology that utilizes innovative nano-optics one tenth the size of traditional holographic structures to create next generation overt security features customized to Nanotech's customers' unique requirements. LiveOptik™ delivers multi-color, 3D depth, movement and image switches for secure brand protection stripes, threads and labels that are nearly impossible to replicate.
- *LumaChrome™* optical thin film security features are manufactured using precision engineered nanometer thick layers of metals and ceramics to form filters designed to uniquely manipulate visible and non-visible light. This unique manipulation of light properties is used to create specialized security features in the form of threads, stripes, and patches that are applied to banknotes and other secure documents. By using sophisticated electron beam and sputtered deposition methods, Nanotech precisely controls the construction and inherent properties to provide custom color-shifting solutions. An individual looking at these threads, stripes and patches sees an obvious color shift (e.g. green to magenta) when the document or bank note is tilted or rotated

Wireless Sensing and Radio Wave Imaging Technology

META's Wireless Sensing platform uses infrared and radio frequency (RF) transmitters and receivers to collect and measure a variety of biological information enabling non-invasive and safe medical diagnostics. The platform requires the ability to cancel reflections (anti-reflection) from the skin to reduce the natural impedance the skin provides to such signals and increase the Signal-to-Noise Ratio ("SNR") of certain diagnostic instruments used in conjunction with the platform. This reflection-cancelling requirement is satisfied using META's proprietary metamaterial films that employ patterned designs, printed on metal-dielectric structures on flexible substrates that act as anti-reflection (impedance-matching) coatings when placed over the human skin in combination with medical diagnostic modalities, such as MRI, ultrasound systems, non-invasive glucometers etc. The Company is developing a number of medical products that employ this proprietary technology. glucoWISE™, is in development as a completely non-invasive glucose measurement device. It is being developed first as a benchtop medical device product, followed by a portable, pocket-size product and ultimately as a wearable. In magnetic resonance imaging (MRI), increasing the SNR by orders of magnitude has been demonstrated to produce much higher resolution images with significant increases in imaging speed resulting in better patient throughput and potentially more accurate diagnoses in imaging clinics. For example, the Company is developing metaSURFACE™ (also known as radiWISE™) an innovation which allows an improvement in signal to noise ratio of up to 40 times for MRI scans. The metaSURFACE™ device consists of proprietary non-ferrous metallic and dielectric layers that are exactingly designed to interact (resonate) with radio waves increasing the SNR.META is also researching the use of its Radio Wave Imaging technology in breast cancer and stroke diagnosis.

The Company is developing wireless sensing and radio wave imaging applications from its London, UK office and its newly established Athens, Greece office.

Oil and Gas operations

As part of the Arrangement Agreement with Torchlight Energy Resources, Inc. ("Torchlight") as mentioned in the following section, the Company acquired a group of oil and gas assets ("O&G assets") and had interest in them as follows:

- the Orogrande Project in Hudspeth County, Texas
- the Hazel Project in Sterling, Tom Green, and Irion Counties, Texas
- the Hunton wells in partnership with Kodiak in Central Oklahoma

The Company has classified these assets as assets held for sale pursuant to its commitment to sell or spin out the O&G assets prior to the earlier of (i) December 31, 2021 or (ii) the date which is six months from the closing of the Arrangement, or (iii) such later date as may be agreed between the Company and the individual appointed to serve as the representative of the holders of Series A Preferred Stock (the "Sale Expiration Date"). The Series A Preferred Stock will automatically be cancelled once the entitled dividends have been paid. See the description in Note 5, "Assets Held for Sale" of the financial statements included with this report for information and disclosure regarding these assets. See Item 1A, risk Factors for more information on these assets.

Customers

The Company's customers are OEM providers in multiple industries including aerospace, automotive, consumer electronics, communications, energy, banknote and brand security, and medical devices. The Company organizes its development and support efforts around these differentiated vertical markets to enable it to effectively penetrate these markets and to develop products specific to the needs of these OEM customers.

Marketing and Sales

The Company operates under a Business-to-Business model. Its marketing and sales functions are organized to support and grow this operating model. The Company utilizes a combination of filed-based and in-house selling resources to promote and sell its more common off-the-shelf products and a vertical market focused Business Development group to develop and support long-term customer relationships in the vertical market of interest. The Company's marketing efforts are focused on technical education of its customer base regarding its products, support of a meaningful presence at trade shows and industry events and routine production of collateral materials to support its sales and business development efforts.

Manufacturing

The Company employs a hybrid model for manufacturing of our high-performance functional materials and nanocomposites.

The Company provides research scale production of its products in-house to its customers in its lithography and holography business areas. The Company is scaling up pilot scale production of its materials in its Pleasanton facility and Highfield Park facility. The Company has current capacity in its Thurso facility to produce its banknote security and brand security product at commercial scale and it is expanding this capacity. In certain instances where volume warrants, the Company will make available on a license basis, its equipment and proprietary processes to its customers or to third party contractors to product its products for their needs.

The Company is constantly improving and investing in its manufacturing capabilities and the associated quality control and resource planning infrastructure. The Company holds ISO9001 certification for its Highfield Park facility and it is pursuing additional certifications in its Thurso facility.

Research And Development

The Company operates in a rapidly evolving industry subject to significant technological change and new product introductions and enhancements. The Company believes that its continued commitment to research and development is a critical element of ability to introduce new and enhanced products and technologies. The Company has historically invested more than forty percent (40%) of its operating expenses in its research and development efforts and these activities are integral to maintaining and enhancing our competitive position. The Company also increasingly seeks to deploy its resources to solve fundamental challenges that are both common to, and provide competitive advantage across, its high-performance functional materials and nanocomposites.

The Company believes that its success depends in part on its ability to achieve the following in a cost-effective and timely manner:

- enable its OEM customers to integrate its functional films into their products;
- develop new technologies that meet the changing needs of the vertical markets it has chosen to pursue;
- improve its existing technologies to enable growth into new application areas; and expand its intellectual property portfolio

Intellectual Property

During 2021, the Company has expanded its patents and trademarks portfolio significantly in a wide range of applications including holography, lithography, wireless sensing technology and nano-optic structures. In addition to META's previous portfolio of 126 patents, the Company acquired more than 23 patents from Interglass Technology AG and 98 patents from the Nanotech acquisition The Company believes that its combination of patents and additional IP that is being held confidential by way of multiple trade secrets provides the Company with an important competitive advantage, marketing benefits, and licensing revenue opportunities.

Regulation

The Company is subject to significant regulation by local, state, federal and international laws in all jurisdictions in which it operates. Compliance with these requirements can be costly and time consuming. The Company believes that its operations, products, services, and actions substantially comply with applicable regulations in all jurisdictions. However, the risk of non-compliance cannot be eliminated and therefore there is no assurance that future costs related to these regulations will not be incurred. There is also the possibility that regulations will be retroactively applied, interpreted, or applied differently to the Company's operations, products, services, and actions which will require significant time and resources.

Human Capital Resources

As of February 28, 2022, the Company had 130 employees. Approximately 90% of its employees are located in Canada and the United States. Of the total workforce, 48 employees are involved in research and development; 28 employees are involved in operations, manufacturing, service and quality assurance; and 54 employees are involved in sales and marketing, finance, information technology, general management and other administrative functions.

Available Information

The Company's Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and amendments to those reports are accessible free of charge on its website at www.metamaterial.com as soon as reasonably practicable after he Company electronically files such material with, or furnish it to, the SEC. The SEC also maintains an internet site that contains reports, proxy and information statements and other information regarding the Company's filings at www.sec.gov. The reference to the Company's website does not constitute incorporation by reference of the information contained at the site.

Business Combinations

Torchlight RTO

On December 14, 2020, the Company (formerly known as “Torchlight Energy Resources, Inc.” or “Torchlight”) and its subsidiaries, Metamaterial Exchangeco Inc. (formerly named 2798832 Ontario Inc., “Canco”) and 2798831 Ontario Inc. (“Callco”), entered into an Arrangement Agreement (the “Arrangement Agreement”) with Metamaterial Inc. ("MMI"), an Ontario corporation headquartered in Nova Scotia, Canada, to acquire all of the outstanding common stock of MMI by way of a statutory plan of arrangement (the “Arrangement”) under the Business Corporations Act (Ontario), on and subject to the terms and conditions of the Arrangement Agreement (the “Torchlight RTO”). On June 25, 2021, the Company implemented a reverse stock split, changed its name from “Torchlight Energy Resources, Inc.” to “Meta Materials Inc.” and changed its trading symbol from “TRCH” to “MMAT”. On June 28, 2021, following the satisfaction of the closing conditions set forth in the Arrangement Agreement, the Arrangement was completed.

On June 28, 2021, and pursuant to the completion of the Arrangement Agreement, the Company began trading on the NASDAQ under the symbol “MMAT” while MMI common stock was delisted from the Canadian Securities Exchange (“CSE”). At the same time, Metamaterial Exchangeco Inc., a wholly owned subsidiary of META, started trading under the symbol “MMAX” on the CSE. Certain previous shareholders of MMI elected to convert their common stock of MMI into exchangeable shares in Metamaterial Exchangeco Inc. These exchangeable shares, which can be converted into common stock of META at the option of the holder, are similar in substance to common shares of META and have been included in the determination of outstanding common shares of META.

For accounting purposes MMI, the legal subsidiary, has been treated as the accounting acquirer and the Company, the legal parent, has been treated as the accounting acquiree. The transaction has been accounted for as a reverse acquisition in accordance with ASC 805 *Business Combination*. Accordingly, these consolidated financial statements are a continuation of MMI consolidated financial statements prior to June 28, 2021 and exclude the balance sheets, statements of operations and comprehensive loss, statement of changes in stockholders’ equity and statements of cash flows of Torchlight prior to June 28, 2021. See note 3 for additional information.

Nanotech acquisition

On August 5, 2021, the Company announced the signing of a definitive agreement to indirectly acquire Nanotech. On October 5, 2021, a wholly owned subsidiary of META purchased 100% of Nanotech's common stock at CA$1.25 per share. In addition, the transaction price included the settlement of certain Nanotech share awards outstanding immediately prior to the closing of the agreement, including the repurchase and cancellation of 303,391 Nanotech restricted share units ("RSU") at a purchase price of CA$1.25 per RSU and the settlement of 4,359,000 Nanotech in-the-money stock options at a purchase price equal to CA$1.25 per option, less the exercise price thereof. The consideration payable to securityholders under the arrangement was payable in cash, resulting in a total purchase price of $71.6 million (CA$90.8 million).

Nanotech is incorporated under the laws of British Columbia, Canada. Nanotech's head office is located at #505 - 3292 Production Way, Burnaby, BC, Canada V5A 4R4. In addition, Nanotech owns and operates a manufacturing facility located in Thurso, Quebec.

Item 1A. Risk Factors.

The following factors could materially affect META's business, financial condition or results of operations and should be carefully considered in evaluating the Company and its business, in addition to other information presented elsewhere in this report.

Risks That Could Affect the Company's Financial Condition

Limited Operating History

The Company has a limited operating history, which can make it difficult for investors to evaluate the Company's operations and prospects and may increase the risks associated with investment in the Company.

The Company has incurred recurring consolidated net losses since its inception and expects its operating costs to continue to increase in future periods as it expends substantial financial and other resources on, among other things, business and headcount expansion in operations, sales and marketing, research and development, and administration as a public company. These expenditures may not result in additional revenues or the growth of the Company's business. If the Company fails to grow revenues or to achieve profitability while its operating costs increase, its business, financial condition, results of operations and growth prospects will be materially, adversely affected.

The Company is expected to be subject to many of the risks common to early-stage enterprises for the foreseeable future, including challenges related to laws, regulations, licensing, integrating and retaining qualified employees; making effective use of limited resources; achieving market acceptance of existing and future products; competing against companies with greater financial and technical resources; acquiring and retaining customers; and developing new solutions; and challenges relating to identified material weaknesses in internal control.

Access to Capital

The Company believes that current working capital will be sufficient to continue its business for at least the next twelve months. Should the Company's costs and expenses prove to be greater than it currently anticipates, or should it change its current business plan in a manner that will increase or accelerate its anticipated costs and expenses, such as through the acquisition of new products, the depletion of its working capital could be accelerated. The Company presently has access to approximately one hundred and twelve million dollars of new funding through its existing At the Market S-3 Shelf Registration (ATM). The Company believes that this funding is sufficient to enable it to fund its current working capital needs well into 2024.

The Company may pursue sources of additional capital through various financing transactions or arrangements, including joint venturing of projects, debt financing, equity financing, or other means. The Company may not be successful in identifying suitable financing transactions in the time period required or at all, and it may not obtain the capital it requires by other means.

The Company's ability to obtain financing, if and when necessary, may be impaired by such factors as the capital markets and its limited operating history.

Any additional capital raised through the sale of equity may dilute the ownership percentage of the Company's stockholders. Raising any such capital could also result in a decrease in the fair market value of its equity securities because its assets would be owned by a larger pool of outstanding equity. The terms of securities the Company issues in future capital transactions may be more favorable to its new investors, and may include preferences, superior voting rights and the issuance of other derivative securities, and issuances of incentive awards under equity employee incentive plans, which may have a further dilutive effect.

The Company may incur substantial costs in pursuing future capital financing, including investment banking fees, legal fees, accounting fees, securities law compliance fees, printing and distribution expenses and other costs. The Company may also be required to recognize non-cash expenses in connection with certain securities it may issue, which may adversely impact our financial condition.

Currency Fluctuations

The Company's revenues and expenses are denominated in US dollars, Canadian dollars, EURO, and Great British Pounds, and therefore are exposed to significant currency exchange fluctuations. Recent events in the global financial markets have been coupled with increased volatility in the currency markets. Fluctuations in the exchange rate between the US dollar, the Canadian dollar and the Great British Pounds may have a material adverse effect on the Company's business, financial condition, and operating results. The Company may, in the future, establish a program to hedge a portion of its foreign currency exposure with the objective of minimizing the impact of adverse foreign currency exchange movements. With appropriate risk management and oversight this may be able to offset future risk, however a hedging strategy will result in additional operating costs.

Costs of Maintaining a Public Listing

As a publicly traded company, there are costs associated with legal, accounting, and other expenses related to regulatory compliance. Securities legislation and the rules and policies of the NASDAQ require listed companies to, among other things, adopt corporate governance and related practices, and to continuously prepare and disclose material information, all of which add to a company's legal and financial compliance costs. The Company may also elect to devote greater resources than it otherwise would have on communication and other activities typically considered important by publicly traded companies.

Risks That Could Have a Material Adverse Effect on the Company's Business

Customer Concentration

The Company relies on a few customers for a significant portion of its revenues. For the year ended December 31, 2021, the Company had 3 customers that accounted for $3,307,914 or 81% of total revenue. For the year ended December 31, 2020, the Company had 3 customers that accounted for $807,912 or 72% of total revenue.

The Company currently derives a significant portion of its revenue from contract services between its wholly-owned subsidiary, Nanotech, and a G10 central bank. The Company is developing a new security feature under a framework contract with this customer. There can be no assurance that this project will be successful, or that will result in long-term production revenue for this security feature.

Risk of not developing new products, applications, and end markets for the Company's products

The Company's future success will depend in part on its ability to generate sales of its products as well as generating development revenue. Current and potential customers may have substantial investment in, and know-how related to the Company's technologies. Customers may be reluctant to change from incumbent suppliers or cease using their own solutions, or the Company's products may miss the design and procurement cycles of its customers. Many target markets have historically been slow to adopt new technologies. These markets often require long testing and qualification periods or lengthy government approval processes before admitting new suppliers or adopting new technologies.

Introduction of new products and product enhancements will require that the Company effectively transfer production processes from research and development to manufacturing and coordinate efforts with those suppliers to achieve increased production volume rapidly. If we are unable to implement this strategy to develop new applications and end markets for products or develop new products, the business, financial condition, results of operations and growth prospects could be materially adversely affected. In addition, any newly developed or enhanced products may not achieve market acceptance or may be rendered obsolete or less competitive by the introduction of new products by other companies.

Research and Market Development

Although the Company, itself and through its investments, is committed to researching and developing new markets and products and improving existing products, there can be no assurances that such research and market development activities will prove profitable or that the resulting markets and/or products, if any, will be commercially viable or successfully produced and marketed. A failure in the demand for products to materialize as a result of competition, technological change or other factors could have a material adverse effect on the business, results of operations and financial condition of the companies in which the Company has or will invest in, and consequently, on the Company.

Raw Material Source

The Company purchases its holographic raw materials from a tier 1 German manufacturer, which is a single source supplier. Disruption in supply from this supplier for any number of factors may cause a material adverse effect on Holography-related products.

Change in Laws, Regulations and Guidelines

The current and proposed operations of the Company are subject to a variety of laws, regulations and guidelines relating to production, the conduct of operations, transportation, storage, health and safety, medical device regulation and the protection of the environment. These laws and regulations are broad in scope and subject to evolving interpretations, which could require the Company to incur substantial costs associated with compliance or alter certain aspects of its business plan. In addition, violations of these laws, or allegations of such violations, could disrupt certain aspects of the Company's business plan and result in a material adverse effect on certain aspects of its planned operations.

The Company launched a new product metaAIR® in March 2019 to provide laser glare protection to pilots in the airline industry. Currently, metaAIR® is not subject to any Federal Aviation Administration regulations, however, metaAIR® may become subject to evolving regulation by governmental authorities as the metaAIR® market evolves further.

Integrating Past or Future Acquisitions

The Company has completed a number of acquisitions during its operating history. The Company has spent and may continue to spend significant resources identifying and pursuing future acquisition opportunities. Acquisitions involve numerous risks including: (1) difficulties in integrating the operations, technologies and products of the acquired companies; (2) the diversion of management's attention from other business concerns; and (3) the potential loss of key employees of the acquired companies. Failure to achieve the anticipated benefits of any prior and future acquisitions or to successfully integrate the operations of the acquired companies could have a material and adverse effect on the Company's business, financial condition, and results of operations. Any future acquisitions could also result in potentially dilutive issuance of equity securities, acquisition or divestiture-related write-offs or the assumption of debt and contingent liabilities.

Regulatory Approval

The Company's wireless sensing technology to enhance MRI and non-invasive glucoWISE® monitoring is under development. The Company has performed many experiments on animals and humans, and will continue to perform additional experiments as needed to continue the development of the related products.
These products have not yet completed clinical trials/regulatory approval processes, and there can be no assurance that trials will be successful, or that approvals will be granted.

Insurance Coverage

The Company will require insurance coverage for a number of risks. Although management of the Company believes that the events and amounts of liability covered by its insurance policies will be reasonable, taking into account the risks relevant to its business, and the fact that agreements with users contain limitations of liability, there can be no assurance that such coverage will be available or sufficient to cover claims to which the Company may become subject. If insurance coverage is unavailable or insufficient to cover any such claims, the Company's financial resources, results of operations and prospects could be adversely affected.

Privacy and Data Security Concerns

Personal privacy, information security and data protection are significant issues worldwide. The regulatory framework governing the collection, use, and other processing of personal data and other information is rapidly evolving. The United States federal and various state and foreign governments have adopted or proposed requirements regarding the collection, distribution, use, security and storage of personally identifiable information and other data relating to individuals, and federal and state consumer protection laws are being applied to enforce regulations related to the online collection, use and dissemination of data.
The costs of compliance with and other burdens imposed by laws, regulations, standards and other actual or asserted obligations relating to privacy, data protection and information security may be substantial, and they may require the Company to modify its data processing practices and policies. Any actual or alleged noncompliance with any of these laws, regulations, standards, and other actual or asserted obligations may lead to claims and proceedings by governmental actors and private parties, and significant fines, penalties or liabilities.

Risk of Inability to Protect our Proprietary Technology and Intellectual Property Rights

The Company relies on a variety of intellectual property rights, including patents, trademarks, trade secrets, technical know-how and other unpatented proprietary information to protect the Company's technologies, products, product development and manufacturing activities from unauthorized use by third parties. The Company's patents do not cover all of its technologies, systems, products and product components and its competitors or others may design around its patented technologies. The Company cannot guarantee that it has entered into appropriate agreements with all parties that have had access to its trade secrets, know-how or other proprietary information to adequately protect all such information. The Company also cannot assure shareholders that those agreements will provide meaningful protection for its trade secrets, know-how or other proprietary information in the event of any unauthorized use or disclosure. The Company's trade secrets, know-how or other proprietary information could be obtained by third parties as a result of breaches of its physical or electronic security systems or its suppliers, employees or consultants could assert rights to its intellectual property.

Risk that Industry Targets will not Adopt the Company's Products

Holography Market-Aviation Industry

The Company launched its first product, a laser glare protection eyewear, named metaAIR®, in March 2019, with a primary focus on the aviation market. The product offers unique performance and benefits over the competition and is the only industry-approved solution to date. The Company has co-developed this product with Airbus through a strategic partnership. Airbus further extended its support by introducing the Company to Satair, an Airbus-owned company, which became the global distribution partner for metaAIR® to the aviation market. Since 2016, Airbus and Satair have invested a total of $2,000,000 for the product development and exclusive distribution rights to metaAIR®. Since the launch of metaAIR® in March 2019, the Company has sold fifty units to its distributor Satair. The Company is currently in the process of increasing its marketing and sales capacity.

Despite the Company's close collaboration with the Airbus Group, with the impact of COVID-19 there can be no assurance that the aviation market will accept the metaAIR® product at the expected market penetration rates and a slower than forecasted market acceptance may have a material adverse effect on Holography laser glare protection related products and the Company's financial position. The Company is pursuing ancillary markets outside of the aviation industry for its metaAIR® laser protection eyewear such as in law enforcement and defense.

Lithography Product and Market-Automotive

Lithography related products have not yet reached required manufacturing maturity. The first pilot scale roll-to-roll line is expected to be ready for low volume production during the second half of fiscal year 2022. Broader sales and production are expected to be launched in two to three years' time after successful completion of automotive product qualification and product introductions. META believes that the automotive market is a strategic high growth opportunity, however despite the Company's close collaboration with automotive partners, there can be no assurance that the automotive market will accept the NANOWEB® product at the expected market penetration rates and a slower than forecasted market acceptance may have a material adverse effect on Lithography de-icing/de-fogging, transparent antenna and other related products and the Company's financial position.

Risks Related to Facilities and Human Resources

New Facility and Permits for Lithography Production

The Company is in the process of moving into a larger facility suitable to host the scale-up of production relating to Holography and Lithography. Lithography is a wet chemistry process which requires specific approvals from the local government to allow use of certain chemicals and their disposal.

Any delay in setting up the facility and receiving permits may impact launch and/or development of related products, and may have a material adverse effect on Lithography and Holography related products and consequently on the Company's financial position.

At present, the facility is expected to be complete during the second half of fiscal 2022.

Recruiting or Retaining Qualified Personnel.

The Company's ability to successfully manage and grow the business and to develop new products depends, in large part, on its ability to recruit and retain qualified employees, particularly highly skilled technical, sales, service, management, and key staff personnel. Competition for qualified resources is intense and other companies may have greater resources available to provide substantial inducements to offer more competitive compensation packages.

Conflicts of Interest

Certain of the Company's directors and officers are, and may continue to be, involved in other business ventures through their direct and indirect participation in corporations, partnerships, joint ventures, etc. that may become potential competitors of the technologies, products and services the Company intends to provide. Situations may arise in connection with potential acquisitions or opportunities where the other interests of these directors and officers conflict with or diverge from the Company's interests. In accordance with applicable corporate law, directors who have a material interest in or who are a party to a material contract or a proposed material contract with the Company are required, subject to certain exceptions, to disclose that interest and generally abstain from voting on any resolution to approve the contract. In addition, the directors and officers are required to act honestly and in good faith with a view to the Company's best interests. However, in conflict of interest situations, the Company's directors and officers may owe the same duty to another company and will need to balance their competing interests with their duties to the Company. Circumstances (including with respect to future corporate opportunities) may arise that may be resolved in a manner that is unfavorable to the Company.

Reliance on Management

The success of the Company is dependent upon the ability, expertise, judgment, discretion, and good faith of its senior management team. Any loss of the services of such individuals could have a material adverse effect on the Company's business, operating results, or financial condition.

Monitoring unauthorized use of the Company's intellectual property is difficult and costly. Unauthorized use of its intellectual property may have already occurred or may occur in the future. The Company's failure to identify unauthorized use or otherwise adequately protect its intellectual property could jeopardize its competitive advantage and materially adversely affect its business. Moreover, any litigation in connection with unauthorized use of its intellectual property could be time consuming, and the Company could be forced to incur significant costs and divert its attention and the efforts of its employees, which could, in turn, result in lower revenues and higher expenses, and it may not be successful in enforcing its intellectual property rights.

Risks Related to Oil and Gas Assets Held for Sale

Series A Preferred Stock Dividends

In connection with the Arrangement, the Company declared a dividend of shares of the Series A Preferred Stock to holders of record of its common stock as of June 24, 2021. The Series A Certificate of Designation entitles the holders of Series A Preferred Stock to receive dividends, or Asset Sale Dividends, comprised of the holder's pro rata portion of the proceeds from the sale of the O&G Assets in the event that the Company consummates one or more such transaction prior to the Sale Expiration Date. However, the Company may not be able to consummate any such transaction prior to such date on terms that will permit itself to pay such dividends, or at all.

Holders of Series A Preferred Stock are entitled to receive Asset Sale Dividends from any O&G Asset Sale. Prior to declaring or paying any dividend, the Company will deduct from the gross proceeds of an O&G Asset Sale various costs and expenses described in the Series A Certificate of Designation, which include, among others, (i) costs and expenses the Company incurs in connection with the applicable O&G Asset Sale transaction, (ii) costs the Company incurs following the consummation of the Arrangement with respect to the O&G Assets, (iii) taxes the combined company incurs in connection with the applicable O&G Asset Sale, the payment of dividends to the holders of Series A Preferred Stock, and the O&G Assets, (iv) liabilities the Company incurs in connection with the applicable O&G Asset Sale and (v) amounts paid or payable with respect to outstanding debt, if any. In addition, the Company will also withhold an amount of 10% of the proceeds from each O&G Asset Sale, ("the Holdback Amount") to cover potential post-closing liabilities and obligations that the combined company may incur in respect of such transaction. If, after the deduction and withholding of these amounts, there are no net proceeds available for distribution to the holders of Series A Preferred Stock, then the Company will not declare or pay a dividend with respect to that transaction unless and until any remaining funds from the Holdback Amount are due to be distributed to the holders of Series A Preferred Stock through a dividend, or the Company receives additional net proceeds from such O&G Asset Sale (for example, as a result of post-closing payments or the release of escrowed funds).

In the event that any O&G Assets have not been sold in an O&G Asset Sale that is consummated prior to the Sale Expiration Date, the Company will, to the extent permitted by applicable law, declare a spin-off dividend to distribute beneficial ownership of the remaining O&G Assets to the holders of Series A Preferred Stock. However, if the combined company cannot effect such spin-off dividend in a manner that is exempt from registration under all applicable securities laws, the combined company will not declare the spin-off dividend and instead will use good faith, commercially reasonable efforts to preserve the value of the remaining O&G Assets or to distribute or provide the value of the remaining O&G Assets to the holders of Series A Preferred Stock, so long as the Company is not required to divert the attention of management or incur material expenses in excess of amount required to be reserved under the Arrangement Agreement. Thus, the Company, ultimately may not be able to deliver the value of any remaining O&G Assets to the holders of Series A Preferred Stock.

Orogrande and Hazel Projects: Risks and Uncertainties.

The Company is in the process of selling or spinning out the O&G Assets. Such dispositions may result in proceeds to Series A preferred shareholders in an amount less than they expect or less than the Company's assessment of the value of the assets. The Company does not know if it will be able to successfully complete such disposition on favorable terms or at all. In addition, the sale of these assets involves risks and uncertainties, including disruption to other parts of its business, potential loss of customers or revenue, exposure to unanticipated liabilities or result in ongoing obligations and liabilities to the Company following any such divestiture.

For example, in connection with a disposition, the Company may enter into transition services agreements or other strategic relationships, which may result in additional expenses. In addition, in connection with a disposition, the Company may be required to make representations about the business and financial affairs of the business or assets. The Company may also be required to indemnify the purchasers to the extent that its representations turn out to be inaccurate or with respect to certain potential liabilities. These indemnification obligations may require the Company to pay money to the purchasers as satisfaction of their indemnity claims. It may also take longer than expected to fully realize the anticipated benefits of this transaction, and those benefits may ultimately be smaller than anticipated or may not be realized at all, which could adversely affect the Company's business and operating results. Any of the foregoing could adversely affect the Company's financial condition and results of operations.

Oil and Gas Operations Liability or Damages

The oil and natural gas business involves a variety of operating hazards and risks such as well blowouts, pipe failures, casing collapse, explosions, uncontrollable flows of oil, natural gas or well fluids, fires, spills, pollution, releases of toxic gas and other environmental hazards and risks. These hazards and risks could result in substantial losses to the Company from, among other things, injury or loss of life, severe damage to or destruction of property, natural resources and equipment, pollution or other environmental damage, cleanup responsibilities, regulatory investigation and penalties and suspension of operations. In addition, the Company may be liable for environmental damages caused by previous owners of property purchased and leased by itself. In recent years, there has also been increased scrutiny on the environmental risk associated with hydraulic fracturing, such as underground migration and surface spillage or mishandling of fracturing fluids including chemical additives. This technology has evolved and continues to evolve and become more aggressive. The Company believes that new techniques can increase estimated ultimate recovery per well to over 1.0 million barrels of oil equivalent and have increased initial production two or three-fold. The Company believes that recent designs have seen improvement in, among other things, proppant per foot, barrels of water per stage, fracturing stages, and clusters per fracturing stage. As a result, substantial liabilities to third parties or governmental entities may be incurred, the payment of which could reduce or eliminate the funds available for exploration, development or acquisitions or result in the loss of the Company's properties and/or force it to expend substantial monies in connection with litigation or settlements. The Company currently has no insurance to cover such losses and liabilities, and even if insurance is obtained, it may not be adequate to cover any losses or liabilities. The occurrence of a significant event not fully insured or indemnified against could materially and adversely affect the Company's financial condition and operations. In addition, pollution and environmental risks generally are not fully insurable. The occurrence of an event not fully covered by insurance could have a material adverse effect on the Company's financial condition and results of operations.

Estimates of the Volume of Reserves

Estimates of reserves and of future net revenues prepared by different petroleum engineers may vary substantially depending, in part, on the assumptions made and may be subject to adjustment either up or down in the future. The Company's actual amounts of production, revenue, taxes, development expenditures, operating expenses, and quantities of recoverable oil and gas reserves may vary substantially from the estimates. Oil and gas reserve estimates are necessarily inexact and involve matters of subjective engineering judgment. In addition, any estimates of its future net revenues and the present value thereof are based on assumptions derived in part from historical price and cost information, which may not reflect current and future values, and/or other assumptions made by management that only represent our best estimates. If these estimates of quantities, prices and costs prove inaccurate, The Company may be unsuccessful in expanding our oil and gas reserves base with our acquisitions. Additionally, if declines in and instability of oil and gas prices occur, then write downs in the capitalized costs associated with any oil and gas assets it obtains may be required. Because of the nature of the estimates of the Company's reserves and estimates in general, reductions to our estimated proved oil and gas reserves and estimated future net revenues may not be required in the future, and/or that our estimated reserves may not present and/or commercially extractable. If the Company's reserve estimates are incorrect, it may be forced to write down the capitalized costs of our oil and gas properties.

Decommissioning Costs are Unknown and May be Substantial

The Company may become responsible for costs associated with abandoning and reclaiming wells, facilities and pipelines which it uses for production of oil and natural gas reserves. Abandonment and reclamation of these facilities and the costs associated therewith is often referred to as “decommissioning.” The Company accrues a liability for decommissioning costs associated with its wells but have not established any cash reserve account for these potential costs in respect of any of our properties. If decommissioning is required before economic depletion of our properties or if the Company's estimates of the costs of decommissioning exceed the value of the reserves remaining at any particular time to cover such decommissioning costs, the Company may have to draw on funds from other sources to satisfy such costs. The use of other funds to satisfy such decommissioning costs could impair our ability to focus capital investment in other areas of our business.

Challenges to the Properties May Impact the Company's Financial Condition.

Title to oil and gas interests is often not capable of conclusive determination without incurring substantial expense. While the Company has made and intends to make appropriate inquiries into the title of properties and other development rights it has acquired and intends to acquire, title defects may exist. In addition, the Company may be unable to obtain adequate insurance for title defects, on a commercially reasonable basis or at all. If title defects do exist, it is possible that the Company may lose all or a portion of our right, title and interests in and to the properties to which the title defects relate. If the property rights are reduced, the Company's ability to conduct exploration, development and production activities may be impaired. To mitigate title problems, common industry practice is to obtain a title opinion from a qualified oil and gas attorney prior to the drilling operations of a well.

Continuing Drilling Obligations Under Leases May Not be Met.

The leases for the Orogrande properties include additional drilling requirements for 2022 and 2023. The Company is intending to sell or spin out the leases in 2022 and transfer the ongoing obligations to the new owners of the leases. If such a transfer is not completed in a timely manner in 2022, the Company may be forced to seek an extension from the lessor of the lease drilling obligations or fund the additional activities out of working capital which could adversely impact the Company's financial condition.

The Company's Ability to Maintain its Rights Under the Leases is Dependent on Numerous Factors Outside of its Control.

The leased assets are held for sale. The Company's ability to attract capital to enable on-going compliance with the lease obligations depends upon numerous factors largely beyond our control. These factors include:

- oil, NGLs and natural gas prices;
- global supply and demand for oil, NGLs and natural gas;
- the overall state of the financial markets, including investor appetite for debt and equity securities issued by oil and natural gas companies and the effects of economic recessions or depressions;
- the ability to secure and maintain financing on acceptable terms;
- legislative, environmental and regulatory matters;
- oil and natural gas reservoir quality;
- the availability of drilling rigs, completions equipment and other facilities and equipment;
- the ability to access lands;
- the ability to access water for hydraulic fracturing operations;
- reliance on vendors, suppliers, contractors and service providers;
- shortages of sufficiently skilled labor, or labor disagreements resulting in unplanned work stoppages;
- changes to free trade agreements;
- inflation and other unexpected cost increases, including with respect to materials and labor;
- prevailing interest and foreign exchange rates;
- royalty and tax rates;
- physical impacts from adverse weather conditions and natural disasters;
- transportation and processing interruptions or constraints, including the availability and proximity of pipeline and processing capacity;
- technology failures; and accidents

Risks Related to Legal Matters

Litigation

The Company is currently subject to securities class action litigation and may be subject to similar or other litigation in the future, all of which will require significant management time and attention, result in significant legal expenses and may result in unfavorable outcomes, which may have a material adverse effect on the Company's business, operating results and financial condition, and negatively affect the price of its common stock.

The Company is, and may in the future become, subject to various legal proceedings and claims that arise in or outside the ordinary course of business. For example, the Company currently has securities class action complaints pending against itself, its chief executive officer, and its chief financial officer, asserting that they made false or misleading statements. The complaints seek monetary damages, costs and expenses. For more information, see "Item 3. Legal Proceedings" in this Annual Report on Form 10-K and "Note 28 – Commitments and Contingencies" of the Company's consolidated financial statements included elsewhere in this report.

The Company cannot predict the outcome of these proceedings or provide an estimate of potential damages, if any. The Company believes that the claims in the securities class actions are without merit and intend to defend against them vigorously. Regardless, failure by the Company to obtain a favorable resolution of the claims set forth in the complaints could require it to pay damage awards or otherwise enter into settlement arrangements for which its insurance coverage may be insufficient. Any such damage awards or settlement arrangements in current or future litigation could have a material adverse effect on the Company's business, operating results or financial condition. Even if plaintiffs' claims are not successful, defending against class action litigation is expensive and could divert management's attention and resources, all of which could have a material adverse effect on its business, operating results and financial condition and negatively affect the price of its common stock. In addition, such lawsuits may make it more difficult for the Company to finance its operations in the future.

Ongoing Government Investigation by the SEC

In September 2021, the Company received a subpoena from the Securities and Exchange Commission, Division of Enforcement, in a matter captioned *In the Matter of Torchlight Energy Resources, Inc.* The subpoena requests that the Company produces certain documents and information related to, among other things, the merger involving Torchlight Energy Resources, Inc. and Metamaterial Inc. The Company is cooperating and intends to continue to cooperate with the SEC's investigation. Investigations of this nature are inherently uncertain and their results cannot be predicted. Regardless of the outcome, the SEC Investigation has had and may continue to have an adverse impact on the Company because of legal costs, diversion of management resources, and other factors. The SEC Investigation could also result in reputational harm to the Company, which, among other things, may limit its ability to obtain new customers and enter into new agreements with its existing customers, or its ability to obtain financing, and have a material adverse effect on its current and future business, financial condition, results of operations and prospects.

Risks Related to Financial Reporting

Material Weakness in Internal Controls over Financial Reporting

Management is responsible for establishing and maintaining adequate internal control over financial reporting (as defined in Rule 13a-15(f) under the Exchange Act) and for evaluating and reporting on the effectiveness of our system of internal control. Effective internal controls are necessary for the Company to provide timely, reliable and accurate financial reports, identify and proactively correct any deficiencies, material weaknesses or fraud and meet our reporting obligations. As disclosed in Part II, Item 9A, Management identified material weaknesses during fiscal year 2021. Remediation efforts place a significant burden on management and add increased pressure on its financial reporting resources and processes. If the Company is unable to successfully remediate this material weakness in a timely manner, or if any additional material weaknesses in our internal control over financial reporting are identified, the accuracy of our financial reporting and the Company's ability to timely file with the SEC may be adversely impacted. In addition, if the Company's remedial efforts are insufficient, or if additional material weaknesses or significant deficiencies in its internal controls occur in the future, the Company could be required to restate our financial statements, which could materially and adversely affect its business, results of operations and financial condition, restrict its ability to access the capital markets, require it to expend significant resources to correct the material weaknesses or deficiencies, subject the Company to regulatory investigations and penalties, harm its reputation, cause a decline in investor confidence or otherwise cause a decline in its stock price.

Item 1B. Unresolved Staff Comments.

None.

Item 2. Properties.

The Company's registered office is located at 85 Swanson Road, Boxborough, Massachusetts 01719, and its principal executive office is located at 1 Research Drive, Halifax, Nova Scotia, Canada.

The Company's principal facilities include the following:

Location	Lease expiration	Approximate size (sqft)	Primary functions
Boxborough, Massachusetts	September 30, 2023	4,414	Administration
Research Drive, Dartmouth, Nova Scotia	month-to-month	8,792	Administration, Research and Development, and Production
Highfield Park, Dartmouth, Nova Scotia	August 31, 2031	68,000	Administration, Research and Development, and Production
Pleasanton, California	September 30, 2026	19,506	Research and Development and Production
London, United Kingdom	October 19, 2022	742	Research and Development
Burnaby, British Columbia	April 30, 2025	7,860	Administration and Research and Development
Thurso, Quebec	Owned	105,000	Production and Research and Development
Maroussi, Athens	October 31, 2031	15,457	Research and Development
Steinhausen, Switzerland	June 30, 2022	1,335	Research and Development
Plano, Texas	July 31, 2022	3,299	Administration

The Company also acquired the following properties as part of the Torchlight RTO on June 28, 2021. Comparative figures in Item 2 refer to the financial information of Torchlight as the legal acquirer and not the accounting acquirer. Refer to note 5 in Item 8. "Financial Statements and supplementary data" for more details.

Investments to support oil and gas properties during the years ended December 31, 2021 and 2020 were $14.2 million and $3.4 million respectively.

As of December 31, 2021 and 2020, the Company had no proved reserves. The Hazel and Orogrande Projects consist only of unevaluated properties in progress of development for future production. At December 31, 2021, there are no proved nonproducing reserves related to these properties. The Oklahoma properties are marginal producing wells which are not economic in the context of proved reserve value.

The Company has not included the standardized measure of discounted future net cash flows relating to proved oil and natural gas reserves given there hasn't been any expected future cash inflows.

Reserve Estimation Process, Controls and Technologies

No reserve report has been prepared for 2021 or 2020. The only producing properties owned by the Company are those located in Oklahoma which are marginally producing and are uneconomic for reserve calculation purposes.

Proved Nonproducing Reserves

As of December 31, 2021 and 2020, the Company's proved nonproducing reserves totaled were 0 barrels of oil equivalents (BOE).

At the end of 2021 and 2020, reserves did not include any value for proved undeveloped properties.

The Company made development progress during 2021 to develop proved producing reserves in the Orogrande Project in the Permian Basin in West Texas. The Company incurred cost of $14.2 million in relation to certain drilling activity carried out to remain in compliance with all aspects of the Company's lease obligations and to satisfy the Continuous Drilling Clause ("CDC") with University Lands.

Production, Price, and Production Cost History

During the year ended December 31, 2020, the Company produced and sold 5,445 barrels of oil net to its interest at an average sale price of $34.48 per bbl. It produced and sold 4,998 MCF of gas net to its interest at an average sales price of $1.13 per MCF. Its average production cost including lease operating expenses and direct production taxes was $30.02 per BOE. Its depreciation, depletion, and amortization expense was $130.68 per BOE. The 2020 production was from properties located in central Oklahoma and in west Texas.

During the year ended December 31, 2021, there was no oil or gas production.

Item 3. Legal Proceedings.

On January 31, 2020, Torchlight Energy Resources, Inc. and its wholly owned subsidiaries Torchlight Energy, Inc. and Torchlight Energy Operating, LLC were served with a lawsuit brought by Goldstone Holding Company, LLC (Goldstone Holding Company, LLC v. Torchlight Energy, Inc., et al., in the 160th Judicial District Court of Dallas County, Texas). On February 24, 2020, Torchlight Energy Resources, Inc., Torchlight Energy, Inc., and Torchlight Energy Operating, LLC timely filed their answer, affirmative defenses, and requests for disclosure. The suit, which sought monetary relief over $1 million, made unspecified allegations of misrepresentations involving a November 2015 participation agreement and a 2016 amendment to the participation agreement. Torchlight denied the allegations and asserted several affirmative defenses including but not limited to, that the suit is barred by the applicable statute of limitations, that the claims had been released, and that the claims were barred because of contractual disclaimers between sophisticated parties. Torchlight also asserted counterclaims for attorney fees. On January 14, 2021, Goldstone Holding Company, LLC dismissed its claims without prejudice, leaving Torchlight's counterclaims for attorney fees as the only pending claim in the case. On February 26, 2021, Torchlight filed a non-suit without prejudice on its counterclaims for attorney fees, leaving no claims in the case. The court signed a final order disposing of the entire case on March 5, 2021. However, Goldstone Holding Company, LLC asked the court to re-instate its claims, and a hearing was held on April 13, 2021. On June 16, 2021, the court signed an order denying the motion to reinstate Goldstone Holding Company's, LLC's claims, and the case is closed.

On April 30, 2020, The Company's wholly owned subsidiary, Hudspeth Oil Corporation, filed suit against Datalog LWT, Inc. d/b/a Cordax Evaluation Technologies. The suit seeks the recovery of approximately $1.4 million in costs incurred as a result of a tool failure during drilling activities on the University Founders A25 #2 well that is located in the Orogrande Field. Working interest owner Wolfbone Investments, LLC, a company owned by the Company's former Chairman Gregory McCabe, is a co-plaintiff in that action. After the suit was filed, Cordax filed a mineral lien in the amount of $104,500 against the Orogrande Field and has sued the operator and counterclaimed against Hudspeth for breach of contract, seeking the same amount as the lien. The Company has added the manufacturer of one of the tool components that the Company contends was a cause of the tool failure. It was later discovered that Datalog LWT, Inc. d/b/a Cordax Evaluation Technologies forfeited its charter to conduct business in the State of Texas by failing to timely pay its franchise taxes, and the Company added members of the board of directors to the case pursuant to the Texas Tax Code. It was recently disclosed that Datalog LWT, Inc. d/b/a Cordax Evaluation Technologies is the subsidiary of a Canadian parent company, Cordax Evaluation Technologies, Inc., who has also been added to the case. The suit, Hudspeth Oil Corporation and Wolfbone Investments, LLC v. Datalog LWT, Inc. d/b/a Cordax Evaluation Technologies, was filed in the 189th Judicial District Court of Harris County, Texas. The Company's current Chairman of the Board filed a special appearance after being served with citation, alleging that he was a Canadian citizen with no meaningful ties to Texas. After discovery was conducted on this issue, the Company filed a nonsuit without prejudice for this Defendant, dismissing him from the case. The remaining parties are currently engaged in preliminary discovery and are scheduling mediation.

On March 18, 2021, Datalog LWT, Inc. d/b/a Cordax Evaluation Technologies filed a lawsuit in Hudspeth County, Texas seeking to foreclose its mineral lien against the Orogrande Field in the amount of $104,500.01 and recover related attorney's fees. The foreclosure action, Datalog LWT Inc. d/b/a Cordax Evaluation Technologies v. Torchlight Energy Resources, Inc., was filed in the 205th Judicial District Court of Hudspeth County, Texas. The Company is contesting the lien in good faith and filed a Plea in Abatement on May 10, 2021, seeking a stay in the Hudspeth County lien foreclosure case pending final disposition of the related case currently pending in Harris County, Texas.

In September 2021, the Company received a subpoena from the Securities and Exchange Commission, Division of Enforcement, in a matter captioned *In the Matter of Torchlight Energy Resources, Inc.* The subpoena requests that the Company produces certain documents and information related to, among other things, the merger involving Torchlight Energy Resources, Inc. and Metamaterial Inc. The Company is cooperating and intends to continue to cooperate with the SEC's investigation. The Company can offer no assurances as to the outcome of this investigation or its potential effect, if any, on the Company or its results of operation.

On January 3, 2022, a putative securities class action lawsuit was filed in the U.S. District Court for the Eastern District of New York captioned Maltagliati v. Meta Materials Inc., et al., No. 1:21-cv-07203, against the Company, its Chief Executive Officer, its Chief Financial Officer, Torchlight's former Chairman of the Board of Directors, and Torchlight's former Chief Executive Officer. The complaint, purportedly brought on behalf of all purchasers of the Company's publicly traded securities from September 21, 2020 through and including December 14, 2021, asserts claims under Sections 10(b) and 20(a) of the Securities Exchange Act of 1934 (the "Exchange Act") arising primarily from a short-seller report and statements related to the Company's business combination with Torchlight. The complaint seeks unspecified compensatory damages and reasonable costs and expenses, including attorneys' fees.

On January 26, 2022, a similar putative securities class action lawsuit was filed in the U.S. District Court for the Eastern District of New York captioned McMillan v. Meta Materials Inc., et al., No. 1:22-cv-00463. This complaint names the same defendants and asserts the same claims on behalf of the same purported class as the Maltagliati action. The Company believes these actions (collectively, the "Securities Class Action") have no merit and intends to vigorously defend itself against these allegations.

On January 14, 2022, a shareholder derivative action was filed in the U.S. District Court for the Easter District of New York captioned Hines v. Palikaras, et al., No. 1:22-cv-00248. The complaint names as defendants certain of the Company's current officers and directors, certain former Torchlight officers and directors, and the Company (as nominal defendant). The complaint, purportedly brought on behalf of the Company, asserts claims under Section 14(a) of the Exchange Act, contribution claims under Sections 10(b) and 21D of the Exchange Act, and various state law claims such as breach of fiduciary duties and unjust enrichment. The complaint seeks, among other things, unspecified compensatory damages in favor of the Company, certain corporate governance related actions, and an award of costs and expenses to the derivative plaintiff, including attorneys' fees. The Company believes this action has no merit and intends to vigorously defend itself against these allegations.

Item 4. Mine Safety Disclosures.
Not Applicable.

PART II

Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities.

Market Information for Common Stock

The Company's common stock is quoted on the NASDAQ Stock Market LLC ("NASDAQ") under the symbol, "MMAT". As of December 31, 2021, the Company had outstanding common shares of 284,573,316 out of which there were 88,274,449 Exchangeable Shares held on the Canadian Securities Exchange ("CSE") under the symbol "MMAX".

The average daily volume of MMAT on NASDAQ from June 28, 2021 through December 31, 2021 was 14,258,758 .

The Exchangeable Shares were listed in connection with the completion of the Torchlight RTO where former holders of Metamaterial Inc.'s common shares (that were previously traded on the CSE) were entitled to receive 1.845 of the Company's common shares for each previously held common share of Metamaterial Inc. or in Exchangeable Shares of a wholly-owned subsidiary of META that reflect the same exchange ratio on issuance.

Holders of Record

As of December 31, 2021, there were 87 holders of record of the Company's common stock listed on NASDAQ. Because many shares of MMAT's common stock are held by brokers and other institutions on behalf of stockholders, the Company is unable to estimate the total number of beneficial owners of its common stock.

Holders of the Company's common stock are entitled to one vote for each share held of record on all matters submitted to a vote of stockholders.

Holders of the Company's common stock have no preemptive rights and no right to convert their common stock into any other securities. There are no redemption or sinking fund provisions applicable to the common stock.

Recent Sales of Unregistered Securities

The table below details all unregistered common shares issued by the Company during the fiscal year 2021. These shares are included in the issued and outstanding share count of the Company at December 31, 2021 and are adjusted to reflect the 1:2 reverse stock split of the Company's common stock effected immediately prior to the closing of the Arrangement agreement. With the exception of the shares issuable to Metamaterial holder in connection with the Arrangement Agreement, all other unregistered shares contained restrictions subjecting them to Rule 144.

All common shares referenced in the below table represents shares issued by Meta Materials Inc., previously Torchlight Energy Resources, Inc. ("Torchlight"), after adjustment of reverse stock split on June 25, 2021.

	2021
Exercised Warrants	1,619,547
Principal of converted notes	8,362,899
Payment in Kind	93,165
Service fees paid in stock	285,868
Shares issued to Metamaterial Inc. Shareholders*	196,968,803
Total Unregistered Shares	207,330,282

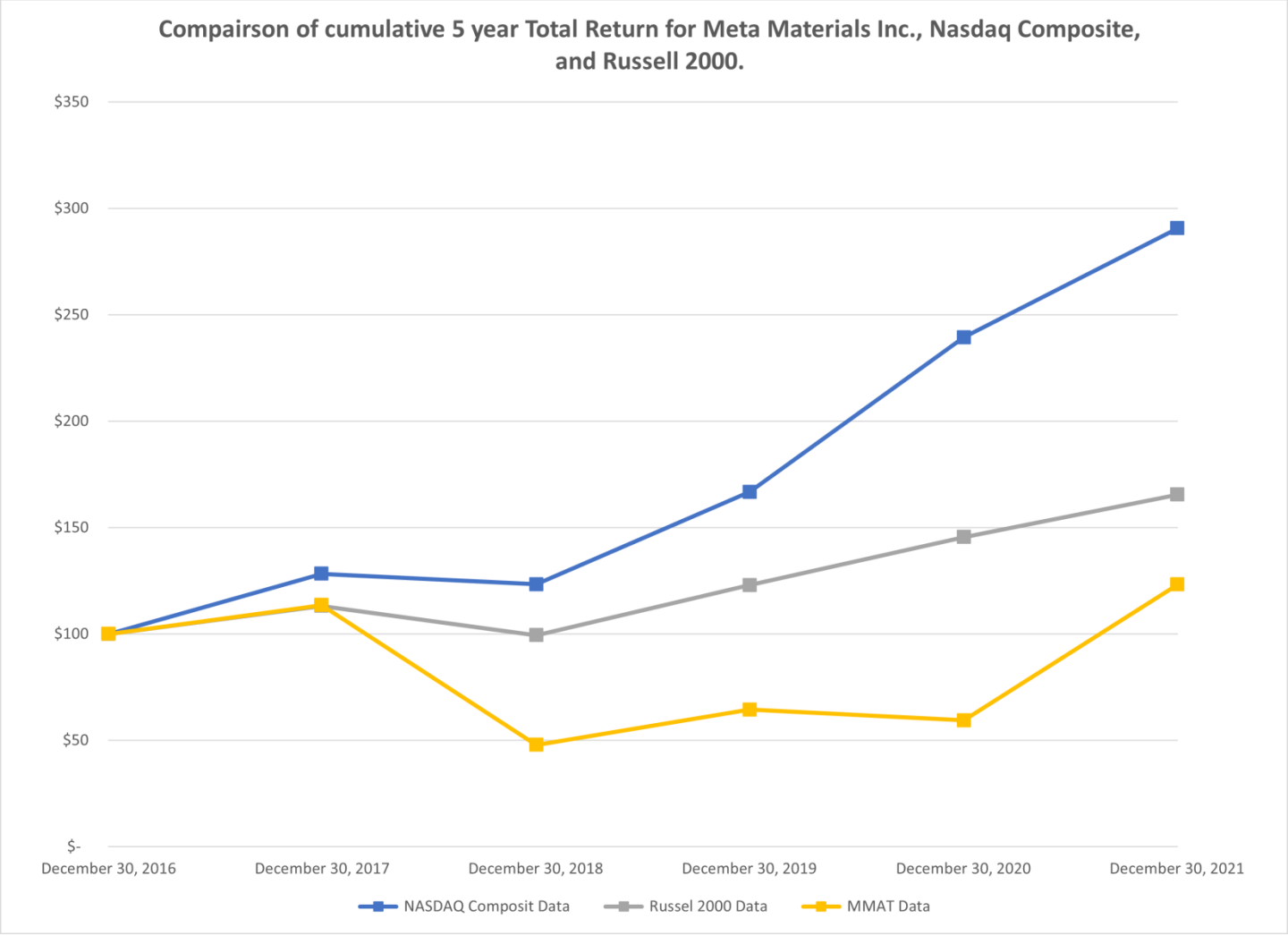
* Issued under an exemption from registration under Section 3(a)(10)

In addition to the common shares detailed above, in June 2021 the Company issued a total of 164,923,363 Series A Preferred Shares to shareholders of record of Torchlight as of June 24, 2021.

Stock Performance Graph

This performance graph shall not be deemed "soliciting material" or to be "filed" with the SEC for purposes of Section 18 of the Exchange Act, or otherwise subject to the liabilities under that Section, and shall not be deemed to be incorporated by reference into any filing of Meta Materials Inc., Inc. under the Securities Act of 1933, as amended, or the Exchange Act.

The following graph shows a comparison of the cumulative total return for the Company's common stock, the Russell 2000 (RUT), and the Nasdaq Composite Index (COMP) beginning December 30, 2016, and ending December 31, 2021. The graph assumes that $100 was invested at the market close on beginning December 30, 2016 in the common stock of MMAT, COMP, and RUT. The stock price performance of the following graph is not necessarily indicative of future stock price performance.



Item 6. [Reserved]

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations.

The following discussion and analysis of the Company's financial condition and results of operations should be read in conjunction with its consolidated financial statements and related notes, each included elsewhere in this Annual Report on Form 10-K. This discussion contains forward-looking statements based upon current plans, expectations and beliefs that involve risks and uncertainties. Our actual results and the timing of certain events could differ materially from those anticipated in or implied by these forward-looking statements as a result of several factors, including those discussed in the section titled "Risk Factors" included under Part I, Item 1A and elsewhere in this Annual Report. See "Note about Forward-Looking Statements" in this Annual Report.

This Report on Form 10-K contains references to the Company's trademarks and to trademarks belonging to other entities. Solely for convenience, trademarks and trade names referred to in this Report on Form 10-K, including logos, artwork and other visual displays, may appear without the ® or TM symbols, but such references are not intended to indicate, in any way, that the Company will not assert, to the fullest extent under applicable law, the Company's rights or the rights of the applicable licensor to these trademarks and trade names. We do not intend for the Company's use or display of other companies' trade names or trademarks to imply a relationship with, or endorsement or sponsorship of the Company by any other companies.

OVERVIEW

Meta Materials Inc. (the "Company" or "META" or "Resulting Issuer") is a developer of high-performance functional materials and nanocomposites specializing in metamaterial research and products, nanofabrication, and computational electromagnetics. The Company's registered office is located at 85 Swanson Road, Boxborough, Massachusetts 01719, and its principal executive office is located at 1 Research Drive, Halifax, Nova Scotia, Canada.

Impact of COVID-19 on the Company's Business

During March 2020, the COVID-19 outbreak was declared a pandemic by the World Health Organization. This has resulted in governments worldwide enacting emergency measures to combat the spread of the virus. In response, the Company's management implemented a Work-From-Home policy for management and non-engineering employees in all of the Company's locations for various periods through Fiscal 2020 and Fiscal 2021 as was required or deemed prudent by management. Engineering staff continued to work on given tasks and followed strict safety guidelines. As of November 2021, the majority of the Company's employees had returned to the workplace. Although the Company's supply chain has slowed down, the Company is currently able to maintain inventory of long lead items and is working with its suppliers to optimize future supply orders

COVID-19 has impacted the Company's 2020 and 2021 sales of its metaAIR® laser protection eyewear product. Worldwide restrictions on travel are significantly impacting the airline industry and purchasing of metaAIR® eyewear has not been the primary spending focus of airline companies emerging from the financial impacts of COVID-19, however, the Company is pursuing sales in adjacent markets such as consumer, military and law enforcement. The situation is dynamic and the ultimate duration and magnitude of the impact of COVID-19 on the economy and financial effect specific to the Company cannot be quantified or known at this time.

BUSINESS AND OPERATIONAL HIGHLIGHTS

Throughout 2021, the Company's activities were focused on its research and development efforts as well as expansion of its intellectual property estate. As the Company moves into 2022, new emphasis will be placed on investments in pilot scale manufacturing of NANOWEB® products, expansion of its production capacity in our banknote and brand security lines and more aggressive design, development and clinical testing of its array of medical products. These efforts represent an efficient approach to monetizing the Company's intellectual property assets.

Highfield Park facility

The Company leased approximately 53,000 square foot facility in Dartmouth, Nova Scotia, with the lease commencing on January 1, 2021. The facility will host the Company's holography and lithography R&D labs and manufacturing operations. The Company also amended this lease agreement on June 9, 2021 to expand the leased space by approximately 15,000 square feet, reduce the annual rent for the 10-year term of the lease and obtain from the landlord CA$0.5 million in cash to fund ongoing tenant improvements. In exchange, the landlord received 993,490 shares of MMI common stock at CA$3.40 per share. As at December 31, 2021, the Company has purchased equipment for approximately $1.5 million as well as spent $3.84 million on construction work. The Company will continue to incur additional construction and equipment costs through 2022.

Pleasanton facility

During 2021, the Company signed multiple lease amendments with its lessor in Pleasanton, California to expand the leased space of the facility in the United States to include additional space of 14,379 square feet as well as extend the duration of the leased spaces until September 30, 2026. The Company has spent approximately $4.3 million on equipment including its first pilot scale roll-to-roll line which is expected to be ready for low volume production during the second half of fiscal year 2022. The Company has also spent $1 million on leasehold improvements

Thurso facility

As part of the Nanotech acquisition, the Company acquired property plant and equipment with an estimated fair value of $25.8 million including a 105,000 square foot facility in Thurso, Quebec. Approximately 35,000 square feet is being utilized for existing production capacity, and the remaining 70,000 square feet is available to expand output to facilitate future growth.

RESULTS OF OPERATIONS

Revenue and Gross Profit

	Year ended December 31,						
	2021	2020	Change		2019	Change	
	$	$	$	%	$	$	%
Product sales	407,915	2,905	405,010	13942%	23,745	(20,840)	-88%
Development revenue	3,674,602	1,119,278	2,555,324	228%	878,665	240,613	27%
Total Revenue	4,082,517	1,122,183	2,960,334	264%	902,410	219,773	24%
Cost of goods sold	675,973	3,254	672,719	20674%	9,172	(5,918)	-65%
Gross Profit	3,406,544	1,118,929	2,287,615	204%	893,238	225,691	25%
Gross Profit percentage	83%	100%	-17%		99%	1%	

Product sales include products, components, and samples sold to various customers. During the year ended December 31, 2021, the Company began earning revenue from development samples sold to certain customers. The $0.4 million increase in product sales in 2021 compared to 2020 is due to:

- $0.3 million in revenue from sale of development samples of NANOWEB®
- $0.1 million in Nano-optic product sales in Q4 2021 generated by Nanotech subsequent to its acquisition by the Company
- Incidental revenue generated by product sales of holoOPTIX™ to different customers

There was minimal change in product sales between 2019 and 2020.

Development revenue is comprised of revenue from contract services and other development revenue. The increase in development revenue of $2.6 million in 2021 compared to 2020 is primarily due to:

- $1.7 million in revenue recognized by Nanotech from contract services subsequent to its acquisition by the Company. Nanotech currently derives a significant portion of its revenue from contract services with a confidential G10 central bank. In 2021, Nanotech entered into a development contract for up to $41.5 million over a period of up to five years. These contract services incorporate both nano-optic and optical thin film technologies and are focused on developing authentication features for future banknotes.
- $1 million in revenue recognized subsequent to achieving performance conditions of the Cooperation Framework Agreement with Covestro Deutschland AG.
- $0.2 million decrease in other development revenue with lower research and development revenue generated from customers in 2021 compared to 2020.

The increase in development revenue of $0.2 million in 2020, compared to 2019, is Primarily due to revenue recognized from statements of work with different customers.

The increase of $0.7 million in cost of sales in 2021, compared to 2020, is primarily due to $0.17 million in cost of sales incurred by Nanotech subsequent to its acquisition by the Company, as well as $0.16 million in cost of sales incurred in generating other product sales. There was minimal decrease in cost of sales in 2020 compared to 2019.

Operating expenses

	Year ended December 31,						
	2021 $	2020 $	Change $	%	2019 $	Change $	%
Operating Expenses							
Selling & Marketing	2,267,354	1,064,659	1,202,695	113%	1,125,719	(61,060)	-5%
General & Administrative	29,699,601	6,707,858	22,991,743	343%	4,819,737	1,888,121	39%
Research & Development	9,497,427	4,102,791	5,394,636	131%	3,825,194	277,597	7%
Total operating expenses	41,464,382	11,875,308	29,589,074	249%	9,770,650	2,104,658	22%

The increase in selling and marketing expenses in 2021, compared to 2020, is primarily due to:

- $0.6 million increase in salaries and benefits due to:
  - $0.2 million in salaries and benefits costs incurred by Nanotech subsequent to its acquisition by the Company.
  - $0.4 million increased cost for new hires in 2021 as part of the Company's expansion and building a sales and marketing team.
- $0.2 million increase in consulting fees for market research and various investor relations campaigns as the Company sought to list on the NASDAQ.
- $0.2 million increase in trade shows and travel and entertainment due to the market rebound after COVID-19 and reopening of trade shows. The Company participated in global tradeshows including AWE in USA and Asia for augmented reality ("AR") and 5G networks, Photonics West for holoOPTIX and AR, CES for various industries and technologies such as 5G networks, augmented reality, consumer electronics, automotive, and medical applications.

There was a minimal decrease in selling and marketing expenses in 2020 compared to 2019.

The increase in general and administrative expenses in 2021, compared to 2020, is primarily due to:

- $5.0 million increase in legal and audit expenses, primarily resulting from costs associated with the Torchlight reverse acquisition ("RTO") and Nanotech acquisition, as well as costs associated with listing on the NASDAQ.
- $6.2 million increase in consulting expenses primarily due to:
  - $4.1 million of expenses relating to the management of, and maintenance of the Oil and Gas assets ("O&G assets") acquired via the Torchlight RTO, including $3.1 million paid to consultants in the form of warrants as well as $0.9 million paid in cash.
  - $1.2 million in advisory fees relating to the acquisition of Nanotech.
- $3.0 million increase in salaries and benefits primarily due to:
  - $2.0 million increase due to incurring an additional $1.1 million in salaries expense for general headcount expansion in 2021 as well as recording accrued bonuses of $0.9 million.
  - $0.9 million in salaries expenses in relation to management of, and maintenance of the O&G assets acquired via the Torchlight RTO.
- $3.9 million increase in investor related expenses due to:
  - $2.7 million warrants and RSUs issued to non-employee consultants in 2021. The fair value of warrants was calculated based on the Monte Carlo simulation valuation technique. The fair value of RSUs was calculated using the grant date share price. Refer to note 14 in Item 8. "Financial Statements and supplementary data" for more details.
  - $1.0 million in other expenses in relation to stock market support, investor communication and holding an annual stockholders meeting.

- $1.6 million increase in rent and utilities due to the new lease for the Company's Highfield Park facility in Nova Scotia, Canada, the expansion of the Pleasanton facility in California, the opening of new administrative locations in Boxborough, Massachusetts and Plano, Texas, and new research and development office in Athens, Greece.
- $1.6 million increase in insurance costs due to the increased insurance requirements in the US resulting from the Company's NASDAQ listing.
- $1.7 million increase in depreciation, amortization and impairment expense.

The increase in general and administrative expenses in 2020, compared to 2019, is primarily due to:

- $1.1 million increase in legal and audit fees for work related to the preparation for the Torchlight RTO and the closing of the CPM RTO, $0.2 million increase in investment banking services, and $0.2 million increase in investor related expenses due to preparation for the acquisition of Torchlight.
- $0.2 million increase in rent and utilities

The increase in research and development expenses in 2021, compared to 2020, is primarily due to:

- $3.1 million increase in salaries and benefits due to general headcount expansion.
- $1.1 million due to R&D materials purchases.
- $0.6 million increase in IT & software, dues and subscriptions, rent & utilities as well as travel and entertainment expenses.

The increase in research and development expenses in 2020, compared to 2019, is primarily due to $0.3 million increase in consulting expenses.

Other expense

	Year ended December 31,						
	2021 $	2020 $	Change $	%	2019 $	Change $	%
Other expense:							
Interest expense, net	(1,106,445)	(1,429,954)	323,509	-23%	(1,135,922)	(294,032)	26%
Loss on foreign exchange, net	(205,882)	(264,831)	58,949	-22%	(316,261)	51,430	-16%
Loss on financial instruments, net	(40,540,091)	(844,993)	(39,695,098)	4698%	(280,319)	(564,674)	201%
Other (loss) income, net	(11,939,068)	1,491,188	(13,430,256)	-901%	2,081,398	(590,210)	-28%
Total other expense	(53,791,486)	(1,048,590)	(52,742,896)	5030%	348,896	(1,397,486)	-401%

The $0.2 million decrease in interest expense in 2021 compared to 2020 was due to the settlement of certain of the Company's convertible promissory notes and debentures, converted into MMI common stock during the year ended December 31, 2021, resulting in less interest expense being incurred.

The $0.3 million increase in interest expense in 2020 compared to 2019 was due to a $5 million loan obtained from BDC and issued in April 2020 as well as issuance of $1 million in unsecured convertible debentures in the first half of fiscal year 2020.

The increase in loss on financial instruments in 2021, compared to 2020, was due to the re-measurement of convertible financial liabilities with carrying value of $12.0 million at the conversion dates and a recognition of a $40.2 million non-cash realized loss in the statements of operations and comprehensive loss. The increase in the fair value of convertible financial liabilities was due to the increase in the Company’s stock price from CA$0.66 as at December 31, 2020 to:

- CA$3.01 at February 16, 2021 when the Company converted unsecured convertible promissory notes of $4.4 million principal and interest at a share price of CA$0.50 in accordance with the terms of the bridge financing;
- CA$3.01 at February 16, 2021 when the Company converted unsecured convertible debentures of $1.5 million principal and interest at share price of CA$0.70 as per terms of the agreement and;
- CA$3.80 at March 3, 2021 when the Company converted secured convertible debentures of $4.3 million principal and interest at share price of CA$0.70 pursuant to the terms of the agreement with Business Development Canada.

Each of the above referenced promissory notes and debentures included a conversion feature, exercisable at the option of the debt holder. For accounting purposes, each of these conversion features was an embedded derivative in the note or debenture. The Company elected to account for fluctuations in (a) the value of the liabilities driven by interest rate volatility and the Company's credit risk and (b) the embedded derivatives driven by fluctuations in the Company's common stock share price, using the fair value option. This accounting method calls for the Company to measure the fair value of the convertible financial liabilities at each balance sheet date and to record any non-cash adjustments relating to instrument-specific credit risk in other comprehensive income, and non-cash adjustments relating to other factors in the statements of operations. If, as was the case for the liabilities described above, the debt is converted, the valuations and any adjustments are to be recorded as of the date of such conversion.

The fair value option also provides that the total revaluation adjustment, in this case $40.2 million, be recorded in common stock and additional paid in capital along with the $10.2 million principal and interest portion, resulting in an increase to stockholders' equity despite the recording of the $40.2 million loss in the statement of operations.

The recorded loss is a non-cash expense. The creditors of the Company exchanged their secured and unsecured debt for common stock of the Company at conversion prices that were established at the time the instruments were created and, at which time, represented a conversion price close to or higher than the then market price of the common stock. Had the Company been permitted to pay off the debts in cash at the time of conversion, fewer shares would have been required to be issued and a lower loss would have been recorded. However, the instruments prevented any pre-payment of the debts by the Company. The conversions had the beneficial effect of significantly reducing the Company's liabilities and eliminating broad-based security interests in all of the Company's assets previously held by the creditors.

The $0.6 million increase in loss on financial instruments in 2020 compared to 2019 is primarily due to the re-measurement of convertible financial liabilities with carrying value of $12.0 million at the conversion dates and a recognition of a $0.8 million non-cash realized loss in the statements of operations and comprehensive loss.

The $13.0 million decrease in net other income in 2021, compared to 2020, is primarily due to costs incurred in relation to certain drilling activity carried out by the company at its Oil and Gas ("O&G") properties, to remain in compliance with all aspects of the Company's lease obligations and to satisfy the Continuous Drilling Clause ("CDC") with University Lands. The Company was successful in maintaining lease compliance and is moving forward with the planned spin-out of the O&G assets.

The $0.6 million decrease in other income in 2020 compared to 2019 was primarily due to the following:

- $0.4 million decrease in recognition of the fair value of the interest free component of the funding obligation.
- $0.6 million decrease in recognition of fair value gain on the ACOA loans.
- Offset by a $0.4 million increase in government assistance.

Deferred Tax recovery

	Year ended December 31,						
	2021	2020	Change		2019	Change	
	$	$	$	%	$	$	%
Income tax recovery	852,063	193,710	658,353	340%	83,549	110,161	132%

The Company records deferred income tax liabilities for some of its foreign subsidiaries in Canada and United Kingdom. The increase in income tax recovery in 2021, compared to 2020, was driven by:

- an increase in accumulated losses, as well as changes in foreign exchange rates, in the Company's foreign subsidiary in United Kingdom.
- an increase in accumulated losses, intangibles amortization and changes in foreign exchange rates in Nanotech securities, the Company's wholly owned subsidiary, pursuant to its acquisition on October 5, 2021.

The increase in income tax recovery in 2020, compared to 2019, was driven by:

- an increase in accumulated losses, as well as changes in foreign exchange rates, in the Company's foreign subsidiary in United Kingdom.

The Company has not yet been able to establish profitability or other sufficient significant positive evidence, to conclude that its deferred tax assets are more likely than not to be realized. Therefore, the Company continues to maintain a valuation allowance against its deferred tax assets.

LIQUIDITY AND CAPITAL RESOURCES

Liquidity risk is the risk that the Company will not meet its financial obligations as they become due after use of currently available cash. The Company has a planning and budgeting process to monitor operating cash requirements, including amounts projected for capital expenditures, which are adjusted as input variables change. These variables include, but are not limited to, the ability of the Company to generate revenue from current and prospective customers, general and administrative requirements of the Company and the availability of equity or debt capital and government funding. As these variables change, the Company may be required to issue equity or obtain debt financing.

At December 31, 2021, the Company had cash and cash equivalents of $46.6 million including $0.8 million in restricted cash compared to $1.4 million in cash and cash equivalents at December 31, 2020. In addition, and as of December 31, 2021, the Company holds short-term investments amounting to $2.8 million (December 31, 2020: $Nil).

For the year ended December 31, 2021, the Company’s principal sources of liquidity included $147 million of cash obtained through the Torchlight RTO, $14.0 million in cash obtained through convertible debt, $1.8 million in cash obtained through revenue and deferred revenue, and $1.1 million in cash obtained through long-term and short-term interest-free debt.

The Company’s primary uses of liquidity included the Nanotech acquisition of $66.1 million net of cash acquired, salaries of $10.3 million, legal and audit fees of $6.3 million, professional service fees of $11.0 million and, Oil and Gas drilling costs of $12.5 million.

The Company believes that its existing cash will be sufficient to meet its working capital and capital expenditure needs as production capacity begins to come on line. The Company may need to raise additional capital to expand the commercialization of its products, fund its operations and further its research and development activities. Future capital requirements may vary materially from period to period and will depend on many factors, including the timing and extent of spending on research and development efforts, the capital expansion of its facilities in Halifax and California and the ongoing investments to support the growth of its business.

The Company also has the option to raise equity through issuing common stock of up to approximately $112.5 million under an existing At-The-Market equity program where the Company's shares have been registered under the Securities Act of 1933, as amended, pursuant to the Registration Statement on Form S-3 (No. 333-256632) filed by the Company with the Securities and Exchange Commission (the “SEC”) on May 28, 2021, and declared effective on June 14, 2021 (the “Registration Statement”).

The following table summarizes META's cash flows for the periods presented:

	Year ended December 31,		
	2021	2020	2019
Net cash used in operating activities	(34,764,911)	(7,929,047)	(4,360,747)
Net cash provided by investing activities	65,144,545	2,412,991	(1,195,342)
Net cash provided by financing activities	15,655,863	6,333,827	5,328,559
Net increase in cash, cash equivalents and restricted cash	46,035,497	817,771	(227,530)

Net cash used in operating activities

During the year ended December 31, 2021, net cash used in operating activities of $36.2 million was primarily driven by a $91.0 million net loss reported for the year, and non-cash adjustments of $51.7 million mainly due to $40.5 million fair value losses on financial instruments, $8 million stock based compensation and non-cash consulting fees, $3.7 million in depreciation, amortization and impairment, and non-cash interest and accretion of $1.1 million, along with other less material line items. Change in operating assets and liabilities totaled $3.2 million.

During the year ended December 31, 2020, net cash used in operating activities of $7.9 million was primarily driven by $11.6 million of net loss reported for the year, and non-cash adjustments of $4.6 million mainly due to $2.3 million in depreciation and amortization, $0.9 in fair value losses on financial instruments, $1.1 million in interest expense and $1.5 million in stock-based compensation. Change in operating assets and liabilities totaled $0.9 million.

During the year ended December 31, 2019, net cash used in operating activities of $4.3 million was primarily driven by $8.4 million of net loss reported for the year, and non-cash adjustments of $3.3 million mainly due to $2.3 million in depreciation and amortization, $1.0 million in interest expense and $1.3 million in stock-based compensation net of $0.5 in non-cash finance income and $0.5 non-cash government assistance. Change in operating assets and liabilities totaled $0.8 million.

Net cash provided by investing activities

During the year ended December 31, 2021, net cash provided by investing activities of $66.6 million was primarily driven by cash acquired as a result of the Torchlight RTO of $147 million, offset by $66.1 million in cash paid for the Nanotech acquisition, $2.9 million purchase of short-term investments, $10.4 million in property plant and equipment purchases associated with the construction of the Highfield Park Facility as well as equipment purchases for both the Highfield Park and Pleasanton facilities, and a $0.9 million increase in intangibles as a result of capitalized legal cost for certain patents, as well as the acquisition of certain intellectual property assets from Interglass Technology AG (Switzerland).

During the year ended December 31, 2020, net cash provided by investing activities of $2.4 million was primarily driven by proceeds from the CPM RTO of $3.1 million offset by $0.7 million in equipment purchases and capitalized legal costs to obtain certain patents.

During the year ended December 31, 2019, net cash used in investing activities of $1.2 million was driven by equipment purchases and capitalized legal costs to obtain certain patents.

Net cash provided by financing activities

During the year ended December 31, 2021, net cash provided by financing activities of $15.5 million was primarily driven by $10.0 million in proceeds received from the issuance of unsecured convertible promissory notes to Torchlight, subsequently eliminated upon consolidation at December 31, 2021, $3.9 million in proceeds from the issuance of unsecured convertible promissory notes to an affiliate that was subsequently converted into common stock during the year and $1.4 million in proceeds from options and warrants exercise.

During the year ended December 31, 2020, net cash provided by financing activities of $6.3 million was primarily driven by $3.6 million in proceeds received from the issuance of secured convertible debentures to BDC Capital that was subsequently converted into common stock in 2021, $0.7 million in proceeds from issuance of unsecured convertible debentures and $0.6 million in proceeds from the issuance of convertible promissory notes to a shareholder that were subsequently converted into common stock in 2021, $0.6 million in proceeds from common stock and warrants issuances offset by $0.2 million in repayments of long-term debt.

During the year ended December 31, 2019, net cash provided by financing activities of $5.3 million was primarily driven by $2.4 million in proceeds received from the issuance of secured convertible promissory notes, $0.6 million in proceeds from issuance of unsecured convertible debentures and $0.8 million in proceeds from a private placement, $0.7 million in proceeds from long-term debt.

CRITICAL ACCOUNTING POLICIES AND ESTIMATES

The preparation of financial statements in conformity with U.S. GAAP requires the Company to make estimates, judgments and assumptions that affect the amounts reported in the consolidated financial statements. These estimates, judgments and assumptions are evaluated on an ongoing basis. The Company bases its estimates on historical experience and on various other assumptions that it believes are reasonable at that time, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ materially from those estimates. The accounting policies that reflect the Company's more significant estimates, judgments and assumptions and which it believes are the most critical to aid in fully understanding and evaluating our reported financial results include the following:

Revenue recognition – The Company’s revenue is generated from product sales as well as development revenue. The Company recognizes revenue when it satisfies performance obligations under the terms of its contracts, and control of its products is transferred to its customers in an amount that reflects the consideration the Company expects to receive from its customers in exchange for those products or services.

Revenue from the sale of prototypes and finished products is recognized at the point in time when control of the asset is transferred to the customer, generally on delivery of goods. The Company considers whether there are other obligations in the contract that are separate performance obligations to which a portion of the transaction price needs to be allocated. In determining the transaction price for the sale of prototypes, the Company considers the effects of variable consideration, the existence of significant financial components, non-cash consideration and consideration payable to the customer (if any).

Revenue from development activities is recognized over time, using an input method to measure progress towards complete satisfaction of the research activities and associated performance obligations identified within each contract have been satisfied.

Goodwill - Goodwill represents the excess of the purchase price in a business combination over the fair value of net tangible and intangible assets acquired. The carrying amount of goodwill is periodically reviewed for impairment (at a minimum annually) and whenever events or changes in circumstances indicate that the carrying value of this asset may not be recoverable.

The Company first performs a qualitative assessment to test the reporting unit's goodwill for impairment. Based on the qualitative assessment, if it is determined that the fair value of our reporting unit is more likely than not (i.e. a likelihood of more than 50 percent) to be less than its carrying amount, the quantitative assessment of the impairment test is performed. In the quantitative assessment, the Company compares the fair value of our reporting unit to its carrying value. If the fair value of the reporting unit exceeds its carrying value, goodwill is not considered impaired and the Company is not required to perform further testing. If the carrying value of the net assets of the reporting unit exceeds its fair value, then an impairment loss equal to the difference, but not exceeding the total carrying value of goodwill allocated to the reporting unit, would be recorded.

Acquired intangibles - In accordance with ASC 805 *Business Combinations*, the Company allocates the purchase price of acquired companies to the tangible and intangible assets acquired and the liabilities assumed based on their estimated fair values. Such valuations may require management to make significant estimates and assumptions, especially with respect to intangible assets. Acquired intangible assets consist of acquired technology and customer relationships. In valuing acquired intangible assets, the Company makes assumptions and estimates based in part on projected financial information, which makes assumptions and estimates inherently uncertain, particularly for early-stage technology companies. The significant estimates and assumptions used by the Company in the determination of the fair value of acquired intangible technology assets include the revenue growth rate, the royalty rate and the discount rate. The significant estimates and assumptions used by the Company in the determination of the fair value of acquired customer contract intangible assets include the revenue growth rate and the discount rate.

As a result of the judgments that need to be made, the Company obtains the assistance of independent valuation firms. The Company completes these assessments as soon as practical after the closing dates. Any excess of the purchase price over the estimated fair values of the identifiable net assets acquired is recorded as goodwill.

Although the Company believes the assumptions and estimates of fair value it has made in the past have been reasonable and appropriate, they are based in part on historical experience and information obtained from the management of the acquired companies and are inherently uncertain and subject to refinement. Unanticipated events and circumstances may occur that may affect the accuracy or validity of such assumptions, estimates or actual results. As a result, during the measurement period, which may be up to one year from the acquisition date, the Company records adjustments to the assets acquired and liabilities assumed with the corresponding offset to goodwill, if the changes are related to conditions that existed at the time of the acquisition. Upon the conclusion of the measurement period or final determination of the values of assets acquired or liabilities assumed, whichever comes first, any subsequent adjustments, based on events that occurred subsequent to the acquisition date, are recorded in our consolidated statements of operations and comprehensive loss.

Business combinations - The Company allocates the fair value of purchase consideration to the tangible assets acquired, liabilities assumed, and intangible assets acquired based on their estimated fair values. The excess of the fair value of purchase consideration over the fair values of these identifiable assets and liabilities is recorded as goodwill to reporting units based on the expected benefit from the business combination. Allocation of purchase consideration to identifiable assets and liabilities affects the amortization expense, as acquired finite-lived intangible assets are amortized over the useful life, whereas any indefinite-lived intangible assets, including goodwill, are not amortized. During the measurement period, which is not to exceed one year from the acquisition date, the Company records adjustments to the assets acquired and liabilities assumed, with the corresponding offset to goodwill. Upon the conclusion of the measurement period, any subsequent adjustments are recorded to earnings. Acquisition-related expenses are recognized separately from business combinations and are expensed as incurred.

Assets held for sale – The Company determines the fair market value of the oil and gas assets held for sale on a periodic basis using inputs from a third party valuation firm skilled in the valuation of this class of assets. The Company estimated the fair value of the Orogrande property at June 28, 2021 as the sum of the median of each of a range of fair values of identified drilling locations determined using numerous assumptions including the number of drilling locations, forecasted production volumes per drilling location, fair value per barrel of forecasted production volumes based on comparable transactions or entities with acreage proximal to the Orogrande Project property, and applying a drilling location risk factor (collectively, "drilling location assumptions"); and a range of fair values of the undeveloped land acreage determined using numerous assumptions including the number of undeveloped land acres, fair value per acre for comparable transactions or entities with acreage proximal to the Orogrande Project property, and applying an acreage risk factor (collectively, "undeveloped land assumptions"). The Company estimated the fair value of the Hazel Property at June 28, 2021 using a discounted cash flow model. The significant estimates and assumptions used by the Company in the determination of the fair value of the Hazel Project property at acquisition date included forecasted production volumes, forecasted commodity prices, and the discount rate. The Company estimated the fair value of the O&G assets at December 31, 2021 by obtaining a valuation study performed by a third party valuation firm. The estimates involved are consistent with those outlined above for the June 28, 2021 valuation estimate.

Commitments and contractual obligations

For a description of the Company's commitments and contractual obligations, please see "Note 28 – Commitments and contingencies" as well as "Note 27 – Leases" in the Notes to the Consolidated Financial Statements of this Form 10-K.

Off-balance sheet arrangements

Off-balance sheet firm commitments relating to outstanding letters of credit amounted to approximately $1.1 million as of December 31, 2021. These letters of credit and bank guarantees are collateralized by $0.8 million in restricted cash. Please see "Note 27 – Commitments and contingencies" in the Notes to the Consolidated Financial Statements of this Form 10-K. The Company does not maintain any other off-balance sheet arrangements.

Recent accounting pronouncements

For a description of recent accounting pronouncements, including the expected dates of adoption and estimated effects, if any, on the Company's Consolidated Financial Statements, please see "Note 2 – Significant accounting policies" in the Notes to the Consolidated Financial Statements of this Form 10-K.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk.

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. Interest rate risk is minimized through management's decision to primarily obtain fixed rate or interest-free debt. The Company's funding obligation and long-term debt have been obtained at a nil interest rate and the interest on the cash balances is insignificant. As a result, the Company is not exposed to material cash flow interest rate risk.

Foreign currency risk

Foreign currency risk is the risk to earnings or capital arising from changes in foreign exchange rates. The Company has transactional currency exposures that arise from loans and receivables as well as purchases in currencies other than their functional currency such as Canadian Dollars, Euros and Great Britain Pounds. Current exposure is not material at this time, as exchange rate impacts occur with a reasonable timeline of the decision to make the expenditure. As a result, the Company does not enter into derivatives to hedge the exposure.

In the future, a hedging strategy may be enacted if long term contracts or operational cash flows create a requirement.

Item 8. Financial Statements and Supplementary Data.

Report of Independent Registered Public Accounting Firm

To the Stockholders and Board of Directors

Meta Materials Inc.:

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of Meta Materials Inc. and subsidiaries (the Company) as of December 31, 2021 and 2020, the related consolidated statements of operations and comprehensive loss, changes in stockholders' equity, and cash flows for each of the years in the three-year period ended December 31, 2021, and the related notes (collectively, the consolidated financial statements). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2021 and 2020, and the results of its operations and its cash flows for each of the years in the three-year period ended December 31, 2021, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2021, based on criteria established in Internal Control – Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission, and our report dated March 1, 2022 expressed an adverse opinion on the effectiveness of the Company's internal control over financial reporting.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these consolidated financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current period audit of the consolidated financial statements that were communicated or required to be communicated to the audit committee and that: (1) relate to accounts or disclosures that are material to the consolidated financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Acquisition date fair value of a developed nanotechnology intangible asset in the acquisition of Nanotech Security Corp.

As discussed in Note 3 to the consolidated financial statements, on October 5, 2021, the Company acquired Nanotech Security Corp. for $72.1 million. The acquisition was accounted for as a business combination. The Company measured the assets acquired and liabilities assumed at fair value, which resulted in the recognition of a developed nanotechnology intangible asset of $14.8 million. As discussed in Note 2 to the consolidated financial statements, the significant estimates and assumptions used by the Company in the determination of the fair value of acquired intangible technology assets include the revenue growth rate, the royalty rate, and the discount rate.

We identified the evaluation of the acquisition date fair value of the developed nanotechnology intangible asset in the acquisition of Nanotech Security Corp. as a critical audit matter. Specifically, the assessment of the revenue growth rate, royalty rate, and discount rate assumptions used in estimating the acquisition date fair value involved a high degree of subjective auditor judgment. In addition, the estimated fair value was sensitive to possible changes to the above estimates and assumptions.

The following are the primary procedures we performed to address this critical audit matter. We evaluated the revenue growth rate by comparing to historical results for the acquired entity and publicly available market data. We involved valuation professionals with specialized skills and knowledge, who assisted in:

- evaluating the Company's discount rate assumption, by comparing it against a discount rate range that was independently developed using publicly available market data for comparable entities

- evaluating the discount rate applied to the developed nanotechnology intangible asset by comparing it to the weighted average return on assets acquired in the Nanotech Security Corp. business combination and the internal rate of return of the Nanotech Security Corp. business combination
- evaluating the Company's royalty rate assumption, by comparing the selected royalty rate to ranges of royalty rates observed in comparable royalty agreements.

Fair value of the Orogrande Project property and preferred stock liability

As discussed in Note 3 to the consolidated financial statements, the Company completed a reverse acquisition of Torchlight Energy Resources, Inc. on June 28, 2021. The assets acquired included certain oil and natural gas properties with a fair value of $72.6 million, of which $71.1 million of the fair value related to the Orogrande Project property. The liabilities assumed included a preferred stock liability with a fair value of $72.6 million entitling the preferred stock owners to the net proceeds of the sale or spinout of the oil and natural gas properties. As a result, the fair value measurement of the oil and natural gas properties, including the Orogrande Project property, also forms the basis for the fair value measurement of the preferred stock liability as of June 28, 2021 and as of December 31, 2021. The Company engaged an independent valuation firm to assist in the determination of the fair value of the Orogrande Project property as of June 28, 2021 and December 31, 2021. The estimated fair value of the Orogrande Project property was calculated as the sum of the median of each of:

- a range of fair values of identified drilling locations determined using numerous assumptions including the number of drilling locations, forecasted production volumes per drilling location, fair value per barrel of forecasted production volumes based on comparable transactions or entities with acreage proximal to the Orogrande Project property, and applying a drilling location risk factor (collectively, "drilling location assumptions"); and
- a range of fair values of the undeveloped land acreage determined using numerous assumptions including the number of undeveloped land acres, fair value per acre for comparable transactions or entities with acreage proximal to the Orogrande Project property, and applying an acreage risk factor (collectively, "undeveloped land assumptions").

We identified the evaluation of the acquisition-date and year-end fair value of the Orogrande Project property as a critical audit matter. A high degree of subjective auditor judgment was required to evaluate the drilling location and undeveloped land assumptions used to calculate the fair value of the Orogrande Project property. Minor changes to these assumptions could have had a significant effect on the estimate of fair value of the Orogrande Project property. Additionally, the audit effort associated with this estimate required specialized skills and knowledge.

The following are the primary procedures we performed to address this critical audit matter. We evaluated the competence, capabilities and objectivity of the independent valuation firm engaged by the Company. We involved valuation professionals with specialized skills and knowledge, who assisted in:

- evaluating the methodology used by the independent valuation firm to calculate the estimated fair value of the Orogrande Project property, including the determination of the number of drilling locations, forecasted production volumes per drilling location, drilling location risk factors, number of undeveloped land acres, and acreage risk factor
- evaluating the Company's determination of fair value per barrel of forecasted production volumes and fair value per acre by comparing to publicly available market data for comparable transactions or entities with acreage proximal to the Orogrande Project property.

/s/ KPMG LLP

Chartered Professional Accountants, Licensed Public Accountants

We have served as the Company's auditor since 2019.

Vaughan, Canada

March 1, 2022

Report of Independent Registered Public Accounting Firm

To the Stockholders and Board of Directors
Meta Materials Inc.:

Opinion on Internal Control Over Financial Reporting

We have audited Meta Material Inc.'s (the Company) internal control over financial reporting as of December 31, 2021, based on criteria established in Internal Control – Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission. In our opinion, because of the effect of the material weaknesses, described below, on the achievement of the objectives of the control criteria, the Company has not maintained effective internal control over financial reporting as of December 31, 2021, based on criteria established in Internal Control – Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets of the Company as of December 31, 2021 and 2020, the related consolidated statements of operations and comprehensive loss, changes in stockholders' equity, and cash flows for each of the years in the three-year period ended December 31, 2021, and the related notes (collectively, the consolidated financial statements), and our report dated March 1, 2022 expressed an unqualified opinion on those consolidated financial statements.

A material weakness is a deficiency, or a combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of the company's annual or interim financial statements will not be prevented or detected on a timely basis. Material weaknesses related to the following have been identified and included in management's assessment:

- An ineffective control environment resulting from a lack of the required number of trained financial reporting, accounting, information technology (IT) and operational personnel with the appropriate skills and knowledge of GAAP and with assigned responsibility and accountability related to the design, implementation, and operation of internal control over financial reporting.
- The insufficient number of personnel described above contributed to an ineffective risk assessment process necessary to identify all relevant risks of material misstatement and to evaluate the implications of relevant risks on its internal control over financial reporting.
- An ineffective information and communication process resulting from: (i) insufficient communication of internal control information, including objectives and responsibilities, such as delegation of authority; and (ii) ineffective general IT controls and ineffective controls over information from service organizations, resulting in insufficient controls to ensure the relevance, timeliness and quality of information used in control activities.
- As a consequence of the above, the Company had ineffective control activities related to the design, implementation and operations of process level and financial statement close controls which had a pervasive impact on the Company's internal control over financial reporting. In addition, process-level automated control activities and manual control activities that are dependent upon information derived from IT systems were also ineffective.
- An ineffective monitoring process resulting from the evaluation and communication of internal control deficiencies, including monitoring corrective actions, not being performed in a timely manner.

The material weaknesses were considered in determining the nature, timing, and extent of audit tests applied in our audit of the 2021 consolidated financial statements, and this report does not affect our report on those consolidated financial statements.

The Company acquired Nanotech Security Corp. during the year ended December 31, 2021, and management excluded Nanotech Security Corp. from its assessment of the effectiveness of the Company's internal control over financial reporting as of December 31, 2021, Nanotech Security Corp.'s internal control over financial reporting associated with 17% of total assets and 45% of total revenues included in the consolidated financial statements of the Company as of and for the year ended December 31, 2021. Our audit of internal control over financial reporting of the Company also excluded an evaluation of the internal control over financial reporting of Nanotech Security Corp.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Form 10-K Item 9A under the header "Management's Report on Internal Control over Financial Reporting". Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audit also included performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control Over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ KPMG LLP

Chartered Professional Accountants, Licensed Public Accountants

Vaughan, Canada

March 1, 2022

PART I—FINANCIAL INFORMATION

Item 1. Financial Statements

META MATERIALS INC.
CONSOLIDATED BALANCE SHEETS

	As of December 31, 2021	2020
Assets		
Current assets:		
Cash and cash equivalents	$ 46,645,704	$ 1,395,683
Restricted cash	788,768	—
Short-term investments	2,875,638	—
Grants receivable	175,780	327,868
Accounts and other receivables	1,665,700	22,833
Inventory	265,718	463,382
Prepaid expenses and other current assets	3,451,367	514,203
Assets held for sale	75,500,000	—
Due from related parties	10,657	—
Total current assets	131,379,332	2,723,969
Intangible assets, net	28,971,824	4,476,614
Property, plant and equipment, net	27,018,114	2,761,171
Operating lease right-of-use assets	6,278,547	270,581
Goodwill	240,376,634	—
Total assets	$ 434,024,451	$ 10,232,335
Liabilities and stockholders' equity (deficit)		
Current liabilities		
Trade and other payables	$ 13,335,470	$ 2,940,452
Due to related party	—	245,467
Current portion of long-term debt	491,278	290,544
Current portion of deferred revenues	779,732	1,239,927
Current portion of deferred government assistance	846,612	779,578
Preferred stock liability	75,500,000	—
Current portion of operating lease liabilities	663,861	150,802
Asset retirement obligations	21,937	—
Unsecured convertible promissory notes	—	1,203,235
Secured convertible debentures	—	5,545,470
Total current liabilities	91,638,890	12,395,475
Deferred revenues	637,008	804,143
Deferred government assistance	3,038	146,510
Deferred tax liability	324,479	318,054
Unsecured convertible debentures	—	1,825,389
Long-term operating lease liabilities	3,706,774	119,779
Funding obligation	268,976	776,884
Long-term debt	2,737,171	2,743,504
Total liabilities	99,316,336	19,129,738
Stockholders' equity (deficit)		
Common stock - $0.001 par value; 1,000,000,000 shares authorized, 284,573,316 shares issued and outstanding at December 31, 2021, and $Nil par value; unlimited shares authorized, 154,163,975 shares issued and outstanding at December 31, 2020	262,751	132,347
Additional paid-in capital	463,136,404	29,022,977
Accumulated other comprehensive loss	(296,936)	(655,884)
Accumulated deficit	(128,394,104)	(37,396,843)
Total stockholders' equity (deficit)	334,708,115	(8,897,403)
Total liabilities and stockholders' equity	$ 434,024,451	$ 10,232,335
Commitments and contingencies (note 28)		
Subsequent events (note 29)		

The accompanying notes are an integral part of these consolidated financial statements

META MATERIALS INC.
CONSOLIDATED STATEMENTS OF OPERATIONS AND COMPREHENSIVE LOSS

	Year ended December 31,		
	2021	2020	2019
Revenue:			
Product sales	$ 407,915	$ 2,905	$ 23,745
Development revenue	3,674,602	1,119,278	878,665
Total revenue	4,082,517	1,122,183	902,410
Cost of goods sold	675,973	3,254	9,172
Gross profit	3,406,544	1,118,929	893,238
Operating expenses:			
Selling & marketing	2,267,354	1,064,659	1,125,719
General & administrative	29,699,601	6,707,858	4,819,737
Research & development	9,497,427	4,102,791	3,825,194
Total operating expenses	41,464,382	11,875,308	9,770,650
Loss from operations	(38,057,838)	(10,756,379)	(8,877,412)
Interest expense, net	(1,106,445)	(1,429,954)	(1,135,922)
Loss on foreign exchange, net	(205,882)	(264,831)	(316,261)
Loss on financial instruments, net	(40,540,091)	(844,993)	(280,319)
Other (loss) income, net	(11,939,068)	1,491,188	2,081,398
Total other expense, net	(53,791,486)	(1,048,590)	348,896
Loss before income taxes	(91,849,324)	(11,804,969)	(8,528,516)
Income tax recovery	852,063	193,710	83,549
Net loss	$ (90,997,261)	$ (11,611,259)	$ (8,444,967)
Other comprehensive income (loss) net of tax			
Foreign currency translation (loss) gain	(321,230)	88,173	81,432
Fair value gain (loss) on changes of own credit risk	680,178	(680,178)	—
Total other comprehensive income (loss)	358,948	(592,005)	81,432
Comprehensive loss	$ (90,638,313)	$ (12,203,264)	$ 81,432
Basic and diluted loss per share [1]	$ (0.39)	$ (0.08)	$ (0.17)
Weighted average number of shares outstanding - basic and diluted [1]	232,898,398	137,258,259	50,015,137

(2) Retroactively restated for the year ended December 31, 2021 and 2020 for the Torchlight reverse acquisition ("Torchlight RTO") and CPM reverse recapitalization ("CPM RTO")

The accompanying notes are an integral part of these consolidated financial statements

META MATERIALS INC.
CONSOLIDATED STATEMENTS OF CHANGES IN STOCKHOLDERS' EQUITY

	Preferred Stock		Common Stock		Additional Paid-in Capital	Accumulated Other Comprehensive Income (loss)	Accumulated Deficit	Total Stockholders' Equity
	Shares	Amount	Shares	Amount				
Balance, December 31, 2018	58,153,368	$ 58,153	49,339,552	$ 27,522	$ 17,270,864	$ (145,311)	$ (17,340,617)	$ (129,389)
Net loss	—	—	—	—	—	—	(8,444,967)	(8,444,967)
Other comprehensive income	—	—	—	—	—	81,432	—	81,432
Issuance of common stock, net	—	—	3,027,283	3,027	636,975	—	—	640,002
Issuance of warrants	—	—	—	—	125,877	—	—	125,877
Conversion of deferred share units	—	—	776,283	776	(776)	—	—	—
Beneficial conversion feature on convertible debt	—	—	—	—	479,061	—	—	479,061
Other stock-based compensation	—	—	154,450	155	1,385,613	—	—	1,385,768
Balance, December 31, 2019	58,153,368	$ 58,153	53,297,568	$ 31,480	$ 19,897,614	$ (63,879)	$ (25,785,584)	$ (5,862,216)
Net loss	—	—	—	—	—	—	(11,611,259)	(11,611,259)
Other comprehensive income	—	—	—	—	—	(592,005)	—	(592,005)
Issuance of common stock, net	—	—	2,613,321	2,613	445,939	—	—	448,552
Issuance of warrants	—	—	—	—	149,994	—	—	149,994
Conversion of deferred share units	—	—	522,596	523	(523)	—	—	—
Conversion of promissory notes	—	—	17,752,163	17,752	3,921,695	—	—	3,939,447
Conversion of preferred stock	(58,153,368)	(58,153)	58,153,368	58,153	—	—	—	—
Effect of reverse recapitalization	—	—	21,599,223	21,599	3,192,903	—	—	3,214,502
Tax withheld on deferred share units	—	—	(72,717)	(73)	(18,669)	—	—	(18,742)
Other stock-based compensation	—	—	298,453	300	1,434,024	—	—	1,434,324
Balance, December 31, 2020	—	$ —	154,163,975	$ 132,347	$ 29,022,977	$ (655,884)	$ (37,396,843)	$ (8,897,403)
Net loss	—	—	—	—	—	—	(90,997,261)	(90,997,261)
Other comprehensive income	—	—	—	—	—	358,948	—	358,948
Conversion of promissory notes	—	—	20,391,239	20,391	23,635,974	—	—	23,656,365
Conversion of secured debentures	—	—	14,155,831	14,156	22,104,626	—	—	22,118,782
Conversion of unsecured debentures	—	—	5,105,338	5,105	5,764,370	—	—	5,769,475
Conversion of long-term debt	—	—	124,716	125	221,718	—	—	221,843
Conversion of payable to related party	—	—	150,522	151	225,835	—	—	225,986
Exercise of stock options	—	—	4,786,927	4,787	1,288,476	—	—	1,293,263
Exercise of warrants	—	—	361,729	362	122,108	—	—	122,470
Exercise of broker warrants	—	—	82,494	83	16,173	—	—	16,256
Effect of reverse acquisition	—	—	82,813,994	82,814	369,378,596	—	—	369,461,410
Shares issued in lieu of operating lease liability	—	—	1,832,989	1,833	2,780,135	—	—	2,781,968
Other stock-based compensation	—	—	603,562	597	8,575,416	—	—	8,576,013
Balance, December 31, 2021	—	$ —	284,573,316	$ 262,751	$463,136,404	$ (296,936)	$ (128,394,104)	$334,708,115

(2) Retroactively restated from the earliest period presented for the Torchlight reverse acquisition ("Torchlight RTO") and CPM reverse recapitalization ("CPM RTO")

The accompanying notes are an integral part of these consolidated financial statements

META MATERIALS INC.
CONSOLIDATED STATEMENTS OF CASH FLOWS

	Year ended December 31,		
	2021	2020	2019
Cash flows from operating activities:			
Net loss	$ (90,997,261)	$ (11,611,259)	$ (8,444,967)
Adjustments to reconcile net loss to net cash used in operating activities:			
Non-cash finance (income) expense	(471,689)	138,927	(448,437)
Non-cash interest expense	902,940	1,052,776	959,838
Non-cash lease expense	439,791	—	—
Deferred income tax	(852,063)	(193,710)	(83,549)
Depreciation and amortization	3,491,493	2,326,220	2,360,043
Impairment of assets	237,013	4,018	66,765
Unrealized foreign currency exchange loss	407,352	205,001	313,387
Loss on financial instruments, net	40,540,091	844,993	280,319
Change in deferred revenue	(679,541)	(551,374)	(627,902)
Non-cash government assistance	(544,932)	(775,800)	(500,051)
Loss on debt settlement	19,253	—	—
Other income	—	—	(401,186)
Stock-based compensation	1,576,849	1,509,684	1,292,773
Non-cash consulting expense	6,513,378	2,307	91,993
Changes in operating assets and liabilities	4,652,415	(880,830)	780,227
Net cash used in operating activities	(34,764,911)	(7,929,047)	(4,360,747)
Cash flows from investing activities:			
Purchases of intangible assets	(1,133,894)	(104,132)	(42,332)
Purchases of property, plant and equipment	(11,655,417)	(555,013)	(1,153,010)
Purchase of short-term investments	(2,889,852)	—	—
Acquisition of business, net of cash acquired	(66,131,025)	—	—
Proceeds from reverse takeover	146,954,733	3,072,136	—
Net cash provided by investing activities	65,144,545	2,412,991	(1,195,342)
Cash flows from financing activities:			
Proceeds from long-term debt	1,127,151	25,783	664,810
Repayments of long-term debt	(1,090,047)	(190,633)	(58,201)
Proceeds from secured promissory notes	—	—	2,407,118
Proceeds from government grants	223,384	198,286	—
Proceeds from unsecured promissory notes	13,963,386	1,378,042	—
Proceeds from secured convertible debentures	—	3,630,019	—
Proceeds from unsecured convertible debentures	—	693,784	566,690
Proceeds on funding obligation	—	—	982,263
Proceeds from issuance of common stock and warrants, net	—	598,546	765,879
Proceeds from stock option exercises	1,293,263	—	—
Proceeds from warrant exercises	138,726	—	—
Net cash provided by financing activities	15,655,863	6,333,827	5,328,559
Net increase in cash, cash equivalents and restricted cash	46,035,497	817,771	(227,530)
Cash, cash equivalents and restricted cash at beginning of the year	1,395,683	407,061	623,532
Effects of exchange rate changes on cash, cash equivalents and restricted cash	3,292	170,851	11,059
Cash, cash equivalents and restricted cash at end of the year	$ 47,434,472	$ 1,395,683	$ 407,061
Supplemental cash flow information			
Accrued purchases of property, equipment and patents	1,692,969	1,449,197	440,751
Right-of-use assets obtained in exchange for lease liabilities	3,590,148	309,907	109,735
Right-of-use assets and prepaid expenses recognized in exchange for common stock	2,149,381	—	—
Settlement of liabilities in common stock	51,992,451	—	—
Beneficial conversion feature on convertible debt	—	—	479,061
Interest paid on debt	64,528	193,745	14,477

The accompanying notes are an integral part of these consolidated financial statements

1. Corporate information

Meta Materials Inc. (the "Company" or "META" or "Resulting Issuer") is a developer of high-performance functional materials and nanocomposites specializing in metamaterial research and products, nanofabrication, and computational electromagnetics. The Company's registered office is located at 85 Swanson Road, Boxborough, Massachusetts 01719, and its principal executive office is located at 1 Research Drive, Halifax, Nova Scotia, Canada.

On March 5, 2020, Metamaterial Inc. ("MMI" or "Resulting Issuer"). and Metamaterial Technologies Inc. ("MTI") completed a business combination by way of a three-cornered amalgamation pursuant to which MTI amalgamated with a subsidiary of Continental Precious Minerals Inc. ("CPM"), known as Continental Precious Minerals Subco Inc. ("CPM Subco"), to become "Metacontinental Inc." (the "CPM RTO"). The CPM RTO was completed pursuant to the terms and conditions of an amalgamation agreement dated August 16, 2019 between CPM, MTI and CPM Subco, as amended March 4, 2020. Following the completion of the RTO, Metacontinental Inc. is carrying on the business of the former MTI, as a wholly-owned subsidiary of CPM. In connection with the RTO, CPM changed its name effective March 2, 2020 from Continental Precious Minerals Inc. to MMI. The common stock of CPM was delisted from the TSX Venture Exchange on March 4, 2020 and was posted for trading on the Canadian Securities Exchange ("CSE") on March 9, 2020 under the symbol "MMAT".

For accounting purposes, the legal subsidiary, MTI, has been treated as the accounting acquirer and CPM, the legal parent, has been treated as the accounting acquiree. The transaction has been accounted for as a reverse recapitalization. Accordingly, these consolidated financial statements are a continuation of MTI consolidated financial statements prior to March 5, 2020 and exclude the balance sheets, statements of operations and comprehensive loss, statement of changes in stockholder's equity and statements of cash flows of CPM prior to March 5, 2020. See note 3 for additional information.

On December 14, 2020, the Company (formerly known as "Torchlight Energy Resources, Inc." or "Torchlight") and its subsidiaries, Metamaterial Exchangeco Inc. (formerly named 2798832 Ontario Inc., "Canco") and 2798831 Ontario Inc. ("Callco"), entered into an Arrangement Agreement (the "Arrangement Agreement") with Metamaterial Inc., an Ontario corporation headquartered in Nova Scotia, Canada ("MMI"), to acquire all of the outstanding common stock of MMI by way of a statutory plan of arrangement (the "Arrangement") under the Business Corporations Act (Ontario), on and subject to the terms and conditions of the Arrangement Agreement (the "Torchlight RTO"). On June 25, 2021, the Company implemented a reverse stock split, changed its name from "Torchlight Energy Resources, Inc." to "Meta Materials Inc." and changed its trading symbol from "TRCH" to "MMAT". On June 28, 2021, following the satisfaction of the closing conditions set forth in the Arrangement Agreement, the Arrangement was completed.

On June 28, 2021, and pursuant to the completion of the Arrangement Agreement, the Company began trading on the NASDAQ under the symbol "MMAT" while MMI common stock was delisted from the Canadian Securities Exchange ("CSE") and at the same time, Metamaterial Exchangeco Inc., a wholly-owned subsidiary of META, started trading under the symbol "MMAX" on the CSE. Certain previous shareholders of MMI elected to convert their common stock of MMI into exchangeable shares in Metamaterial Exchangeco Inc. These exchangeable shares, which can be converted into common stock of META at the option of the holder, are similar in substance to common shares of META and have been included in the determination of outstanding common shares of META.

For accounting purposes, the legal subsidiary, MMI, has been treated as the accounting acquirer and the Company, the legal parent, has been treated as the accounting acquiree. The transaction has been accounted for as a reverse acquisition in accordance with ASC 805 *Business Combinations*. Accordingly, these consolidated financial statements are a continuation of MMI consolidated financial statements prior to June 28, 2021 and exclude the balance sheets, statements of operations and comprehensive loss, statement of changes in stockholders' equity and statements of cash flows of Torchlight prior to June 28, 2021. See note 3 for additional information.

2. Significant accounting policies

Basis of presentation – These consolidated financial statements and related notes are presented in accordance with accounting principles generally accepted in the United States of America ("US GAAP"). The Company's fiscal year-end is December 31. The consolidated financial statements include the accounts of Meta Materials Inc. and its wholly-owned subsidiaries (collectively, the Company). All significant intercompany balances and transactions have been eliminated in consolidation.

Functional currency – Items included in the consolidated financial statements of each of the Company and its subsidiaries are measured using the currency of the primary economic environment in which the entity operates (the 'functional currency').

Reporting Currency – The reporting currency of the Company is in US Dollars. The consolidated financial statements, and the financial information contained herein, are reported in US dollars, except share amounts or as otherwise stated, as the Company believes this results in more relevant and reliable information for its financial statement users.

- ***transactions and balances*** – Foreign currency transactions are recorded into the functional currency using the exchange rates prevailing at the dates of the associated transactions. Foreign exchange gains and losses resulting from the settlement of such transactions and from the measurement at period end exchange rates of monetary assets and liabilities denominated in foreign currencies are recognized in the statement of operations.

- ***translation*** – The results and financial position of all subsidiaries that have a functional currency different from the presentation currency are translated into the presentation currency as follows:

    - Company's assets and liabilities are translated at the closing rate at the date of the balance sheet;

    - Company's income and expenses are translated at average exchange rates;

    - Company's resulting exchange differences are recognized in other comprehensive income, a separate component of equity.

Use of estimates – The preparation of these consolidated financial statements in conformity with US GAAP requires management to make estimates and certain assumptions that affect the amounts reported in these consolidated financial statements and accompanying notes. Actual results could differ from these estimates. Significant items subject to such estimates and assumptions include the valuation of goodwill, the valuation of net assets acquired via business combinations; the valuation of oil & natural gas properties, and the valuation of financial instruments measured at fair value.

Cash and cash equivalents – The Company considers all highly liquid investments with a maturity of three months or less when purchased to be cash equivalents.

Inventory – Inventory is measured at the lower of cost and net realizable value. Cost is determined using the first-in, first-out method (FIFO) for all inventory. Inventory consumed during research and development activities is recorded as a research and development expense.

Long-lived assets – Long-lived assets, such as property, plant and equipment, and intangible assets subject to amortization, are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable. If circumstances require a long-lived asset or asset group be tested for possible impairment, the Company first compares undiscounted cash flows expected to be generated by that asset or asset group to its carrying amount. If the carrying amount of the long-lived asset or asset group is not recoverable on an undiscounted cash flow basis, an impairment is recognized to the extent that the carrying amount exceeds its fair value. Fair value is determined through various valuation techniques including discounted cash flow models, quoted market values and third-party independent appraisals, as considered necessary.

Assets held for sale – Assets held for sale are measured at the lower of their carrying amount or fair value less cost to sell. See Note 3 for further discussion of assets held for sale.

Goodwill – Goodwill represents the excess of the purchase price in a business combination over the fair value of net tangible and intangible assets acquired. The carrying amount of goodwill is periodically reviewed for impairment (at a minimum annually) and whenever events or changes in circumstances indicate that the carrying value of this asset may not be recoverable.

The Company first performs a qualitative assessment to test the reporting unit's goodwill for impairment. Based on the qualitative assessment, if it is determined that the fair value of our reporting unit is more likely than not (i.e. a likelihood of more than 50 percent) to be less than its carrying amount, the quantitative assessment of the impairment test is performed. In the quantitative assessment, the Company compares the fair value of our reporting unit to its carrying value. If the fair value of the reporting unit exceeds its carrying value, goodwill is not considered impaired and the Company is not required to perform further testing. If the carrying value of the net assets of the reporting unit exceeds its fair value, then an impairment loss equal to the difference, but not exceeding the total carrying value of goodwill allocated to the reporting unit, would be recorded.

Acquired intangibles – In accordance with ASC 805 *Business Combinations*, the Company allocates the purchase price of acquired companies to the tangible and intangible assets acquired and the liabilities assumed based on their estimated fair values. Such valuations may require management to make significant estimates and assumptions, especially with respect to intangible assets. Acquired intangible assets consist of acquired technology and customer relationships. In valuing acquired intangible assets, the Company makes assumptions and estimates based in part on projected financial information, which makes assumptions and estimates inherently uncertain, particularly for early-stage technology companies. The significant estimates and assumptions used by the Company in the determination of the fair value of acquired intangible technology assets include the revenue growth rate, the royalty rate and the discount rate. The significant estimates and assumptions used by the Company in the determination of the fair value of acquired customer contract intangible assets include the revenue growth rate and the discount rate.

As a result of the judgments that need to be made, the Company obtains the assistance of independent valuation firms. The Company completes these assessments as soon as practical after the closing dates. Any excess of the purchase price over the estimated fair values of the identifiable net assets acquired is recorded as goodwill.

Business combinations - The Company allocates the fair value of purchase consideration to the tangible assets acquired, liabilities assumed and intangible assets acquired based on their estimated fair values. The excess of the fair value of purchase consideration over the fair values of these identifiable assets and liabilities is recorded as goodwill to reporting units based on the expected benefit from the business combination. Allocation of purchase consideration to identifiable assets and liabilities affects the amortization expense, as acquired finite-lived intangible assets are amortized over the useful life, whereas any indefinite-lived intangible assets, including goodwill, are not amortized. During the measurement period, which is not to exceed one year from the acquisition date, the Company records adjustments to the assets acquired and liabilities assumed, with the corresponding offset to goodwill. Upon the conclusion of the measurement period, any subsequent adjustments are recorded to earnings. Acquisition-related expenses are recognized separately from business combinations and are expensed as incurred.

Leases - The Company is a lessee in several non-cancellable operating leases for buildings. The Company accounts for leases in accordance with ASC 842 *Leases*. The Company determines if an arrangement is or contains a lease at contract inception. The Company recognizes a right-of-use (ROU) asset and a lease liability at the lease commencement date.
For operating leases, the lease liability is initially and subsequently measured at the present value of the unpaid lease payments at the lease commencement date. Lease expense for lease payments is recognized on a straight-line basis over the lease term. For finance leases, the lease liability is initially measured in the same manner and date as for operating leases and is subsequently measured at amortized cost using the effective-interest rate method.
The ROU asset is initially measured at cost, which comprises the initial amount of the lease liability adjusted for lease payments made at or before the lease commencement date, plus any initial direct costs incurred less any lease incentives received. The ROU asset is subsequently measured throughout the lease term at the carrying amount of the lease liability, plus initial direct costs, plus (minus) any prepaid (accrued) lease payments, less the unamortized balance of lease incentives received.

Government grants and assistance – Government grants are recognized at their fair value in the period when there is reasonable assurance that the conditions attaching to the grant will be met and that the grant will be received. Grants are recognized as income over the periods necessary to match them with the related costs that they are intended to compensate. When the grant relates to an asset, it is recognized as income over the useful life of the depreciable asset by way of government assistance.
The Company also receives interest-free repayable loans from the Atlantic Canada Opportunities Agency ("ACOA"), a government agency. The benefit of the loan at a below-market rate of interest is treated as a government grant, measured as the difference between proceeds received and the fair value of the loan based on prevailing market interest rates. The fair value of the components, being the loan and the government grant, must be calculated initially in order to allocate the proceeds to the components. The valuation is complex, as there is no active trading market for these items and is based on unobservable inputs.

Revenue recognition – The Company's revenue is generated from product sales as well as development revenue. The Company recognizes revenue when it satisfies performance obligations under the terms of its contracts, and control of its products is transferred to its customers in an amount that reflects the consideration the Company expects to receive from its customers in exchange for those products or services.

Revenue from the sale of prototypes and finished products is recognized at the point in time when control of the asset is transferred to the customer, generally on delivery of goods. The Company considers whether there are other obligations in the contract that are separate performance obligations to which a portion of the transaction price needs to be allocated. In determining the transaction price for the sale of prototypes, the Company considers the effects of variable consideration, the existence of significant financial components, non-cash consideration and consideration payable to the customer (if any).

Revenue from development activities is recognized over time, using an input method to measure progress towards complete satisfaction of the research activities and associated performance obligations identified within each contract have been satisfied.

Deferred revenue – consist of fees invoiced or paid by the Company's customers for which the associated performance obligations have not been satisfied and revenue has not been recognized based on the Company's revenue recognition criteria described above.
Deferred revenue is reported in a net position on an individual contract basis at the end of each reporting period and is classified as current in the consolidated balance sheet when the revenue recognition associated with the related customer payments and invoicing is expected to occur within one year of the balance sheet date and as long-term when the revenue recognition associated with the related customer payments and invoicing is expected to occur more than one year from the balance sheet date.

Fair value measurements – The Company uses valuation approaches that maximize the use of observable inputs and minimize the use of unobservable inputs to the extent possible. The Company determines fair value based on assumptions that market participants would use in pricing an asset or liability in the principal or most advantageous market. When considering market participant assumptions in fair value measurements, the following fair value hierarchy distinguishes between observable and unobservable inputs, which are categorized in one of the following levels:

- Level 1 inputs: Unadjusted quoted prices in active markets for identical assets or liabilities accessible to the reporting entity at the measurement date.

- Level 2 inputs: Other than quoted prices included in Level 1 inputs that are observable for the asset or liability, either directly or indirectly, for substantially the full term of the asset or liability.

- Level 3 inputs: Unobservable inputs for the asset or liability used to measure fair value to the extent that observable inputs are not available, thereby allowing for situations in which there is little, if any, market activity for the asset or liability at measurement date.

Fair value option – Under the Fair Value Option Subsections of ASC Subtopic 825-10, *Financial Instruments* – Overall, the Company has the irrevocable option to report certain financial assets and financial liabilities at fair value on an instrument-by-instrument basis, with changes in fair value reported in the statement of operations. Any changes in the fair value of liabilities resulting from changes in instrument-specific credit risk are reported in other comprehensive income.

Research and development – Research and development activities are expensed as incurred.

Basic and diluted earnings (loss) per share – Basic earnings (loss) per common share is computed by dividing net income (loss) available to common stockholders by the weighted average number of common stock outstanding during the period. Diluted earnings (loss) per common share gives effect to all dilutive potential common stock outstanding during the period including stock options, deferred stock units ("DSUs"), Restricted Share Units ("RSUs"), and warrants which are calculated using the treasury stock method, and convertible debt instruments using the if-converted method. Diluted earnings (loss) per common share excludes all dilutive potential stock if their effect is anti-dilutive.

Stock based compensation – The Company recognizes compensation expense for equity awards based on the grant date fair value of the award. The Company recognizes stock-based compensation expense for awards granted to employees that have a graded vesting schedule based on a service condition only on a straight-line basis over the requisite service period for each separately vesting portion of the award as if the award was, in substance, multiple awards (the "graded-vesting attribution method"), based on the estimated grant date fair value for each separately vesting tranche. For equity awards with a graded vesting schedule and a combination of service and performance conditions, the Company recognizes stock-based compensation expense using a graded-vesting attribution method over the requisite service period when the achievement of a performance-based milestone is probable, based on the relative satisfaction of the performance condition as of the reporting date.

For stock-based awards granted to consultants and non-employees, compensation expense is recognized using the graded-vesting attribution method over the period during which services are rendered by such consultants and non-employees until completed.
The measurement date for each tranche of employee awards is the date of grant, and stock-based compensation costs are recognized as expense over the employees' requisite service period, which is the vesting period.

The Company estimates the grant date fair value of awards using the Black-Scholes option pricing model and estimates the number of forfeitures expected to occur. The Company may use other pricing models when applicable such as Monte-Carlo simulation. See note 15 for the Company's assumptions used in connection with option grants made during the periods covered by these consolidated financial statements.

Income taxes – Income taxes are accounted for under the asset and liability method. Deferred tax assets and liabilities are recognized for the future tax consequences attributable to differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases and operating loss carry forwards. Deferred tax assets and liabilities are measured using enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to be recovered or settled. The effect on deferred tax assets and liabilities of a change in tax rates is recognized in income in the period that includes the enactment date. A valuation allowance is established to reduce deferred tax assets if it is more likely than not that the related tax benefits will not be realized.

Authoritative guidance for uncertainty in income taxes requires that the Company recognize the financial statement benefit of a tax position only after determining that the relevant tax authority would more likely than not sustain the position following an examination. Management has reviewed the Company's tax positions and determined there were no uncertain tax positions requiring recognition in the consolidated financial statements. Company tax returns remain subject to Federal, Provincial and State tax examinations. Generally, the applicable statutes of limitation are three to four years from their respective filings.

Recently adopted accounting pronouncements

ASU 2019-12

Effective January 1, 2021, the Company adopted ASU 2019-12 on a prospective basis. The new standard was issued in December 2019 with the intent of simplifying the accounting for income taxes. The accounting update removes certain exceptions to the general principles in Accounting Standards Codification (ASC) Topic 740 *Income Taxes* and provides simplification by clarifying and amending existing guidance. The adoption of this ASU did not have a material impact on the Company's consolidated financial statements.

ASU 2020-09

In October 2020, the FASB issued ASU 2020-09, Debt (Topic 470): Amendments to SEC Paragraphs Pursuant to SEC Release No. 33-10762. The amendments in ASU 2020-09 amend rules focused on the provision of material, relevant, and decision-useful information regarding guarantees and other credit enhancements and eliminate prescriptive requirements that have imposed unnecessary burdens and incentivized issuers of securities with guarantees and other credit enhancements to offer and sell those securities on an unregistered basis. The adopted amendments relate to the financial disclosure requirements for guarantors and issuers of guaranteed securities registered or being registered in Rule 3-10 of Regulation S-X, and affiliates whose securities collateralize securities registered or being registered in Rule 3-16 of Regulation S-X. The amendments in ASU 2020-09 are effective for public business entities for annual periods beginning after December 15, 2020. The Company adopted ASU 2020-09 on January 1, 2021 and its adoption did not have a material effect on the Company's consolidated financial statements and related disclosures.

ASU 2020-10

In October 2020, the FASB issued ASU 2020-10, *Codification Improvements*, which updated various codification topics by clarifying or improving disclosure requirements to align with the SEC's regulations. The amendments in ASU 2020-10 are effective for annual periods beginning after December 15, 2020, for public business entities. The Company adopted ASU 2020-10 on January 1, 2021 and its adoption did not have a material effect on the Company's consolidated financial statements and related disclosures.

Accounting pronouncements not yet adopted

ASU 2021-04

In April 2021, the FASB issued ASU 2021-04, *Earnings Per Share* (Topic 260). This guidance clarifies and reduces diversity in an issuer's accounting for modifications or exchanges of freestanding equity-classified written call options due to a lack of explicit guidance in the FASB Codification. This guidance is effective for the Company's interim and annual reporting periods beginning after December 15, 2021. The Company is currently evaluating the impact of the new guidance on its consolidated financial statements.

ASU 2021-08

In October 2021, the FASB issued ASU 2021-08, *Business Combinations* (Topic 805): Accounting for Contract Assets and Contract Liabilities from Contracts with Customers, which clarifies that an acquirer of a business should recognize and measure contract assets and contract liabilities in a business combination in accordance with ASC Topic 606, *Revenue from Contracts with Customers*. This guidance will be effective for the Company's interim and annual reporting periods beginning after December 15, 2022. The Company is currently evaluating the impact of the new guidance on its consolidated financial statements.

ASU 2021-10

In November 2021, the FASB issued ASU 2021-10, *Government Assistance* (Topic 832): Disclosure by Business Entities about Government Assistance, which improves the transparency of government assistance received by most business entities by requiring the disclosure of: (1) the types of government assistance received; (2) the accounting for such assistance; and (3) the effect of the assistance on a business entity's financial statements. This guidance is effective for the Company's interim and annual reporting periods beginning after December 15, 2021. The Company is currently evaluating the impact of the new guidance on its consolidated financial statements.

3. Acquisitions and preferred stock liability

Torchlight RTO

Arrangement

As discussed in note 1, on December 14, 2020, Meta Materials Inc. and its subsidiaries, Metamaterial Exchangeco Inc. and 2798831 Ontario Inc. ("Callco") entered into an Arrangement Agreement with Torchlight Energy Resources, Inc. to acquire all of the outstanding common stock of MMI. On March 12, 2021, MMI's annual general and special meeting was held and MMI's securityholders approved the Arrangement and on June 11, 2021, approval was obtained from Torchlight shareholders through a special meeting.

On June 25, 2021, Torchlight effected a reverse stock split of its Common Stock, at a ratio of two-to-one, changed its name from "Torchlight Energy Resources, Inc." to "Meta Materials Inc." and declared a dividend, on a one-for-one basis, of stock of Series A Non-Voting Preferred Stock to holders of record of Company Common Stock as of June 24, 2021.

On June 28, 2021, following the satisfaction of the closing conditions set forth in the Arrangement Agreement, the Arrangement was completed. The stock of Company Common Stock, previously traded on the NASDAQ under the ticker symbol "TRCH," commenced trading on the NASDAQ under the ticker symbol "MMAT".

Securities conversion

Pursuant to the completion of the Arrangement, each common share of MMI that was issued and outstanding immediately prior to June 28, 2021 was converted into the right to receive 1.845 newly issued shares of common stock, par value $0.001 per share of the Resulting Issuer or stock of Canco, which are exchangeable for shares of the Resulting Issuer at the election of each former MMI stockholder. In addition, all of MMI's outstanding options, deferred share units and other securities exercisable or exchangeable for, or convertible into, and any other rights to acquire MMI Common Stock were exchanged for securities exercisable or exchangeable for, or convertible into, or other rights to acquire Resulting Issuer Common Stock. Immediately following the completion of the RTO, the former security holders of MMI owned approximately 70% of the Resulting Issuer Common Stock, accordingly, the former shareholders of MMI, as a group, retained control of the Resulting Issuer, and while Torchlight was the legal acquirer of MMI, MMI was deemed to be the acquirer for accounting purposes.

Reverse acquisition

Pursuant to ASC 805 *Business Combinations*, the transaction was accounted for as a reverse acquisition since: (i) the shareholders of MMI owned the majority of the outstanding common stock of the Company after the share exchange; (ii) a majority of the directors of the Company are also directors of MMI; and (iii) the previous officers of the Company were replaced with officers designated by MMI. The Company and MMI remain separate legal entities (with the Company as the parent of MMI). These consolidated financial statements are those of MMI prior to June 28, 2021 and exclude the balance sheets, results of operations and comprehensive loss, statement of changes in stockholders' equity, and statements of cash flows of Torchlight prior to June 28, 2021.

Measuring the Consideration Transferred

The accounting acquirer issued no cash consideration for the acquiree. Instead, the accounting acquiree issued its 196,968,803 common shares to the owners of the accounting acquirer. However, the acquisition-date fair value of the consideration transferred by the accounting acquirer for its interest in the accounting acquiree is based on the number of equity interests the legal subsidiary would have had to issue to give the owners of the legal parent the same percentage equity interest in the combined entity that results from the reverse acquisition. Accordingly, the consideration transferred of $358,138,773 was based on the following calculation:

- The assumption that MMI would have issued 44,885,634 shares to Torchlight in order for MMI shareholders to own approximately 70% of the outstanding Combined Company Stock at a share price of $7.96, the closing share price of MMI on June 28, 2021 to equal $357,289,644.
- Adding the fair value of deemed issuance of Torchlight options and warrants that were outstanding at the time of acquisition.
- Deducting the estimated fair value of the previously existing unsecured promissory notes issued by MMI to Torchlight of $11,000,000 plus interest. These notes were effectively settled pursuant to the closing of the Arrangement.

The fair value of the number of equity interests calculated in that way can be used as the fair value of consideration transferred in exchange for the acquiree. The assets and liabilities of the legal acquiree are measured and recognized in the consolidated financial statements at their pre-combination carrying amounts.

Presentation of Consolidated Financial Statements Post Reverse Acquisition

The consolidated financial statements reflect all of the following:

a) the assets and liabilities of the legal subsidiary (the accounting acquirer) recognized and measured at their pre-combination carrying amounts

b) the assets and liabilities of the legal parent (the accounting acquiree) recognized and measured in accordance with ASC 805 *Business Combinations*

c) the retained earnings and other equity balances of the legal subsidiary (accounting acquirer) before the business combination

d) the amount recognized as issued equity interests in the consolidated financial statements determined by adding the issued equity interest of the legal subsidiary (the accounting acquirer) outstanding immediately before the business combination to the fair value of the legal parent (accounting acquiree). However, the equity structure (that is, the number and type of equity interests issued) reflects the equity structure of the legal parent (the accounting acquiree)

All references to common stock, options, deferred share units, and warrants as well as per share amounts have been retroactively restated to reflect the number of shares of the legal parent (accounting acquiree) issued in the reverse acquisition.

Pursuant to the completion of Torchlight RTO on June 28, 2021 and as a result of information presented post acquisition, the Company has made the following changes to the purchase price allocation previously disclosed in the interim financial statements for the three and six months ended June 30, 2021 in Form 10-Q:

- decreased the consideration by $169,592 and reclassed the preferred stock liability from the consideration value to the acquired liabilities.
- decreased the value of the acquired oil and natural gas ("O&G") assets and the preferred stock liability by $197,608 and $5,306,354 respectively, to reflect the finalization of a third-party valuation study of the O&G assets as of June 28, 2021.
- decreased working capital by $1,034,288 as a result of recording pre-acquisition receivable of $3,404,866, liabilities of $865,650 and reduce cash as of June 28, 2021 by $3,573,504. The pre-acquisition receivable represents shares issued before acquisition date where the cash was received immediately after the acquisition date.
- As a result, the Goodwill balance has decreased by $4,244,265.

The Company believes that information gathered to date provides a reasonable basis for estimating the fair value of assets acquired and liabilities assumed, however the Company is waiting for additional information necessary to finalize these fair values including assessment of any tax assets and liabilities and tax position in different jurisdictions. Therefore, the provisional measurements of fair value set forth below are subject to change. The Company expects to complete the purchase price allocation as soon as practicable but no later than one year from the acquisition date.

The following table summarizes the preliminary allocation of the purchase price to the net assets acquired based on the respective fair value of the acquired assets and liabilities:

		Amount
Fair value of deemed issuance of MMI's stock – Common Stock	$	82,814
Fair value of deemed issuance of MMI's stock – Additional paid in capital		357,206,830
Fair value of Torchlight's outstanding warrants – Additional paid in capital		2,773,778
Fair value of Torchlight's outstanding options – Additional paid in capital		9,397,988
Total Effect on Equity		369,461,410
Effective settlement of notes payable by MMI to Torchlight [1]		(11,322,637)
	$	358,138,773
Net assets (liabilities) of Torchlight:		
Cash and cash equivalents	$	143,381,229
Other assets		3,906,290
Oil and natural gas properties [2]		72,600,000
Preferred stock liability [2]		(72,600,000)
Accounts payable		(2,496,510)
Other liabilities		(21,937)
Goodwill [3]		213,369,701
	$	358,138,773

1 Notes receivable/payable

Notes receivable or payable represent unsecured promissory notes previously issued by MMI to Torchlight between September 20, 2020 to February 18, 2021 for proceeds of $11,000,000 plus interest. These notes have been eliminated upon acquisition and subsequent consolidation (see note 10 to these consolidated financial statements for further details).

2 Oil and natural gas properties and preferred stock liability

Valuation at acquisition

Acquired oil and natural gas properties include the Orogrande Project property in West Texas and the Hazel Project property in the Midland basin in West Texas. Refer to note 5 for additional details.

The Company engaged an independent valuation firm to assist in the determination of the fair value of the Orogrande Project property and the Hazel Project property as of June 28, 2021 and December 31, 2021.

The estimated fair value of the Orogrande Project property was calculated as the sum of the median of each of:

- a range of fair values of identified drilling locations determined using numerous assumptions including the number of drilling locations, forecasted production volumes per drilling location, fair value per barrel of forecasted production volumes based on comparable transactions or entities with acreage proximal to the Orogrande Project property, and applying a drilling location risk factor (collectively, "drilling location assumptions"); and

- a range of fair values of the undeveloped land acreage determined using numerous assumptions including the number of undeveloped land acres, fair value per acre for comparable transactions or entities with acreage proximal to the Orogrande Project property, and applying an acreage risk factor (collectively, "undeveloped land assumptions").

The estimated fair value of the Hazel Project property was calculated using a discounted cash flow model. The significant estimates and assumptions used by the Company in the determination of the fair value of the Hazel Project property at acquisition date included forecasted production volumes, forecasted commodity prices, and the discount rate.

The Company valuation concluded an implied enterprise value as of June 28, 2021 to be between $57.7 million and $101.1 million. The Company recorded the fair value of the Orogrande Project property at $71.1 million and the fair value of the Hazel Project property at $1.5 million, totaling a value of $72.6 million.

On June 11, 2021, Torchlight's stockholders approved an amendment to its Articles of Incorporation to increase the authorized number of shares of Torchlight's preferred stock, par value $0.001 per share ("Preferred Stock"), from 10,000,000 shares to 200,000,000 shares. In addition, Torchlight's Board of Directors formally declared the Preferred Dividend and set June 24, 2021 as the Dividend Record Date.

On June 25, 2021, the Company declared a dividend, on a one-for-one basis, of shares of Series A Non-Voting Preferred Stock (the "Series A Preferred Stock") to holders of record of Torchlight's common stock as of June 24, 2021. This preferred stock entitles its holders to receive certain dividends based on the net proceeds of the sale of any assets that are used or held for use in the Company's oil and gas exploration business (the "O&G Assets"), subject to certain holdbacks. Such asset sales must occur prior to the earlier of (i) December 31, 2021 or (ii) the date which is six months from the closing of the Arrangement, or such later date as may be agreed between the Company and the individual appointed to serve as the representative of the holders of Series A Preferred Stock (the "Sale Expiration Date"). The Series A Preferred Stock will automatically be cancelled once the entitled dividends have been paid.

As a result, the fair value measurement of the oil and natural gas properties also forms the basis for the fair value measurement of the preferred stock liability as of June 28, 2021 and as of December 31, 2021. The preferred stock liability is accounted for in accordance with ASC 480 *Distinguishing Liabilities from Equity*.

2021 developments

After the closing of the merger transaction with Torchlight, the Company engaged in a series of activities related to the oil and gas assets to ensure that compliance with the relevant leases was maintained and that the lease rights retained their value in advance of a possible sale or other disposition. The activities over a 4-month period were focused on the obligation to drill four wells on the subject leased property by year-end 2021 to ensure continued compliance with the lease requirements. The activities included assembly of a team of professionals to manage the efforts, permitting, site preparation, drilling equipment rentals, pad preparations at each of the four sites and a variety of site clean-up, data summarization and similar activities. In 2021, the Company invested approximately $14.2 million in these activities to preserve compliance and the value of the assets. These costs were initially capitalized and then assessed at December 31, 2021 to determine if an adjustment was required to the carrying value based on the updated fair value determination. In addition to the drilling activities, the Company organized a new wholly owned subsidiary to enable consolidation of the leases into one company to help facilitate any future sale or other disposition of the assets and provide additional structural alternatives for such sale or disposition.

Valuation at December 31, 2021

The Company continues to actively explore the sale of the assets or spinout, should a sale not occur. The Company estimated the fair value of the O&G assets by obtaining a valuation study performed by a third party valuation firm. The estimates involved are consistent with those outlined above as part of the acquisition. The valuation concluded an implied enterprise value as of December 31, 2021 to be between $55.1 million and $109.0 million. The Company recorded the fair value of the Orogrande Project property at $72.0 million and the fair value of the Hazel Project property at $3.5 million, totaling a value of $75.5 million.

There are 164,923,363 outstanding Series A Non-Voting Preferred shares as of December 31, 2021.

3 Goodwill

Goodwill is attributed to the difference between the total consideration calculated above and deemed to be transferred by the accounting acquirer (MMI) and, the total net assets of the accounting acquiree (Torchlight). Based on the market value of META's Stock on June 28, 2021, this resulted in total “consideration” being transferred to Torchlight of approximately $358.1 million. Further, the net assets of Torchlight acquired by MMI has been estimated to be approximately $144.8 million. The difference between the $358.1 million of consideration deemed to have been transferred and the $144.8 million of net assets acquired results in goodwill of approximately $213.4 million. Torchlight is delivering a NASDAQ listed legal entity in good standing that will provide the Company with ready access to significant capital sources in the future to fund its growth plans.

The company deemed it necessary to perform an annual test for impairment at December 31, 2021 due to market conditions. As at December 31, 2021 no impairment was found.

Revenue and losses from the Torchlight RTO since the acquisition date included in the consolidated statements of operations and comprehensive loss for the year ended December 31, 2021 were $Nil and $15.8 million respectively.

Unaudited pro forma results of operations for the years ended December 31, 2021 and 2020 are included below as if the Torchlight RTO occurred on January 1, 2020. This summary of the unaudited pro forma results of operations is not necessarily indicative of what the Company’s results of operations would have been had Torchlight been acquired at the beginning of 2020, nor does it purport to represent results of operations for any future periods.

	Year ended December 31, 2021			Year ended December 31, 2020		
	META excluding Torchlight	Torchlight	Total	META	Torchlight	Total
Revenue	$ 4,082,517	$ 94,537	$ 4,177,054	$ 1,122,183	$ 193,379	$ 1,315,562
Net loss	(75,181,395)	(23,652,112)	(98,833,507)	(11,611,259)	(12,781,896)	(24,393,155)
Add back: acquisition cost	3,220,870	4,103,184	7,324,054	724,129	—	724,129
Adjusted net loss	$ (71,960,525)	$ (19,548,928)	$ (91,509,453)	$ (10,887,130)	$ (12,781,896)	$ (23,669,026)

Acquisition cost includes legal, accounting, and other professional fees related to the Torchlight acquisition.

Nanotech acquisition

On August 5, 2021, the Company announced the signing of a definitive agreement to indirectly acquire Nanotech Security Corp. (“Nanotech”). On October 5, 2021, a wholly-owned subsidiary of META purchased 100% of Nanotech’s common stock at CA$1.25 per share. In addition, the transaction price included the settlement of certain Nanotech share awards outstanding immediately prior to the closing of the agreement, including the repurchase and cancellation of 303,391 Nanotech restricted share units ("RSU") at a purchase price of CA$1.25 per RSU and the settlement of 4,359,000 Nanotech in-the-money stock options at a purchase price equal to CA$1.25 per option, less the exercise price thereof. The consideration payable to securityholders under the arrangement was payable in cash, resulting in a total purchase price of $72.1 million (CA$90.8 million).

The Company believes that information gathered to date provides a reasonable basis for estimating the fair value of assets acquired and liabilities assumed, however the Company is waiting for additional information necessary to finalize these fair values including assessment of any tax assets and liabilities and tax position in different jurisdictions. Therefore, the provisional measurements of fair value set forth below are subject to change. The Company expects to complete the purchase price allocation as soon as practicable but no later than one year from the acquisition date.

The preliminary allocation of consideration paid for the Nanotech acquisition is summarized as follows:

		Amount
Consideration paid to acquire Nanotech outstanding common stock	$	69,214,652
Consideration paid to repurchase Nanotech restricted stock units (RSUs)		300,610
Consideration paid to repurchase Nanotech stock options		2,612,035
	$	72,127,297
Net assets (liabilities) of Nanotech:		
Cash and cash equivalents	$	5,974,254
Accounts receivable		741,783
Trade payables		(1,349,139)
Prepaid expenses		271,741
Inventory		126,326
Property and equipment		14,771,456
Intangibles		25,309,847
Deferred tax liability		(859,394)
Goodwill		27,140,423
	$	72,127,297

The preliminary purchase price allocation is subject to change as additional information becomes available concerning the fair value and tax basis of the assets acquired and liabilities assumed, including certain contracts and obligations. Any additional adjustments to the purchase price allocation will be made as soon as practicable but no later than one year from the date of acquisition.

The estimated fair value of acquired assets and liabilities has been measured as at the acquisition date based on a valuation report provided by a third-party valuation expert.

Acquired property, plant and equipment acquired totaling $14.8 million is comprised primarily of a production facility in Quebec, Canada with an estimated fair value of $6.0 million, as well as specialized machinery and equipment with an estimated fair value of $8.6 million.

Acquired intangible assets totaling $25.3 million include a developed optical thin film technology intangible asset ($0.2 million), a developed nanotechnology intangible asset ($14.8 million) as well as a customer contract intangible asset for $10.3 million. The significant estimates and assumptions used by the Company in the determination of the fair value of acquired intangible technology assets include the revenue growth rate, the royalty rate and the discount rate. The significant estimates and assumptions used by the Company in the determination of the fair value of the acquired customer contract intangible asset include the revenue growth rate and the discount rate.

The goodwill resulting from the transaction is attributable to different factors including assembled workforce, Nanotech's market potential, specific purchase synergies, technical know-how and expertise, customer service capabilities, geographical presence, and manufacturing capabilities.

Revenue and losses from the Nanotech acquisition since the acquisition date included in the consolidated statements of operations for the year ended December 31, 2021 were $1.8 million and $0.9 million respectively.

Unaudited pro forma results of operations for the years ended December 31, 2021 and 2020 are included below as if the Nanotech acquisition occurred on January 1, 2020. This summary of the unaudited pro forma results of operations is not necessarily indicative of what the Company's results of operations would have been had Nanotech been acquired at the beginning of 2020, nor does it purport to represent results of operations for any future periods.

	Year ended December 31, 2021			Year ended December 31, 2020		
	META excluding Nanotech	Nanotech	Total	META	Nanotech	Total
Revenue	$ 2,237,470	$ 7,755,350	$ 9,992,820	$ 1,122,183	$ 5,944,983	$ 7,067,166
Net loss	(90,279,119)	(2,942,395)	(93,221,514)	(11,611,259)	(1,040,463)	(12,651,722)
Add back: acquisition cost	1,837,796	1,646,522	3,484,318	—	—	—
Deduct: additional depreciation and amortization	—	(3,143,659)	(3,143,659)	—	(3,844,899)	(3,844,899)
Adjusted net loss	$(88,441,323)	$ (4,439,532)	$(92,880,855)	$(11,611,259)	$ (4,885,362)	$(16,496,621)

Acquisition cost includes legal, accounting, and other professional fees related to the Nanotech acquisition. Additional depreciation and amortization is based on the above-mentioned valuation report that was performed as at October 5, 2021.

CPM RTO

As outlined in note 1, on August 16, 2019, MTI entered into an Amalgamation Agreement ("Amalgamation Agreement") with CPM, a Canadian public company listed on the CSE in relation to a Reverse Takeover transaction of CPM by MTI ("CPM RTO"). On October 10, 2019, CPM shareholders approved matters ancillary to the transaction and on November 25, 2019, MTI shareholders approved the CPM RTO. Subject to an amendment to the Amalgamation Agreement dated March 4, 2020, the CPM RTO was completed on March 5, 2020.

The CPM RTO was completed by the way of three-cornered amalgamation, whereby MTI was amalgamated with CPM Subco and holders of stock of MTI received common stock of MMI as consideration. Pursuant to the Amalgamation Agreement, the holders of the common stock of MTI ("MTI Common Stock") and holders of MTI's Class A-1 preferred stock of MTI received MMI Common Stock in exchange for their MTI Common Stock at a ratio of 2.75 MMI Common Stock for each MTI Common Share or Class A-1 Preferred share held. Also pursuant to the Amalgamation Agreement, the holders of MTI's Class A-2 preferred stock received 4.125 Resultant Issuer Common Stock for each Class A-2 preferred share held.

Upon completion of the CPM RTO, all of MTI's outstanding options, deferred share units and other securities exercisable or exchangeable for, or convertible into, and any other rights to acquire MTI Common Stock were exchanged for securities exercisable or exchangeable for, or convertible into, or other rights to acquire MMI Common Stock. Immediately following the completion of the CPM RTO, the former security holders of MTI owned approximately 86% of the Resulting Issuer Common Stock, on a fully diluted basis; accordingly, the former shareholders of MTI, as a group, retained control of MMI, and while CPM was the legal acquirer of MTI, MTI was deemed to be the acquirer for accounting purposes. As CPM did not meet the definition of a business as defined in ASC 805—*Business Combinations*, the acquisition is not within the scope of ASC 805 and was considered to be a reverse recapitalization.

Reverse recapitalization accounting applies when a non-operating public shell company (CPM) acquires a private operating company (MTI) and the owners and management of the private operating company have actual or effective voting and operating control of the combined company. A reverse recapitalization is equivalent to the issuance of stock by the private operating company for the net monetary assets of the public shell corporation accompanied by a recapitalization with accounting similar to that resulting from a reverse acquisition, except that no goodwill or other intangible assets are recorded.

Since the transaction was treated as capital transaction in substance, the consideration transferred was assumed to equal the fair value of CPM's net monetary assets of $3,110,834. Consideration transferred was then allocated between stock and options based on the fair value of the options deemed to have been issued. Accordingly, $212,566 has been allocated to options as outlined in consolidated Statements of changes in stockholders' equity with the remainder $2,898,268 allocated to common stock.

The carrying value of CPM's assets and liabilities have been assumed to approximate their fair values, due to their short-term nature. The following table summarizes the monetary assets acquired and liabilities assumed using the March 5, 2020 exchange rate of $1.00 CAD = $0.7454 USD:

	Amount
Cash and cash equivalents	$ 3,112,172
Marketable securities	3,274
Accounts receivable	20,277
Accounts payable and accrued liabilities	(24,889)
	$ 3,110,834

The fair value of CPM's 700,000 options issued has been estimated using the Black-Scholes option pricing model with the following assumptions:

	Amount
Risk free interest rate	0.83% - 0.96%
Expected volatility	117% -134%
Expected dividend yield	0%
Expected forfeiture rate	0%
Fair value of Resulting Issuer Common Share	CA$0.62
Exercise price of the options	CA$0.35
Expected term for directors resigning from CPM board	6 months
Expected term for a director continuing as Resulting Issuer director	8 years

Revenue and losses from the CPM RTO since the acquisition date were Nil since acquisition.

4. Related party transactions

As of December 31, 2021 and December 31, 2020, receivables due from a related party (Lamda Guard Technologies Ltd, or "LGTL") were for a nominal amount and $nil, respectively. On March 16, 2021, MMI converted an amount of $0.3 million owing to LGTL into 81,584 MMI common stock for a price per share of CA$4.51. The conversion price of CA$4.51 per share represented a 10% premium to the CA$4.10 closing price of MMI stock on the CSE at the close of business on March 12, 2021. MMI has recognized $0.2 million in common stock in the consolidated statements of changes in stockholders' equity at fair value at the time of conversion and recorded the difference of $0.1 million between the fair value of the common stock and the carrying value of the extinguished liability as a loss on debt settlement in the consolidated statements of operations and comprehensive loss.

As of December 31, 2021, and 2020, related party payables due to LGTL were $Nil and $0.2 million respectively.

5. Assets held for sale

As of December 31, 2021, assets held for sale represented the acquired oil and natural gas properties from the Torchlight RTO. Refer to note 3 for details of the fair value determination.

Orogrande Project, West Texas

On August 7, 2014, Torchlight entered into a Purchase Agreement with Hudspeth Oil Corporation ("Hudspeth"), McCabe Petroleum Corporation ("MPC"), and Gregory McCabe, Torchlight prior Chairman. Mr. McCabe was the sole owner of both Hudspeth and MPC. Under the terms and conditions of the Purchase Agreement, Torchlight purchased 100% of the capital stock of Hudspeth which held certain oil and gas assets, including a 100% working interest in approximately 172,000 predominately contiguous acres in the Orogrande Basin in West Texas. Mr. McCabe has, at his option, a 10% working interest back-in after payout and a reversionary interest if drilling obligations are not met, all under the terms and conditions of a participation and development agreement among Hudspeth, MPC and Mr. McCabe. Mr. McCabe also holds a 4.5% overriding royalty interest in the Orogrande acreage, which he obtained prior to, and was not a part of the August 2014 transaction.

Effective March 27, 2017, the property became subject to a DDU Agreement which allows for all 192 existing leases covering approximately 134,000 net acres leased from University Lands to be combined into one drilling and development unit for development purposes. The term of the DDU Agreement expires on December 31, 2023, and the time to drill on the drilling and development unit

continues through December 2023. The DDU Agreement also grants the right to extend the DDU Agreement through December 2028 if compliance with the DDU Agreement is met and the extension fee associated with the additional time is paid.

On July 25, 2018, Torchlight and Hudspeth entered into a Settlement & Purchase Agreement (the "Settlement Agreement") with Founders (and Founders Oil & Gas Operating, LLC, former Operator), Wolfbone and MPC (entities controlled by Torchlight prior Chairman), which agreement provided for Founders assigning all of its working interest in the oil and gas leases of the Orogrande Project to Hudspeth and Wolfbone equally. Future well capital spending obligations remained the same 50% contribution from Hudspeth and 50% from Wolfbone until such time as the $40.5 million to be spent on the project.

The Company's outstanding drilling obligations includes five wells in 2022 and 2023. All drilling obligations through December 31, 2021 have been met. The drilling obligations are minimum yearly requirements and may be exceeded if acceleration is desired.

The Orogrande Project ownership as of December 31, 2021 is detailed as follows:

	Revenue Interest	Working Interest
University Lands - Mineral Owner	20.00%	n/a
ORRI - Magdalena Royalties, LLC, and entity controlled by Gregory McCabe, Chairman	4.50%	n/a
ORRI - Unrelated Party	0.50%	n/a
Hudspeth Oil Corporation, a subsidiary of Meta Materials Inc.	49.88%	66.50%
Wolfbone Investments LLC, and entity controlled by Gregory McCabe, Chairman	18.75%	25.00%
Conversion by Note Holders in March, 2020	4.50%	6.00%
Unrelated Party	1.88%	2.50%
	100.00%	100.00%

Hazel Project in the Midland Basin in West Texas

Effective April 4, 2016, a wholly owned subsidiary of Torchlight acquired from MPC a 66.66% working interest in approximately 12,000 acres in the Midland Basin. A back-in after payout of a 25% working interest was retained by MPC and another unrelated working interest owner.

In October 2016, the holders of Torchlight's outstanding shares of Series C Preferred Stock (which were issued in July 2016) elected to convert into a total 33.33% working interest in the Hazel Project, reducing Torchlight ownership from 66.66% to a 33.33% working interest.

On January 30, 2017, Torchlight entered into and closed an Agreement and Plan of Reorganization and a Plan of Merger with an entity which was wholly-owned by Mr. McCabe, which resulted in the acquisition of approximately 40.66% working interest in the 12,000 gross acres, 9,600 net acres, in the Hazel Project.

Also, on January 30, 2017, the Company entered into and closed a Purchase and Sale Agreement with Wolfbone. Under the agreement, Torchlight acquired certain of Wolfbone's Hazel Project assets, including its interest in the Flying B Ranch #1 well and the 40 acre unit surrounding the well.

Upon the closing of the transactions, Torchlight's working interest in the Hazel Project increased by 40.66% to a total ownership of 74%.

Effective June 1, 2017, Torchlight acquired an additional 6% working interest from unrelated working interest owners increasing its working interest in the Hazel project to 80%, and an overall net revenue interest of 74-75%.

The Company has drilled six test wells on the Hazel Project to capture and document the scientific base in support of demonstrating the production potential of the property.

Option Agreement with Masterson Hazel Partners, LP

On August 13, 2020, Torchlight's subsidiaries Torchlight Energy, Inc. and Torchlight Hazel, LLC (collectively, "Torchlight") entered into an option agreement (the "Option Agreement") with Masterson Hazel Partners, LP ("MHP") and McCabe Petroleum Corporation. Under the agreement, MHP was obligated to drill and complete, or cause to be drilled and completed, at its sole cost and expense, a new lateral well (the "Well") on the Hazel Project, sufficient to satisfy Torchlight's continuous development obligations on the southern half of the prospect no later than September 30, 2020. MHP has satisfied this drilling obligation. MHP paid to Torchlight $1,000 as an option

fee at the time of execution of the Option Agreement. MHP is entitled to receive, as its sole recourse for the recoupment of drilling costs, the revenue from production of the Well attributable to Torchlight's interest until such time as it has recovered its reasonable costs and expenses for drilling, completing, and operating the well.

In exchange for MHP satisfying the above drilling obligations, Torchlight granted to MHP the exclusive right and option to perform operations, at MHP's sole cost and expense, on the Hazel Project sufficient to satisfy Torchlight's continuous development obligations on the northern half of the prospect. Because MHP exercised this drilling option and satisfied the continuous development obligations on the northern half of the prospect, under the terms of the Option Agreement (as amended in September 2020) MHP had the option to purchase the entire Hazel Project no later than May 31, 2021 under the terms of a form of Purchase and Sale Agreement included as an exhibit to the Option Agreement, at an aggregate purchase price of $12,690,704 for approximately 9,762 net mineral acres, and not less than 74% net revenue interest (approximately $1,300 per net mineral acre).The option expired unexercised.

Hunton Play, Central Oklahoma

Presently, the Company is producing from one well in the Viking Area of Mutual Interest and one well in Prairie Grove. These assets were not included in the third party valuation given their nominal value.

6. Inventory

Inventory consists of photosensitive materials, lenses, laser protection film and finished eyewear, and is comprised of the following:

	As of December 31,	
	2021	2020
Raw materials	$ 196,868	$ 378,265
Supplies	8,886	14,414
Work in process	30,636	69,380
Finished goods	29,328	1,323
Total inventory	$ 265,718	$ 463,382

The Company has a contract with a primary raw material supplier which outlines certain restrictions for use of the associated materials. Raw material inventory as at December 31, 2021 includes $Nil (2020 - $0.3 million) that is restricted.

The Company expensed $0.2 million of restricted raw materials inventory to research and development expense during the year ended December 31, 2021 (2020 - $0.2 million).

During the year ended December 31, 2021, the Company recognized $0.7 million (2020 - Nominal amount) of inventory in cost of goods sold in the consolidated statements of operations and comprehensive loss.

7. Prepaid expenses and other current assets

Prepaid expenses and other current assets consist of the following:

	As of December 31,	
	2021	2020
Prepaid expenses	$ 1,262,112	$ 227,425
Other current assets	683,044	134,466
Taxes receivable	1,506,211	152,312
Total prepaid expenses and other current assets	$ 3,451,367	$ 514,203

8. Property, plant and equipment, net

Property, plant and equipment consist of the following:

	Useful life (years)	As of December 31, 2021	2020
Land	N/A	$ 469,317	$ —
Building	25	5,509,403	—
Computer equipment	3-5	262,320	163,856
Computer software	1	277,717	256,554
Manufacturing equipment	2-10	17,762,405	6,645,986
Office furniture	5-7	525,961	99,234
Leasehold improvements	2-5	236,251	—
Enterprise Resource Planning software	5	211,149	210,254
Assets under construction	N/A	8,872,695	424,393
		34,127,218	7,800,277
Accumulated depreciation and impairment		(7,109,104)	(5,039,106)
		$ 27,018,114	$ 2,761,171

Depreciation expense was $1.8 million and $1.6 million for the year ended December 31, 2021 and 2020, respectively.

Impairment expense was $0.3 million and $Nil for the year ended December 31, 2021 and 2020 respectively.

Land and building were acquired as part of the Nanotech acquisition.

Manufacturing equipment additions include $8.6 million of acquired equipment as part of the Nanotech acquisition, $1.4 million in purchased equipment for the Highfield Park facility in Nova Scotia, Canada and $1.2 million in equipment purchased for the NANOWEB® pilot scale production line in the facility in Pleasanton, California, USA.

Assets under construction include $5.4 million in costs related to ongoing construction work at the Highfield Park and Pleasanton facilities and $3.6 million of equipment in transit.

Property, plant and equipment is pledged as security under a General Security Agreement (a "GSA") signed in favor of the Royal Bank of Canada ("RBC") on July 14, 2014, which is related to the Company's corporate bank account and credit card and includes all property, plant and equipment and intangible assets.

9. Intangible Assets and Goodwill

Intangibles

Intangibles consist of the following:

	Useful life (years)	As of December 31, 2021	2020
Patents	5-10	$ 7,839,182	$ 6,954,657
Trademarks	N/A	132,636	72,804
Developed technology	20	14,931,377	—
Customer contract	5	10,253,983	—
		33,157,178	7,027,461
Accumulated amortization and impairment		(4,185,354)	(2,550,847)
		$ 28,971,824	$ 4,476,614

Amortization expense was $1.7 million and $0.8 million for the years ended December 31, 2021 and 2020, respectively.

Developed technology and customer contract additions represent the acquired intangibles as part of the Nanotech acquisition.

Goodwill
During the year ended December 31, 2021, the Company recognized $213.4 million in goodwill from the Torchlight RTO and $27.1 million in goodwill from the Nanotech acquisition.

The Company performs the annual impairment test for goodwill at year-end, by comparing the reporting unit's fair value to its carrying amount, including goodwill, as of December 31, 2021, using the market approach to determine fair value. As the reporting unit's fair value exceeded its carrying amount, the Company determined that goodwill was not impaired. The key assumption used to calculate the recoverable amount of goodwill as of December 31, 2021 was the Company's share price.

10. Unsecured convertible promissory notes

	Year ended December 31, 2021			Year ended December 31, 2020		
	Bridge loan (a)	Torchlight (b)	Total	Bridge loan (a)	Torchlight (b)	Total
Beginning balance	$ 538,020	$ 665,215	$ 1,203,235	$ —	$ —	$ —
Issued	3,963,386	10,000,000	13,963,386	378,042	1,000,000	1,378,042
Interest accrued	17,804	329,965	347,769	2,698	12,701	15,399
Fair value loss (gain)	19,163,417	333,947	19,497,364	139,609	(354,839)	(215,230)
Unrealized fair value loss (gain) due to own credit risk	—	(5,554)	(5,554)	—	14,132	14,132
Unrealized foreign currency exchange gain	—	(258,480)	(258,480)	—	(23,849)	(23,849)
Foreign currency translation adjustment	(26,262)	257,544	231,282	17,671	17,070	34,741
Conversion to common stock	(23,656,365)	—	(23,656,365)	—	—	—
Elimination pursuant to Torchlight RTO (note 3)	—	(11,322,637)	(11,322,637)	—	—	—
Ending balance	$ -	$ -	$ -	$ 538,020	$ 665,215	$ 1,203,235

a) In November 2020, MMI entered into a commitment letter (the "Commitment Letter") with a shareholder, pursuant to which the shareholder will provide up to CA$5,500,000 in debt financing (the "Bridge Loan") to fund MMI's continued operations while MMI worked toward completion of the Proposed Transaction with Torchlight. Pursuant to the Commitment Letter, MMI was able to draw up to CA$500,000 monthly beginning in November 2020. The Bridge Loan bore interest at the rate of 8% per annum, payable monthly in arrears. The principal amount and any accrued but unpaid interest was due and payable on the 10th business day after the closing of the Proposed Transaction, or on November 29, 2022, if the Transaction did not close before that date. At the option of the holder, the Bridge Loan, or any portion of the Bridge Loan and accrued but unpaid interest was convertible into MMI Common Stock at a conversion price of CA$0.50 per share, subject to customary adjustments. MMI had the option to repay the Bridge Loan in whole or in part, without penalty, at any time on or after March 28, 2021.

MMI elected to measure the financial instrument at fair value. MMI subsequently remeasured the instrument on December 31, 2020 and recorded fair value loss of $139,609 in the statements of operations. There was no change in instrument specific credit risk.

On February 16, 2021, the total Bridge Loan of $4,361,930 of principal and accrued interest was converted at CA$0.50 per share into 20,391,239 common shares, in accordance with the terms of the bridge financing. MMI has remeasured the instrument as of the conversion date and recognized a non-cash realized fair value loss of $19,163,417 and the full amount of $23,656,365 was reclassified into the consolidated statements of changes in stockholders' equity.

b) On September 15, 2020, MMI entered into a non-binding Letter of Intent (the "LOI") with Torchlight pursuant to which Torchlight loaned MMI three unsecured convertible promissory notes totaling $11,000,000. These Unsecured Convertible Promissory Notes bore interest at 8% annually, with principal and interest due and payable on the maturity date. If MMI and Torchlight had not entered into a Definitive Agreement, or the Definitive Agreement were terminated, then the Unsecured Convertible Promissory Notes and all accrued and unpaid interest were convertible at the option of the holder into common stock of the Company at the conversion prices set out

below. The Company had the option to repay all or part of the Unsecured Convertible Promissory Notes, plus any accrued and unpaid interest, without penalty on or after 120 days from the note issuance date.

	Tranche 1	Tranche 2	Tranche 3
Face value of notes issued	$ 500,000	$ 500,000	$ 10,000,000
Issuance date	September 20, 2020	December 16, 2020	February 18, 2021
Maturity date	September 20, 2022	December 16, 2022	February 18, 2022
Interest rate	8%	8%	8%
Conversion price	CA$0.35	CA$0.62	CA$2.80

The conversion option was a foreign currency embedded derivative as the note was denominated in USD and the conversion price was in Canadian dollars. MMI elected to measure the financial instrument at fair value. MMI subsequently remeasured the instrument on March 31, 2021, and recorded fair value gain of $197,527, of which $5,554 was a gain recorded in other comprehensive income relating to instrument specific credit risk and $191,973 was a gain recorded in the statements of operations.

As part of the closing of the Arrangement, the promissory notes were remeasured at fair value and a fair value loss of $525,920 was recorded in the statements of operations and comprehensive loss. The notes were considered part of the consideration transferred (see note 3) and were eliminated upon acquisition and subsequent consolidation. In addition, the related accumulated fair value losses in OCI of $9,011 were recycled to the statements of operations and comprehensive loss.

11. Secured convertible debentures

	Year ended December 31, 2021	2020
Beginning balance	$ 5,545,470	$ —
Issued	—	3,630,019
Interest accrued	121,860	508,757
Interest paid	(64,528)	(285,154)
Fair value loss	16,408,482	511,699
Fair value loss—own credit	—	865,280
Foreign currency translation adjustment	107,498	314,869
Conversion to common stock	(22,118,782)	—
Ending balance	$ —	$ 5,545,470

On April 3, 2020, MMI issued CA$5,000,000 in Secured Debentures to BDC Capital Inc.(“BDC”), a wholly owned subsidiary of the Business Development Bank of Canada. The Secured Debentures mature on October 31, 2024, and bear interest at a rate of 10.0% per annum, payable monthly in cash. In addition to the cash interest, the Secured Debentures accrued a non-compounding payment in kind (“PIK”) of 8% per annum. The PIK may be reduced by up to 3% (reduced to as low as 5% per annum) upon meeting certain conditions. BDC may elect to have the PIK paid in cash.

The Secured Debentures and the PIK are convertible in full or in part, at BDC’s option, into MMI common stock at any time prior to their maturity at a conversion price of CA$0.70 (the “Conversion Price”) or MMI may force the conversion of Secured Debentures if MMI’s common stock are trading on the CSE on a volume-weighted average price greater than 100% of the Conversion Price (i.e. greater than CA$1.40) for any 20 consecutive trading days with a minimum daily volume of at least 100,000 Common Stock.

MMI elected to measure the financial instrument at fair value. MMI subsequently remeasured the instrument on December 31, 2020, and recorded a fair value loss of $1,376,979, of which $511,699 was recorded in other comprehensive income relating to instrument specific credit risk and $865,280 was recorded in the statements of operations.

The secured debentures were subject to a covenant clause, whereby MMI was required to maintain a working capital ratio of no less than 3:1. The working capital ratio excluded deferred revenue and deferred government assistance from current liabilities. MMI did not fulfil the ratio as required in the contract and consequently, the secured debentures were reclassified as a current liability as at December 31, 2020.

On March 3, 2021, MMI forced the conversion of the Secured Debentures pursuant to the terms of the agreement with BDC. The total debentures balance of $3,910,954 was converted at CA$0.70 per share into 14,155,831 common shares. MMI remeasured the liability as of the conversion date and recognized a non-cash realized fair value loss of $16,408,482 and the full amount of $22,118,782 was reclassified into the consolidated statements of changes in stockholders’ equity. All security interests held by BDC on assets of MMI were immediately discharged.

In addition, the accumulated losses in OCI of $511,699 were recycled to the statements of operations and comprehensive loss.

12. Unsecured convertible debentures

Unsecured convertible debentures (the "Unsecured Debentures") consist of the following:

	Year ended December 31, 2021	2020
Beginning balance	$ 1,825,389	$ 585,267
Issued	—	693,784
Interest accrued	23,660	147,304
Fair value loss	3,914,931	189,708
Fair value loss due to own credit risk	—	154,347
Foreign currency translation adjustment	5,495	54,979
Conversion to common stock	(5,769,475)	—
Ending balance	$ —	$ 1,825,389

On December 10, 2019, an agreement was signed to convert an existing CA$250,000 short-term loan into an Unsecured Debenture, and also during December 2019, MMI issued an additional CA$500,000 in Unsecured Debentures to the same investor, under the same terms.

During the year ended December 31, 2020, MMI issued an additional CA$950,000 (US $693,784) in Unsecured Debentures to individuals and companies under the same terms as previous issues.

The Unsecured Debentures bear interest at a fixed rate of 1% per month, compounding monthly and have a maturity date of April 30, 2025. Each Unsecured Debenture is convertible at the option of the holder into MMI common stock at a price of CA$0.70 per share. Following completion of the RTO, MMI may elect to repay the outstanding amounts owing under the Unsecured Debentures in cash or in stock at a conversion price of CA$0.70 upon meeting certain conditions or the holder can convert the Unsecured Debentures at CA$0.70 or the Unsecured Debentures can be converted at maturity at the greater of 80% of the 10 day volume-weighted average price of the Resulting Issuer's common stock or the closing price on the preceding trading day less the maximum permitted discount by the exchange.

MMI elected to measure the financial instrument at fair value. MMI subsequently remeasured the instrument on December 31, 2020 and recorded a fair value loss of $344,055, of which $154,347 was recorded in other comprehensive income relating to instrument specific credit risk and $189,708 was recorded in the statements of operations.

On February 16, 2021, MMI converted $1,439,103 of principal and accrued interest of Unsecured Debentures at CA$0.70 per share into 5,105,338 common shares in accordance with the terms of their debt instruments. MMI remeasured the liability as of the conversion date and recognized a non-cash realized fair value loss of $3,914,931 and the full amount of $5,769,475 was reclassified into the consolidated statements of changes in stockholders' equity.

In addition, the accumulated losses in OCI of $154,347 were recycled to the statements of operations.

13. Long-term debt

	As of December 31, 2021	As of December 31, 2020
'ACOA Business Development Program ("BDP") 2012 interest-free loan[1] with a maximum contribution of CA$500,000, repayable in monthly repayments commencing October 1, 2015 of CA$5,952 until June 1, 2023. Loan repayments were temporarily paused effective April 1, 2020 until January 1, 2021 as a result of the COVID-19 outbreak. As at December 31, 2021, the amount of principle drawn down on the loan, net of repayments, is CA$107,143 (2020 - CA$178,571).	$ 80,390	$ 129,384
'ACOA Atlantic Innovation Fund ("AIF") 2015 interest-free loan1,[2] with a maximum contribution of CA$3,000,000. Annual repayments, commencing June 1, 2021, are calculated as a percentage of gross revenue for the preceding fiscal year, at Nil when gross revenues are less than CA$1,000,000, 5% when gross revenues are less than CA$10,000,000 and greater than CA$1,000,000, and CA$500,000 plus 1% of gross revenues when gross revenues are greater than CA$10,000,000. As at December 31, 2021, the amount or principle drawn down on the loan, net of repayments, is CA$2,924,615 (2020 - CA$3,000,000).	1,666,764	1,458,954
ACOA BDP 2018 interest-free loan1,[3] with a maximum contribution of CA$3,000,000, repayable in monthly repayments commencing June 1, 2021 of CA$31,250 until May 1, 2029. As at December 31, 2021, the amount of principle drawn down on the loan, net of repayments, is CA$2,781,250 (2020 - CA$3,000,000).	1,319,130	1,285,307
ACOA BDP 2019 interest-free loan[1] with a maximum contribution of CA$100,000, repayable in monthly repayments commencing June 1, 2021 of CA$1,400 until May 1, 2027. As at December 31, 2021, the amount of principle drawn down on the loan, net of repayments, is CA$90,278 (2020 - CA$62,165).	42,011	30,138
ACOA Regional Relief and Recovery Fund ("RRRF") 2020 interest-free loan with a maximum contribution of CA$390,000, repayable on monthly repayments commencing April 1, 2023 of CA$11,000 until April 1, 2026. As at December 31, 2021, the amount of principle drawn down on the loan is CA$390,000 (2020 - $Nil).	120,154	—
CAIXA Capital loan bearing interest at 6-month EURIBOR rate plus 4% interest spread. The loan principal and interest are fully repayable on January 15, 2025. On March 12, 2021, the principal loan balance with outstanding interest totaling $209,506 (EUR 171,080) was converted into MMI common stock at $3.87 per share[4]. Pursuant to the conversion, CAIXA Capital was issued 67,597 MMI common shares.	—	130,265
	3,228,449	3,034,048
Less: current portion	491,278	290,544
	$ 2,737,171	$ 2,743,504

[1] The Company was required to maintain a minimum balance of positive equity throughout the term of the loan. However, on November 14, 2019, ACOA waived this requirement for the period ending June 30, 2019 and for each period thereafter until the loan is fully repaid.

[2] The carrying amount of the ACOA AIF loan is reviewed each reporting period and adjusted as required to reflect management's best estimate of future cash flows, discounted at the original effective interest rate.

[3] A portion of the ACOA BDP 2018 loan was used to finance the acquisition and construction of manufacturing equipment resulting in $425,872 was recorded as deferred government assistance, which is being amortized over the useful life of the associated equipment. The Company recorded the amortization expense for the year ended December 31, 2021 of $145,739 (year ended December 31, 2020— $136,320) as government assistance in the consolidated statements of operations and comprehensive loss.

[4] MMI has recognized the common stock issued in the consolidated statements of changes in stockholders' equity at fair value at time of conversion to be $221,842 and recorded the difference of $88,763 between the fair value of the common stock and the carrying value of the long-term debt as loss on debt settlement in the consolidated statements of operations and comprehensive loss.

14. Capital stock

Common stock

Authorized: 1,000,000,000 common shares, $0.001 par value.

All references to numbers of common shares and amounts in the consolidated statements of changes in stockholder's equity and in the notes to the consolidated financial statements have been retroactively restated to reflect as if the CPM RTO and the Torchlight RTO had taken place as of the beginning of the earliest period presented.

- The numbers of common shares issued pre-CPM RTO have been multiplied by the 2.75 CPM conversion ratio and the 1.845 Torchlight conversion ratio.
- The numbers of common shares issued post-CPM RTO have been multiplied by the 1.845 Torchlight conversion ratio.
- The amounts of common shares issued pre-CPM RTO were calculated by multiplying the number of shares by 0.001, the 2.75 CPM conversion ratio and the 1.845 Torchlight conversion ratio and the difference was recognized in additional paid in capital.
- The amounts of common shares issued post-CPM RTO were calculated by multiplying the number of shares by 0.001 and the 1.845 Torchlight conversion ratio and the difference were recognized in additional paid in capital.

During the year ended December 31, 2021, the Company converted unsecured convertible promissory notes of $23,656,365, secured convertible debentures of $22,118,782, and unsecured convertible debentures of $5,769,475 into common stock. The Company remeasured the financial liabilities at fair value as of respective conversion dates and recognized a non-cash realized loss of $39,486,830. The Company subsequently reclassified the remeasured liabilities into equity and recognized $39,652 in common stock and $51,504,970 in additional paid in capital. The number of shares issued was calculated as the total outstanding principal and interest of each liability divided by the conversion price stated in each respective instrument's agreement.

During the year ended December 31, 2021, the Company converted long-term debt of $221,843 and due to related party of $225,986 into common stock. The Company recorded the common stock issued at fair value using the Company's share price at the time of conversion. The Company recognized $276 in common stock and $447,553 in additional paid in capital. The resulting net loss calculated as the difference between the fair value of common stock and the carrying value of the liabilities of $19,330 was recorded in other income in the consolidated statements of operations and comprehensive loss. The number of shares issued was calculated as the total outstanding principal and interest of each liability multiplied by the agreed upon conversion price.

During the year ended December 31, 2021, the Company issued 286,292 common shares at CA$0.58 per share as compensation in exchange for a fairness opinion obtained with respect to the Torchlight RTO. The company paid CA $90,000 in cash in 2020 and agreed to settle the remaining CA $90,000 in common stock. The Company recognized the share-based payment in trade and other payables in 2020 until the shares were issued in 2021.

During the year ended December 31, 2021, and pursuant to the Torchlight RTO, the Company recognized $369,631,002 in equity as the fair value of 82,813,994 common shares that were deemed to have been issued to Torchlight as part of the Torchlight RTO (note 3).

During the year ended December 31, 2021, the Company issued 148,368 common shares as stock-based compensation at $3.37 per share to a service provider. The total amount of $500,000 was recorded as prepaid expenses and is being amortized over the period of service.

During the year ended December 31, 2021, the Company issued 125,000 common shares as stock-based compensation at $5.27 per share for a total of $658,750 as partial compensation for a fairness opinion obtained with respect to the Nanotech acquisition. The company paid the remaining $511,406 in cash.

During the year ended December 31, 2020 and pursuant to the CPM RTO, all preferred shares were converted into 58,153,368 common shares.

During the year ended December 31, 2020, the aggregate principal of the Secured Promissory Notes and all interest accrued up until January 28, 2020 were converted into 17,752,163 common shares.

During the year ended December 31, 2020, and pursuant to the CPM RTO, the Company recognized $3,214,502 in equity as the fair value of 21,599,223 common shares that were deemed to have been issued to CPM as part of the CPM RTO.

At-the-Market Equity Offering Program ("ATM")

On June 16, 2021, Torchlight Energy Resources, Inc. ("Torchlight") entered into a Sales Agreement (the "Sales Agreement") with Roth Capital Partners, LLC (the "Agent") to conduct an "at-the-market" equity offering program pursuant to which the Company may issue and sell, from time to time at its sole discretion, shares (the "Placement Shares") of its common stock, par value $0.001 per share, having an aggregate offering price of up to $100,000,000 (the "Shares"), through or to the Agent, as the Company's sales agent. Subject to the terms and conditions of the Sales Agreement, the Agent will use its commercially reasonable efforts to sell the Shares from time to time, based upon the Company's instructions. The Company has no obligation to sell any of the Shares, and may, at any time, suspend the sale of the Shares under the Sales Agreement upon proper notice to the other party. The Sales Agreement will terminate upon the issuance and sale of all of the Shares through or to the Agent, unless earlier terminated in accordance with its terms.

On June 21, 2021, the Sales Agreement was amended and restated to increase the aggregate offering price to up to $250,000,000.

The Company has provided the Agent with customary indemnification rights, and the Agent will be entitled to an aggregate fixed commission of 3.0% of the gross proceeds from Shares sold through the Agent under the Sales Agreement. Sales of the Shares under the Sales Agreement will be made in transactions that are deemed to be "at-the-market offerings" as defined in Rule 415 under the Securities Act of 1933, as amended, including sales made by means of ordinary brokers' transactions, including on The NASDAQ Capital Market, at market prices or as otherwise agreed to with the Agent.

The Shares have been registered under the Securities Act of 1933, as amended, pursuant to the Registration Statement on Form S-3 (No. 333-256632) filed by the Company with the Securities and Exchange Commission (the "SEC") on May 28, 2021, and declared effective on June 14, 2021 (the "Registration Statement"). The Company has prepared a prospectus supplement dated June 16, 2021 and a prospectus supplement dated June 21, 2021 specifically relating to the Placement Shares to the base prospectus included as part of such registration statement.

During the period from June 16, 2021 to June 25, 2021 and prior to the Torchlight RTO, Torchlight sold a total of 16,185,805 shares of common stock under the ATM for aggregate gross proceeds of approximately $137.5 million. There was no sale of common stock under the ATM after June 28, 2021.

Warrants

Prior to completion of the CPM RTO on March 5, 2020, every two warrants had the right to purchase one MTI common share for CA$2.475 per share.

Pursuant to the completion of the RTO on March 5, 2020, MTI warrants were adjusted such that one warrant has the right to purchase one MMI Common Share for CA$0.90 per share.

On June 28, 2021 and pursuant to the completion of Torchlight RTO, each MMI warrant was converted into 1.845 META warrants and the exercise price was updated to be CA$0.49. Also, as part of the Torchlight RTO, Torchlight outstanding warrants of 853,278 underwent a reverse stock split at a ratio of 2:1 resulting in warrants of 430,380 and for an amount being recorded at $2,773,779 in additional paid in capital as part of the consideration transferred.

The following table summarizes the changes in warrants of the Company:

	Year ended December 31, 2021		Year ended December 31, 2020	
	Number of warrants [1]	Amount [1]	Number of warrants [1]	Amount [1]
Balance, beginning of year	3,046,730	$ 402,883	1,590,866	$ 132,299
Issued	2,153,500	3,831,124	1,455,864	166,916
Adjustment to 2019 warrants	—	—	—	103,668
Exercised	(365,651)	(49,812)	—	—
Fair value of deemed issuance to Torchlight	430,380	2,773,779	—	—
Balance, end of year	5,264,959	$ 6,957,974	3,046,730	$ 402,883

[1] All references to numbers of warrants have been retroactively restated to reflect as if Torchlight RTO had taken place as of the beginning of the earliest period presented. The numbers of warrants issued pre-CPM RTO have been divided by 2, multiplied by the 2.75 CPM conversion ratio and the 1.845 Torchlight conversion ratio. There were no warrants issued post CPM RTO except for Torchlight warrants.

During the year ended December 31, 2021, the Company granted 2,153,500 five-year warrants (year ended December 31, 2020 - 1,455,864) to purchase common stock to external consultants as stock-based compensation.

The fair value of 1,153,500 warrants issued during the year ended December 31, 2021 was estimated to be $3,129,208 using the Black-Scholes option pricing model. The total amount has been recorded in General & Administrative expense in the consolidated statements of operations and comprehensive loss.

The fair value of 1,000,000 warrants issued during the year ended December 31, 2021 was estimated to be $701,910 using the Monte Carlo Simulation model. The total amount has been recorded in General & Administrative expense in the consolidated statements of operations and comprehensive loss.

During the year ended December 31, 2021, 365,651 warrants were exercised to purchase 361,729 common shares where a warrant holder elected a cashless exercise and consequently, the difference of 3,922 shares was withheld to cover the exercise cost.

Broker warrants

Prior to completion of the CPM RTO on March 5, 2020, every MTI broker warrant had the right to purchase one MTI common share for CA$1.70 per share.

Pursuant to the completion of the RTO on March 5, 2020, each MTI broker warrant was converted into 1.845 MMI warrants, and the exercise price was updated to be CA$0.62.

On June 28, 2021, and pursuant to the completion of the Torchlight RTO, each MMI warrant was converted into 1.845 META warrants and the exercise price was updated to be CA$0.34.

The following table summarizes the changes in broker warrants of the Company:

	Year ended December 31, 2021		Year ended December 31, 2020	
	Number of warrants [1]	Amount [1]	Number of warrants [1]	Amount [1]
Balance, beginning of year	97,542	$ 16,144	—	$ —
Issued	—	—	97,542	16,144
Exercised	(83,655)	(14,318)	—	—
Balance, end of year	13,887	$ 1,826	97,542	$ 16,144

[1] All references to numbers of broker warrants have been retroactively restated to reflect the number of stock of the legal parent (accounting acquiree) issuable following the reverse acquisition. The numbers of broker warrants issued pre-CPM RTO have been multiplied by the 2.75 CPM conversion ratio and the 1.845 Torchlight conversion ratio. There were no broker warrants issued post CPM RTO.

During the year ended December 31, 2021, 83,655 warrants were exercised to purchase 82,494 common shares where a warrant holder elected a cashless exercise and consequently, the difference of 1,161 shares was withheld to cover the exercise cost.

The fair value of warrants and broker warrants that were issued and estimated using the Black-Scholes option pricing model have the following inputs and assumptions:

	Year ended December 31, 2021	Year ended December 31, 2020
Risk free interest rate	0.45% - 0.98%	0.80% - 1.43%
Expected volatility	92%	134%
Expected dividend yield	0%	0%
Expected forfeiture rate	0%	0%
Common stock price	5.31	1.70
Exercise price per common stock	$0.85 - $4.50	$1.70 - $2.475
Expected term of warrants	2.20 - 5 years	2 years

The fair value of warrants that were issued and estimated using the Monte Carlo Simulation have the following inputs and assumptions:

	Year ended December 31, 2021
Risk free interest rate	0.42%
Weighted average expected volatility	80%
Expected term of warrants	5 years

15. Stock-based payments

On December 3, 2021, the shareholders of the Company approved the 2021 Equity Incentive Plan to utilize the 3,500,000 shares reserved and unissued under the Torchlight 2015 Stock Option and Grant Plan and the 6,445,745 shares reserved and unissued under the MMI 2018 Stock Option and Grant plan to set the number of shares reserved for issuance under the 2021 Equity Incentive Plan at 34,945,745 shares.

The 2021 Equity Incentive Plan allows the grants of non-statutory stock options, restricted stock, restricted stock units ("RSUs"), stock appreciation rights, performance units and performance shares to employees, directors, and consultants.

DSU Plan

Each unit is convertible at the option of the holder into one common share of the Company.

On March 28, 2013, the Company implemented a Deferred Stock Unit (DSU) Plan for its directors, employees and officers. Directors, employees and officers are granted DSUs of the Company with immediate vesting as a form of compensation. Each unit is convertible at the option of the holder into one common share of the Company. Eligible individuals are entitled to receive all DSUs (including dividends and other adjustments) no later than December 1st of the first calendar year commencing after the time of termination of their services.

On December 22, 2021, the Company granted 191,802 DSUs to directors of the Company with immediate vesting. The Company recognized an expense of $517,869 in the consolidated statement of operations and comprehensive loss based on grant date fair value of $2.70.

The following table summarizes the change in outstanding DSUs of the Company:

	Year ended December 31, 2021	2020
Outstanding, beginning of year	3,455,224	3,977,820
Issued	491,802	—
Converted into common stock	—	(522,596)
Outstanding, end of year	3,947,026	3,455,224

Information concerning units outstanding is as follows:

	As of December 31,	
	2021	2020
Issue price	Number of units	Number of units
CA$0.27	3,348,675	3,348,675
CA$0.51	106,549	106,549
US$2.70	491,802	—
	3,947,026	3,455,224

[1] All references to numbers of DSUs have been retroactively restated to reflect as if the Torchlight RTO had taken place as of the beginning of the earliest period presented. The numbers of DSUs issued pre-CPM RTO have been multiplied by the 2.75 CPM conversion ratio and the 1.845 Torchlight conversion ratio.

RSU Plan

Each unit is convertible at the option of the holder into one common share of the Company upon meeting the vesting conditions.

During the year ended December 31, 2021, the Company granted 300,000 RSUs to a consulting firm with vesting conditions satisfied in 2021. The Company recognized an expense of $1,928,000 in the consolidated statement of operations and comprehensive loss based on weighted average grant date fair value of $6.43/unit.

As of December 31, 2021, there was $Nil unrecognized compensation cost related to unvested RSUs.

Employee Stock Option Plan

Each stock option is convertible at the option of the holder into one common share of the Company.

The Company has an Employee Stock Option Plan [the "Plan"] for directors, officers, and employees. Unless otherwise determined by the Board of Directors, 25% of the options shall vest and become exercisable on the first anniversary of the grant date and 75% of the options issuable under the Plan shall vest and become exercisable in equal monthly installments over the three-year period commencing immediately after the first anniversary of the grant date. The option exercise price will not be less than the fair market value of a share on the grant date, as determined by the Board of Directors, taking into account any considerations which it determines to be appropriate at the relevant time. The contractual term of the stock options is 10 years and there are no cash settlement alternatives for the employees.

During the year ended December 31, 2020, the Company's existing MTI options were converted at a ratio of 2.75 MMI options for each MTI option pursuant to the CPM RTO. Also, as part of the CPM RTO, 1,291,500 stock options were issued to executives and directors of CPM. Additionally, and subsequent to the completion of the CPM RTO, the Company granted 13,402,080 options to employees and directors, 898,515 of which vested upon grant date and 12,503,565 of which vest over 1-4 years. Subsequent to the completion of the CPM RTO, 2,589,457 stock options were forfeited as a result of employee departures and 2,090,866 options expired unexercised.

During the year ended December 31, 2021, the Company's existing MMI options were converted at a ratio of 1.845 META options for each MMI option pursuant to the Torchlight RTO. Also, as part of the Torchlight RTO, Torchlight outstanding options of 3,000,000 underwent a reverse stock split at a ratio of 2:1 resulting in outstanding options of 1,500,000 and an amount of $9,397,988 was recorded in additional paid in capital as part of the consideration transferred.

Total stock-based compensation expense included in the consolidated statements of operations was as follows:

	Year ended December 31,		
	2021	2020	2019
Selling & Marketing	$ 34,735	$ 61,560	$ 154,086
General & Administrative	544,530	1,114,556	940,613
Research & Development	479,715	333,570	198,073
	$ 1,058,980	$ 1,509,686	$ 1,292,772

The following table summarizes the change in outstanding stock options of the Company:

	Number of options	Average exercise price per stock option	Average exercise remaining contractual term (years)	Aggregate intrinsic value
Outstanding, December 31, 2019	14,502,303	$ 0.33	8.38	$ 104,500
Issued to CPM executives and directors pursuant to CPM RTO	1,291,500	0.19		
Granted	13,402,080	0.34		
Forfeited	(2,627,510)	0.34		
Expired	(2,090,866)	0.27		
Outstanding, December 31, 2020	24,477,507	$ 0.33	8.36	$ 688,952
Exercised	(4,486,965)	0.36		
Forfeited	(85,901)	0.34		
Fair value of deemed issuance to Torchlight	1,500,000	2.22		
Outstanding, December 31, 2021	21,404,641	$ 0.46	7.34	$ 56,924,556
Exercisable, December 31, 2021	13,231,030	$ 0.54	6.74	$ 34,148,435

Below is a summary of the outstanding options as at December 31, 2021:

Exercise price $	Number outstanding	Number exercisable
CA$0.34	19,067,529	10,893,918
CA$0.15	518,112	518,112
CA$0.19	369,000	369,000
US$2.00	1,075,000	1,125,000
US$1.00	375,000	325,000
	21,404,641	13,231,030

Below is a summary of the outstanding options as at December 31, 2020:

Exercise price	Number outstanding	Number exercisable
CA$0.34	23,550,394	9,636,758
CA$0.15	558,113	558,113
CA$0.19	369,000	369,000
	24,477,507	10,563,871

[1] All references to numbers of stock options have been retroactively restated to reflect as if the Torchlight RTO had taken place as of the beginning of the earliest period presented. The numbers of stock options issued pre-CPM RTO have been multiplied by the 2.75 CPM conversion ratio and the 1.845 Torchlight conversion ratio. The numbers of stock options issued post CPM RTO have been multiplied by the 1.845 Torchlight conversion ratio.

The weighted average remaining contractual life for the stock options outstanding as at December 31, 2021 was 7.65 (December 31, 2020 – 8.36) years. There were 1,500,000 and 13,402,080 stock options granted with a weighted-average grant date fair value of $6.27 and $0.39 per share respectively during the year ended December 31, 2021 and the year ended December 31, 2020.

The fair value of options granted was estimated at the grant date using the following weighted-average assumptions:

	Year ended December 31,		
	2021	2020	2019
Dividend yield [%]	—	—	—
Volatility	84%	52%-134%	84%-130%
Risk-free interest rate	0.73%	0.73%	1.21%
Expected term (in years)	1 year	7.48 years	8.67 years

The expected life of the stock options is based on historical data and current expectations and is not necessarily indicative of exercise patterns that may occur. The expected volatility reflects the assumption that the historical volatility over a period similar to the life of the options is indicative of future trends, which may not necessarily be the actual outcome.

16. Income taxes

Loss before income taxes was as follows:

	Year ended December 31,		
	2021	2020	2019
Local	$ (30,552,839)	$ (1,549,534)	$ (1,278,498)
Foreign	(61,296,485)	(10,255,435)	(7,250,018)
Loss before income taxes	$ (91,849,324)	$ (11,804,969)	$ (8,528,516)

Income tax provision was as follows:

	Year ended December 31,		
	2021	2020	2019
Current tax expense:			
Local	$ 800	$ 800	$ 800
Foreign	—	—	—
Current tax expense	800	800	800
Deferred tax benefit:			
Local	—	—	—
Foreign	(852,863)	(194,510)	(84,349)
Deferred tax benefit	(852,863)	(194,510)	(84,349)
Income tax recovery	$ (852,063)	$ (193,710)	$ (83,549)

The income tax provision differs from the amount computed by applying the federal income tax rate of 21% for 2021 (2020 - 21%) to the loss before income taxes as a result of the following differences:

	Year ended December 31,		
	2021	2020	2019
Tax computed at federal statutory rate	$ (19,288,357)	$ (2,479,044)	$ (1,790,988)
State income taxes, net of federal benefit	(1,075,114)	(136,979)	(113,019)
Share-based compensation	2,289,214	317,034	285,287
Unrealized loss on FVTPL liabilities	11,752,697	—	—
Other permanent items	(114,799)	104,181	145,204
Foreign currency and other	929,664	343,574	159,409
Impact of different tax rate in foreign jurisdiction	(4,889,797)	(787,329)	(644,394)
Change in valuation allowance	9,544,429	2,444,853	1,874,952
Income tax recovery	$ (852,063)	$ (193,710)	$ (83,549)

The tax effects of temporary differences that give rise to significant portions of the deferred tax assets and deferred tax liabilities are as follows:

	As of December 31,	
	2021	2020
Deferred tax assets		
Non-capital losses	$ 25,110,497	$ 10,059,528
Intangible assets	69,964	62,938
Other assets	46,725	42,488
Research and development tax credits	1,972,694	—
Total gross deferred tax assets	27,199,880	10,164,954
Less: valuation allowance	(18,659,901)	(9,115,472)
	8,539,979	1,049,482
Deferred tax liabilities		
Intangible assets	(6,276,390)	(703,872)
Property and equipment	(2,226,741)	(281,092)
Long-term debt	(251,646)	(293,168)
Funding obligation	(109,681)	(35,404)
Unsecured convertible promissory notes	—	(54,000)
	(8,864,458)	(1,367,536)
Net deferred tax liability	$ (324,479)	$ (318,054)

At December 31, 2021, the Company has net operating loss carryforwards ("NOLs") of approximately $91.3 million (2020: $34.7 million) that can be used to offset future taxable income, and such NOLs, as well as timing differences from certain financial instruments, result in a gross deferred tax asset of approximately $27.2 million (2020: $10.2 million). These NOLs begin to expire in 2028.

In evaluating its valuation allowance, the Company considers all available positive and negative evidence, including projected future taxable income and recent financial performance. Due to uncertainty with respect to the ultimate realizability of these deferred tax assets, the Company has recorded a valuation allowance of approximately $18.7 million (2020: $9.1 million) against its deferred tax assets.

17. Net loss per share

The following table sets forth the calculation of basic and diluted net loss per share during the periods presented:

	Year ended December 31,		
	2021	2020	2019
Numerator:			
Net loss	$ (90,997,261)	$ (11,611,259)	$ (8,444,967)
Denominator:			
Weighted-average shares, basic	232,898,398	137,258,259	50,015,137
Weighted-average shares, diluted	232,898,398	137,258,259	50,015,137
Net loss per share			
Basic	(0.39)	(0.08)	(0.17)
Diluted	(0.39)	(0.08)	(0.17)

The following potentially dilutive shares were not included in the calculation of diluted shares above as the effect would have been anti-dilutive:

	As of December 31,		
	2021	2020	2019
Convertible debt	—	10,423,477	9,957,387
Options	21,404,641	24,477,507	7,860,328
Warrants	5,278,846	3,144,272	862,258
DSUs	3,947,026	3,947,026	1,872,750
	30,630,513	41,992,282	20,552,723

18. Additional cash flow information

The net changes in operating assets and liabilities consist of the following:

	As of December 31,		
	2021	2020	2019
Grants receivable	$ 149,798	$ (131,318)	$ 16,243
Inventory	325,657	(109,986)	(17,495)
Accounts and other receivables	(880,613)	58,891	(95,244)
Prepaid expenses and other current assets	(2,100,371)	(27,313)	(124,555)
Trade payables	6,906,376	(644,120)	998,335
Due to related party	(78,940)	(26,984)	2,943
Operating lease Right-of-use Asset	1,018,691	—	—
Operating lease liabilities	(688,183)	—	—
	$ 4,652,415	$ (880,830)	$ 780,227

19. Fair value measurements

The Company uses a fair value hierarchy, based on the relative objectivity of inputs used to measure fair value, with Level 1 representing inputs with the highest level of objectivity and Level 3 representing the lowest level of objectivity.

The fair values of cash and cash equivalents, restricted cash, short-term investments, grants and accounts receivables, due from (to) related parties and trade and other payables approximate their carrying values due to the short-term nature of these instruments. The current portion of long-term debt has been included in the below table.

The fair values of convertible promissory notes secured convertible debentures and unsecured convertible debentures are classified at level 3 as they were accounted for under the fair value option election of ASC 825 and the estimated fair value was computed using significant inputs that are not observable in the market.

The fair value of assets held for sale is classified at level 3 as the fair value of the O&G assets was estimated by obtaining a valuation study performed by a third party valuation firm. Refer to note 3 for the significant estimates and assumptions used by the Company in the determination of the fair value.

The fair value of the preferred stock liability is also classified as level 3 since the fair value measurement of the oil and natural gas properties forms the basis for the fair value measurement of the preferred stock liability as of June 28, 2021 and as of December 31, 2021.

The fair values of the funding obligation, operating lease liabilities, and long-term debt would be classified at Level 3 in the fair value hierarchy, as each instrument is estimated based on unobservable inputs including discounted cash flows using the market rate, which is subject to similar risks and maturities with comparable financial instruments as at the reporting date.

Carrying values and fair values of financial instruments that are not carried at fair value are as follows:

	2021		2020	
Financial liability	Carrying value	Fair value	Carrying value	Fair value
Funding obligation	$ 268,976	$ 170,338	$ 776,884	$ 571,839
Operating lease liabilities	4,370,635	6,149,369	270,581	270,641
Long-term debt	3,228,449	2,303,648	3,034,048	2,734,931

20. Revenue

The Company has one operating segment based on how management internally evaluates separate financial information, business activities and management responsibility.

Revenue is disaggregated as follows:

	Year ended December 31,		
	2021	2020	2019
Product sales	$ 407,914	$ 2,905	$ 23,745
Contract revenue [1]	3,427,938	624,316	247,669
Other development revenue	246,665	494,962	630,996
Development revenue	3,674,603	1,119,278	878,665
	$ 4,082,517	$ 1,122,183	$ 902,410

[1] Contract revenue represents previously recorded deferred revenue that was recognized as revenue after satisfaction of performance obligations either through passage of time or after completion of specific performance milestones. Refer to note 21 for outstanding contracts.

Customer concentration

A significant amount of the revenue is derived from contracts with major customers. For the year ended December 31, 2021, the Company had 3 customers that accounted for $3,307,914 or 81% of total revenue. For the year ended December 31, 2020, the Company had 3 customers that accounted for $807,912 or 72% of total revenue.

Nanotech currently derives a significant portion of its revenue from contract services with a G10 central bank. In 2021, Nanotech entered into a development contract for up to $41.5 million over a period of up to five years. These contract services incorporate both nano-optic and optical thin film technologies and are focused on developing authentication features for future banknotes. During the year ended December 31, 2021, revenue recognized from this development contract represented 45% of the Company's total revenue.

Cooperation Framework Agreement

During the year ended December 31, 2020, the Company entered into a Cooperation Framework Agreement ("CFA") with Covestro Deutschland AG (“Covestro”) where Covestro is obligated to provide EUR 800,000 (US$987,577) of proceeds to the Company in exchange for a license to the Interglass patents and upon the completion of certain performance milestones. The Company has also entered into an agreement with Canton Zug in Switzerland for the acquisition of specialized lens casting production equipment and intellectual property ("Interglass assets") for US$800,000.

During the year ended December 31, 2021, and pursuant to receiving the required funds from Covestro, the Company acquired and recognized the Interglass assets in property, plant and equipment in the amount of $320,000 and intangibles in the amount of $480,000. The Company identified the performance obligations associated with the agreement as per ASC 606 *Revenue Recognition* and recognized the full amount of the contract as development revenue in the consolidated statement of operations and comprehensive loss.

21. Deferred revenue

Deferred revenue consists of the following:

	As of December 31,	
	2021	2020
Satair A/S-exclusive rights [1]	717,615	815,310
Satair A/S-advance against PO [2]	490,929	488,847
LM Aero-MetaSOLAR commercialization [3]	92,698	646,135
Breakthrough Starshot Foundation [4]	75,000	75,000
Innovate UK-R&D tax credit	18,588	18,778
Other deferred revenue	21,910	—
	1,416,740	2,044,070
Less current portion	779,732	1,239,927
	$ 637,008	$ 804,143

[1] On September 18, 2018, the Company signed an exclusive distribution agreement with Satair A/S for a term of 10 years. According to this agreement, the Company grants Satair A/S the exclusive right to sell, market, and distribute eyewear and visor products incorporating metamaterial-based laser protection technology that are developed or manufactured by the Company for use in aviation, military and defense. On September 13, 2018, the Company received a fee of $1,000,000 for the exclusive distribution rights granted under this agreement and the payment was recognized as deferred revenue on the consolidated balance sheets. It will be accounted as development revenue over a period of 8 years and no repayment of the $1,000,000 is required if the contract termination is after the 8th anniversary of the effective date. During the year ended December 31, 2021, the Company has recognized $102,269 (2019: $98,292) as development revenue related to this agreement.

[2] On July 20, 2018, the Company received a purchase order for MetaVisor (eyewear/eye protection) from Satair A/S for $2,000,000. On November 7, 2018, the Company received a partial advance payment of $500,000 against this purchase order. The Company has set up a guarantee/standby letter of credit with RBC. In the event the Company fails to deliver the product as per the contract or refuse to accept the return of the product as per the buyback clause of the contract or fails to repay the advance payment in accordance with the conditions of the agreement signed with Satair on September 18, 2018, Satair shall draw from the letter of credit with RBC. As at December 31, 2021, no amount has been drawn from the letter of credit with RBC. Refer to note 28 for information regarding the letter of credit.

[3] On April 26, 2017, the Company received $4,150,000 from Lockheed Martin Aeronautics Corporation (“LM Aero”) in relation to the Offset Project Agreement (“OPA”). The purpose of the OPA was to document the agreement between LM Aero and the Company with respect to the Company’s planned growth through R&D and commercialization activities using the MetaSOLAR technology as well as the contribution that LM Aero made to the Company in return for the Company’s effective assistance in obtaining credit arising from the project as set forth in the OPA. The Company has set up an irrevocable standby letter of credit with RBC. In the event the Company fails to meet the obligations under the OPA, LM Aero shall draw from the letter of credit with RBC. The performance obligations for the milestone are satisfied through-out the period. During the year ended December 31, 2021, the Company has recognized $562,531 (2020: $526,109) as development revenue related to this agreement.

[4] On March 1, 2020, the Company entered into a research agreement with Breakthrough Starshot Foundation LLC under the project “Lightsail” for $150,000. The Company received $75,000 on March 6, 2020 which has been recorded as part of deferred revenue.

22. Deferred government assistance

a) Grants receivable

	As of December 31, 2021	2020
ACOA-PBS [1]	$ 8,069	$ 11,960
Co-Op wage subsidy [2]	7,318	31,400
Canada Emergency Wage Subsidy [3]	122,940	233,446
Innovate UK – Diabet [4]	13,790	51,062
NSBI - Export development program [5]	23,663	—
	$ 175,780	$ 327,868

[1] On November 21, 2018, ACOA approved two non-repayable contribution of $37,679 each to the Company under Business Development Program – Productivity and Business skills (“PBS”) for the cost to create product and commercialization strategies.

[2] During 2021 and 2020, the Company applied for and received grants related to co-op students and recent graduates under the Nova Scotia Co-Op Subsidy, Graduate To Opportunity Program ("GTO") and Venture for Canada program ("VFC").

[3] During 2021, the Company received the 2020 outstanding balance of $233,446 as well as recognized $443,494 government assistance from Canada Emergency Wage subsidy ("CEWS") as other income in the consolidated statements of operations and comprehensive loss, of which $321,547 has been received.

[4] On February 13, 2019, Innovate UK approved a grant to MediWise for the project “Diabet – Innovate wrist device for high accuracy non-invasive blood glucose monitoring”. During 2021, the Company received $132,288 (2020: $139,940) in relation to the grant and recognized government assistance of $110,125 (2020: $130,734) as other income in the consolidated statements of operations and comprehensive loss.

[5] On December 15, 2021, the Company applied for NSBI - Export development program and recognized $23,663 as other income in the consolidated statements of operations and comprehensive loss.

b) Deferred government assistance

	As of December 31, 2021	2020
SDTC [1]	$ 846,612	$ 779,579
Deferred government assistance	3,038	31,400
	849,650	810,979
Less: current portion	846,612	779,578
	$ 1,696,262	$ 1,590,557

[1] On May 15, 2018, the Company entered into an agreement with the Canada Foundation for Sustainable Development Technology Canada (“SDTC”) for $4,189,966. The contribution provides funding for eligible costs incurred relating to the further development and demonstration of technology related to solar cells in connection with the project entitled “Enabling solar flight a testing ground for lightweight and efficient solar panels”. On March 30, 2021, the Company has received an additional 5% contribution from SDTC of $223,409 (2020: $211,868). The Company has recognized $161,990 (2020: $639,505) as government assistance in the consolidated statements of operations and comprehensive loss.

c) Government assistance recognized in the consolidated statements of operations and comprehensive loss

	Year ended December 31,		
	2021	2020	2019
SDTC	$ 161,990	$ 639,505	$ 192,574
Payroll subsidies	741,322	831,148	690,434
Amortization of deferred government assistance	145,739	135,654	135,125
Fair value gain on initial recognition of ACOA loans	236,021	—	172,352
Scientific Research and Experimental Development ("SR&ED")	448,894	—	—
Other grants	—	23,807	41,290
	$ 1,733,966	$ 1,630,114	$ 1,231,775

23. Interest expense, net

	Year ended December 31,		
	2021	2020	2019
Non-cash interest accretion	$ (904,925)	$ (1,052,478)	$ (742,360)
Interest & bank charges	(220,460)	(394,330)	(394,147)
Interest income	18,940	16,854	585
	$ (1,106,445)	$ (1,429,954)	$ (1,135,922)

24. Loss on financial instruments, net

	Year ended December 31,		
	2021	2020	2019
Loss on secured convertible promissory notes	$ —	$ (5,234)	$ (280,319)
Loss on unsecured convertible promissory notes – Bridge loan	(19,163,417)	(139,610)	—
(Loss) Gain on unsecured convertible promissory notes – Torchlight notes	(343,197)	354,840	—
Loss on secured convertible debentures	(16,957,029)	(865,280)	—
Loss on unsecured convertible debentures	(4,076,448)	(189,709)	—
	$ (40,540,091)	$ (844,993)	$ (280,319)

The net gain/loss on financial instruments for the years ending December 31, 2021 and December 31, 2020 represent non-cash gains/losses resulting from remeasurement of the fair value of convertible financial liabilities at each balance sheet date or on conversion date using the fair value option.

Each of the above referenced promissory notes and debentures included a conversion feature, exercisable at the option of the debt holder. For accounting purposes, each of these conversion features is an embedded derivative in the note or debenture. The Company elected to account for fluctuations in (a) the value of the liabilities driven by interest rate volatility and the Company's credit risk and (b) the embedded derivatives driven by fluctuations in the Company's common stock share price using a method known as Fair Value option. This accounting method calls for the Company to measure the fair value of the convertible financial liabilities at each balance sheet date and to record any fluctuations in the values that as non-cash adjustments relating to instrument specific credit risk in the other comprehensive income and non-cash adjustments relating to other factors in the statements of operations. If, as in the case of the liabilities described above, the debt is converted, the valuations and any adjustments are to be recorded as of the date of such conversion.

The Fair Value option also provides that the total revaluation adjustment be recorded in Common Stock and additional paid in capital thus having no impact on stockholders' equity despite the recording of the loss in the statement of operations.

25. Other (loss) income, net

	Year ended December 31,		
	2021	2020	2019
O&G assets maintenance cost [1]	$ (14,155,851)	$ —	$ —
Government Assistance (note 22)	1,733,966	1,630,114	1,231,775
Other income	8,850	—	401,186
Fair value gain (loss) on long-term debt	2,278	(106,635)	448,437
Fair value gain (loss) on funding obligation (note 26)	471,689	(32,291)	—
	$ (11,939,068)	$ 1,491,188	$ 2,081,398

[1] The Company incurred costs of $14.2 million in relation to certain drilling activity carried out at its Oil and Gas properties, to remain in compliance with all aspects of the Company's lease obligations and to satisfy the Continuous Drilling Clause ("CDC") with University Lands.

26. Funding obligation

	As of December 31,	
	2021	2020
Outstanding obligation [1]	$ 1,025,398	$ 1,021,050
Fair value of interest-free component [2]	(855,060)	(384,056)
Principal adjusted for interest-free component	170,338	636,994
Accumulated non-cash interest accretion	98,638	139,890
Carrying amount	268,976	776,884
Less current portion	—	—
	$ 268,976	$ 776,884

[1] In June 2019, the Company entered into a statement of work ("SOW") with a third party for the purchase of manufacturing equipment. The SOW was initiated based on the Industrial and Regional Benefits general investment funding between the third party and the Government of Canada. The Company received the funds in two tranches after achieving two milestones as per the SOW. The funds are repayable, commencing three years from date of receipt, based on 10% of revenue from the sale of holographic film that is produced using the related manufacturing equipment paid for under this funding obligation.

In June 2019, the Company achieved the first milestone and received CA$325,000 and in October 2019, the Company achieved the second milestone and received CA$975,000. The Company has not sold holographic film related to this SOW to date.

[2] The amounts received under the agreement have been recorded at fair value by applying the effective interest rate method on the dates the funding was received, using an estimated market interest rate of 15%. Accordingly, during the year ended December 31, 2019, the Company recognized $401,186 as other income in the consolidated statements of operations and comprehensive loss. In the year ended 2020, the Company recognized a loss of $32,291 resulting from changes in repayment period of the obligation. The gain was recorded in the consolidated statements of operations and comprehensive loss. During the year ended December 31, 2021, the Company elected to bring the market interest rate to current rates and increased it to 19.17%. Following management discussions the revenue generation ability from the manufacturing equipment bought under the funding obligation was reduced, resulting in a longer repayment period. The combination of these two changes prompted the Company to recognize a gain of $471,004 for the year ended December 31, 2021 in the consolidated statements of operations and comprehensive loss.

27. Leases

The Company entered into the following leases during the years ended December 31, 2021 and 2020 respectively outlined below:

Nova Scotia, Canada

On January 1, 2013, MMI signed an initial lease with a lessor in Dartmouth, Nova Scotia, commencing in 2013. The most recent amendment was signed on July 1, 2020 for a month to month lease for an 8,792 square foot facility, which currently hosts the Company's holography and lithography R&D labs and manufacturing operations.

On August 31, 2020, MMI signed a ten-year lease with a lessor in Nova Scotia, Canada, commencing January 1, 2021, for an approximately 53,000 square foot facility, which will host the Company's holography and lithography R&D labs and manufacturing operations. Commencing in September 2021, the Company was to pay monthly basic rent of CA$28,708 and additional rent for its proportionate share of operating costs and property taxes of CA$24,910 per month, subject to periodic adjustments. In conjunction with signing the lease, the Company entered into a loan agreement with the lessor in the amount of CA$500,000 to fund leasehold improvements.

The Company has accounted for the lease as an operating lease and recorded a right-of-use ("ROU") asset in the amount of $1,021,499. The ROU asset is being amortized over the remaining lease term in an amount equal to the difference between the calculated straight-line expense of the total lease payments less the monthly interest calculated on the remaining lease liability.

On June 9, 2021, MMI signed a lease amendment with the landlord to expand the leased space of the facility by approximately 15,000 square feet, reduce the annual rent for the 10-year term of the lease and obtain from the landlord CA$500,000 in cash to fund ongoing tenant improvements. In exchange, the landlord received 993,490 MMI common shares valued at CA$3.40 per share.

The lease amendment was accounted for as a lease modification. As such, the operating lease liability was remeasured, and the difference was recorded in ROU assets.

California, United States

On June 3, 2021, MMI signed a lease amendment with its lessor in Pleasanton, California to expand the leased space of the facility in the United States to include additional office space of 5,475 square feet, commencing from June 2021. Alongside this lease amendment, the durations of all of the leased spaces were also extended until August 31, 2024. The lease amendment was accounted for as a lease modification. As such, the operating lease liability was remeasured, and the difference was recorded in ROU assets. These amendments required the Company to derecognize the existing right-of-use asset and operating lease liability and recognize a new right-of-use asset and an operating lease liability commencing June 2021.

On September 16, 2021, the Company signed an agreement to extend the lease term of its existing leased premises at Pleasanton, California, from September 1, 2024 to September 30, 2026. In addition, the Company also signed an agreement to lease an additional 8,904 square feet at the same property to have a total leased area at Pleasanton of 19,506 square feet. The new lease commenced on October 1, 2021 and has the same expiry date as above. The lease amendment was accounted for as a lease modification. As such, the operating lease liability was remeasured, and the difference was recorded in ROU assets as of December 31, 2021.

Massachusetts, United States

On September 17, 2021, the Company entered into an lease agreement with Boxer Property Management Corp. to lease a space of 4,414 square feet at 85 Swanson Road, Boxborough, MA with a term of two years commencing October 1, 2021. The Company recognized a ROU asset and an operating lease liability of $132,780 for this lease.

Athens, Greece

On November 1, 2021, the Company entered into a lease agreement with Special Purpose AP10 S.A. Real Estate Company, to lease a space of 1,436 square meters (15,457 square feet) in Athens, Greece, with a term of 10 years commencing oNovember 1, 2021. The Company recognized a ROU asset and an operating lease liability of $1,019,795 (EUR 898,419) as of November 1, 2021. The Company

secured a rent-free period of 9 months commencing the date of lease commencement, and also prepaid two months amounting to $35,188 (EURO 31,000).

British Columbia, Canada

As part of the Nanotech acquisition (note 3) the Company acquired Nanotech's lease obligations, including a space of 7,860 square feet in British Columbia, Canada with a remaining lease term of 3 years and 7 months, ending on April 30, 2025. The Company recognized a ROU asset and an operating lease liability of $607,354 for this lease.

London, United Kingdom

In October 2020, the Company renewed its lease agreement to lease a space of 742 square feet in London, United Kingdom with a term of two years commencing on October 20, 2020. The Company recognized a ROU asset and an operating lease liability of $62,543 (GBP 46,284) at initial recognition.

Steinhausen, Switzerland

The Company entered into a lease agreement with a lessor to lease a space of 1,335 square feet at Steinhausen, Switzerland with a term of one year and four months commencing on March 1, 2021. The Company recognized a ROU asset and an operating lease liability of $25,009 (CHF 22,815) as of March 1, 2021. The monthly rent was reduced from $1,756 (CHF 1,602) to $ 1,019 (CHF 930) in August 2021 as per the terms of the agreement.

Total operating lease expense included in the consolidated statements of operations and comprehensive loss is as follows:

	Year ended December 31,		
	2021	2020	2019
Operating lease expense	$ 546,197	$ 224,210	$ 201,242
Short term lease expense	229,475	104,470	126,421
Variable and other lease expense	92,862	40,006	31,408
Total	868,534	368,686	359,071

The Company completed its evaluation of the provisions of ASC 842 "*Leases*" and elected the practical expedient to not capitalize any leases with initial terms of less than twelve months on its balance sheet and include them as short term lease expense in the consolidated statements of operations.

Future minimum payments under non-cancelable operating lease obligations were as follows as of December 31, 2021:

2022	1,028,314
2023	1,176,935
2024	1,180,745
2025	1,098,049
Thereafter	3,965,777
Total minimum lease payments	8,449,820
Less: interest	(4,079,185)
Present value of net minimum lease payments	4,370,635
Less: current portion of lease liabilities	(663,861)
Total long-term lease liabilities	$ 3,706,774

Supplemental balance sheet information related to leases is as follows:

	Year ended December 31,	
	2021	2020
Weighted Average Remaining Lease Term	5 years	2 years
Weighted Average Discount Rate	17.85 %	15 %

28. Commitments and contingencies

Legal Matters

On January 31, 2020, Torchlight Energy Resources, Inc. and its wholly owned subsidiaries Torchlight Energy, Inc. and Torchlight Energy Operating, LLC were served with a lawsuit brought by Goldstone Holding Company, LLC (Goldstone Holding Company, LLC v. Torchlight Energy, Inc., et al., in the 160th Judicial District Court of Dallas County, Texas). On February 24, 2020, Torchlight Energy Resources, Inc., Torchlight Energy, Inc., and Torchlight Energy Operating, LLC timely filed their answer, affirmative defenses, and requests for disclosure. The suit, which sought monetary relief over $1 million, made unspecified allegations of misrepresentations involving a November 2015 participation agreement and a 2016 amendment to the participation agreement. Torchlight denied the allegations and asserted several affirmative defenses including but not limited to, that the suit is barred by the applicable statute of limitations, that the claims had been released, and that the claims were barred because of contractual disclaimers between sophisticated note parties. Torchlight also asserted counterclaims for attorney fees. On January 14, 2021, Goldstone Holding Company, LLC dismissed its claims without prejudice, leaving Torchlight's counterclaims for attorney fees as the only pending claim in the case. On February 26, 2021, Torchlight filed a non-suit without prejudice on its counterclaims for attorney fees, leaving no claims in the case. The court signed a final order disposing of the entire case on March 5, 2021. However, Goldstone Holding Company, LLC asked the court to re-instate its claims, and a hearing was held on April 13, 2021. On June 16, 2021, the court signed an order denying the motion to reinstate Goldstone Holding Company's, LLC's claims, and the case is closed.

On April 30, 2020, The Company's wholly owned subsidiary, Hudspeth Oil Corporation, filed suit against Datalog LWT, Inc. d/b/a Cordax Evaluation Technologies. The suit seeks the recovery of approximately $1.4 million in costs incurred as a result of a tool failure during drilling activities on the University Founders A25 #2 well that is located in the Orogrande Field. Working interest owner Wolfbone Investments, LLC, a company owned by the Company's former Chairman Gregory McCabe, is a co-plaintiff in that action. After the suit was filed, Cordax filed a mineral lien in the amount of $104,500 against the Orogrande Field and has sued the operator and counterclaimed against Hudspeth for breach of contract, seeking the same amount as the lien. The Company has added the manufacturer of one of the tool components that the Company contends was a cause of the tool failure. It was later discovered that Datalog LWT, Inc. d/b/a Cote rdax Evaluation Technologies forfeited its charter to conduct business in the State of Texas by failing to timely pay its franchise taxes, and the Company added members of the board of directors to the case pursuant to the Texas Tax Code. It was recently disclosed that Datalog LWT, Inc. d/b/a Cordax Evaluation Technologies is the subsidiary of a Canadian parent company, Cordax Evaluation Technologies, Inc., who has also been added to the case. The suit, Hudspeth Oil Corporation and Wolfbone Investments, LLC v. Datalog LWT, Inc. d/b/a Cordax Evaluation Technologies, was filed in the 189th Judicial District Court of Harris County, Texas. The Company's current Chairman of the Board filed a special appearance after being served with citation, alleging that he was a Canadian citizen with no meaningful ties to Texas. After discovery was conducted on this issue, the Company filed a nonsuit without prejudice for this Defendant, dismissing him from the case. The remaining parties are currently engaged in preliminary discovery and are scheduling mediation.

On March 18, 2021, Datalog LWT, Inc. d/b/a Cordax Evaluation Technologies filed a lawsuit in Hudspeth County, Texas seeking to foreclose its mineral lien against the Orogrande Field in the amount of $104,500.01 and recover related attorney's fees. The foreclosure action, Datalog LWT Inc. d/b/a Cordax Evaluation Technologies v. Torchlight Energy Resources, Inc., was filed in the 205th Judicial District Court of Hudspeth County, Texas. The Company is contesting the lien in good faith and filed a Plea in Abatement on May 10, 2021, seeking a stay in the Hudspeth County lien foreclosure case pending final disposition of the related case currently pending in Harris County, Texas.

In September 2021, the Company received a subpoena from the Securities and Exchange Commission, Division of Enforcement, in a matter captioned *In the Matter of Torchlight Energy Resources, Inc.* The subpoena requests that the Company produces certain documents and information related to, among other things, the merger involving Torchlight Energy Resources, Inc. and Metamaterial Inc. The Company is cooperating and intends to continue to cooperate with the SEC's investigation. The Company can offer no assurances as to the outcome of this investigation or its potential effect, if any, on the Company or its results of operation.

On January 3, 2022, a putative securities class action lawsuit was filed in the U.S. District Court for the Eastern District of New York captioned Maltagliati v. Meta Materials Inc., et al., No. 1:21-cv-07203, against the Company, its Chief Executive Officer, its Chief Financial Officer, Torchlight's former Chairman of the Board of Directors, and Torchlight's former Chief Executive Officer. The complaint, purportedly brought on behalf of all purchasers of the Company's publicly traded securities from September 21, 2020 through and including December 14, 2021, asserts claims under Sections 10(b) and 20(a) of the Securities Exchange Act of 1934 (the "Exchange Act") arising primarily from a short-seller report and statements related to the Company's business combination with Torchlight. The complaint seeks unspecified compensatory damages and reasonable costs and expenses, including attorneys' fees.

On January 26, 2022, a similar putative securities class action lawsuit was filed in the U.S. District Court for the Eastern District of New York captioned McMillan v. Meta Materials Inc., et al., No. 1:22-cv-00463. This complaint names the same defendants and asserts the

same claims on behalf of the same purported class as the Maltagliati action. The Company believes these actions (collectively, the "Securities Class Action") have no merit and intends to vigorously defend itself against these allegations.

On January 14, 2022, a shareholder derivative action was filed in the U.S. District Court for the Easter District of New York captioned Hines v. Palikaras, et al., No. 1:22-cv-00248. The complaint names as defendants certain of the Company's current officers and directors, certain former Torchlight officers and directors, and the Company (as nominal defendant). The complaint, purportedly brought on behalf of the Company, asserts claims under Section 14(a) of the Exchange Act, contribution claims under Sections 10(b) and 21D of the Exchange Act, and various state law claims such as breach of fiduciary duties and unjust enrichment. The complaint seeks, among other things, unspecified compensatory damages in favor of the Company, certain corporate governance related actions, and an award of costs and expenses to the derivative plaintiff, including attorneys' fees.

Contractual Commitments and Purchase Obligations

a) As highlighted in note 20, on January 29, 2021, the Company arranged an irrevocable standby letter of credit with TD in favor of Covestro for EUR 600,000 in relation to the CFA agreement. In the event the Company fails to meet the performance milestones under the CFA, Covestro shall draw from the letter of credit with TD. The letter of credit was secured by restricted cash of CA$1,000,000 under a cash use agreement which has been recorded as long-term debt in the consolidated balance sheets. In July 2021, the Company settled the long term debt and used its own funds as guarantee. Covestro has issued certificates of reduction of $462,563 (ER 300,000) to reduce the letter of credit after completion of certain performance milestones. This will take effect in Fiscal 2022. As at December 31, 2021, the letter of credit has an outstanding amount of EUR 600,000.

b) During 2018, the Company arranged a guarantee/standby letter of credit with RBC in favor of Satair A/S for $500,000 in relation to an advance payment received. In the event the Company fails to deliver the product as per the contract or refuse to accept the return of the product as per the buyback clause of the contract or fails to repay the advance payment in accordance with the conditions of the agreement signed with Satair on September 18, 2018, Satair shall draw from the letter of credit with RBC. Borrowings from the letter of credit with RBC are repayable on demand. The letter of credit from RBC is secured by a performance security guarantee cover issued by Export Development of Canada. Further, this guarantee/standby letter of credit expires on October 5, 2022. As at December 31, 2021, no amount has been drawn from the letter of credit with RBC.

c) On December 8, 2016, the Company entered into a cooperation agreement with a large aircraft manufacturer to co-develop laser protection filters for space and aeronautical civil and military applications, metaAIR, and support the setup of manufacturing facilities for product certification and development. The cooperation agreement includes financial support provided to the Company in the form of non-recurring engineering costs of up to $4,000,000 to be released upon agreement of technical milestones in exchange for a royalty fee due by the Company on gross profit after sales and distribution costs. The total royalty fee to be paid may be adjusted based on the timing of the Company's sales and the amount ultimately paid to the Company by large aircraft manufacturer to support the development.

d) Certain nano-optic products are subject to a 3% sales royalty in favor of Simon Fraser University ("SFU") where certain elements of the nano-optic technology originated. Royalties were $Nil during the period since acquisition date until December 31, 2021. In 2014, the Company's wholly owned subsidiary, Nanotech, prepaid royalties that would offset against future royalties owed as part of the transfer of the intellectual property from SFU, of which $197,016 remains prepaid as at December 31, 2021.

e) Product revenue associated with six patents acquired by Nanotech is subject to royalties. The Company agreed to share 10% of any revenues related to the patents received from a specific customer for a period of two years and ongoing royalties of 3% to 6% on other revenues derived from the patents for a period of five years. There were no royalties during the year ended December 31, 2021.

f) As at December 31, 2021, the Company had on-going commitments for maintenance contracts as follow:

2022	$	292,125
2023		43,730
2024		3,105
	$	338,960

29. Subsequent events

Subsequent to December 31, 2021, 82,753 stock options and 156,728 warrants were exercised.

Item 9. Changes in and Disagreements With Accountants on Accounting and Financial Disclosure.
None.

Item 9A. Controls and Procedures.

Evaluation of Disclosure Controls and Procedures
Management, with the participation of the Chief Executive Officer and Chief Financial Officer, has evaluated the effectiveness of the Company's disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act) as of December 31, 2021.

Based on this evaluation, the Company's management including the Chief Executive Officer and Chief Financial Officer have concluded that, due to the material weaknesses in the Company's internal control over financial reporting described below, the Company's disclosure controls and procedures were not effective as of December 31, 2021.

However, giving full consideration to the material weaknesses, the Company has concluded that the consolidated financial statements included in the Annual Report on Form 10-K present fairly, in all material respects, the Company's financial position, the results of its operations and its cash flows for each of the periods presented in conformity with U.S. generally accepted accounting principles.

Management's Report on Internal Control over Financial Reporting

The Company's management is responsible for establishing and maintaining effective internal control over financial reporting, as such term is defined in Securities Exchange Act Rule 13a-15(f). The Company's internal control over financial reporting is a process designed by and under the supervision of the Company's management, including the Company's Chief Executive Officer and Chief Financial Officer, and effected by the Company's management and other personnel, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of consolidated financial statements for external purposes in accordance with U.S. generally accepted accounting principles. The Company's management, under the supervision and with the participation of its Chief Executive Officer and Chief Financial Officer, conducted an evaluation of the effectiveness of the Company's internal control over financial reporting as of December 31, 2021, using the criteria set forth in *Internal Control – Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission. Based on this evaluation, management concluded that internal control over financial reporting was not effective as of December 31, 2021, due to material weaknesses in internal control over financial reporting.

A material weakness is a deficiency, or a combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of the Company's annual or interim financial statements may not be prevented or detected on a timely basis.

Management has determined that it did not maintain effective internal controls over financial reporting due to the existence of the following identified material weaknesses:

- An ineffective control environment resulting from a lack of the required number of trained financial reporting, accounting, information technology (IT) and operational personnel with the appropriate skills and knowledge and with assigned responsibility and accountability related to the design, implementation, and operation of internal control over financial reporting.
- The insufficient number of personnel described above contributed to an ineffective risk assessment process necessary to identify all relevant risks of material misstatement and to evaluate the implications of relevant risks on its internal control over financial reporting.
- An ineffective information and communication process resulting from: (i) insufficient communication of internal control information, including objectives and responsibilities, such as delegation of authority; and (ii) ineffective general IT controls and ineffective controls over information from a service organization, resulting in insufficient controls to ensure the relevance, timeliness and quality of information used in control activities.
- As a consequence of the above, the Company had ineffective control activities related to the design, implementation and operation of process level and financial statement close controls which had a pervasive impact on the Company's internal control over financial reporting.

- An ineffective monitoring process resulting from the evaluation and communication of internal control deficiencies, including monitoring corrective actions, not being performed in a timely manner.

These material weaknesses resulted in material misstatements, which were corrected prior to the release of the consolidated financial statements as of and for the year ended December 31, 2021, and also in immaterial misstatements, some of which were corrected prior to the release of the consolidated financial statements as of and for the year ended December 31, 2021. These material weaknesses create a reasonable possibility that a material misstatement to the consolidated financial statements will not be prevented or detected on a timely basis.

In accordance with guidance issued by the SEC, companies are permitted to exclude acquisitions from their final assessment of internal control over financial reporting for the first fiscal year in which the acquisition occurred. Our management, with the participation of our Chief Executive Officer and Chief Financial Officer, has limited the evaluation of our internal controls over financial reporting to exclude controls, policies and procedures and internal controls over financial reporting of the recently acquired operations of Nanotech Security Corp. (acquired on October 5, 2021). The operations of Nanotech Security Corp. represent approximately 17% of our total assets and 45% of our total revenues for the year ended December 31, 2021.

KPMG LLP, our independent registered public accounting firm, has issued an attestation report on the Company's internal control over financial reporting, which report expresses an adverse opinion on the effectiveness of internal control over financial reporting.

Plan for Remediation of Material Weaknesses

Management is continuing to evaluate and strengthen the Company's internal controls over financial reporting to ensure that management can routinely prepare our financial statements under GAAP, meet the requirements of the Company's independent auditors and remain in compliance with the SEC reporting requirements. These efforts are time consuming and require significant resource investment that the Company is committed to making.

The Company is still developing and documenting the full extent of the procedures to implement to remediate the material weaknesses described above, however the current remediation plan includes:

- Training the newly hired ERP specialist and Supply Chain and Procurement Director.
- Identifying and hiring additional key positions necessary to support the Company's initiatives related to internal controls over financial reporting, including but not limited to Technical Accounting, Transactional Accounting, IT Management and Analysts.
- Hiring consultants to assist with process improvements and control remediation efforts in targeted accounting, IT and operations processes.
- Continuing on-going testing of policies and procedures implemented in late 2021 to assess their effectiveness.
- Formalizing its entity-wide risk assessment process, and documenting internal ownership of risk monitoring and mitigation efforts, with improved risk monitoring activities and regular reporting to those charged with governance at an appropriate frequency.
- Finalize a delegation of authority matrix to enforce desired limits of authority for key transactions, events, and commitments, and communicating these limits of authority to relevant personnel throughout the Company.

Changes in Internal Controls.

Except for the material weaknesses described above, no changes in the Company's internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act) occurred during the quarter ended December 31, 2021 that has materially affected, or is reasonably likely to materially affect, the Company's internal control over financial reporting.

Limitations on Effectiveness of Internal Controls

Management, including the Chief Executive Officer and Chief Financial Officer, does not expect that disclosure controls or internal controls, when effective, will prevent all error and all fraud. A control system, no matter how well conceived and operated, can provide only reasonable, not absolute, assurance that the objectives of the control system are met. In addition, the design of a control system must reflect the fact that there are resource constraints, and the benefits of controls must be considered relative to their costs. Because of the inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that all control issues and instances of fraud, if any, within a company have been detected. These inherent limitations include the realities that judgments in decision-making can be faulty, and that breakdowns can occur because of simple error or mistake.

Additionally, controls can be circumvented by the individual acts of some persons, by collusion of two or more people or by management's override of the control. The design of any systems of controls is based in part upon certain assumptions about the likelihood of future events, and there can be no assurance that any design will succeed in achieving its stated goals under all potential future conditions. Over time, control may become inadequate because of changes in conditions, or the degree of compliance with the policies or procedures may deteriorate. Because of these inherent limitations in a cost-effective control system, misstatements due to error or fraud may occur and not be detected. Individual persons may perform multiple tasks which normally would be allocated to separate persons and therefore extra diligence must be exercised during the period these tasks are combined.

Item 9B. Other Information.
Effective as of February 28, 2022, the Board of Directors of the Company voted to promote Kenneth L. Rice to the position of Chief Operating Officer. In this new role Mr. Rice will retain his duties as Chief Financial Officer and will assume management responsibility for Business Development Operations, Manufacturing and Quality Control.

Item 9C. Disclosure Regarding Foreign Jurisdictions that Prevent Inspections.
None.

Item 10. Directors, Executive Officers and Corporate Governance.
The information required by this Item will be provided in an amendment to this Annual Report on Form 10-K in accordance with General Instruction G(3) to Form 10-K.

Item 11. Executive Compensation.
The information required by this Item will be provided in an amendment to this Annual Report on Form 10-K in accordance with General Instruction G(3) to Form 10-K.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters.
The information required by this Item will be provided in an amendment to this Annual Report on Form 10-K in accordance with General Instruction G(3) to Form 10-K.

Item 13. Certain Relationships and Related Transactions, and Director Independence.
The information required by this Item will be provided in an amendment to this Annual Report on Form 10-K in accordance with General Instruction G(3) to Form 10-K.

Item 14. Principal Accounting Fees and Services.
The information required by this Item will be provided in an amendment to this Annual Report on Form 10-K in accordance with General Instruction G(3) to Form 10-K.

PART IV

Item 15. Exhibits, Financial Statement Schedules.

Exhibit Index

Exhibit Number	Exhibit Description	Incorporated by Reference		Filed Herewith
		Form	Filing Date	
1.1.0	Underwriting Agreement, dated February 8, 2021, between Torchlight Energy Resources, Inc. and Roth Capital Partners, LLC	10k	18-Mar-21	
1.2.0	Sales Agreement, dated as of June 16, 2021, by and between Torchlight Energy Resources, Inc. and Roth Capital Partners, LLC	8k	16-Jun-21	
1.2.1	Amended and Restated Sales Agreement, dated as of June 21, 2021, by and between Torchlight Energy Resources, Inc. and Roth Capital Partners, LLC	8k	21-Jun-21	
2.1.0	Arrangement Agreement between Metamaterial Inc. and Torchlight Energy Resouces, Inc., dated December 14, 2020	8k	14-Dec-20	
2.1.1	Amendment to Arrangement Agreement dated February 3, 2021	8k	3-Feb-21	
2.1.2	Amendment to Arrangement Agreement dated March 11, 2021	8k	11-Mar-21	
2.1.3	Amendment to Arrangement Agreement dated March 31, 2021	8k	1-Apr-21	
2.1.4	Amendment to Arrangement Agreement dated April 15, 2021	8k	15-Apr-21	
2.1.5	Amendment to Arrangement Agreement dated May 2, 2021	8k	3-May-21	
2.1.6	Amendment to Arrangement Agreement dated June 18, 2021	8k	21-Jun-21	

2.2.0	Arrangement Agreement between Meta Materials Inc. and Nanotech Securities, dated August 4, 2021			X
3.1.0	Articles of Incorporation	10k	18-Mar-19	
3.1.1	Certificate of Amendment to Articles of Incorporation dated December 10, 2014.	10Q	15-May-15	
3.1.2	Certificate of Amendment to Articles of Incorporation dated September 15, 2015.	10Q	12-Nov-15	
3.1.3	Certificate of Amendment to Articles of Incorporation dated August 18, 2017.	10Q	9-Nov-18	
3.1.4	Amendment to the Articles of Incorporation of Torchlight Energy Resources, Inc., dated June 14, 2021	8K	16-Jun-21	
3.1.5	Certificate of Amendment related to the Reverse Stock Split and Name Change, filed June 25, 2021	8k	29-Jun-21	
3.2.0	Amended and Restated Bylaws	8k	26-Oct-16	
3.3.0	Certificate of Designation of Preferences, Rights and Limitations of Series A Non-Voting Preferred Stock, dated June 14, 2021, as modified by the Certificate of Correction, dated June 15, 2021	8k	16-Jun-21	
3.3.1	Certificate of Designation of Preferences, Rights and Limitations of Series B Special Voting Preferred Stock, dated June 14, 2021	8k	16-Jun-21	
4.1.0	Form of Investor Warrant			X
4.2.0	Form of Broker Warrant			X
4.3.1	ACOA BDP (2015) - Contract 200804 - Original Document			X
4.3.2	ACOA AIF (2015) - Contract 203260 - Original Document			X
4.3.3	ACOA BDP (2018) - Contract 211326 - Original Document			X
4.3.4	ACOA BDP (2019) - Contract 212622 - Original Document			X
4.3.5	ACOA RRRF (2021) - Contract 217574 - Original Document			X
4.6	Form of Common Stock			X
10.1.1	Highfield Park, Dartmouth, NS - Lease 20200828 - Original Document			X
10.1.1.1	Highfield Park, Dartmouth, NS - Lease 20210603 - Amendment June 1, 2021			X
10.1.1.2	Highfield Park, Dartmouth, NS - Subscription Agreement			X
10.2.0	Employment Agreement with George Palikaras, dated July 1, 2021			X
10.2.1	Employment Agreement with Kenneth Rice, dated December 11, 2020			X
10.2.2	Employment Agreement with Jonathan Waldern dated December 16, 2020			X
10.14.0	Form of Meta Materials Inc. Indemnification Agreement (Incorporated by reference form 8-k filed with the SEC on June 29, 2021)			X
14.0	Code of Conduct			X
21.1.0	List of Subsidiaries			X
23.0	Consent of Independent Auditors			X
23.1.0	Consent of Independent Registered Public Accounting Firm			X
24.0	Power of Attorney			X
31.1	Certification of Principal Executive Officer Pursuant to Rules 13a-14(a) and 15d-14(a) under the Securities Exchange Act of 1934, as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.			X
31.2	Certification of Principal Financial Officer Pursuant to Rules 13a-14(a) and 15d-14(a) under the Securities Exchange Act of 1934, as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.			X

32.1	Certification of Principal Executive Officer Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.	X
32.2	Certification of Principal Financial Officer Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.	X
101.SCH	Inline XBRL Instance Document – the instance document does not appear in the Interactive Data File because XBRL tags are embedded within the Inline XBRL document.	
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase Document	
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase Document	
101.LAB	Inline XBRL Taxonomy Extension Label Linkbase Document	
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase Document	
104	Cover Page Interactive Data File (embedded within the Inline XBRL document)	

Item 16. Form 10-K Summary

None.

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this Report to be signed on its behalf by the undersigned, thereunto duly authorized.

Meta Materials Inc.

Dated: March 1, 2022 By: /s/ George Palikaras

George Palikaras
President, Chief Executive Officer and
(Principal Executive Officer)

Dated: March 1, 2022 By: /s/ Ken Rice

Ken Rice
Chief Financial Officer and Executive Vice President
(Principal Financial and Accounting Officer)

POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints George Palikaras and Ken Rice and each of them, as his or her true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for him or her and in his or her name, place and stead, in any and all capacities, to sign any and all amendments to this Annual Report on Form 10-K, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he or she might or could do in person, hereby ratifying and confirming that all said attorneys-in-fact and agents, or any of them or their or his or her substitute or substitutes, may lawfully do or cause to be done by virtue hereof. Pursuant to the requirements of the Securities Exchange Act of 1934, this Annual Report on Form 10-K has been signed by the following persons on behalf of the Registrant and in the capacities and on the dates indicated:

Signature	Title	Date
/s/ Georgios Pallifaras **Georgios Palikaras**	Chief Executive Officer *(Principal Executive Officer)*	1-Mar-22
/s/ Kenneth Rice **Kenneth Rice**	Chief Financial Officer *(Principal Financial Officer)*	1-Mar-22
/s/ Jonathan Waldern **Jonathan Waldern**	Chief Technology Officer *(Principal Technology Officer)*	1-Mar-22
/s/ Ram Ramkumar **Ram Ramkumar**	Chairman and Director	1-Mar-22
/s/ Maurice Guitton **Maurice Guitton**	Director	1-Mar-22
/s/ Allison Christilaw **Allison Christilaw**	Director	1-Mar-22
/s/ Steen Karsbo **Steen Karsbo**	Director	1-Mar-22
/s/ Eric Leslie **Eric Leslie**	Director	1-Mar-22
/s/ Ken Hannah **Ken Hannah**	Director	1-Mar-22

POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints George Palikaras and Ken Rice and each of them, as his or her true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for him or her and in his or her name, place and stead, in any and all capacities, to sign any and all amendments to this Annual Report on Form 10-K, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he or she might or could do in person, hereby ratifying and confirming that all said attorneys-in-fact and agents, or any of them or their or his or her substitute or substitutes, may lawfully do or cause to be done by virtue hereof. Pursuant to the requirements of the Securities Exchange Act of 1934, this Annual Report on Form 10-K has been signed by the following persons on behalf of the Registrant and in the capacities and on the dates indicated:

Signature	Title	Date
DocuSigned by: George Palikaras 663370BE1891466... George Palikaras	*President, Chief Executive Officer and Director (Principal Executive Officer)*	3/1/2022
DocuSigned by: ken Rice 5364A14F40044D2... Ken Rice	*Chief Financial Officer and Executive Vice President (Principal Financial and Accounting Officer)*	3/1/2022
DocuSigned by: A05F582CC9B141C... Rami Ramkumar	Director	3/1/2022
DocuSigned by: Maurice Guitton 4128C777DC98472... Maurice Guitton	Director	3/1/2022
DocuSigned by: 08C64CA54B62426... Allison Christilaw	Director	3/1/2022
DocuSigned by: 18B84E2EDD2B41B... Steen Karsbo	Director	3/1/2022
DocuSigned by: 0EDF48CD4CDF4B9... Eric M. Leslie	Director	3/1/2022
DocuSigned by: ken Hannah 109C60FEA025490... Ken Hannah	Director	3/1/2022

Exhibit 2.2

EXECUTION VERSION

META MATERIALS INC.

- and -

1315115 BCINC.

- and-

NANOTECH SECURITY CORP.

ARRANGEMENT AGREEMENT

August 4, 2021

TABLE OF CONTENTS

ARRANGEMENT AGREEMENT

ARRANGEMENT AGREEMENT dated August 4, 2021 among META MATERIALS INC., a corporation existing under the laws of Nevada ("**META**"), 1315115 BC INC., a corporation existing under the laws of the Province of British Columbia ("**Purchaser**") and NANOTECH SECURITY CORP., a corporation existing under the laws of the Province of British Columbia ("**Nanotech**").

WHEREAS:

A. META, Purchaser and Nanotech wish to complete a transaction pursuant to which, among other things, META will, indirectly through Purchaser, acquire all of the Nanotech Shares in exchange for the Consideration, by way of a statutory plan of arrangement, which is to be completed under the provisions of the BCBCA on and subject to the terms and conditions contained herein;

B. the Nanotech Financial Advisor has advised the Nanotech Board that, as of August 4, 2021, the applicable Consideration to be received by the Nanotech Shareholders pursuant to the Arrangement is fair, from a financial point of view, to the Nanotech Shareholders, subject to the assumptions, limitations, qualifications and other matters set forth in the Nanotech Fairness Opinion;

C. the Nanotech Board has determined, upon the recommendation of the Nanotech Special Committee and after having considered financial and legal advice, that the Arrangement is in the best interests of Nanotech and is fair to Nanotech Shareholders and the Nanotech Board has unanimously resolved to recommend that Nanotech Securityholders vote in favour of the Nanotech Arrangement Resolution at the Nanotech Meeting;

D. META has entered into the Nanotech Voting Agreements with the Nanotech Supporting Shareholders, pursuant to which, among other things, such Nanotech Supporting Shareholders agree, subject to the terms and conditions thereof, to vote the Nanotech Shares and any securities convertible, exercisable or exchangeable into Nanotech Shares held by them in favour of the Nanotech Arrangement Resolution;

E. the Parties have entered into this Agreement to provide for the matters referred to in the foregoing recitals and for other matters relating to the Arrangement; and

F. capitalized terms used but not otherwise defined in these recitals have the meanings ascribed to such terms in Section 1.1.

NOW THEREFORE in consideration of the covenants and agreements herein contained and other good and valuable consideration (the receipt and sufficiency of which are hereby acknowledged), the Parties hereto covenant and agree as follows:

ARTICLE 1
INTERPRETATION

1.1 Definitions

In this Agreement, unless the context otherwise requires:

"**Acceptable Confidentiality Agreement**" has the meaning ascribed thereto in Subsection 7.3(a)(iv);

"**affiliate**" has the meaning ascribed thereto in the Securities Act;

"**Agreement**" means this arrangement agreement, including all schedules annexed hereto, together with the Nanotech Disclosure Letter, as the same may be amended, supplemented or otherwise modified from time to time in accordance with the terms hereof;

"**Alternative Acquisition Agreement**" has the meaning ascribed thereto in Subsection 7.2(a)(iv);

"**Anti-Money Laundering Laws**" means all financial recordkeeping and reporting requirements, the applicable anti-money laundering statutes of all jurisdictions where a Person and/or its subsidiaries conduct business, the rules and regulations thereunder and any related or similar rules, regulations, or guidelines issued, administered, or enforced by any Governmental Entity;

"**Arrangement**" means the arrangement under Division 5 of Part 9 of the BCBCA on the terms and subject to the conditions set out in the Plan of Arrangement, subject to any amendments or variations thereto made in accordance with this Agreement, Article 6 of the Plan of Arrangement or made at the direction of the Court in the Final Order, with the prior written consent of Nanotech and META, each acting reasonably;

"**Authorization**" means, with respect to any Person, any order, permit, approval, licence, registration, consent, privilege, award, determination, direction, decision, decree, waiver or similar authorization of any Governmental Entity having jurisdiction over the Person;

"**BCBCA**" means the *Business Corporations Act* (British Columbia);

"**BC Registrar**" means the Registrar of Companies appointed under Section 400 of the BCBCA;

"**Business Day**" means a day other than a Saturday, a Sunday or any other day on which commercial banking institutions in Toronto, Ontario, Vancouver, British Columbia or New York, New York are authorized or required by applicable Law to be closed;

"**Claim**" means: (i) any suit, action, proceeding, dispute, investigation, claim, arbitration, order, summons, citation, directive, ticket, charge, demand or prosecution, whether legal or administrative; or (ii) any appeal or application for review; whether at law or in equity or by any Governmental Entity;

"**Confidentiality Agreement**" means the confidentiality agreement between Nanotech and META dated February 9, 2021;

"**Consideration**", for a Nanotech Share, Nanotech Option or Nanotech RSU, means the cash consideration to be received pursuant to the Plan of Arrangement in respect of such security in accordance with Sections 2.2(e), 2.2(b) and 2.2(d), respectively, of the Plan of Arrangement;

"**Contract**" means any contract, agreement, license, franchise, lease, arrangement, commitment, joint venture, partnership or other right or obligation (written or, to the extent enforceable, oral) to which a Party or any of its subsidiaries is a party or by which it or any of its subsidiaries is bound or to which any of their respective properties or assets is subject;

"**Court**" means the Supreme Court of British Columbia;

"**COVID-19**" means the novel coronavirus, SARS-CoV-2 or COVID-19 (and all related strains and sequences), including any intensification, resurgence or any evolutions or mutations thereof, and/or related or associated epidemics, pandemics, disease outbreaks or public health emergencies;

"**COVID-19 Measures**" means measures undertaken by a Party or its subsidiaries to comply with any quarantine, "shelter in place", "stay at home", workforce reduction, social distancing, curfew, shut down, closure, sequester, travel restrictions or any other applicable Law, or any other similar directives, guidelines or recommendations issued by any Governmental Entity in connection with or in response to COVID-19;

"**D&O Insurance**" has the meaning ascribed thereto in Subsection 5.4(b);

"**Debt Instrument**" means any bond, debenture, mortgage, promissory note or other instrument evidencing indebtedness for borrowed money;

"**Depositary**" means AST Trust Company (Canada) or such other person appointed by Nanotech and META (each acting reasonably), for the purpose of, among other things, exchanging certificates representing Nanotech Shares for the applicable Consideration;

"**Dissent Rights**" means the rights of dissent exercisable by the Nanotech Shareholders under Section 237 to 247 of the BCBCA, as modified by Article 3.1 of the Plan of

Arrangement, the Interim Order and the Final Order, in respect of the Nanotech Arrangement Resolution;

"**Dissenting Shareholder**" has the meaning ascribed thereto in the Plan of Arrangement;

"**DP Laws**" means all Laws relating to data protection and privacy which is from time to time applicable to Nanotech in any jurisdiction together with all applicable codes of conduct and practice, guidance and opinions relating to data protection and privacy issued in any relevant jurisdiction by, or with the approval of, any Governmental Entity.

"**Effective Date**" means the date upon which the Arrangement becomes effective pursuant to Subsection 2.8(a);

"**Effective Time**" has the meaning ascribed thereto in the Plan of Arrangement;

"**Employee Plans**" means all benefit or compensation plans, programs, policies, practices, contracts, agreements or other arrangements, covering current or former employees, directors or consultants of Nanotech, including without limitation employment, consulting, deferred compensation, equity, benefit, bonus, incentive, pension, retirement, savings, stock purchase, profit sharing, stock option, stock appreciation, phantom stock, termination, change of control, life insurance, medical, health, welfare, hospital, dental, vision care, drug, sick leave, disability, and similar plans, programmes, arrangements or practices, whether or not in writing and whether or not funded, in each case, which is sponsored, maintained or contributed to by Nanotech, or to which Nanotech is obligated to contribute, or with respect to which Nanotech has any liability, direct or indirect, contingent or otherwise, other than benefit plans established pursuant to statute;

"**Encumbrance**" means any encumbrance, lien, charge, hypothec, pledge, mortgage, title retention agreement, security interest of any nature, adverse claim, exception, reservation, easement, right of occupation, option, right of pre-emption, privilege or any similar matter capable of registration against title or any Contract to create any of the foregoing;

"**Environmental Laws**" means all Laws aimed at, or relating to, the reclamation or restoration of properties, occupational health and safety, protection of the environment, abatement of pollution, protection of wildlife, ensuring public safety from environmental hazards and all other Laws relating to (i) the management processing, use, treatment, storage, disposal, discharge, transport or handling of any Hazardous Substances; (ii) plant and animal life, (iii) lands; or (iv) other natural resources;

"**Final Order**" means the final order of the Court contemplated by Section 2.6 of this Agreement and made pursuant to Section 291 of the BCBCA, in a form acceptable to each of the Parties, acting reasonably, approving the Arrangement, as such order may be affirmed, amended, modified, supplemented or varied by the Court (with the consent of the Parties, each acting reasonably) at any time prior to the Effective Date or, if appealed, then,

unless such appeal is withdrawn or denied, as affirmed, amended, modified, supplemented or varied (provided, however, that any such amendment, modification, supplement or variation is acceptable to the Parties, each acting reasonably) on appeal, unless such appeal is withdrawn, abandoned or denied;

"**Former Nanotech Securityholder**" means a holder of Nanotech Shares, In-the-Money Options or Nanotech RSUs immediately prior to the Effective Time;

"**Governmental Entity**" means (i) any multinational, supranational, national, federal, state, provincial, county, territorial, municipal, local or other government, administrative, judicial or regulatory authority, agency, board, body, bureau, commission, instrumentality, court or tribunal or any political subdivision thereof, or any central bank (or similar monetary or regulatory authority) thereof, any taxing authority, any ministry or department or agency of any of the foregoing, (ii) any self-regulatory organization or securities exchange or over-the-counter market, including the TSXV and NASDAQ, (iii) any entity exercising executive, legislative, judicial, regulatory or administrative functions of or pertaining to government; and (iv) any corporation or other entity owned or controlled, through stock or capital ownership or otherwise, by any of such entities or other bodies pursuant to the foregoing;

"**Hazardous Substance**" means any waste or other substance that is prohibited, listed, defined, designated or classified as hazardous, radioactive, corrosive, explosive, infectious, carcinogenic, or toxic or a pollutant or a contaminant under or pursuant to, or for which any liability or standard of care is imposed under, any applicable Environmental Laws, including petroleum and all derivatives thereof or synthetic substitutes therefor, hydrogen sulphide, arsenic, cadmium, lead, mercury, polychlorinated biphenyls ("**PCBs**"), PCB-containing equipment and material, mould, asbestos, asbestos-containing material, urea-formaldehyde, urea-formaldehyde-containing material and any other material or substance that may impair the environment;

"**IFRS**" means International Financial Reporting Standards;

"**In-The-Money Option**" means each Nanotech Option that, immediately prior to the Effective Time, has an exercise price per Nanotech Share less than the Nanotech Share Price per Nanotech Share;

"**including**" means including without limitation, and "**include**" and "**includes**" have a corresponding meaning;

"**Incentive Plan**" means Nanotech's Employee and Management Share Incentive Plan adopted January 28, 2015, made affective April 8, 2015 and as amended February 20, 2019;

"**Indemnified Person**" has the meaning ascribed thereto in Subsection 5.4(a);

"**Intellectual Property**" means domestic and foreign intellectual property rights, whether or not registrable, patentable or otherwise formally protectable, including: (i) inventions (whether patentable or unpatentable and whether or not reduced to practice), patents, applications for patents and reissues, divisions, continuations, renewals, extensions and continuations-in-part of patents or patent applications; (ii) works, copyrights, copyright registrations and applications for copyright registration, including all moral rights or similar rights of authorship or attribution; (iii) mask works, integrated circuit topographies and registrations and applications for registration of same; (iv) designs, design registrations, design registration applications and; (v) trade names, business names, corporate names, domain names, website names and world wide web addresses, common law trade-marks, trade-mark registrations, trade-mark applications, trade dress and logos and the goodwill associated with any of the foregoing; (vi) know-how, trade secrets, proprietary information, algorithms, formulae, recipes, systems, compositions, manufacturing and production processes, methods and techniques and related documentation, clinical and testing data, customer and supplier information, and market and survey information; and (vii) social media identities (including accounts, user names and handles);

"**Interim Order**" means an interim order of the Court contemplated by Section 2.3 of this Agreement and made pursuant to Section 291 of the BCBCA, in a form acceptable to each of the Parties, acting reasonably, providing for, among other things, the calling and holding of the Nanotech Meeting, as the same may be affirmed, amended, modified, supplemented or varied by the Court with the consent of the Parties, each acting reasonably;

"**ITA**" means the *Income Tax Act* (Canada), as amended from time to time;

"**Key Regulatory Approvals**" means those rulings, consents, orders, exemptions, Permits, Authorizations and other approvals of Governmental Entities, necessary to proceed with the transactions contemplated by this Agreement and the Plan of Arrangement, as listed in Schedule F;

"**Law**" means, with respect to any Person, any and all applicable law (statutory, common, civil or otherwise), constitution, treaty, convention, ordinance, code, rule, regulation, order, injunction, judgment, decree, ruling or other similar requirement, whether domestic or foreign, enacted, adopted, promulgated or applied by a Governmental Entity that is binding upon or applicable to such Person or its business, property or securities, and to the extent that they have the force of law, policies, guidelines, notices and protocols of any Governmental Entity, as amended;

"**material change**", "**material fact**" and "**misrepresentation**" have the meanings ascribed thereto in the Securities Act;

"**Material Contract"** means any of the following for Nanotech:

(a) any Contract that if terminated or modified or if it ceased to be in effect would reasonably be expected to have a Nanotech Material Adverse Effect;

(b) any management, employment, severance, retention, transaction bonus, change in control, material consulting, relocation, repatriation or expatriation agreement or other similar Contract;

(c) any Contract with any distributor, reseller or sales representative with an annual value in excess of $100,000;

(d) any Contract with any manufacturer, vendor, or other Person for the supply of materials or performance of services by such third party to Nanotech in relation to the manufacture of Nanotech's products or product candidates with an annual value in excess of $100,000;

(e) any agreement or plan, including, without limitation, any stock option plan, stock appreciation right plan or stock purchase plan, any of the benefits of which will be increased, or the vesting of benefits of which will be accelerated, by the occurrence of any of the transactions contemplated by this Agreement;

(f) any Contract incorporating or relating to any guaranty, any sharing of liabilities or any indemnity not entered into in the ordinary course of business, including any indemnification agreements between Nanotech and any of its officers or directors;

(g) any Contract imposing any restriction on the right or ability of Nanotech or that would by the terms of the Contract impose any restriction on the right or ability of Nanotech: (A) to compete with any other Person; (B) to acquire any product or other asset or any services from any other Person; (C) to solicit, hire or retain any Person as a director, an officer or other employee, a consultant or an independent contractor; (D) to develop, sell, supply, distribute, offer, support or service any product or any technology or other asset to or for any other Person; (E) to perform services for any other Person; or (F) to transact business with any other Person;

(h) any Contract currently in force relating to the disposition or acquisition of assets not in the ordinary course of business or any ownership interest in any corporation, partnership, joint venture or other business enterprise;

(i) any mortgages, indentures, loans or credit agreements, security agreements or other agreements or instruments relating to the borrowing of money or extension of credit;

(j) any joint marketing or development agreement;

(k) any Contract that provides for: (A) any right of first refusal, right of first negotiation, right of first notification or similar right with respect to any securities or assets of Nanotech; (B) any "no shop" provision or similar exclusivity provision with respect to any securities or assets of Nanotech; or (C) contains most favored nation pricing provisions with any third party or any requirements or minimum purchase obligations of Nanotech;

(l) any Contract that contemplates or involves the payment or delivery of cash or other consideration in an amount or having a value in excess of $100,000 or more in the aggregate, or contemplates or involves the performance of services having a value in excess of $100,000 in the aggregate other than any arrangement or agreement expressly contemplated or provided for under this Agreement;

(m) any Contract that does not allow Nanotech to terminate the Contract for convenience with no more than thirty (30) days prior notice to the other party and without the payment of any rebate, chargeback, penalty or other amount to such third party in connection with any such termination in an amount or having a value in excess of $100,000 in the aggregate; or

(n) that is a "material contract" within the meaning of National Instrument 51-102 – *Continuous Disclosure Obligations*.

"**META**" has the meaning ascribed thereto in the recitals above;

"**META SEC Filings**" means META's filings with the SEC required under the U.S. Securities Act or the U.S. Exchange Act in connection with the transactions contemplated herein;

"**MI 61-101**" means Multilateral Instrument 61-101 – *Protection of Minority Security Holders in Special Transactions*;

"**Nanotech**" has the meaning ascribed thereto in the recitals above;

"**Nanotech Acquisition Proposal**" means, other than the transactions contemplated by this Agreement, any offer, proposal or inquiry from any Person or group of Persons, acting jointly or in concert, whether or not in writing and whether or not delivered to Nanotech, after the date hereof relating to: (i) any acquisition or purchase, direct or indirect, of: (A) the assets of Nanotech that, individually or in the aggregate, constitute twenty percent (20%) or more of the consolidated assets of Nanotech or which contribute twenty percent (20%) or more of the consolidated revenue of Nanotech (or any lease, long-term supply, hedging arrangement, joint venture, strategic alliance, partnership or other transaction having the same economic effect as an acquisition or purchase of such assets), or (B) beneficial ownership of twenty percent (20%) or more of the issued and outstanding voting or equity securities of Nanotech; (ii) any take-over bid, tender offer or exchange offer that,

if consummated, would result in such Person or group of Persons beneficially owning twenty percent (20%) or more of the issued and outstanding voting or equity securities of any class of voting or equity securities of Nanotech; (iii) any plan of arrangement, merger, amalgamation, consolidation, share exchange, business combination, reorganization, recapitalization, liquidation, dissolution or other similar transaction involving Nanotech; in all cases, whether in a single transaction or in a series of related transactions; (iv) any direct or indirect sale of assets (or any alliance, joint venture, earn-in right, option to acquire, lease, licence or other arrangement having a similar economic effect as a sale) by Nanotech, which assets represent twenty percent (20%) or more of the consolidated assets of Nanotech, or contribute twenty percent (20%) or more of the consolidated revenue or operating income of Nanotech; or (v) any other similar transaction, the consummation of which prevents, delays, impedes or interferes with, the transactions contemplated by this Agreement;

"**Nanotech Annual Financial Statements**" means the audited consolidated financial statements of Nanotech as at, and for the years ended September 30, 2019 and September 30, 2020 including the auditor's report thereon and the notes thereto;

"**Nanotech Arrangement Resolution**" means the special resolution of the Nanotech Securityholders approving the Plan of Arrangement, which is to be considered at the Nanotech Meeting in the form of Schedule B hereto (unless META agrees in writing to any changes to such form);

"**Nanotech Board**" means the board of directors of Nanotech as the same is constituted from time to time;

"**Nanotech Board Recommendation**" has the meaning ascribed thereto in Subsection 2.5(b)(iii);

"**Nanotech Business**" means the business and affairs of Nanotech as described in the Nanotech Disclosure Documents;

"**Nanotech Change in Recommendation**" occurs or is made when: (i) the Nanotech Board and/or any committee of the Nanotech Board fails to unanimously make or withdraws, amends, modifies or qualifies, publicly proposes or states its intention, to withdraw, amend, modify or qualify, in a manner adverse to META, the Arrangement or the Nanotech Arrangement Resolution, or fails to publicly reaffirm (without qualification) within five (5) Business Days (and in any case prior to the Nanotech Meeting) after having been requested in writing by META to do so, the Nanotech Board Recommendation; (ii) the Nanotech Board or any committee of the Nanotech Board takes no position or a neutral position with respect to a Nanotech Acquisition Proposal for more than five (5) Business Days after a Nanotech Acquisition Proposal is made or publicly announced; or (iii) the Nanotech Board or any committee of the Nanotech Board resolves or publicly proposes to take any of the foregoing actions;

"**Nanotech Circular**" means the notice of the Nanotech Meeting and accompanying management information circular, including all schedules, appendices and exhibits thereto and enclosures therewith, to be sent to the Nanotech Securityholders, as required by the Court in the Interim Order, in connection with the Nanotech Meeting, as amended, supplemented or otherwise modified from time to time in accordance with the terms of this Agreement;

"**Nanotech Disclosure Documents**" means all information, disclosure, forms, reports, schedules, statements, certifications and other documents, including without limitation all press releases, forms, reports, schedules, financial statements and notes and schedules to such financial statements, management's discussion and analysis of financial condition and results of operations, certifications, annual information forms, management information circulars, material change reports, business acquisition reports and other documents publicly disclosed or filed by Nanotech with the Securities Authorities since October 1, 2019 and prior to the date hereof and publicly available at www.sedar.com;

"**Nanotech Disclosure Letter**" means the disclosure letter executed by Nanotech and delivered to META prior to or concurrently with the execution of this Agreement;

"**Nanotech Employees**" means employees employed by Nanotech;

"**Nanotech Fairness Opinion**" means the opinion of the Nanotech Financial Advisor to the effect that, as of the date of such opinion, the Consideration to be received by the Nanotech Shareholders pursuant to the Arrangement is fair, from a financial point of view, to the Nanotech Shareholders;

"**Nanotech Financial Advisor"** means Echelon Wealth Partners Inc.;

"**Nanotech Financial Statements**" means collectively the Nanotech Interim Financial Statements and the Nanotech Annual Financial Statements;

"**Nanotech Interim Financial Statements**" means the unaudited interim condensed consolidated financial statements of Nanotech as at, and for the three-month and six-month period ended March 31, 2021 and 2020 including the notes thereto, or any subsequent interim financial statement of Nanotech filed on SEDAR prior to the Effective Time;

"**Nanotech Material Adverse Effect**" means any effect, fact, change, event, occurrence or circumstance that individually or in the aggregate with other such effects, facts, changes, events, occurrences or circumstances is, or would reasonably be expected to be, material and adverse to the business, condition (financial or otherwise), properties, assets (tangible or intangible), liabilities (whether absolute, accrued, conditional or otherwise), capital, operations or results of operations of Nanotech other than any effect, fact, change, event, occurrence or circumstance arising from, relating to or resulting from, as applicable: (i) the global economy, political conditions (including the outbreak of war or any acts of

terrorism), international trade or securities, financial or credit markets in general, natural disasters or other acts of God; (ii) the nanotechnology film and nano-optics industry in general, (iii) any generally applicable change in applicable Law (other than orders, judgments, claims or decrees against Nanotech), including the COVID-19 Measures, or accounting standards or the enforcement or interpretation thereof; (iv) a change in the market trading price or trading volume of Nanotech Shares (it being understood that the underlying cause of any such change may be taken into consideration when determining whether a Nanotech Material Adverse Effect has occurred, unless otherwise excepted under this definition); (v) the announcement of this Agreement, including the impact thereof on the relationships, contractual or otherwise, on Nanotech with customers, suppliers, business partners, regulators, vendors, Governmental Entities or other third Persons; (vi) any action required to be taken or omitted from being taken by Nanotech pursuant to this Agreement or that META has expressly consented to, approved or requested in writing following the date of this Agreement and (vii) any disease outbreaks, pandemics or epidemics or other related condition including COVID-19; *provided*, however, that (x) in the event that Nanotech is materially and disproportionately affected by an effect described in clause (i), (ii), (iii) or (vii) above relative to other participants in the industries in which Nanotech operates, the extent (and only the extent) of such effect, relative to such other participants, on Nanotech may be taken into account in determining whether there has been a Nanotech Material Adverse Effect; and (y) references in certain sections of this Agreement to dollar amounts are not intended to be, and shall not be deemed to be, illustrative or interpretive for the purposes of determining whether a Nanotech Material Adverse Effect has occurred;

"**Nanotech Meeting**" means the special meeting of Nanotech Securityholders, including any adjournment or postponement thereof, to be called and held in accordance with the Interim Order to consider the Nanotech Arrangement Resolution, and for any other purpose as may be set out in the Nanotech Circular with the prior consent of META, acting reasonably;

"**Nanotech Optionholders**" means the holders at the relevant time of Nanotech Options;

"**Nanotech Options**" means, at any time, options exercisable to acquire Nanotech Shares granted under the Incentive Plan which are, at such time, outstanding, whether or not vested;

"**Nanotech Owned Real Property**" has the meaning ascribed thereto in Schedule C(jj);

"**Nanotech RSU**" means an issued and outstanding restricted share unit of Nanotech granted under the Incentive Plan, whether or not vested;

"**Nanotech Securityholder Approval**" has the meaning ascribed thereto in Subsection 2.3(c);

"**Nanotech Securityholders**" means Nanotech Shareholders, Nanotech Optionholders and holders of Nanotech RSUs;

"**Nanotech Shareholders**" means the holders of Nanotech Shares;

"**Nanotech Shares**" means issued and outstanding common shares in the capital of Nanotech;

"**Nanotech Share Price**" means $1.25 per Nanotech Share;

"**Nanotech Special Committee**" means the special committee of independent members of the Nanotech Board formed *inter alia* to make a recommendation to the Nanotech Board with respect to the transactions contemplated by this Agreement;

"**Nanotech Superior Proposal**" means any bona fide written Nanotech Acquisition Proposal to acquire not less than all of the outstanding Nanotech Shares or all or substantially all of the assets of Nanotech on a consolidated basis that: (i) complies with Securities Laws and did not result from or involve a breach of Article 7; (ii) in the good faith opinion of the Nanotech Board is reasonably capable of being completed without undue delay, taking into account, all financial, legal, regulatory and other aspects of such proposal and the Person making such proposal; (iii) is not subject, either by the terms of such Nanotech Acquisition Proposal or by virtue of any applicable Law, or rule or requirement of any stock exchange, to any requirement that the approval of the shareholders of the Person making the Nanotech Acquisition Proposal be obtained; (iv) if any consideration is cash, is not subject to any financing contingency or condition; (v) is not subject to any due diligence or access condition (other than an access provision substantially similar to Section 7.5); (vi) does not provide for the payment of any break, termination or other similar fees or expenses to the Person making such proposal in the event that Nanotech completes the Arrangement or any similar other transaction with META or any of its affiliates agreed to prior to any termination of this Agreement; and (vii) that the Nanotech Board determines, in its good faith judgment, after receiving the advice of its outside legal and financial advisors and after taking into account all the terms and conditions of the Nanotech Acquisition Proposal, including all legal, financial, regulatory and other aspects of such Nanotech Acquisition Proposal and the Person making such Nanotech Acquisition Proposal, would, if consummated in accordance with its terms, but without assuming away the risk of non-completion, result in a transaction which is more favourable, from a financial point of view, to the Nanotech Shareholders than the Arrangement (including any amendments to the terms and conditions of the Arrangement proposed by META pursuant to Subsection 7.4(b));

"**Nanotech Supporting Shareholders**" means the individuals listed in Schedule E hereto;

"**Nanotech Voting Agreements**" means the voting agreements of even date herewith (including all amendments thereto after the date hereof) between META and the Nanotech Supporting Shareholders setting forth the terms and conditions upon which the Nanotech Supporting Shareholders have agreed, among other things, to vote their Nanotech Shares in favour of the Nanotech Arrangement Resolution;

"**NASDAQ**" means the NASDAQ Capital Market;

"**ordinary course of business**", "**ordinary course of business consistent with past practice**", or any similar reference, means, with respect to an action taken by a Person, that such action is consistent with the past practices (in terms of nature, scope and magnitude) of such Person and is taken in the ordinary course of the normal day-to-day business and operations of such Person;

"**OTC**" means the OTCQX tier of the OTC Markets Group platform;

"**Out-of-The-Money Option**" means a Nanotech Option that is not an In-The-Money Option;

"**Outside Date**" means October 31, 2021 or such later date as may be agreed to in writing by the Parties;

"**Parties**" means, collectively, Nanotech, META and the Purchaser and a "**Party**" means any one of them;

"**Permit**" means any license, permit, certificate, consent, order, grant, approval, agreement, classification, restriction, registration or other authorization of, from or required by any Governmental Entity;

"**Permitted Encumbrance**" means, with respect to Nanotech:

(a) assignments of insurance provided to landlords (or their mortgagees) pursuant to the terms of any lease to which Nanotech or any of its subsidiaries is the tenant;

(b) liens for Taxes, assessments and governmental charges which are not yet due or payable or that are being contested in good faith and diligently by appropriate proceedings and for the payment of which adequate provision has been made in Nanotech's financial statements;

(c) registered servitudes, easements, restrictions, rights of way and other similar rights in real property or any interest therein, *provided*: (i) the same are not of such nature as to materially restrict, limit, impair or impede the use of the property subject thereto in

Nanotech's business; and (ii) each such encumbrance has been complied with and is in good standing;

(d) security given in the ordinary course of Nanotech's business to any public utility, municipality or other Governmental Entity in connection with the operations of Nanotech's business, other than security for borrowed money*, provided* that such security does not materially restrict, limit, impair of impede the ability of Nanotech or any of its subsidiaries to carry on its business;

(e) undetermined or inchoate liens, charges and privileges incidental to current construction or current operations and statutory liens, charges, adverse claims, security interests or Encumbrances to which any Governmental Entity may be entitled that have not at the time been filed or registered against the title to the asset or served upon the owner or lessee of the property subject thereto pursuant to Law and that relate to obligations not due or delinquent*, provided* that they do not materially restrict, limit, impair of impede the ability of Nanotech or any of its subsidiaries to carry on its business;

(f) municipal by-laws, regulations, ordinances, zoning law, building or land use restrictions and other limitations imposed by any Governmental Entity having jurisdiction over real property; and

(g) the right reserved to or vested in any Governmental Entity by any statutory provision;

"**Person**" includes any individual, firm, partnership, limited partnership, limited liability partnership, joint venture, venture capital fund, limited liability company, unlimited liability company, association, trust, trustee, executor, administrator, legal personal representative, estate, body corporate, corporation, company, unincorporated association or organization, Governmental Entity, syndicate or other entity, whether or not having legal status;

"**Personal Information**" means any information (regardless of form) that relates to an identified or identifiable individual; an identifiable individual is one who can be identified, directly or indirectly, in particular by reference to an identifier, such as a name, an identification number, location data, an online identifier or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person; or any other information about an individual that is defined as "personal data" or "personal information" by applicable Law. Personal Information may include information such as name, street address, telephone number, email address, photograph, date of birth, social security number, driver's license number or data collected through an automated license plate recognition system, passport number, financial account information, username and password combinations or customer or account number, geolocation information of an individual or device, biometric data, medical or health information, cookie identifiers associated with registration information, or any other

browser- or device-specific number or identifier, and web or mobile browsing or usage information that is linked to the foregoing;

"**Plan of Arrangement**" means the plan of arrangement of Nanotech, substantially in the form of Schedule A hereto, and any amendments or variations thereto made from time to time in accordance with this Agreement, the Plan of Arrangement or upon the direction of the Court in the Final Order with the consent of the Parties, each acting reasonably;

"**Privacy Requirements**" means (i) DP Laws; and (ii) to the extent not inconsistent with the foregoing, all of the obligations, restrictions and prohibitions related to protection of privacy and personal data imposed by Nanotech's policies and contracts;

"**Purchaser**" has the meaning ascribed thereto in the recitals above;

"**Quebec Nanotech Owned Real Property**" means the property bearing civic address 350 Rue Nash, in the City of Thurso, Province of Quebec, and further described in Schedule C(jj);

"**Representative**" means, collectively, in respect of a Person, its subsidiaries and its affiliates and its and their officers, directors, employees, consultants, advisors, agents or other representatives (including financial, legal or other advisors);

"**SEC**" means the U.S. Securities and Exchange Commission; "**Securities Act**" means the *Securities Act* (British Columbia);

"**Securities Authorities**" means all securities regulatory authorities, including the applicable securities commission or similar regulatory authorities in each of the provinces and territories of Canada, having jurisdiction over Nanotech, or the TSXV;

"**Securities Laws**" means the Securities Act, together with all other applicable Canadian provincial securities laws, and the rules and regulations and published policies of the securities authorities thereunder, as now in effect and as they may be promulgated or amended from time to time, and includes the rules and policies of the TSXV that are applicable to Nanotech;

"**SEDAR**" means the Canadian Securities Administrators' System for Electronic Document Analysis and Retrieval;

"**subsidiary**" has the meaning ascribed thereto in the National Instrument 45-106 – *Prospectus Exemptions*;

"**Superior Proposal Matching Period**" has the meaning ascribed thereto in Subsection 7.4(a)(iv);

"**Superior Proposal Notice**" has the meaning ascribed thereto in Subsection 7.4(a)(iii);

"**Tax Returns**" means all domestic and foreign federal, state, provincial, territorial, municipal and local returns, reports, declarations, disclosures, elections, notices, filings, forms, statements, information statements and other documents (whether in tangible, electronic or other form) and including any amendments, schedules, attachments, supplements, appendices and exhibits thereto, made, prepared, filed or required to be made, prepared or filed by Law in respect of Taxes;

"**Taxes**" means any and all domestic and foreign federal, state, provincial, municipal, territorial and local taxes, assessments and other governmental charges, duties, fees, levies, impositions and liabilities imposed by any Governmental Entity (whether payable directly or by withholding and whether or not requiring the filing of a Tax Return), including without limitation pension plan contributions, tax instalment payments, unemployment insurance contributions and employment insurance contributions, disability, severance, social security, workers' compensation and deductions at source, including taxes based on or measured by gross receipts, income, profits, sales, capital, use, and occupation, and including goods and services, value added, ad valorem, sales, capital gains, capital stock, windfall profits, premium, transfer, franchise, stamp, license, non-resident withholding, customs, payroll, recapture, employment, excise and property duties and taxes, together with all estimated taxes, deficiency assessments, interest, penalties, fines and additions to tax imposed with respect to such amounts, and shall include any liability for such amounts as a result of (i) being a transferee or successor or member of a combined, consolidated, unitary or affiliated group, or (ii) a contractual obligation to indemnify any Person or other entity;

"**Termination Payment**" means an amount equal to $2,800,000;

"**Transaction Personal Information**" has the meaning ascribed thereto in Section 9.1;
"**TSXV**" means the TSX Venture Exchange Inc.;

"**U.S. Exchange Act**" means the *United States Securities Exchange Act of 1934*, as amended and the rules and regulations promulgated thereunder;

"**U.S. Securities Act**" means the *United States Securities Act of 1933*, as amended and the rules and regulations promulgated thereunder; and

"**United States**" means the United States of America.

1.2 Interpretation

For the purposes of this Agreement, except as otherwise expressly provided:

(a) "**this Agreement**" means this Arrangement Agreement, including the recitals and Schedules hereto, and not any particular Article, Section, Subsection or other subdivision, recital or Schedule hereof, and includes any agreement, document or instrument entered into, made or delivered pursuant to the terms hereof, as the same may, from time to time, be supplemented or amended and in effect;

(b) the words "**hereof**", "**herein**", "**hereto**" and "**hereunder**" and other words of similar import refer to this Agreement as a whole and not to any particular Article, Section, Subsection, or other subdivision, recital or Appendix hereof;

(c) all references in this Agreement to a designated "**Article**", "**Section**", "**Subsection**" or other subdivision, recital or "**Schedule**" hereof are references to the designated Article, Section, Subsections or other subdivision, recital or Schedule to, this Agreement;

(d) a reference to a statute in this Agreement includes all regulations, rules, policies or instruments made thereunder, all amendments to the statute, regulations, rules, policies or instruments in force from time to time, and any statutes, regulations, rules, policies or instruments that supplement or supersede such statute, regulations, rules, policies or instruments; and

(e) the division of this Agreement into Article, Sections, Subsections and other subdivisions, recitals or Schedule, the inclusion of a table of contents and the insertion of headings and captions are for convenience of reference only and are not intended to interpret, define or limit the scope, extent or intent of this Agreement or any provision hereof.

1.3 Number, Gender and Persons

In this Agreement, unless the context otherwise requires, words importing the singular shall include the plural and vice versa, words importing the use of either gender shall include both genders and neuters.

1.4 Date for Any Action

If the date on which any action is required to be taken hereunder by a Party is not a Business Day, such action shall be required to be taken on the next succeeding day which is a Business Day.

1.5 Time References.

Unless otherwise stated, references to time are to local time, Vancouver, British Columbia.

1.6 Currency

Unless otherwise stated, all references in this Agreement to sums of money are expressed in lawful money of Canada and "**$**" refers to Canadian dollars.

1.7 Accounting Matters

Unless otherwise stated, all accounting terms used in this Agreement in respect of Nanotech shall have the meanings attributable thereto under IFRS and all determinations of an accounting nature in respect of Nanotech required to be made shall be made in a manner consistent with IFRS consistently applied.

1.8 Knowledge

Where any representation or warranty in this Agreement is expressly qualified by reference to the knowledge of Nanotech, it shall be deemed to refer to the actual knowledge, after making reasonable inquiries regarding the relevant subject matter, of any of the Chief Executive Officer and the Chief Financial Officer.

Where any representation or warranty in this Agreement is expressly qualified by reference to the knowledge of META or the Purchaser, it shall be deemed to refer to the actual knowledge, after making reasonable inquiries regarding the relevant subject matter, of any of the Chief Executive Officer and the Chief Financial Officer.

1.9 Schedules

The following Schedules are annexed to this Agreement and are incorporated by reference into this Agreement and form a part hereof:

Schedule A	–	Plan of Arrangement
Schedule B	–	Nanotech Arrangement Resolution
Schedule C	–	Representations and Warranties of Nanotech
Schedule D	–	Representations and Warranties of META
Schedule E	–	Signatories of Nanotech Voting Agreements
Schedule F	–	Key Regulatory Approvals

ARTICLE 2
THE ARRANGEMENT

2.1 Arrangement

The Parties agree that the Arrangement will be implemented in accordance with and subject to the terms and conditions contained in this Agreement and the Plan of Arrangement, pursuant to which (among other things) each Nanotech Shareholder (other than Nanotech Shareholders who have validly exercised Dissent Rights) shall receive the Consideration provided for in Section 2.2(e) of the Plan of Arrangement for each Nanotech Share held.

2.2 Obligations of Nanotech

Subject to the terms and conditions of this Agreement, Nanotech will take all actions reasonably needed to:

(a) apply for, and diligently pursue a notice of application before the Court for, the Interim Order in respect of the Arrangement;

(b) in accordance with the terms of and the procedures contained in the Interim Order, duly call, give notice of, convene and hold the Nanotech Meeting as soon as reasonably practicable after the date hereof, and in any event no later than September 30, 2021;

(c) solicit proxies of the Nanotech Shareholders in favour of the Nanotech Arrangement Resolution and against any resolution or proposal submitted by any Person that is inconsistent with the Nanotech Arrangement Resolution or that would reasonably be expected to materially impair, delay or impede the completion of any of the transactions contemplated by this Agreement, including, if so requested by META, acting reasonably, using proxy solicitation services firms selected by Nanotech and acceptable to and at the expense of META to solicit proxies in favour of the approval of the Nanotech Arrangement Resolution; *provided* that Nanotech shall not be required to continue to solicit proxies if there has been a Nanotech Change in Recommendation specifically permitted pursuant to Section 7.4;

(d) fix the date of the Nanotech Meeting, which date shall be no later than September 30, 2021, give notice to META of the Nanotech Meeting, and allow META and META's Representatives (including legal counsel) to attend the Nanotech Meeting;

(e) subject to obtaining the approvals as contemplated in the Interim Order and as may be directed by the Court in the Interim Order, take all steps necessary to submit the Arrangement to the Court and appear at Court to seek the Final Order as soon as reasonably practicable (and, in any event, within five (5) Business Days following the approval of the Nanotech Arrangement Resolution at the Nanotech Meeting); and

(f) consult with META in respect of the actions as set out in this Article 2, including providing META with a reasonable opportunity to comment on all draft documentation prepared by Nanotech in connection with the foregoing, and to give due consideration to, and act reasonably with respect to, adopting such comments.

2.3 Interim Order

As soon as reasonably practicable after the date of this Agreement, and in any event no later than August 25, 2021, Nanotech shall apply to the Court in a manner and on terms acceptable to META, acting reasonably, pursuant to Section 291 of the BCBCA and, in cooperation with META, prepare, file and diligently pursue a notice of application for the Interim Order, which shall provide, among other things:

(a) for the class of Persons to whom notice is to be provided in respect of the Arrangement and the Nanotech Meeting and for the manner in which such notice is to be provided;

(b) for a fixed record date for the purposes of determining the Nanotech Securityholders entitled to receive notice of and vote at the Nanotech Meeting (which date shall be fixed and published by Nanotech in consultation with META);

(c) that the requisite approval for the Nanotech Arrangement Resolution shall be (i) two-thirds of the votes cast by the Nanotech Shareholders present in person or by proxy at the Nanotech Meeting; (ii) a majority of the votes cast by the Nanotech Shareholders present in person or represented by proxy at the Nanotech Meeting excluding for this purpose the votes attached to Nanotech Shares held by Persons described in items (a) through (d) of Section 8.1(2) of MI 61-101; and (iii) two- thirds of the votes cast by the Nanotech Shareholders and the holders of Nanotech Options and the holders of Nanotech RSUs, voting together as a single class (on an as-converted to Nanotech Share basis), present in person or by proxy at the Nanotech Meeting (collectively, "**Nanotech Securityholder Approval**");

(d) that, in all other respects, the terms, conditions and restrictions of the constating documents of Nanotech relating to a meeting of Nanotech Shareholders, including quorum requirements, shall apply in respect of the Nanotech Meeting;

(e) for the grant of Dissent Rights to the Nanotech Shareholders who are registered Nanotech Shareholders, as set out in the Plan of Arrangement;

(f) for the notice requirements with respect to the presentation of the application to the Court for the Final Order;

(g) that the Nanotech Meeting may be adjourned or postponed from time to time by Nanotech in accordance with the terms of this Agreement without the need for additional approval of the Court;

(h) that the record date for Nanotech Securityholders entitled to notice of and to vote at the Nanotech Meeting will not change in respect of any adjournment(s) or postponement(s) of the Nanotech Meeting, unless required pursuant to applicable Law;

(i) that each Nanotech Securityholder shall have the right to appear before the Court at the hearing of the Court to approve the application for the Final Order so long as they enter a response to petition within a reasonable time; and

(j) for such other matters as Securities Authorities may require in connection with the Arrangement, or as META and/or Nanotech may reasonably require, subject to obtaining the prior consent of Nanotech and/or META, respectively, such consent not to be unreasonably withheld, delayed or conditioned; *provided* that such other matters would not reasonably be expected to materially impair, delay or impede the completion of the transactions contemplated by this Agreement.

2.4 Nanotech Meeting

Subject to the terms of this Agreement:

(a) Nanotech agrees to convene the Nanotech Meeting in accordance with the Interim Order, the constating documents of Nanotech and applicable Law as soon as practicable, and in any event no later than September 30, 2021;

(b) Nanotech agrees to conduct the Nanotech Meeting in accordance with the Interim Order, the constating documents of Nanotech and applicable Law;

(c) Nanotech will promptly advise META on a daily basis on each of the last ten (10) Business Days prior to the date of the Nanotech Meeting as to the aggregate tally of the proxies received by Nanotech in respect of the Nanotech Arrangement Resolution;

(d) Nanotech will promptly advise META of any written communication from or written claims brought by (or threatened in writing, to be brought by) any Nanotech Securityholder or any other Person in opposition to the Arrangement, the Nanotech Arrangement Resolution and/or any exercise or purported exercise by any Nanotech Shareholder of Dissent Rights received by Nanotech and any withdrawal of Dissent Rights received by Nanotech and any written communications sent by or on behalf of Nanotech to any Nanotech Shareholder exercising or purporting to exercise Dissent Rights; and

(e) except as required by applicable Law, Nanotech will not propose or submit for consideration at the Nanotech Meeting any business other than the approval of the Nanotech Arrangement Resolution without META's prior written consent, which consent shall not be unreasonably withheld, delayed or conditioned provided that such

business would not reasonably be expected to materially impair, delay or impede the completion of the transactions contemplated by this Agreement.

2.5 Nanotech Circular

(a) As soon as reasonably practicable following execution of this Agreement, but subject to Subsection 2.5(c), Nanotech shall (i) prepare, in consultation with META, the Nanotech Circular, together with any other documents required by applicable Law in connection with the Nanotech Meeting, (ii) cause the Nanotech Circular to be sent to Nanotech Securityholders and any other Person as required by the Interim Order and applicable Law, and (iii) cause the Nanotech Circular (and any other filings required to be filed under applicable Law) to be filed in all jurisdictions where the same is required to be filed, all in accordance with applicable Law and the Interim Order, in each case so as to permit the Nanotech Meeting to be held by the date specified in Subsection 2.4(a). Nanotech shall ensure that the Nanotech Circular complies in all material respects with all applicable Law, does not include any misrepresentation (other than with respect to any information relating solely to META and/or the Purchaser and provided by META in writing specifically for inclusion in the Nanotech Circular) and contains sufficient detail to permit the Nanotech Securityholders, to form a reasoned judgement concerning the Arrangement and the Nanotech Arrangement Resolution to be placed before them at the Nanotech Meeting.

(b) Except in the case of a Nanotech Change in Recommendation specifically permitted pursuant to Section 7.4, Nanotech shall disclose in the Nanotech Circular:

(i) that the Nanotech Board has received the Nanotech Fairness Opinion from the Nanotech Financial Advisor;

(ii) the general terms of the Nanotech Fairness Opinion and a copy of such Nanotech Fairness Opinion shall be included in the Nanotech Circular;

(iii) that the Nanotech Board has unanimously determined, after receiving financial and legal advice, that (A) the Arrangement is fair to the Nanotech Shareholders, (B) the Arrangement is in the best interests of Nanotech, and (C) the Nanotech Board unanimously recommends that the Nanotech Securityholders vote in favour of the Nanotech Arrangement Resolution (the "**Nanotech Board Recommendation**"); and

(iv) that each director, senior officer and shareholder of Nanotech set out in Schedule E hereto has signed a Nanotech Voting Agreement and agreed to vote all of such Person's Nanotech Securities (including any Nanotech Shares issued upon the exercise of any securities convertible, exercisable or exchangeable into or for Nanotech Shares) in favour of the Nanotech Arrangement Resolution, and against

any resolution submitted by any Person that is inconsistent with the Arrangement, subject to the other terms of the Nanotech Voting Agreements.

(c) META shall promptly provide to Nanotech all information regarding META or its subsidiaries and affiliates, as required by the Interim Order and applicable Law for inclusion in the Nanotech Circular, or in any amendments or supplements to such Nanotech Circular. META shall ensure that no such information provided by META specifically for inclusion in the Nanotech Circular will contain any misrepresentation concerning META, its subsidiaries and affiliates.

(d) META and its legal counsel shall be given a reasonable opportunity to review and comment on the Nanotech Circular and all such other documents required to be filed or distributed to Nanotech Shareholders under the Securities Laws in connection with the Arrangement. Nanotech and its legal counsel shall give reasonable and good faith consideration to any comments of META and its legal counsel in respect of the Nanotech Circular and all such other documents. Final copies of the Nanotech Circular and all such other documents shall be satisfactory to META, acting reasonably, before they are printed, or distributed to Nanotech Shareholders or filed with any Governmental Entity. Nanotech agrees that all information relating solely to META and its subsidiaries and affiliates included in the Nanotech Circular must be in a form and content satisfactory to META, acting reasonably.

(e) Each of Nanotech and META shall promptly notify the other Party if at any time before the Effective Date either becomes aware that the Nanotech Circular contains a misrepresentation, or otherwise requires an amendment or supplement. The Parties shall co-operate in the preparation of any amendment or supplement to the Nanotech Circular as required or appropriate, and Nanotech shall promptly mail or otherwise publicly disseminate any amendment or supplement to the Nanotech Circular to Nanotech Securityholders and, if required by the Court or applicable Law, file the same with any Governmental Entity and as otherwise required.

(f) Nanotech shall keep META informed of any material requests or comments made by any Securities Authorities in connection with the Nanotech Circular and, as promptly as reasonably practicable, provide META with copies of any correspondence received by Nanotech from, or sent by Nanotech to, any Securities Authorities in connection with the Nanotech Circular.

2.6 Final Order

If the Interim Order is obtained and the Nanotech Arrangement Resolution is passed at the Nanotech Meeting in accordance with applicable Law and the Interim Order, then Nanotech shall take all steps necessary or desirable to submit the Arrangement to the Court as soon as practicable (and, in any event, within five (5) Business Days following the Nanotech Meeting) and diligently pursue an application to the Court for the Final Order

pursuant to Section 291 of the BCBCA approving the Arrangement on terms reasonably satisfactory to each of Nanotech and META.

2.7 Court Proceedings

Subject to the terms of this Agreement, Nanotech shall diligently pursue, and Nanotech and META shall cooperate with each other in pursuing, the Interim Order and the Final Order. Nanotech will provide META and its legal counsel with a reasonable opportunity to review and comment upon drafts of all material to be filed with the Court in connection with the Interim Order and the Final Order and shall give reasonable and good faith consideration to any comments of META and its counsel. Nanotech will ensure that all materials filed with the Court in connection with the Arrangement are consistent with this Agreement and the Plan of Arrangement. Subject to applicable Law, Nanotech will not file any material with the Court in connection with the Arrangement or serve any such material, and will not agree to modify or amend materials so filed or served, except in compliance with this Agreement and with META's prior written consent, such consent not to be unreasonably withheld, conditioned or delayed; *provided*, however, that nothing herein shall require META to agree or consent to any increase or change in the applicable Consideration or any modification or amendment to such filed or served materials that expands or increases META's obligations set forth in any such filed or served materials or under this Agreement or the Arrangement. Nanotech shall also provide to META and to META's legal counsel on a timely basis copies of any response to petition or other Court documents served on Nanotech in respect of the application for the Interim Order or the Final Order or any appeal therefrom and of any notice, whether written or oral, received by Nanotech indicating any intention to oppose the granting of the Interim Order or the Final Order or to appeal the Interim Order or the Final Order. In addition, Nanotech will not object to legal counsel to META making such submissions on the hearing of the motion for the Interim Order and the application for the Final Order as such counsel considers appropriate; provided, however, that Nanotech and its legal counsel are advised of the nature of any submissions a reasonable time prior to the hearing and such submissions are consistent with this Agreement and the Plan of Arrangement. Nanotech will also oppose any proposal from any party other than a Party that the Interim Order or the Final Order contain any provision inconsistent with this Agreement, and, if at any time after the issuance of the Final Order and prior to the Effective Time, Nanotech is required by the terms of the Final Order or by Law to return to Court with respect to the Final Order, it shall do so only after reasonable advance notice to, and in consultation and cooperation with, META. If the Courts in British Columbia are closed due to COVID-19, COVID-19 Measures or other related conditions, then the time to make application to the Court or convene and conduct the Nanotech Meeting in Sections 2.2(d), 2.4 and 2.6**,** shall be tolled for such period as the Courts are closed plus three (3) Business Days; *provided* that in no event shall such tolling and three (3) Business Day period extend beyond the Outside Date.

2.8 Arrangement and Effective Date

(a) On the third (3rd) Business Day after the satisfaction or, where permitted, the waiver of the conditions (excluding conditions that, by their terms, cannot be satisfied until the Effective Date, but subject to the satisfaction or, where not prohibited, the waiver of those conditions as of the Effective Date) set forth in Article 6, unless another time or date is agreed to in writing by the Parties (the "**Effective Date**"), the Arrangement shall be effective as of the Effective Time. From and after the Effective Time, the Plan of Arrangement will have all of the effects provided by applicable Law, including the BCBCA.

(b) The closing of the Arrangement will take place at the offices of Fasken Martineau DuMoulin LLP in Toronto at the Effective Time on the Effective Date, or at such other time and place as may be agreed to by the Parties.

2.9 Payment of Consideration

As soon as reasonably practicable following receipt by Nanotech of the Final Order and in any event not later than the Business Day prior to the Effective Date, Purchaser shall deposit or cause to be deposited in escrow with the Depositary,

(a) for the benefit of the holders of Nanotech Shares, a cash amount equal to the aggregate Consideration payable to such holders in accordance with Section 2.2(e) of the Plan of Arrangement, and

(b) payable on behalf of Nanotech and for the benefit of the holders of In-the-Money Options and Nanotech RSUs, a cash amount equal to the aggregate Consideration payable to such holders in accordance with Sections 2.2(b) and 2.2(d) of the Plan of Arrangement, and the aggregate amount of which shall be held by the Depositary as agent and nominee for Former Nanotech Securityholders for distribution to such Former Nanotech Securityholders in accordance with the provisions of this Plan of Arrangement. The payment of the cash amount described in paragraph (c) of this Section 2.9 by the Depositary for the benefit of the holders of In-the-Money Options and Nanotech RSUs shall be recorded by Nanotech and the Purchaser as indebtedness owing by Nanotech to the Purchaser.

2.10 META SEC Filings

Nanotech shall promptly provide to META all information regarding Nanotech, as required by applicable Law for inclusion in the META SEC Filings, or in any amendments or supplements to such META SEC Filings. Nanotech shall ensure that no such information provided by Nanotech specifically for inclusion in the META SEC Filings will contain any untrue statement of a material fact or omit to state any material fact required to be stated therein or necessary in order to make the statements made therein, in light of the circumstances under which they were made, not misleading.

2.11 Announcements and Consultations

META and Nanotech shall consult with each other in respect to issuing any press release, preparing any presentations or otherwise making any public statement or in making any filing with any Governmental Entity with respect to this Agreement or the Arrangement, except as otherwise set forth in this Agreement. Each of META and Nanotech shall use all commercially reasonable efforts to enable the other Party to review and comment on all such press releases, presentations, public statements and, except as otherwise set forth in this Agreement, filings prior to the release or filing, respectively, thereof, and neither META nor Nanotech shall release, make or file any press release, presentation or public statements or, except as otherwise set forth in this Agreement, filing without the prior written consent of the other Party (which consent shall not be unreasonably withheld or delayed)*, provided*, however, that the obligations herein shall not prevent a Party from making such disclosure as is required by applicable Law or the rules and policies of any applicable securities exchange, and the Party making such disclosure shall use all commercially reasonable efforts to enable the other Party to review or comment on the disclosure or filing, and if such prior notice is not possible, to give such notice immediately following the making of such disclosure or filing. Reasonable consideration shall be given to any comments made by the other Party and its counsel. For the avoidance of doubt, none of the foregoing shall prevent Nanotech or META from making: (i) internal announcements to employees and having discussions in the ordinary course of business with Nanotech Shareholders or shareholders of META, respectively, financial analysts and other stakeholders so long as such announcements and discussions are consistent in all material respects with the most recent press releases, public disclosures or public statements made by such Party and, in the case of Nanotech, comply with its obligations under Article 7; or (ii) public announcements in the ordinary course of business that do not relate to this Agreement or the Arrangement so long as such announcements and discussions are consistent in all material respects with the most recent press releases, public disclosures or public statements made by such Party.

2.12 Withholding Taxes

The Parties, the Depositary and any Person making any payment on their behalf in connection with the Arrangement shall be entitled to deduct and withhold from any consideration or amount payable or otherwise deliverable to any Person hereunder and from all dividends, interest or other amounts payable to any Person (including, for greater certainty, any Nanotech Shareholder, any holder of Nanotech Options or Nanotech RSUs and any Dissenting Shareholder), such amounts as Nanotech, META, the Purchaser, the Depositary or such Person making any payment on their behalf, as applicable, is required or permitted to deduct and withhold with respect to such payment under the ITA, United States Tax Laws or any other applicable Law or the administrative practice of any Governmental Entity; *except* when such Person has paid such amount in cash to Nanotech, META, Purchaser, or the Depository, as applicable, to enable such Person to comply with such deduction or withholding requirement. To the extent that such amounts are so deducted or withheld, such amounts shall be treated for all purposes under this Agreement as having been paid to the Person to whom such amounts would otherwise have been paid;

provided that such withheld amounts are actually remitted to the appropriate Governmental Entity.

2.13 Holders of Convertible Securities

(a) Each In-The-Money Option that is outstanding immediately prior to the Effective Time, whether or not vested, shall, without any further action on behalf of any holder thereof, be acquired for cancellation by Nanotech, free and clear of all Encumbrances, in consideration for a cash payment payable on behalf of Nanotech equal to the product obtained by multiplying the amount by which the Nanotech Share Price exceeds the exercise price per Nanotech Share of such In-The-Money Option by the number of Nanotech Shares underlying such In-The-Money Option, subject to applicable withholdings in accordance with Section 4.4 of the Plan of Arrangement, and the name of such holder will be removed from the applicable register of Nanotech as a holder of Nanotech Options. Each In-The-Money Option issued and outstanding immediately prior to the Effective Time shall thereafter immediately be cancelled and all option agreements related thereto shall be terminated and the holder thereof shall thereafter have only the right to receive the Consideration to which such holder is entitled pursuant to Subsection 2.2(b) of the Plan of Arrangement.

(b) Each Out-of-The-Money Option that is outstanding immediately prior to the Effective Time, whether or not vested, shall, without any further action on behalf of any holder of such Out-Of-The-Money Option, be cancelled without payment of any consideration to any holder thereof and all option agreements related thereto shall be terminated and the name of such holder will be removed from the applicable register of Nanotech as a holder of Nanotech Options and none of Nanotech, META and Purchaser shall have any liability with respect to such option agreements or Out-Of-The-Money Options.

(c) Each Nanotech RSU that is outstanding immediately prior to the Effective Time, whether or not vested, shall, without any further action on the part of the holder thereof, be acquired for cancellation by Nanotech free and clear of all Encumbrances in consideration for a cash payment payable on behalf of Nanotech equal to the Nanotech Share Price, subject to applicable withholdings in accordance with Section 4.4 of the Plan of Arrangement, and each such Nanotech RSU issued and outstanding immediately prior to the Effective Time shall thereafter immediately be cancelled and the name of such holder will be removed from the applicable register of Nanotech as a holder of Nanotech RSUs and all Nanotech RSU agreements related thereto shall be terminated and the holder thereof shall thereafter have only the right to receive the Consideration to which such holder is entitled pursuant to Subsection 2.2(d) of the Plan of Arrangement.

(d) The Parties acknowledge that no deduction will be claimed by Nanotech or any Person not dealing at arm's length with Nanotech in respect of any payment made to a holder of In-The-Money Options pursuant to this Agreement or the Plan of Arrangement who

is a resident of Canada or who is or was employed in Canada (all within the meaning of the ITA), to the extent that the deduction under paragraph 110(1)(d) of the ITA would otherwise be available to such holder in respect of the disposition of In-The-Money Options (each, a "**Canadian Nanotech Optionholder**"), in computing the taxable income of, Nanotech or any Person not dealing at arm's length with Nanotech under the ITA and the Parties will cause: (i) where applicable, an election to be made by the appropriate Person pursuant to subsection 110(1.1) of the ITA in respect of the payments made to Canadian Nanotech Optionholders in consideration for the cancellation of In-The-Money Options; and (ii) provide evidence in writing of such election to Canadian Nanotech Optionholders as contemplated by the ITA, it being understood that Canadian Nanotech Optionholders will be entitled to claim deductions available to them pursuant to paragraph 110(1)(d) the ITA in respect of the calculation of any benefit arising from the disposition of Nanotech Options.

ARTICLE 3
REPRESENTATIONS AND WARRANTIES OF NANOTECH

3.1 Representations and Warranties of Nanotech

Except as disclosed in the Nanotech Disclosure Letter, Nanotech represents and warrants to META and the Purchaser as set forth in Schedule C and acknowledges and agrees that META and the Purchaser are relying upon such representations and warranties in connection with the entering into of this Agreement. Any investigation by META or its Representatives shall not mitigate, diminish or affect the representations and warranties of Nanotech pursuant to this Agreement.

3.2 Survival of Representations and Warranties

The representations and warranties of Nanotech contained in this Agreement shall not survive the completion of the Arrangement and shall expire and be terminated on the earlier of the Effective Time and the date on which this Agreement is terminated in accordance with its terms.

ARTICLE 4
REPRESENTATIONS AND WARRANTIES OF META AND THE PURCHASER

4.1 Representations and Warranties of META and the Purchaser

META and the Purchaser jointly and severally represent and warrant to Nanotech as set forth in Schedule D and acknowledge and agree that Nanotech is relying upon such representations and warranties in connection with the entering into of this Agreement. Any investigation by Nanotech or its Representatives shall not mitigate, diminish or affect the representations and warranties of META and the Purchaser pursuant to this Agreement.

4.2 Survival of Representations and Warranties

The representations and warranties of META and the Purchaser contained in this Agreement shall not survive the completion of the Arrangement and shall expire and be terminated on the earlier of the Effective Time and the date on which this Agreement is terminated in accordance with its terms.

ARTICLE 5
COVENANTS

5.1 Covenants of Nanotech Relating to the Arrangement

Except such actions as are expressly permitted pursuant to any other term of this Agreement, Nanotech shall perform all obligations required to be performed by Nanotech under this Agreement, co-operate with META in connection therewith, and use its commercially reasonable efforts to do all such other acts and things as may be necessary or desirable in order to consummate and make effective, as soon as reasonably practicable, the Arrangement and the other transactions contemplated in this Agreement and, without limiting the generality of the foregoing, Nanotech shall:

(a) apply for and use all commercially reasonable efforts in co-operation with META to obtain all Key Regulatory Approvals and, in doing so, keep META informed in a timely manner as to the status of the proceedings or other actions related to obtaining the Key Regulatory Approvals, including (i) providing META with copies of all related applications and notifications, in draft form, in order for META to provide its comments thereon, and Nanotech shall give reasonable and good faith consideration to any comments of META and its legal counsel; (ii) promptly furnishing to META copies of notices or other formal communications received by Nanotech from, or given by Nanotech to, any Governmental Entity (including any Securities Authority) with respect to the transactions contemplated by this Agreement or otherwise; and (iii) subject to applicable Law, Nanotech shall, to the extent reasonably practicable, provide META and its counsel with the opportunity to participate in any substantive meeting, teleconference or other material communication with any Governmental Entity in respect of any filing, investigation or other inquiry in connection with the Key Regulatory Approvals;

(b) use all commercially reasonable efforts to satisfy all conditions precedent in this Agreement applicable to it, take all steps set forth in the Interim Order and Final Order applicable to it and comply promptly with all requirements which applicable Law may impose on Nanotech with respect to the Arrangement or the other transactions contemplated by this Agreement and including effecting all necessary registrations, filings and submissions of information requested by Governmental Entities required to be effected by Nanotech in connection with the Arrangement and cooperating with META in connection with its performance of its obligations hereunder;

(c) use all commercially reasonable efforts to defend all lawsuits or other legal, regulatory or other proceedings against Nanotech challenging or affecting this Agreement or the consummation of the transactions contemplated hereby and use all commercially reasonable efforts to have lifted or rescinded any injunction or restraining order or other order relating to Nanotech which may materially impede the ability of the Parties to consummate the Arrangement or the other transactions contemplated by this Agreement; *provided* that none of the Parties nor any of their respective subsidiaries shall consent to the entry of any judgment or settlement with respect to any such proceeding without the prior written approval of the other Parties, not to be unreasonably withheld, conditioned or delayed;

(d) use all commercially reasonable efforts to obtain, and to assist META with respect to obtaining, as applicable, all consents, waivers or approvals required under all Material Contracts, including waivers required in connection with any change of control provisions contained in any Material Contracts;

(e) cooperate with META and use all commercially reasonable efforts to take, or cause to be taken, all actions and do or cause to be done all things reasonably necessary, proper or advisable on its part under applicable Law and the policies of the TSXV and the OTC to enable the delisting by Nanotech of the Nanotech Shares from the TSXV and the OTC as soon as reasonably practicable (and in any event in compliance with applicable Law) following the Effective Time;

(f) until the earlier of the Effective Time and termination of this Agreement in accordance with its terms, Nanotech shall, to the extent not precluded by applicable Law, promptly notify META, in writing, and promptly provide copies of any related documentation received, when Nanotech has knowledge of:

(i) any notice or other communication from any Person alleging that the consent (or waiver, permit, exemption, order, approval, agreement, amendment or confirmation) of such Person (or other Person) is or may be required in connection with this Agreement or the Arrangement;

(ii) any notice or other communication from any Governmental Entity in connection with the Arrangement or this Agreement; or

(iii) any filings, actions, suits, claims, investigations or proceedings commenced or, to the knowledge of Nanotech, threatened orally or in writing against, or, in respect of any filings, actions, suits, claims, investigations or proceedings existing as at the date hereof, if any additional filings, actions, suits, claims, investigations or proceedings are made or threatened orally or in writing, in each case relating to or involving or otherwise affecting Nanotech or any of its assets that would reasonably be expected to be material to Nanotech; and

(g) not take any action, or refrain from taking any commercially reasonable action, or permit any action to be taken or not taken, which is inconsistent with this Agreement or which would reasonably be expected to, individually or in the aggregate, prevent, materially delay or otherwise materially impede the consummation of the Arrangement.

5.2 Covenants of META and the Purchaser to the Arrangement

Except such actions as are expressly permitted pursuant to any other term of this Agreement, META and the Purchaser shall, on a joint and several basis, perform all obligations required to be performed by META and the Purchaser under this Agreement, co-operate with Nanotech in connection therewith, and use their commercially reasonable efforts to do all such other acts and things as may be necessary or desirable in order to consummate and make effective, as soon as reasonably practicable, the Arrangement and the other transactions contemplated in this Agreement and, without limiting the generality of the foregoing, META and the Purchaser shall:

(a) apply for and use all commercially reasonable efforts in co-operation with Nanotech to obtain all Key Regulatory Approvals and, in doing so, keep Nanotech informed in a timely manner as to the status of the proceedings or other actions related to obtaining the Key Regulatory Approvals, including (i) providing Nanotech with copies of all related applications and notifications, in draft form, in order for Nanotech to provide its comments thereon, and META and the Purchaser shall give reasonable and good faith consideration to any comments of Nanotech and its legal counsel; (ii) promptly furnishing to Nanotech copies of notices or other formal communications received by META and/or the Purchaser from, or given by META or the Purchaser to, any Governmental Entity (including any Securities Authority) with respect to the transactions contemplated by this Agreement or otherwise; and (iii) subject to applicable Law, each of META and the Purchaser shall, to the extent reasonably practicable, provide Nanotech and its counsel with the opportunity to participate in any substantive meeting, teleconference or other material communication with any Governmental Entity in respect of any filing, investigation or other inquiry in connection with the Key Regulatory Approvals;

(b) use all commercially reasonable efforts to satisfy all conditions precedent in this Agreement applicable to it and comply promptly with all requirements which applicable Law may impose on META and the Purchaser with respect to the Arrangement or the other transactions contemplated by this Agreement and including effecting all necessary registrations, filings and submissions of information requested by Governmental Entities required to be effected by META, the Purchaser or any of their subsidiaries in connection with the Arrangement and cooperating with Nanotech in connection with its performance of its obligations hereunder;

(c) use all commercially reasonable efforts to defend all lawsuits or other legal, regulatory or other proceedings against META and/or the Purchaser challenging or affecting this

Agreement or the consummation of the transactions contemplated hereby and use all commercially reasonable efforts to have lifted or rescinded any injunction or restraining order or other order relating to META and/or the Purchaser which may materially impede the ability of the Parties to consummate the Arrangement or the other transactions contemplated by this Agreement; *provided* that none of the Parties nor any of their respective subsidiaries shall consent to the entry of any judgment or settlement with respect to any such proceeding without the prior written approval of the other Parties, not to be unreasonably withheld, conditioned or delayed; and

(d) until the earlier of the Effective Time and termination of this Agreement in accordance with its terms, META and the Purchaser shall, to the extent not precluded by applicable Law, promptly notify Nanotech, in writing, and promptly provide copies of any related documentation received, when META has knowledge of:

(i) any notice or other communication from any Person alleging that the consent (or waiver, permit, exemption, order, approval, agreement, amendment or confirmation) of such Person (or other Person) is or may be required in connection with this Agreement or the Arrangement;

(ii) any notice or other communication from any Governmental Entity in connection with the Arrangement or this Agreement; or

(iii) any filings, actions, suits, claims, investigations or proceedings commenced or, to the knowledge of META, threatened orally or in writing against, or, in respect of any filings, actions, suits, claims, investigations or proceedings existing as at the date hereof, if any additional filings, actions, suits, claims, investigations or proceedings are made or threatened orally or in writing, in each case relating to or involving or otherwise affecting META, its subsidiaries or any of their respective assets that would reasonably be expected to be material to META and its subsidiaries, taken as a whole; and

(e) not take any action, or refrain from taking any commercially reasonable action, or permit any action to be taken or not taken, which is inconsistent with this Agreement or which would reasonably be expected to, individually or in the aggregate, prevent, materially delay or otherwise materially impede the consummation of the Arrangement.

5.3 Covenants of Nanotech Relating to the Conduct of Nanotech Business

(a) Nanotech covenants and agrees, during the period from the date of this Agreement until the earlier of the Effective Time and the time that this Agreement is terminated in accordance with its terms, except (i) with the prior written consent of META (which consent may not be unreasonably withheld, conditioned or delayed), (ii) as required or expressly permitted by this Agreement or the Plan of Arrangement, (iii)

as required by applicable Law or a Governmental Entity, (iv) as required to comply with, or implement, any COVID-19 Measures, or (v) as disclosed in the Nanotech Disclosure Letter, Nanotech shall:

(i) conduct its business in the ordinary course of business consistent with past practice in all material respects and in accordance with applicable Laws, and use commercially reasonable efforts to maintain and preserve in all material respects its present business organization, assets (including associated intellectual property), goodwill, employment relationships with employees and material business relationships with suppliers, distributors, consultants, customers and other Persons with which Nanotech has business relations; and

(ii) use all commercially reasonable efforts to cause its current insurance (or re-insurance) policies not to be cancelled or terminated or any of the coverage thereunder to lapse before the earlier of the Effective Time and termination of this Agreement in accordance with its terms, unless simultaneously with such termination, cancellation or lapse, replacement policies underwritten by insurance and re-insurance companies of nationally recognized standing providing coverage equal to or greater than the coverage under the cancelled, terminated or lapsed policies for substantially similar premiums are in full force and effect; and

(iii) promptly notify META orally and in writing upon becoming aware of any circumstance or development that, to the knowledge of Nanotech, would, or would reasonably be expected to, constitute or result in a Nanotech Material Adverse Effect. The giving of notice provided under this Subsection 5.3(a)(iii) will not affect the representations, warranties, covenants, agreements or obligations of the Parties (or remedies with respect thereto) or the conditions to the obligations of the Parties under this Agreement unless and until a Material Adverse Effect has actually occurred.

(b) Nanotech covenants and agrees that, during the period from the date of this Agreement until the earlier of the Effective Time and the time that this Agreement is terminated in accordance with its terms, except (i) with the prior written consent of META (which consent may not be unreasonably withheld, conditioned or delayed), (ii) as required or expressly permitted by this Agreement or the Plan of Arrangement, (iii) as required by applicable Law or a Governmental Entity, (iv) as required to comply with, or implement, any COVID-19 Measures, or (v) as disclosed in the Nanotech Disclosure Letter, it shall not:

(i) issue, deliver, sell, pledge, lease, dispose of or encumber, or agree or offer to issue, deliver sell, pledge, lease, dispose of or encumber, any Nanotech Shares, or any securities convertible, exchangeable or exercisable into or for Nanotech Shares, or any options, warrants, stock appreciation rights, phantom stock awards or other rights or equity-based or convertible securities (including, for greater certainty, Nanotech Options and Nanotech RSUs) that are linked to the price or value of the

Nanotech Shares (other than pursuant to the exercise, in accordance with their respective terms, of convertible or exercisable securities of Nanotech outstanding on the date hereof) or amend, extend or terminate, or agree to amend, extend or terminate, any of the terms of, or agreements governing, any of the outstanding options, warrants or other convertible securities of Nanotech;

(ii) amend or propose to amend its articles of incorporation or by-laws or other constating documents or the terms of any of its securities; reduce its stated capital; or split, consolidate, subdivide or reclassify, or propose to split, consolidate, subdivide or reclassify, any of the Nanotech Shares or undertake or propose to undertake any other capital reorganization or change in or exchange of Nanotech Shares, any other of its securities or its share capital;

(iii) declare, set aside or pay any dividend or other distribution or payment (whether in cash, securities or property or any combination thereof) in respect of the Nanotech Shares or any other securities of Nanotech, redeem, purchase or otherwise acquire, or offer to redeem, purchase or otherwise acquire, any outstanding securities of Nanotech, adopt a plan of liquidation or resolution providing for the complete or partial liquidation, winding-up or dissolution of Nanotech, or enter into any agreement with respect to any of the foregoing;

(iv) reorganize, restructure, recapitalize, merge, combine, consolidate or amalgamate with any Person or sell all or substantially all of its assets, or enter into any agreement with respect to any of the foregoing;

(v) sell, pledge, lease, transfer, dispose of or encumber any assets, rights or properties of Nanotech, other than (A) in the ordinary course of business consistent with past practice; (B) property or equipment which is obsolete; or (C) assets, rights or property which individually or in the aggregate do not exceed $100,000 in sale value or price;

(vi) acquire or agree to acquire (by merger, amalgamation, arrangement, acquisition of shares or assets or otherwise) any Person or division or business unit thereof, or incorporate or form, or agree to incorporate or form, any Person or make or agree to make any investment either by purchase of shares or securities, contributions of capital, property transfer or purchase of, any property or assets of any other Person, other than acquisitions of: (i) tangible personal property in the ordinary course of business, or (ii) Persons, divisions, businesses, property or assets which individually or in the aggregate do not exceed $100,000 in purchase price or investment amount;

(vii) make any material change to the Nanotech Business or enter into enter into any Contract that, if entered into prior to the date hereof, would be a Material Contract of Nanotech, other than in the ordinary course of business consistent with past practice;

(viii) enter into or agree to the terms of any joint venture, strategic alliance, partnership, or similar agreement, arrangement or relationship;

(ix) incur, create, assume or otherwise become liable for, any indebtedness for borrowed money, other than in respect of trade payables, which trade payables in no event will exceed $1,300,000 in the aggregate as of the Effective Time;

(x) assume, guarantee, endorse or otherwise as an accommodation become responsible for the obligation of any other Person or make any loans, capital contribution, investments or advances to any other Persons;

(xi) pay, discharge or satisfy any material claims, liabilities or obligations of Nanotech other than (A) the payment, discharge or satisfaction of liabilities reflected or reserved against in Nanotech Financial Statements or incurred in the ordinary course of business consistent with past practice; or (B) payments, discharges or satisfaction in the ordinary course of business, consistent with past practice;

(xii) waive, release, grant or transfer any material rights, claims or benefits under, or otherwise modify or change, any existing Material Contract, Authorization or Permit of Nanotech, other than in the ordinary course of business consistent with past practice or as required by applicable Law or the terms of any such Material Contract, Authorization or Permit;

(xiii) enter into or modify (or make a promise regarding entering into or modifying) any Employee Plan or any employment, consulting, severance or similar agreements or arrangements with, or grant any bonuses, salary or fee increases, severance or termination pay to, any officers, directors, employees or consultants; *provided*, however, that it is acknowledged and agreed that Nanotech will abide by the terms and conditions of any Employee Plan and any employment agreements and consulting agreements in effect on the date of this Agreement, including with respect to the payments of any severance amounts or change of control payments, if applicable;

(xiv) enter into any collective bargaining or similar agreement;

(xv) enter into or adopt any shareholder rights plan or similar agreement or arrangement;

(xvi) take any action or fail to take any action which action or failure to act would result in the material loss, expiration or surrender of, or the loss of any material benefit under, or reasonably be expected to cause any Governmental Entities to institute proceedings for the suspension, revocation or limitation of rights under, any material Authorizations or Permits;

(xvii) make, revoke or change any Tax election; amend any previously filed Tax Return except as may be required by applicable Law; file any Tax Return except in the ordinary course of business consistent with past practice; settle or compromise any material liability for Taxes; agree to an extension or waiver of the limitation period with respect to the assessment, reassessment, or determination of Taxes; enter into any closing agreement with respect to any Tax; surrender any right to claim a material Tax refund; change an annual accounting period; adopt or change any accounting method with respect to Taxes; or consent to any extension or waiver of the limitation period applicable to any Tax claim or assessment unless, in each case, such action is required by Law;

(xviii) amend its accounting policies or adopt new accounting policies, except as may be required by applicable Law or IFRS;

(xix) make any capital expenditures, other than expenditures which individually or in the aggregate do not exceed $100,000;

(xx) waive, release, settle, agree to settle or compromise any pending or threatened material suit, action, claim, arbitration, mediation, inquiry, proceeding or investigation against Nanotech;

(xxi) engage in any transaction with any related parties, other than transactions under employment agreements in the ordinary course of business consistent with past practice

(xxii) grant, modify, sell, lease, license, sublicense, covenant not to assert, abandon, allow to lapse, assign, transfer, or otherwise dispose of or terminate any rights in any Intellectual Property of Nanotech or enter into any agreement relating to material Intellectual Property or do or omit to do anything to jeopardize the validity or enforceability thereof, including the non-payment of any application, search, maintenance or other official fees; or disclosing any trade secrets to any other Person (except pursuant to sufficiently protective non-disclosure agreements);

(xxiii) take any action that would cause a violation by any Person of economic sanctions or export controls;

(xxiv) take any action or fail to take any action that prevents, or materially delays, impedes or interferes with, or that would reasonably be expected to prevent or materially delay, impede or interfere with, the ability of the Parties to consummate the transactions contemplated by this Agreement or the Arrangement;

(xxv) take any action or fail to take any action which action or failure to act would result in the material loss, expiration or surrender of, or the loss of any material benefit

under, or reasonably be expected to cause any Governmental Entities to institute proceedings for the suspension, revocation or limitation of rights under, any material Authorizations or Permits; or

(xxvi) announce an intention, authorize or propose, or enter into or modify any Contract, agreement, commitment or arrangement to do any of the matters prohibited by the foregoing provisions of this Subsection 5.3(b).

5.4 Insurance and Indemnification

(a) From and after the Effective Time for a period of six (6) years, Nanotech shall, and META shall cause Nanotech (or its successor) to, indemnify and hold harmless, to the fullest extent permitted as of the Effective Time under applicable Law (and to also advance expenses as incurred to the fullest extent permitted under applicable Law), each present and former director and officer of Nanotech (each, an "**Indemnified Person**") against any costs or expenses (including reasonable legal fees), judgments, fines, losses, claims, damages or liabilities incurred in connection with any claim, inquiry, action, suit, proceeding or investigation, whether civil, criminal, administrative or investigative, arising out of or related to such Indemnified Person's service as a director or officer of Nanotech at or prior to the Effective Time, whether asserted or claimed prior to, at or after the Effective Time. Neither META nor Nanotech shall settle, compromise or consent to the entry of any judgment in any claim, inquiry, action, suit, proceeding or investigation or threatened claim, inquiry, action, suit, proceeding or investigation involving or naming an Indemnified Person or arising out of or related to an Indemnified Person's service as a director or officer of Nanotech at or prior to the Effective Time without the prior written consent (not to be unreasonably withheld or delayed) of that Indemnified Person.

(b) Prior to the Effective Time, Nanotech shall (at Nanotech's expense but provided that the cost of such policies shall not exceed $250,000), obtain and fully prepay the premium for the irrevocable extension of (i) the directors' and officers' liability coverage of Nanotech's existing directors' and officers' insurance policies and (ii) Nanotech's existing fiduciary liability insurance policies, in each case for a claims reporting or run-off and extended reporting period and claims reporting period of six (6) years from and after the Effective Time with respect to any claim related to any period of time at or prior to the Effective Time from an insurance carrier with the same or better credit rating as Nanotech's insurance carriers at the date here of with respect to directors' and officers' liability insurance ("**D&O Insurance**"), and with terms, conditions, retentions and limits of liability that are no less advantageous to the Indemnified Persons than the coverage provided under Nanotech's existing policies with respect to any actual or alleged error, misstatement, misleading statement, act, omission, neglect, breach of duty or any matter claimed against a director or officer of Nanotech by reason of him or her serving in such capacity that existed or occurred at or prior to the Effective Time (including in connection with the approval or completion of this Agreement, the Arrangement or the other transactions contemplated by this

Agreement). If Nanotech for any reason fails to obtain such "run off" insurance policies as of the Effective Time, Nanotech or META shall continue to maintain in effect for a period of at least six (6) years from and after the Effective Time Nanotech's D&O Insurance in place as of the date hereof with terms, conditions and limits of liability that are no less advantageous in any respect in the aggregate than the coverage provided under Nanotech's existing policies as of the date hereof, or Nanotech shall purchase comparable D&O Insurance for such six (6) year period with terms, conditions, retentions and limits of liability that are at least as favourable to the Indemnified Persons as provided in Nanotech's existing policies as of the date hereof; provided that in no event shall Nanotech or META be obligated to spend more than $250,000 to obtain such insurance and if Nanotech or META is unable to obtain such insurance for $250,000, then Nanotech and META shall only be required to obtain the maximum amount of insurance coverage as they can obtain for $250,000.

(c) If Nanotech, META or any of their respective successors or assigns shall (i) amalgamate, consolidate with or merge or wind-up into any other Person and, if applicable, shall not be the continuing or surviving corporation or entity, or (ii) transfer all or substantially all of its properties and assets to any Person or Persons (including as part of the Arrangement), then, and in each such case, proper provisions shall be made so that the successors, assigns and transferees of Nanotech or META, as the case may be, shall assume all of the obligations set forth in this Section 5.4.

(d) If any Indemnified Person makes any claim for the indemnification or advancement of expenses under this Section 5.4 that is denied by Nanotech or META, and a court of competent jurisdiction determines that the Indemnified Person is entitled to such indemnification, then Nanotech and META shall pay such Indemnified Person's costs and expenses, including reasonable legal fees and expenses, incurred in connection with pursuing such claim against Nanotech or META if and as may be awarded by such court.

(e) The rights of the Indemnified Persons under this Section 5.4 shall be in addition to any rights such Indemnified Persons may have under the Constating Documents of Nanotech and its successors and assigns, or under any applicable Law or under any contract of any Indemnified Person with Nanotech and its successors and assigns in place on the date of this Agreement. All rights to indemnification and exculpation from liabilities for acts or omissions occurring at or prior to the Effective Time and rights to advancement of expenses relating thereto now existing in favour of any Indemnified Person as provided in the Constating Documents of Nanotech or any indemnification agreement between such Indemnified Person and Nanotech in place on the date of this Agreement shall survive the Effective Time, be transferred and assumed in accordance with the Plan of Arrangement, and shall not be amended, repealed or otherwise modified in any manner that would adversely affect any right thereunder or any such Indemnified Person.

(f) This Section 5.4 shall survive the completion of the Arrangement and is intended to be for the benefit of, and shall be enforceable by, the Indemnified Persons and their respective heirs, executors, administrators and personal representatives and shall be binding on Nanotech, META and their respective successors and assigns.

ARTICLE 6
CONDITIONS

6.1 Mutual Conditions Precedent

The obligations of the Parties to complete the Arrangement are subject to the fulfillment of each of the following conditions precedent on or before the Effective Time or the waiver thereof by each of Nanotech and META to the extent permitted by applicable Law and without prejudice to their right to rely on the fulfilment of any other of such conditions:

(a) the Interim Order having been granted on terms consistent with this Agreement and the Interim Order not having been set aside or modified in a manner unacceptable to either Nanotech or META, acting reasonably, on appeal or otherwise;

(b) the Nanotech Arrangement Resolution having been passed by the Nanotech Securityholders in accordance with the Interim Order;

(c) the Final Order having been granted on terms consistent with this Agreement and the Final Order not having been set aside or modified in a manner unacceptable to either Nanotech or META, acting reasonably, on appeal or otherwise;

(d) no Law is in effect, and there shall have been no action taken by any Governmental Entity of competent jurisdiction, which make it illegal or otherwise directly or indirectly restrains, enjoins or prohibits the completion of the Arrangement;

(e) this Agreement shall not have been terminated in accordance with its terms; and

(f) the Key Regulatory Approvals shall have been obtained on terms acceptable to META and Nanotech, each acting reasonably, and each such Key Regulatory Approval is in full force and effect and has not been modified.

6.2 Additional Conditions Precedent in Favour of META and the Purchaser

The obligation of META and the Purchaser to complete the Arrangement is subject to the fulfillment of each of the following additional conditions precedent on or before the

Effective Time (each of which is for the exclusive benefit of META and the Purchaser and may be waived by META):

(a) all covenants of Nanotech under this Agreement to be performed on or before the Effective Time which have not been waived by META shall have been duly performed by Nanotech in all material respects and META shall have received a certificate of Nanotech addressed to META and dated the Effective Date, signed on behalf of Nanotech by two (2) of its senior executive officers (on Nanotech's behalf and without personal liability), confirming the same as of the Effective Time;

(b) the representations and warranties of Nanotech set forth in this Agreement shall have been true and correct in all respects as of the date of this Agreement, and shall be true and correct in all respects as of the Effective Time as if made as of the Effective Time (except, in each case, for representations and warranties made as of a specified date, the accuracy of which shall be determined as of that specified date), except where any failure or failures of such representations and warranties to be so true and correct in all respects would not have, individually or in the aggregate, a Nanotech Material Adverse Effect (it being understood that, for purposes of determining the accuracy of such representations and warranties, all materiality, Nanotech Material Adverse Effect and similar qualifiers set forth in such representations and warranties shall be disregarded), and META shall have received a certificate of Nanotech addressed to META and dated the Effective Date, signed on behalf of Nanotech by two (2) senior executive officers of Nanotech (on Nanotech's behalf and without personal liability), confirming the same as at the Effective Time;

(c) there shall not have occurred a Nanotech Material Adverse Effect since October 1, 2020 to the date hereof which is continuing and since the date of this Agreement, there shall not have occurred a Nanotech Material Adverse Effect, and META shall have received a certificate signed on behalf of Nanotech by two (2) senior executive officers of Nanotech (on Nanotech's behalf and without personal liability) to such effect;

(d) Nanotech shall have a minimum of $5,000,000 in cash and cash equivalents on hand (for greater certainty, excluding any cash or cash equivalents received from META pursuant to the Plan of Arrangement); and

(e) holders of greater than five percent (5%) of the Nanotech Shares shall not have validly exercised, and as at the Effective Date not withdrawn, Dissent Rights.

The foregoing conditions will be for the sole benefit of META and the Purchaser and may be waived by META in whole or in part at any time in its sole discretion.

6.3 Additional Conditions Precedent in Favour of Nanotech

The obligation of Nanotech to complete the Arrangement is subject to the fulfillment of each of the following additional conditions precedent on or before the Effective Time (each of which is for the exclusive benefit of Nanotech and may be waived by Nanotech):

(a) all covenants of META and the Purchaser under this Agreement to be performed on or before the Effective Time which have not been waived by Nanotech shall have been duly performed by META and the Purchaser in all material respects and Nanotech shall have received a certificate of META and the Purchaser addressed to Nanotech and dated the Effective Date, signed on behalf of META and the Purchaser by two (2) senior executive officers of META and the Purchaser (on META's and the Purchaser's behalf and without personal liability), confirming the same as of the Effective Time

(b) the representations and warranties of META and the Purchaser set forth in this Agreement, shall have been true and correct in all material respects as of the date of this Agreement, and shall be true and correct in all material respects as of the Effective Time as if made as of the Effective Time (except, in each case, for representations and warranties made as of a specified date, the accuracy of which shall be determined as of that specified date), except where any failure or failures of such representations and warranties to be so true and correct in all material respects would not have, individually or in the aggregate, a material adverse effect (it being understood that for purposes of determining the accuracy of such representations and warranties, all materiality, material adverse effect and similar qualifiers set forth in such representations and warranties shall be disregarded) on the ability of META or the Purchaser to perform its obligations under this Agreement or consummate the Arrangement, and Nanotech shall have received a certificate of META and the Purchaser addressed to Nanotech and dated the Effective Date, signed on behalf of META and the Purchaser by two senior executive officers of META and the Purchaser (on META's and the Purchaser's behalf and without personal liability), confirming the same as at the Effective Time; and

(c) META and the Purchaser shall have complied with their obligations under Section 2.9 and the Depositary shall have confirmed receipt of the aggregate Consideration contemplated thereby.

The foregoing conditions will be for the sole benefit of Nanotech and may be waived by Nanotech in whole or in part at any time in its sole discretion.

6.4 Notice and Cure Provisions

(a) Each Party will give prompt notice to the other of the occurrence, or failure to occur, at any time from the date hereof until the earlier to occur of the termination of this

Agreement and the Effective Time, of any event or state of facts which occurrence or failure would, or would be reasonably likely to:

(i) cause any of the representations or warranties of any Party contained herein to be untrue or inaccurate in any material respect on the date hereof or at the Effective Time; or

(ii) result in the failure to comply with or satisfy any covenant or agreement in any material respect, or condition to be complied with or satisfied by any Party hereunder prior to the Effective Time.

(b) Notice provided under this Section 6.4 will not affect the representations, warranties, covenants, agreements or obligations of the Parties (or remedies with respect thereto) or the conditions to the obligations of the Parties under this Agreement.

(c) META may not exercise its rights to terminate this Agreement pursuant to Subsection 8.2(a)(iii)(B) and Nanotech may not exercise its right to terminate this Agreement pursuant to Subsection 8.2(a)(iv)(B) unless the Party intending to rely thereon has delivered a written notice to the other Party specifying in reasonable detail all breaches of covenants, representations and warranties or other matters which the Party delivering such notice is asserting as the basis for termination. If any such notice is delivered*, provided* that a Party is proceeding diligently to cure such matter and such matter is capable of being cured prior to the Outside Date, no Party may terminate this Agreement until the earlier of the Outside Date and the expiration of a period of ten (10) Business Days from such notice, and then only if such matter has not been cured by such date. If such notice has been delivered by Nanotech to META and the Purchaser less than ten (10) Business Days prior to the Nanotech Meeting, the Nanotech Meeting shall be adjourned or postponed until the earlier of (i) the expiry of such period, and (ii) eight (8) Business Days prior to the Outside Date. If such notice has been delivered by META to Nanotech less than ten (10) Business Days prior to the Nanotech Meeting, then the Nanotech Meeting may only be adjourned or postponed at the request of META until the earlier of (iii) the expiry of such period, and (iv) eight (8) Business Days prior to the Outside Date. For greater certainty, in the event that such matter is cured within the time period referred to herein without having a material adverse effect on META or a Nanotech Material Adverse Effect, as the case may be, this Agreement may not be terminated as a result of the cured breach.

6.5 Satisfaction of Conditions

The conditions precedent set out in Section 6.1, Section 6.2 and Section 6.3 shall be conclusively deemed to have been satisfied, waived or released upon delivery by the Parties of written confirmation of the Effective Date.

ARTICLE 7
ADDITIONALCOVENANS

7.1 Covenant Regarding Non-Solicitation

Nanotech shall, and shall direct and cause its Representatives to immediately, cease and cause to be terminated any solicitation, encouragement, activity, discussion or negotiation with any parties that may be ongoing with respect to a Nanotech Acquisition Proposal whether or not initiated by Nanotech, discontinue access to any parties (other than a Part to this Agreement and its Representatives) to any dataroom that contains information regarding Nanotech, and to the extent Nanotech entered into a confidentiality agreement with any such parties, Nanotech shall request the return of information regarding Nanotech previously provided to such parties or shall request the destruction of all materials including or incorporating any confidential information regarding Nanotech pursuant to any such confidentiality agreement. Nanotech represents and warrants that it has not, and agrees not to, release or permit the release of any Person from, or waive or forbear in the enforcement of, any confidentiality agreement or other similar agreement relating to a potential Nanotech Acquisition Proposal to which such third party is a party. Nanotech further represents and warrants that it has not, and agrees not to, release or permit the release of any Person from, or waive or forbear in the enforcement of, any standstill or similar agreement or obligation to which such third party is a party or by which such third party is bound (it being acknowledged by META and the Purchaser that the automatic termination or release of any standstill restrictions of any such agreements as a result of the entering into and announcement of this Agreement shall not be a violation of this Section 7.1).

7.2 Covenant Regarding Acquisition Proposals

(a) Nanotech agrees that it shall not, and shall cause its Representatives not to, directly or indirectly:

(i) solicit, initiate, knowingly encourage or otherwise facilitate, (including by way of furnishing non-public information, permitting access to non-public areas of its facilities or properties or entering into any form of agreement, arrangement or understanding) any inquiries or offers or the making of any proposals that constitute or that would reasonably be expected to constitute or lead to a Nanotech Acquisition Proposal;

(ii) participate, directly or indirectly, in any discussions or negotiations regarding, or furnish to any Person any non-public information or otherwise co-operate with, respond to, assist or participate in any Nanotech Acquisition Proposal or potential Nanotech Acquisition Proposal or participate in any discussions or negotiations regarding an actual or potential Nanotech Acquisition Proposal, or furnish any information or access to any Person (other than a Party to this Agreement and its Representatives) with respect to any inquiries, proposals or offers that constitute,

or that would reasonably be expected to constitute or lead to, an actual or potential Nanotech Acquisition Proposal; *provided* that Nanotech may advise any Person making a Nanotech Acquisition Proposal that the Nanotech Board has determined that such Nanotech Acquisition Proposal does not constitute a Nanotech Superior Proposal;

(iii) remain neutral with respect to, or agree to, approve or recommend any actual or potential Nanotech Acquisition Proposal (it being understood that publicly taking no position or a neutral position with respect to a Nanotech Acquisition Proposal for five (5) Business Days following formal announcement of a Nanotech Acquisition Proposal shall not be considered to be a violation of this Subsection 7.2(a)(iii));

(iv) enter into any agreement, arrangement or understanding related to any Nanotech Acquisition Proposal (other than an Acceptable Confidentiality Agreement) or requiring it to abandon, terminate or fail to consummate the Arrangement or the transactions contemplated by this Agreement or providing for the payment of any break, termination or other similar fees or expenses to any Person making a Nanotech Acquisition Proposal in the event that Nanotech completes the Arrangement or any similar other transaction with META or with an affiliate of META that is agreed to prior to any termination of this Agreement (any such agreement, arrangement or understanding, an "**Alternative Acquisition Agreement**"); or

(v) make a Nanotech Change in Recommendation.

(b) Nanotech shall promptly (and in any event within forty-eight (48) hours) notify META and the Purchaser, at first orally and then in writing, of any proposals, offers or inquiries constituting or that would reasonably be expected to constitute or lead to a Nanotech Acquisition Proposal received by Nanotech or any request for non- public information relating to Nanotech in connection with any inquiry, proposal or offer that constitutes, or is reasonably expected to constitute or lead to, a Nanotech Acquisition Proposal. Such notice shall include a description of the material terms and conditions of any proposal, inquiry or offer, the identity of the Person making such proposal, inquiry or offer, a copy of the proposal, offer or inquiry (if written), and provide such other details of the proposal, inquiry or offer as META or the Purchaser may reasonably request. Nanotech shall keep META and the Purchaser fully informed on a prompt basis of the status, including any change to the material terms, of any such proposal, inquiry or offer.

(c) Nanotech shall ensure that its officers, directors and any financial advisors or other advisors or Representatives retained by it are aware of the provisions of Section 7.1 and this Section 7.2, and Nanotech shall be responsible for any breach of Section 7.1 or this Section 7.2 by such officers, directors, financial advisors or other advisors or Representatives.

7.3 Responding to an Acquisition Proposal

(a) Notwithstanding Section 7.1 and Section 7.2, if at any time, Nanotech receives a written Nanotech Acquisition Proposal prior to obtaining the Nanotech Securityholder Approval, Nanotech may engage in or participate in discussions or negotiations with such Person regarding such Nanotech Acquisition Proposal, and may provide copies of, access to or disclosure of confidential information, properties, facilities, books or records of itself, if and only if:

(i) its board of directors first determines in good faith, after receiving the advice of its financial advisors and its outside counsel, that such Nanotech Acquisition Proposal constitutes, or would reasonably be expected to constitute, a Nanotech Superior Proposal;

(ii) such Person was not restricted from making such Nanotech Acquisition Proposal pursuant to an existing standstill, confidentiality, non-disclosure, business purpose, use or similar restriction or agreement;

(iii) it has been, and continues to be, in compliance with its obligations under Section 7.1 through Section 7.4;

(iv) prior to providing any such copies, access, or disclosure, it enters into a confidentiality and standstill agreement with such Person having terms at least as favorable to Nanotech as the Confidentiality Agreement; *provided* that such agreement may permit the counterparty to make a confidential Nanotech Acquisition Proposal that constitutes or would reasonably be expected to constitute a Nanotech Superior Proposal to the Nanotech Board (an "**Acceptable Confidentiality Agreement**"); and

(v) it provides META and the Purchaser with:

(A) any copies, access or disclosure provided to such Person which has not already been provided to META and the Purchaser prior to or concurrently with providing such copies, access or disclosure to such Person; and

(B) prior to providing any such copies, access or disclosure, a true, complete and final executed copy of the Acceptable Confidentiality Agreement referred to in Subsection 7.3(a)(iv).

7.4 Superior Proposals; Right to Match

(a) Notwithstanding Section 7.1 and Section 7.2, at any time prior to obtaining the Nanotech Securityholder Approval, the Nanotech Board may (A) make a Nanotech

Change in Recommendation in response to a Nanotech Superior Proposal and (B) cause Nanotech to terminate this Agreement in accordance with Subsection 8.2(a)(iv)(A) and concurrently enter into an Alternative Acquisition Agreement; *provided* that:

(i) the Person making the Nanotech Superior Proposal was not restricted from making such Nanotech Acquisition Proposal pursuant to an existing standstill, confidentiality, non-disclosure, business purpose, use or similar restriction or agreement;

(ii) Nanotech has been, and continues to be, in compliance with its obligations under Section 7.1 through Section 7.4;

(iii) Nanotech has delivered to META a written notice of the determination of the Nanotech Board that such Nanotech Acquisition Proposal constitutes a Nanotech Superior Proposal and of the intention of the Nanotech Board to make a Nanotech Change in Recommendation, terminate this Agreement pursuant to Subsection 8.2(a)(iv)(A), and enter into a definitive Alternative Acquisition Agreement with respect to such Nanotech Superior Proposal (other than an Acceptable Confidentiality Agreement), together with (A) a written notice from the Nanotech Board regarding the value and financial terms that the Nanotech Board, in consultation with its financial advisors, has determined should be ascribed to any non-cash consideration offered under such Nanotech Superior Proposal and a copy of the proposed definitive Alternative Acquisition Agreement and any other relevant transaction documents (the "**Superior Proposal Notice**");

(iv) at least five (5) Business Days (the "**Superior Proposal Matching Period**") have elapsed from the date on which META and the Purchaser received the Superior Proposal Notice;

(v) during any Superior Proposal Matching Period, META and the Purchaser has had the opportunity (but not the obligation), in accordance with Subsection 7.4(b), to offer to amend this Agreement and the Arrangement in order for such Nanotech Acquisition Proposal to cease to be a Nanotech Superior Proposal; and

(vi) if META or the Purchaser has offered to amend this Agreement and the Arrangement under Subsection 7.4(b), the Nanotech Board has determined in good faith, after receiving the advice of its outside legal counsel and financial advisers, that such Nanotech Acquisition Proposal continues to constitute a Nanotech Superior Proposal compared to the terms of the Arrangement as proposed to be amended under Subsection 7.4(b).

(b) During any Superior Proposal Matching Period, or such longer period as Nanotech may approve in writing for such purpose: (i) the Nanotech Board shall review any

offer made by META or the Purchaser under Subsection 7.4(a)(vi) to amend the terms of this Agreement and the Arrangement in good faith in order to determine whether such proposal would, upon acceptance, result in the Nanotech Acquisition Proposal previously constituting a Nanotech Superior Proposal ceasing to be a Nanotech Superior Proposal; and (ii) Nanotech shall negotiate in good faith with META and the Purchaser to make such amendments to the terms of this Agreement and the Arrangement as would enable META and the Purchaser to proceed with the transactions contemplated by this Agreement on such amended terms. If, as a consequence of the foregoing, the Nanotech Board determines that such Nanotech Acquisition Proposal would cease to be a Nanotech Superior Proposal, Nanotech shall promptly so advise META and the Purchaser, and the Parties shall amend this Agreement to reflect such offer made by META or the Purchaser, and shall take and cause to be taken all such actions as are necessary to give effect to the foregoing.

(c) Each successive amendment to any Nanotech Acquisition Proposal that results in an increase in, or modification of, the consideration (or value of such consideration) to be received by the shareholders of Nanotech or other material terms or conditions thereof shall constitute a new Nanotech Acquisition Proposal for the purposes of this Section 7.4, which shall require a new Superior Proposal Notice to META and the Purchaser. META and the Purchaser shall be afforded a new Superior Proposal Matching Period of five (5) Business Days from the date on which META and the Purchaser receives the Superior Proposal Notice with respect to such amended Nanotech Acquisition Proposal from Nanotech.

(d) The Nanotech Board shall promptly reaffirm the Nanotech Board Recommendation by press release after any Nanotech Acquisition Proposal which the Nanotech Board has determined not to be a Nanotech Superior Proposal is publicly announced or the Nanotech Board determines that a proposed amendment to the terms of this Agreement as contemplated under Subsection 7.4(b) would result in a Nanotech Acquisition Proposal no longer being a Nanotech Superior Proposal. Nanotech shall provide META and its outside legal counsel with a reasonable opportunity to review the form and content of any such press release and shall make all reasonable amendments to such press release as requested by META and its outside legal counsel.

(e) If Nanotech provides a Superior Proposal Notice to META and the Purchaser after a date that is less than ten (10) Business Days before the Nanotech Meeting, Nanotech may, and shall, as directed by META, postpone such meeting to a date that is not more than ten (10) Business Days after the scheduled date of that meeting; *provided* the Nanotech Meeting shall not be postponed to a date which would prevent the Effective Date from occurring on or prior to the Outside Date.

7.5 Access to Information; Confidentiality; Transition

From the date hereof until the earlier of the Effective Time and the termination of this Agreement pursuant to its terms, subject to compliance with applicable Law and COVID-

19 Measures and the terms of any existing Contracts, solely for the purpose of furthering the consummation of the transactions contemplated by this Agreement (and integration activities related thereto), Nanotech shall, and shall cause its Representatives to, afford to the other Parties and their Representatives reasonable access during normal business hours upon reasonable notice, to the properties, information and records relating to, and the personnel of, Nanotech, including but not limited to, the related facilities, books, contracts, financial statements, forecasts, financial projections (to the extent permitted by confidentiality agreements in force on the date hereof), studies, records, operating Permits, and any other documentation (whether in writing or stored in computerized, electronic, disk, tape, microfilm or any other form); *provided*, however, that such access does not unduly interfere with the ordinary course of business of Nanotech. Nanotech shall, and shall cause its Representatives to work cooperatively and in good faith to ensure an orderly transition following the Effective Time, including with respect to transitional planning, transitional services, and the retention of personnel (and any related arrangements thereto). From the date hereof until the earlier of the Effective Time and the termination of this Agreement pursuant to its terms, Nanotech will maintain the access of the other Parties and its Representatives to the information contained as at the date of this Agreement in any dataroom that contains information regarding Nanotech to which the other Parties and its Representatives have access as at the date of this Agreement.

7.6 Other Deliveries

Concurrent with the execution and delivery of this Agreement, Nanotech shall deliver to META all of the Nanotech Voting Agreements.

ARTICLE 8
TERM, TERMINATION, AMENDMENT AND WAIVER

8.1 Term

This Agreement shall be effective from the date hereof until the earlier of the Effective Time and the termination of this Agreement in accordance with its terms.

8.2 Termination

(a) This Agreement may be terminated at any time prior to the Effective Time:

(i) by mutual written agreement of Nanotech and META;

(ii) by either Nanotech or META, if:

(A) the Effective Time shall not have occurred on or before the Outside Date; *provided* that the right to terminate this Agreement under this Subsection

8.2(a)(ii)(A) shall not be available to any Party whose failure to fulfill any of its obligations or whose breach of any of its covenants, representations and warranties under this Agreement has been the cause of, or resulted in, the failure of the Effective Time to occur on or before the Outside Date; and *provided further*, that if completion of the Arrangement is delayed by (i) an injunction or order made by a Governmental Entity of competent jurisdiction, or (ii) META or Nanotech not having obtained any Key Regulatory Approval or the Interim Order or the Final Order which is necessary to permit the completion of the Arrangement such that the conditions set forth in Subsection 6.1(a), 6.1(c) or 6.1(f) shall not have been satisfied or waived then; *provided* that such injunction or order is being contested or appealed by the Parties or such regulatory waiver, consent or approval or the Interim Order or the Final Order is being actively sought by the Parties, as applicable, the Outside Date shall automatically be extended for a one-time, additional period of thirty (30) days;

(B) any Governmental Entity of competent jurisdiction shall have issued an order, decree or ruling or there shall be enacted or made any applicable Law that makes consummation of the Arrangement illegal or otherwise prohibited or otherwise restrains, enjoins or prohibits Nanotech or META or the Purchaser from consummating the Arrangement (unless such order, decree, ruling or applicable Law has been withdrawn, reversed or otherwise made inapplicable) and such order, decree, ruling or applicable Law or enjoinment shall have become final and non-appealable; *provided* the Party seeking to terminate this Agreement pursuant to this Subsection 8.2(a)(ii)(B) has used its commercially reasonable efforts to, as applicable, prevent, withdraw, reverse, appeal, overturn or otherwise have rendered non-applicable in respect of the Arrangement, such order, decree, ruling or applicable Law and *provided further* that the issuance of such order, decree or ruling or the enactment or making of such Law was not primarily due to such Party's breach of any of its covenants or obligations under this Agreement, such order, decree ruling or applicable Law; and

(C) the Nanotech Securityholder Approval shall not have been obtained at the Nanotech Meeting in accordance with applicable Law and the Interim Order.

(iii) by META, if:

(A) there shall have occurred a Nanotech Change in Recommendation;

(B) subject to Section 6.4, Nanotech is in default of a covenant or obligation hereunder (other than the covenants and obligations set forth in Section 7.1 and Section 7.2, as to which Subsection 8.2(a)(iii)(C) shall apply) such that the condition contained in Subsection 6.2(a) is not satisfied or is incapable of satisfaction, or any representation or warranty of Nanotech under this

Agreement is untrue or incorrect or shall have become untrue or incorrect such that the condition contained in Subsection 6.2(b) would be incapable of satisfaction; *provided* that META and the Purchaser are not then in breach of this Agreement so as to cause any of the conditions set forth in Section 6.1 or Section 6.3 not to be satisfied; or

(C) Nanotech shall have breached or failed to perform any of its obligations set forth in Section 7.1 through Section 7.4;

(iv) by Nanotech, if

(A) prior to obtaining the Nanotech Securityholder Approval, the Nanotech Board authorizes Nanotech to accept a Nanotech Superior Proposal and Nanotech shall simultaneously with such termination enter into a definitive Alternative Acquisition Agreement associated therewith; *provided* that Nanotech has (1) otherwise complied with its obligations set forth in Section 7.1 through Section 7.4 and (2) paid, or caused to be paid, any amounts due pursuant to Subsection 8.3(b); or

(B) subject to Section 6.4, META or the Purchaser is in default of a covenant or obligation hereunder such that the condition contained in Subsection 6.3(a) is not satisfied or is incapable of satisfaction, or any representation or warranty of META or the Purchaser under this Agreement is untrue or incorrect or shall have become untrue or incorrect such that the condition contained in Subsection 6.3(b) would be incapable of satisfaction; *provided* that Nanotech is not then in breach of this Agreement so as to cause any of the conditions set forth in Section 6.1 or Section 6.2 not to be satisfied.

(b) Subject to Subsection 6.4(b), the Party desiring to terminate this Agreement pursuant to this Section 8.2 (other than pursuant to Subsection 8.2(a)(i)) shall give notice of such termination to the other Party, specifying in reasonable detail the basis for such Party's exercise of its termination right.

(c) If this Agreement is terminated pursuant to this Section 8.2, this Agreement shall become void and be of no further force or effect without liability of any Party (or any shareholder, director, officer, employee, agent, consultant or Representative of such Party) to any other Party hereto, except that the provisions of this Subsection 8.2(c) and Sections 8.3, 9.1, 9.3, 9.4, 9.6, 9.8 and 9.9 and all related definitions set forth in Section 1.1 and the provisions of the Confidentiality Agreement shall survive any such termination *provided* that neither the termination of this Agreement pursuant to this Section 8.2 nor anything contained in this Section 8.2 shall relieve a Party from any liability arising prior to such termination arising from any willful breach of this Agreement or fraud.

8.3 Expenses and Termination Payment

(a) Except as otherwise provided herein, the Parties agree that all costs and expenses of the Parties relating to the Arrangement and the transactions contemplated in this Agreement, including legal fees, accounting fees, financial advisory fees, strategic advisory fees, regulatory filing fees, stock exchange fees, all disbursements of advisors and printing and mailing costs, shall be paid by the Party incurring such expenses.

(b) The Termination Payment shall be payable by Nanotech to META in the event that this Agreement is terminated in the following circumstances:

(i) pursuant to Subsection 8.2(a)(iii)(A), Subsection 8.2(a)(iii)(C) or Subsection 8.2(a)(iv)(A); or

(ii) pursuant to Subsection 8.2(a)(ii)(A), Subsection 8.2(a)(ii)(C) or Subsection 8.2(a)(iii)(B) if, in any such case, following the date hereof and prior to the earlier of the termination of this Agreement or the holding of the Nanotech Meeting, (A) a Nanotech Acquisition Proposal, or the intention to make a Nanotech Acquisition Proposal, shall have been publicly announced by any Person (other than META or any of its affiliates) and not withdrawn prior to such termination or holding of the Nanotech Meeting, and (B) within twelve (12) months after the date of such termination (1) Nanotech has entered into a definitive agreement (other than a confidentiality agreement) with respect to or consummated a Nanotech Acquisition Proposal, or (2) a Nanotech Acquisition Proposal has been publicly accepted or recommended by the Nanotech Board,. For the purpose of this Subsection 8.3(b)(ii), the term "**Nanotech Acquisition Proposal**" shall have the meaning ascribed to such term in Section 1.1, except that references to "20%" shall be deemed to be "more than 50%". For the avoidance of doubt, the Nanotech Acquisition Proposal referred to in clause (B) of this Subsection 8.3(b)(ii) need not be the same Nanotech Acquisition Proposal that was made to Nanotech or publicly announced prior to the termination of this Agreement or holding of the Nanotech Meeting.

The Termination Payment shall be made, or caused to be made, by Nanotech by wire transfer of same-day funds, to an account designated by META, (x) in the event that this Agreement is terminated pursuant to Subsection 8.2(a)(iv)(A), simultaneously with, and as a condition to the effectiveness of, such termination, (y) in the event that this Agreement is terminated pursuant to Subsection 8.2(a)(iii)(A) or Subsection 8.2(a)(iii)(C), as soon as practicable, and in any event within two (2) Business Days of the date on which this Agreement is terminated, and (z) in the event that the Termination Payment is payable pursuant to Subsection 8.3(b)(ii), on the earliest to occur of the events referred to in clause (B) of that Subsection 8.3(b)(ii).

META and the Purchaser hereby acknowledge that the Termination Payment to which META may become entitled to is a payment of liquidated damages which is a genuine pre-estimate of the damages which META and the Purchaser will suffer or incur as a result of the event giving rise to such damages and the resultant non- completion of the Arrangement and the transactions contemplated by this Agreement and is not a penalty. Nanotech hereby irrevocably waives any right it may have to raise as a defence that any such liquidated damages are excessive or punitive. META and the Purchaser hereby acknowledge that the

Termination Payment in the manner provided in this Section 8.3 is the sole and exclusive monetary remedy of META and the Purchaser in respect of the events giving rise to such payment and the termination of this Agreement. Upon receipt by META of the Termination Payment, neither META nor the Purchaser shall have any further Claim against Nanotech at law or in equity or otherwise (including injunctive relief to restrain any breach or threatened breach by Nanotech of any of its obligations hereunder or otherwise to obtain specific performance).

8.4 Amendment

Subject to the provisions of the Interim Order, the Final Order and applicable Law, this Agreement and the Plan of Arrangement may, at any time and from time to time prior to the Effective Time, be amended only by mutual written agreement of META and Nanotech, and any such amendment may without limitation:

(a) change the time for performance of any of the obligations or acts of the Parties;

(b) waive any inaccuracies or modify any representation or warranty contained herein or in any document delivered pursuant hereto;

(c) waive compliance with or modify any of the covenants herein contained and waive or modify performance of any of the obligations of the Parties; or

(d) waive compliance with or modify any mutual conditions precedent herein contained, without further notice to or authorization on the part of the Nanotech Shareholders or Nanotech Securityholders.

Notwithstanding the foregoing, after the Nanotech Securityholder Approval has been obtained, no amendment shall be made that pursuant to applicable Law requires approval or adoption by the Nanotech Shareholders or the Nanotech Securityholders without such further approval or adoption.

8.5 Waiver

Any Party may (a) extend the time for the performance of any of the obligations or acts of another Party, (b) waive compliance, except as provided herein, with any of another Party's agreements or the fulfilment of any conditions to its own obligations contained herein, or (c) waive inaccuracies in any of an other Party's representations or warranties contained herein or in any document delivered by the other Party, in each case only to the extent such obligations, agreements and conditions are intended for its benefit. Notwithstanding the foregoing, after the Nanotech Securityholder Approval has been obtained, no waiver shall be made that pursuant to applicable Law requires approval or adoption by the Nanotech Shareholders or Nanotech Securityholders without such approval or adoption. No extension or waiver shall be valid unless set forth in an instrument in writing signed on

behalf of the waiving Party and, unless otherwise provided in the written waiver, will be limited to the specific breach or condition waived and shall not extend to any other matter or occurrence. No failure or delay in exercising any right, power or privilege under this Agreement will operate as a waiver thereof, nor will any single or partial exercise thereof preclude any other or further exercise thereof or the exercise of any right, power or privilege under this Agreement.

ARTICLE 9
GENERAL PROVISIONS AND MISCELLANEOUS

9.1 Privacy

Each Party shall comply with applicable privacy Laws in the course of collecting, using and disclosing Personal Information in connection with the transactions contemplated hereby (the "**Transaction Personal Information**"). No Party shall disclose Transaction Personal Information originally collected by any other Party to any Person other than to its advisors who are evaluating and advising on the transactions contemplated by this Agreement.

The Parties shall protect and safeguard the Transaction Personal Information against unauthorized collection, use or disclosure. META and Nanotech shall cause their respective advisors to observe the terms of this Section 9.1 and to protect and safeguard all Transaction Personal Information in their possession. If this Agreement shall be terminated, each Party shall promptly deliver to the other Party all Transaction Personal Information originally collected by such other Party in its possession or in the possession of any of its advisors, including all copies, reproductions, summaries or extracts thereof, except, unless prohibited by applicable Law, for electronic backup copies made automatically in accordance with the usual backup procedures of the Party returning such Transaction Personal Information.

9.2 Notices

All notices and other communications given or made pursuant to this Agreement shall be in writing and shall be deemed to have been duly given and received on the day it is delivered; *provided*, however, that it is delivered on a Business Day prior to 4:30 p.m. local time in the place of delivery or receipt. However, if notice is delivered after 4:30 p.m. local time or if such day is not a Business Day then the notice shall be deemed to have been given and received on the next Business Day. Notice shall be sufficiently given if delivered (either in person, by courier service or other personal method of delivery), or if transmitted

by email to the Parties at the following addresses (or at such other addresses as shall be specified by any Party by notice to the other given in accordance with these provisions):

(a) if to META or the Purchaser:

c/o Meta Materials Inc.
1 Research Drive
Dartmouth, Nova Scotia
B2Y 4M9

Attention: George Palikaras
Email: george.palikaras@metamaterial.com

with a copy (that shall not constitute notice) to:

Fasken Martineau DuMoulin LLP
333 Bay Street, Suite 2400
Toronto, Ontario M5H 2T6

Attention: John Sabetti
Email: jsabetti@fasken.com

and

Wilson Sonsini Goodrich & Rosati PC 28 State Street
37th Floor
Boston, MA 02109-5703

Attention: Mark Fitzgerald
Email: MFitzgerald@wsgr.com

(b) if to Nanotech:

505 - 3292 Production Way
Burnaby, BC V5A 4R4

Attention: Troy Bullock
Email: tbullock@nanosecurity.ca

with a copy (that shall not constitute notice) to:

Borden Ladner Gervais LLP
1200 Waterfront Centre
200 Burrard Street
Vancouver, BC, Canada V7X 1T2

Attention: Fred R. Pletcher
Email: FPletcher@blg.com

9.3 Governing Law

This Agreement shall be governed, including as to validity, interpretation and effect, by the Laws of the Province of British Columbia and the Laws of Canada applicable therein, without giving effect to any principles of conflict of Laws thereof which would result in the application of the Laws of any other jurisdiction. Each of the Parties hereby irrevocably attorns to the exclusive jurisdiction of the courts of the Province of British Columbia in respect of all matters arising under and in relation to this Agreement and the Arrangement. Notwithstanding the foregoing, any provisions of this Agreement with respect to US Securities Laws shall be governed by applicable US Laws, and any provisions with respect to the corporate governance, existence, good standing and authority of META shall be governed by NRS.

9.4 Injunctive Relief

Subject to Subsection 8.3(b), the Parties acknowledge and agree that irreparable harm would occur for which money damages would not be an adequate remedy at law in the event that any of the provisions of this Agreement were not performed in accordance with their specific terms or were otherwise breached. Accordingly, the Parties agree that, in the event of any breach or threatened breach of this Agreement by a Party, the non-breaching Party will be entitled, without the requirement of posting a bond or other security, to seek equitable relief, including injunctive relief and specific performance, and the Parties shall not object to the granting of injunctive or other equitable relief on the basis that there exists an adequate remedy at law. Subject to Subsection 8.3(b), such remedies will not be the exclusive remedies for any breach of this Agreement but will be in addition to all other remedies available at law or equity to each of the Parties.

9.5 Time of Essence

Time shall be of the essence in this Agreement.

9.6 Entire Agreement, Binding Effect and Assignment

This Agreement (including the exhibits and schedules hereto and the Nanotech Disclosure Letter and the other agreements, documents and certificates delivered pursuant to this Agreement), the Nanotech Voting Agreements, and the Confidentiality Agreement constitute the entire agreement, and supersede all other prior agreements and understandings, both written and oral, among the Parties, or any of them, with respect to the subject matter hereof and thereof and, except as expressly provided herein, this Agreement is not intended to and shall not confer upon any Person other than the Parties any rights or remedies hereunder. This Agreement shall enure to the benefit of and be binding upon the Parties and their respective successors and permitted assigns. Neither this Agreement nor any of the rights, interests or obligations hereunder may be assigned by any of the Parties without the prior written consent of the other Parties.

9.7 Third Party Beneficiaries

(a) Except as provided in Section 5.4 and Section 9.8 which, without limiting their terms, are intended as stipulations for the benefit of the third Persons mentioned in such provisions (such third Persons referred to in this Section 9.7, the "**Third Party Beneficiaries**") and except for the rights of the Nanotech Securityholders to receive the Consideration payable to them as provided for in the Plan of Arrangement following the Effective Time pursuant to the Arrangement, the Parties intend that this Agreement will not benefit or create any right or cause of action in favour of any Person, other than the Parties and that no Person, other than the Parties, shall be entitled to rely on the provisions of this Agreement in any claim, inquiry, action, suit, proceeding, hearing or other forum.

(b) Despite the foregoing, each of META and the Purchaser acknowledge to each of the Third Party Beneficiaries their direct rights under Section 5.4 and Section 9.8, which are intended for the benefit of, and shall be enforceable by, each Third Party Beneficiary, his or her heirs and his or her legal representatives.

9.8 No Liability

No director or officer of META or the Purchaser shall have any personal liability whatsoever to Nanotech under this Agreement, or any other document delivered in connection with the transactions contemplated hereby on behalf of META or the Purchaser. No director or officer of Nanotech shall have any personal liability whatsoever to META or the Purchaser under this Agreement, or any other document delivered in connection with the transactions contemplated hereby on behalf of Nanotech.

9.9 Severability

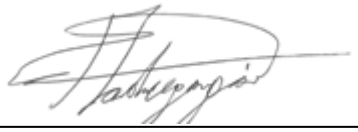
If any term or other provision of this Agreement is invalid, illegal or incapable of being enforced by any rule or Law or public policy, all other conditions and provisions of this Agreement shall nevertheless remain in full force and effect so long as the economic or legal substance of the transactions contemplated hereby is not affected in any manner materially adverse to any Party. Upon such determination that any term or other provision is invalid, illegal or incapable of being enforced, the Parties shall negotiate in good faith to modify this Agreement so as to effect the original intent of the Parties as closely as possible in an acceptable manner to the end that the transactions contemplated hereby are fulfilled to the fullest extent possible.

9.10 Counterparts, Execution

This Agreement may be executed in one or more counterparts, each of which shall be deemed to be an original but all of which together shall constitute one and the same instrument. The Parties shall be entitled to rely upon delivery of an executed facsimile or similar executed electronic copy of this Agreement, and such facsimile or similar executed electronic copy shall be legally effective to create a valid and binding agreement among the Parties.

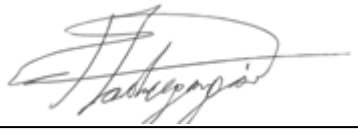
IN WITNESS WHEREOF the Parties have executed this Arrangement Agreement as of the date first written above by their respective officers thereunto duly authorized.

META MATERIALS INC.

By: 

Name: George Palikaras
Title: President & CEO

1315115 BC INC.

By: 

Name: George Palikaras
Title: President & CEO

NANOTECH SECURITY CORP.

By: _____

Name:
Title:

IN WITNESS WHEREOF the Parties have executed this Arrangement Agreement as of the date first written above by their respective officers thereunto duly authorized.

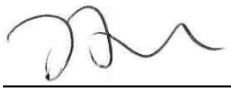
META MATERIALS INC.

By: _____
Name:
Title:

1315115 BC INC.

By: _____
Name:
Title:

NANOTECH SECURITYCORP.

By: 
Name: Troy Bullock
Title: President & CEO

123000939:v10

SCHEDULE A
PLAN OF ARRANGEMENT

PLAN OF ARRANGEMENT

ARTICLE 1
INTERPRETATION

1.1 Definitions

In this Plan of Arrangement:

"**affiliate**" has the meaning ascribed thereto in the *Securities Act* (British Columbia), as amended.

"**Arrangement**" means the arrangement under Division 5 of Part 9 of the BCBCA on the terms and subject to the conditions set out in this Plan of Arrangement, subject to any amendments or variations hereto made in accordance with the Arrangement Agreement, Article 5 of the Plan of Arrangement or made at the direction of the Court in the Final Order, with the prior written consent of Nanotech, META and Purchaser, each acting reasonably.

"**Arrangement Agreement**" means the arrangement agreement made as of August 4, 2021 among META, Purchaser and Nanotech, as amended, supplemented and/or restated in accordance with its terms.

"**BCBCA**" means the *Business Corporations Act* (British Columbia) and the regulations made thereunder, as now in effect and as they may be promulgated or amended from time to time.

"**Business Day**" means a day other than a Saturday, a Sunday or any other day on which commercial banking institutions in Toronto, Ontario, Vancouver, British Columbia or New York, New York are authorized or required by applicable Law to be closed.

"**Consideration**", for a Nanotech Share, Nanotech Option or Nanotech RSU, means the cash consideration to be received pursuant to the Plan of Arrangement in respect of such security in accordance with Sections 2.2(b), 2.2(d) and 2.2(e), respectively.

"**Court**" means the Supreme Court of British Columbia.

"**Depositary**" means AST Trust Company (Canada) or such other person appointed by Nanotech and META, each acting reasonably, for the purpose of, among other things, exchanging certificates representing Nanotech Shares for the Consideration.

"**Dissent Rights**" has the meaning set out in Section 3.1.

"**Dissenting Shareholder**" means a registered holder of Nanotech Shares that has duly and

validly exercised Dissent Rights in strict compliance with the dissent procedures set out under Division 2 of Part 8 of the BCBCA, as modified by Section 3.1 of this Plan of Arrangement, the Interim Order and the Final Order and who has not withdrawn or been deemed to have withdrawn such exercise of Dissent Rights and who is ultimately entitled to be paid the fair value of such holder's Nanotech Shares as determined in accordance with Section 3.1.

"**Effective Date**" means the date upon which the Arrangement becomes effective pursuant to the Arrangement Agreement.

"**Effective Time**" means 12:01 a.m. (Vancouver time) on the Effective Date or such other time as META, Purchaser and Nanotech may agree upon in writing.

"**Encumbrance**" has the meaning set out in the Arrangement Agreement.

"**Final Order**" means the final order of the Court pursuant to Section 291 of the BCBCA, in a form acceptable to META, Purchaser and Nanotech, each acting reasonably, approving the Arrangement after a hearing upon the procedural and substantive fairness of the terms and conditions of the Arrangement, as such order may be affirmed, amended, modified, supplemented or varied by the Court (with the consent of META, Purchaser and Nanotech, each acting reasonably) at any time prior to the Effective Date or, if appealed, then, unless such appeal is withdrawn or denied, as affirmed, amended, modified, supplemented or varied (provided, however, that any such amendment, modification, supplement or variation is acceptable to META, Purchaser and Nanotech, each acting reasonably) on appeal, unless such appeal is withdrawn, abandoned or denied.

"**Former Nanotech Securityholder**" means a holder of Nanotech Shares, In-the-Money Options or Nanotech RSUs immediately prior to the Effective Time.

"**Governmental Entity**" means (i) any multinational, supranational, national, federal, state, provincial, county, territorial, municipal, local or other government, administrative, judicial or regulatory authority, agency, board, body, bureau, commission, instrumentality, court or tribunal or any political subdivision thereof, or any central bank (or similar monetary or regulatory authority) thereof, any taxing authority, any ministry or department or agency of any of the foregoing, (ii) any self-regulatory organization or stock exchange, including the TSXV and NASDAQ, (iii) any entity exercising executive, legislative, judicial, regulatory or administrative functions of or pertaining to government; and (iv) any corporation or other entity owned or controlled, through stock or capital ownership or otherwise, by any of such entities or other bodies pursuant to the foregoing.

"**holder**" means the holder of Nanotech Shares, Nanotech Options or Nanotech RSUs shown from time to time in the central securities register maintained by or on behalf of Nanotech in respect of such securities, as the context requires.

"**Incentive Plan**" means Nanotech's Employee and Management Share Incentive Plan adopted January 28, 2015, made effective April 8, 2015 and as amended February 20, 2019.

"**including**" means "including without limitation" and "**includes**" means "includes without limitation".

"**Interim Order**" means an interim order of the Court made pursuant to Section 291 of the BCBCA, in a form acceptable to each of Nanotech, META and Purchaser, acting reasonably, providing for, among other things, the calling and holding of the Nanotech Meeting, as the same may be affirmed, amended, modified, supplemented or varied by the Court with the consent of Nanotech, META and Purchaser, each acting reasonably.

"**In-The-Money Option**" means each Nanotech Option that, immediately prior to the Effective Time, has an exercise price per Nanotech Share less than the Nanotech Share Price per Nanotech Share.

"**ITA**" means the *Income Tax Act* (Canada), as amended.

"**Law**" means, with respect to any person, any and all applicable law (statutory, common, civil or otherwise), constitution, treaty, convention, ordinance, code, rule, regulation, order, injunction, judgment, decree, ruling or other similar requirement, whether domestic or foreign, enacted, adopted, promulgated or applied by a Governmental Entity that is binding upon or applicable to such person or its business, undertaking, property or securities, and to the extent that they have the force of law, policies, guidelines, notices and protocols of any Governmental Entity, as amended.

"**Letter of Transmittal**" means the letter of transmittal for use by holders of Nanotech Shares or other securities of Nanotech, in the form accompanying the Nanotech Circular.

"**META**" means Meta Materials Inc., a corporation governed under the laws of Nevada.
"**Nanotech**" means Nanotech Security Corp., a corporation governed under the BCBCA.

"**Nanotech Arrangement Resolution**" means the special resolution of Nanotech Shareholders, Nanotech Optionholders and holders of Nanotech RSUs approving the Arrangement and this Plan of Arrangement to be considered at the Nanotech Meeting.

"**Nanotech Circular**" means the notice of the Nanotech Meeting and accompanying management proxy circular, including all schedules, appendices and exhibits thereto and enclosures therewith, sent to the Nanotech Securityholders, as required by the Court in the Interim Order, in connection with the Nanotech Meeting, as amended, supplemented or otherwise modified from time to time in accordance with the terms of the Arrangement Agreement.

"**Nanotech Meeting**" means the special meeting of Nanotech Securityholders, including any adjournment or postponement thereof, to be called and held in accordance with the Interim Order to consider the Nanotech Arrangement Resolution, and for any other purpose as may be set out in the Nanotech Circular with the prior consent of META, acting reasonably.

"**Nanotech Optionholders**" means the holders at the relevant time of Nanotech Options.

"**Nanotech Options**" means, at any time, options exercisable to acquire Nanotech Shares granted under the Incentive Plan which are, at such time, outstanding, whether or not vested.

"**Nanotech RSU**" means a restricted share unit of Nanotech granted under the Incentive Plan which are, at the relevant time, outstanding, whether or not vested.

"**Nanotech Securityholders**" means Nanotech Shareholders, Nanotech Optionholders and holders of Nanotech RSUs.

"**Nanotech Shareholders**" means the holders of Nanotech Shares.

"**Nanotech Shares**" means, at any particular time, the issued and outstanding common shares in the capital of Nanotech at that time.

"**Nanotech Share Price**" means $1.25 per Nanotech Share. "**NASDAQ**" means the NASDAQ Capital Market.

"**Out-of-The-Money Option**" means a Nanotech Option that is not an In-The-Money Option.

"**person**" includes any individual, firm, partnership, limited partnership, limited liability partnership, joint venture, venture capital fund, limited liability company, unlimited liability company, association, trust, trustee, executor, administrator, legal personal representative, estate, body corporate, corporation, company, unincorporated association or organization, Governmental Entity, syndicate or other entity, whether or not having legal status.

"**Plan of Arrangement**" means this plan of arrangement, and any amendments or variations thereto made from time to time in accordance with the Arrangement Agreement, the plan of arrangement or upon the direction of the Court in the Final Order with the consent of META, Purchaser and Nanotech, each acting reasonably.

"**Purchaser**" means 1315115 BC Inc., a corporation existing under the laws of British Columbia.

"**TSXV**" means the TSX Venture Exchange Inc.

1.2 Headings and References

The division of this Plan of Arrangement into Articles and Sections and the insertion of headings are for convenience of reference only and do not affect the construction or interpretation of this Plan of Arrangement. Unless otherwise specified, references to Articles or Sections are to Articles and Sections, respectively, of this Plan of Arrangement.

1.3 Currency

Except as expressly indicated otherwise, all sums of money referred to in this Plan of Arrangement are expressed and shall be payable in lawful money of Canada and "$" refers to Canadian dollars.

1.4 Time

Time shall be of the essence in each and every matter or thing herein provided. Unless otherwise indicated, all times expressed herein are local time at Vancouver, British Columbia.

ARTICLE 2
THE ARRANGEMENT

2.1 Binding Effect

Subject to the terms of the Arrangement Agreement, the Arrangement will become effective at the Effective Time and shall be binding at and after the Effective Time on Nanotech, META, Purchaser, the Depositary and all holders and beneficial holders of Nanotech Shares, Nanotech Options and Nanotech RSUs including Dissenting Shareholders, without any further act or formality required on the part of any person.

2.2 The Arrangement

Commencing at the Effective Time on the Effective Date, subject to the terms and conditions of the Arrangement Agreement, the following shall occur as part of the Arrangement and shall be deemed to occur in the following order without any further act or formality:

(a) each Nanotech Share held by a Dissenting Shareholder shall be deemed to be transferred by the holder thereof, without any further act or formality on its part, free and clear of all Encumbrances (as such term is defined in the Arrangement Agreement), to Nanotech and Nanotech shall thereupon be obliged to pay the amount

therefor determined and payable in accordance with Article 3 hereof, subject to applicable withholdings in accordance with Section 4.4, such Dissenting Shareholder shall cease to be the holder of such Nanotech Shares and to have any rights as a holder of such Nanotech Shares, the name of such Dissenting Shareholder shall be removed from the central securities register of Nanotech as a holder of Nanotech Shares, and Nanotech shall be recorded as the registered holder of the Nanotech Shares so transferred and shall be deemed to be the legal owner of such Nanotech Shares (free and clear of all Encumbrances), which Nanotech Shares shall thereupon be cancelled and such Dissenting Shareholders will cease to have any rights as Nanotech Shareholders other than the right to be paid the fair value for their Nanotech Shares by Nanotech;

(b) each In-The-Money Option that is outstanding immediately prior to the Effective Time, whether or not vested, shall, without any further action on behalf of any holder thereof, be acquired for cancellation by Nanotech, free and clear of all Encumbrances, in consideration for a cash payment payable on behalf of Nanotech equal to the product obtained by multiplying the amount by which the Nanotech Share Price exceeds the exercise price per Nanotech Share of such In-The-Money Option by the number of Nanotech Shares underlying such In-The-Money Option, subject to applicable withholdings in accordance with Section 4.4, and the name of such holder will be removed from the applicable register of Nanotech as a holder of Nanotech Options. Each In-The-Money Option issued and outstanding immediately prior to the Effective Time shall thereafter immediately be cancelled and all option agreements related thereto shall be terminated and the holder thereof shall thereafter have only the right to receive the Consideration to which such holder is entitled pursuant to this Section 2.2(b);

(c) each Out-of-The-Money Option that is outstanding immediately prior to the Effective Time, whether or not vested, shall, without any further action on behalf of the holder of such Out-Of-The-Money Option, be cancelled without payment of any consideration to any holder thereof and all option agreements related thereto shall be terminated and the name of such holder will be removed from the applicable register of Nanotech as a holder of Nanotech Options and none of Nanotech, META and Purchaser shall have any liability with respect to such option agreements or Out-Of-The-Money Options;

(d) each Nanotech RSU that is outstanding immediately prior to the Effective Time, whether or not vested, shall, without any further action on the part of the holder thereof, be acquired for cancellation by Nanotech free and clear of all Encumbrances in consideration for a cash payment payable on behalf of Nanotech equal to the Nanotech Share Price, subject to applicable withholdings in accordance with Section 4.4, and each such Nanotech RSU issued and outstanding immediately prior to the Effective Time shall thereafter immediately be cancelled and the name of such holder will be removed from the applicable register of Nanotech as a holder of Nanotech RSUs and all Nanotech RSU agreements related thereto shall be terminated and the

holder thereof shall thereafter have only the right to receive the Consideration to which such holder is entitled pursuant to this Section 2.2(d); and

(e) each issued and outstanding Nanotech Share (other than Nanotech Shares held by META or an affiliate thereof or Dissenting Shareholders) held by a Nanotech Shareholder shall be transferred by the holder thereof, without any further action or formality on the part of the holder, free and clear of all Encumbrances, to Purchaser in exchange for a cash payment equal to the Nanotech Share Price, in accordance with Section 4.1 less any amounts withheld in accordance with Section 4.4.

The events provided for in this Section 2.2 will be deemed to occur on the Effective Date notwithstanding that certain of the procedures related thereto may not be completed until after the Effective Date.

2.3 Share Registers

Every registered Nanotech Shareholder (other than a Dissenting Shareholder or META or an affiliate thereof) from whom a Nanotech Share is transferred and acquired pursuant to the Arrangement shall cease to be a registered holder thereof and every Nanotech Shareholder shall be removed from the register of holders of Nanotech Shares at the Effective Time and shall cease to have any rights in respect of such Nanotech Shares, and Purchaser shall become the holder of such Nanotech Shares and shall be added to that register at the Effective Time and shall be entitled as of that time to all of the rights and privileges attached to the Nanotech Shares.

2.4 Adjustments to Consideration

Notwithstanding any restriction or any other matter in this Plan of Arrangement to the contrary, if, between the date of the Arrangement Agreement and the Effective Time, the issued and outstanding Nanotech Shares shall have been changed into a different number of shares or a different class by reason of any split, consolidation, reclassification, redenomination, reorganization, recapitalization or stock dividend of the issued and outstanding Nanotech Shares or similar event, provided such action is permitted by the Arrangement Agreement, then the Consideration shall be appropriately adjusted to provide to Nanotech Securityholders the same economic benefit as contemplated by this Plan of Arrangement prior to such action.

ARTICLE 3
DISSENT RIGHTS

3.1 Rights of Dissent

Registered holders of Nanotech Shares (other than META or an affiliate thereof) may exercise rights of dissent with respect to those Nanotech Shares held by such holder

pursuant to, and (except as expressly indicated to the contrary in this Section 3.1), in the manner set forth in Sections 237 to 247 of the BCBCA, as modified by this Section 3.1 and the Interim Order, and the Final Order, in connection with the Arrangement (the "**Dissent Rights**"); provided that, notwithstanding Section 242 of the BCBCA, the written objection to Arrangement Resolution must be received by Nanotech not later than 5:00 p.m. (Vancouver time) on the second Business Day before the Nanotech Meeting (as it may be adjourned or postponed from time to time); and provided further that, notwithstanding the provisions of the BCBCA, Nanotech Shareholders who duly exercise Dissent Rights and who have not withdrawn or been deemed to have withdrawn such exercise of Dissent Rights and who:

(a) ultimately are determined to be entitled to be paid fair value for their Nanotech Shares by Nanotech, which fair value, notwithstanding anything to the contrary contained in Section 245 of the BCBCA, shall be determined as of the time immediately prior to the approval of the Nanotech Arrangement Resolution**,** shall be deemed to have transferred those Nanotech Shares to Nanotech as of the Effective Time at the fair value in accordance with Section 2.2(a), without any

further act or formality and free and clear of all Encumbrances, to Nanotech and shall not be entitled to any other payment or consideration, including any payment that would be payable under the Arrangement had such holder not exercised their Dissent Rights in respect of such Nanotech Shares, and shall be deemed to not to have participated in the transactions in Article 2 (other than Section 2.2(a)); or

(b) ultimately are determined not to be entitled, for any reason, to be paid fair value for their Nanotech Shares, shall be deemed to have participated in the Arrangement on the same basis as a holder of Nanotech Shares who has not exercised Dissent Rights;

but in no case shall Nanotech, META, Purchaser, the Depositary or any other person be required to recognize any such holder as a holder of Nanotech Shares after the Effective Time, and the names of each such holder shall be deleted from the register of holders of Nanotech Shares at the Effective Time.

ARTICLE 4
PAYMENT AND CERTIFICATES

4.1 Payment of Consideration

As soon as reasonably practicable following receipt by Nanotech of the Final Order and in any event not later than the Business Day prior to the Effective Date, Purchaser shall deposit or cause to be deposited in escrow with the Depositary,

(a) for the benefit of the holders of Nanotech Shares, a cash amount equal to the aggregate Consideration payable to such holders in accordance with Section 2.2(e), and

(b) payable on behalf of Nanotech and for the benefit of the holders of In-the-Money Options and Nanotech RSUs, a cash amount equal to the aggregate Consideration payable to such holders in accordance with Sections 2.2(b) and 2.2(d), respectively,

and the aggregate amount of which shall be held by the Depositary as agent and nominee for Former Nanotech Securityholders for distribution to such Former Nanotech Securityholders in accordance with the provisions of this Plan of Arrangement.

Upon surrender to the Depositary by a holder of Nanotech Shares, Nanotech Options or Nanotech RSUs of a duly completed Letter of Transmittal or such other documents and instruments as the Depositary may reasonably require along with the certificate or certificates, if any, representing such securities transferred or disposed of under the Arrangement, such holder thereof shall be entitled to receive in exchange therefor, and promptly after the Effective Date the Depositary shall deliver, a cheque, wire transfer or other form of immediately available funds representing the Consideration which such holder is entitled to receive in accordance with Sections 2.2(b), 2.2(d) and 2.2(e) less any amounts withheld pursuant to Section 4.4, and any certificate so surrendered shall forthwith be cancelled. In the event of a transfer of ownership of Nanotech Shares which was not registered in the transfer records of Nanotech, the Consideration payable to the registered holder may be paid to the transferee if the certificate representing such Nanotech

Shares is presented to the Depositary, accompanied by a duly completed Letter of Transmittal and all documents required to evidence and effect such transfer. Without limiting the provisions of Section 2.3, until surrendered as contemplated by this Section 4.1, each certificate which immediately prior to the Effective Time represented one or more outstanding Nanotech Shares (other than Nanotech Shares held by META or any of its affiliates) that, under the Arrangement, were transferred pursuant to Section 2.2 shall be deemed at all times after the Effective Time to represent only the right to receive upon such surrender the Consideration to which the holder thereof is entitled under the Arrangement less any amounts withheld pursuant to Section 4.4.

No holder of Nanotech Shares, Nanotech Options or Nanotech RSUs shall be entitled to receive any consideration or entitlement with respect to such Nanotech Shares, Nanotech Options or Nanotech RSUs other than the applicable Consideration to which such holder is entitled to receive in accordance with Section 2.2, this Section 4.1 and the other terms of this Plan of Arrangement and, for greater certainty, no such holder will be entitled to receive any interest, dividends, premium or other payment in connection therewith.

4.2 Lost Certificates

In the event any certificate which immediately prior to the Effective Time represented one or more outstanding Nanotech Shares that were acquired by Purchaser pursuant to Section

2.2 shall have been lost, stolen or destroyed, upon the making of an affidavit of that fact by the person claiming such certificate to be lost, stolen or destroyed, the Depositary will deliver to such person or make available for pick up at its offices in exchange for such lost, stolen or destroyed certificate, a cheque or other form of immediately available funds representing the applicable Consideration which such holder is entitled to in accordance with Section 2.2 and such holder's Letter of Transmittal, less any amounts withheld pursuant to Section 4.4. When authorizing such payment in exchange for any lost, stolen or destroyed certificate, the person to whom the Consideration is payable shall, as a condition precedent to the payment thereof, give a bond satisfactory to Nanotech, META, Purchaser and its transfer agent (each acting reasonably) in such amount as META may direct or otherwise indemnify Nanotech, META and Purchaser in a manner satisfactory to Nanotech, META and Purchaser (each acting reasonably) against any claim that may be made against Nanotech, META or Purchaser with respect to the certificate alleged to have been lost, stolen or destroyed.

4.3 Extinction of Rights

Any certificate which immediately prior to the Effective Time represented outstanding Nanotech Shares that were acquired pursuant to Section 2.2 that is not deposited with all other instruments required by Section 4.1 on or prior to the sixth anniversary of the Effective Date shall cease to represent a claim or interest of any kind or nature in the applicable Consideration, and the Consideration that the holder of such Nanotech Shares was entitled to receive shall no longer be payable. On such date, the Consideration to which the former holder of the certificate referred to in the preceding sentence was ultimately entitled shall be deemed to have been donated and forfeited for no consideration to Purchaser or its successors and the interest of the holder of such Nanotech Shares in such Consideration shall be terminated. None of Nanotech, META, Purchaser or the Depositary shall be liable to any person in respect of any cash or property delivered to a public official pursuant to any applicable abandoned property, escheat or similar Law.

4.4 Withholding Rights

Nanotech, META, Purchaser, the Depositary, and any person making any payment on their behalf, in connection with the Arrangement shall be entitled to deduct and withhold from any dividend (actual or deemed for tax purposes), consideration or other amount otherwise payable to any person (including, for greater certainty, any Nanotech Shareholder, any holder of Nanotech Options or Nanotech RSUs and any Dissenting Shareholder), such amounts as Nanotech, META, Purchaser, the Depositary, or such person making any payment on their behalf, as applicable, is required to deduct and withhold with respect to such payment under the ITA, United States tax Laws or any other applicable Law or the administrative practice of any Governmental Entity, except when such person has paid such amount in cash to Nanotech, META, Purchaser or the Depository, as applicable, to enable it to comply with such deduction or withholding requirement. To the extent that amounts are so withheld, such withheld amounts shall be treated for all purposes hereof as having been paid to the holder of the securities in respect of which such deduction and

withholding was made; *provided* that such withheld amounts are actually remitted to the appropriate Governmental Entity.

4.5 Paramountcy

From and after the Effective Time: (i) this Plan of Arrangement shall take precedence and priority over any and all Nanotech Shares, Nanotech Options and Nanotech RSUs issued prior to the Effective Time; (ii) the rights and obligations of the registered holders of Nanotech Shares, Nanotech Options and Nanotech RSUs (other than META, Purchaser or any of their respective affiliates), and of Nanotech, META, Purchaser, the Depositary and any transfer agent or other depositary in relation thereto, shall be solely as provided for in this Plan of Arrangement and the Arrangement Agreement; and (iii) all actions, causes of action, claims or proceedings (actual or contingent and whether or not previously asserted) based on or in any way relating to any Nanotech Shares, Nanotech Options or Nanotech RSUs shall be deemed to have been settled, compromised, released and determined without liability except as set forth herein.

ARTICLE 5
AMENDMENT

5.1 Plan of Arrangement Amendment

(a) With the prior written consent of META and Purchaser, Nanotech may amend, modify and/or supplement this Plan of Arrangement at any time and from time to time, provided that any such amendment, modification and/or supplement must be contained in a written document that is filed with the Court and, if made after the Nanotech Meeting, approved by the Court and communicated to Nanotech Shareholders, Nanotech Optionholders and holders of Nanotech RSUs if and as required by the Court.

(b) With the prior written consent of META and Purchaser, any amendment, modification or supplement to this Plan of Arrangement may be proposed by Nanotech at any time before or at the Nanotech Meeting with or without any other prior notice or communication and, if so proposed and accepted by the persons voting at the Nanotech Meeting in the manner required under the Interim Order, shall become part of this Plan of Arrangement for all purposes.

(c) Any amendment, modification or supplement to this Plan of Arrangement that is approved or directed by the Court following the Nanotech Meeting shall be effective only if (i) it is consented to in writing by Nanotech, META and Purchaser, and (ii) if required by the Court, it is consented to by Nanotech Shareholders, Nanotech Optionholders and/or holders of Nanotech RSUs voting in the manner directed by the Court.

(d) With the prior written consent of META and Purchaser, any amendment, modification or supplement to this Plan of Arrangement may be made prior to the Effective Date by Nanotech and without the approval of the Court, Nanotech Shareholders, Nanotech Optionholders or holders of Nanotech RSUs, provided that it concerns a matter which, in the reasonable opinion of Nanotech, is of an administrative nature required to better give effect to the implementation of this Plan of Arrangement and is in no way adverse to the financial or economic interests of any Nanotech Shareholder, Nanotech Optionholder or holder of Nanotech RSUs.

(e) This Plan of Arrangement may be withdrawn prior to the Effective Time in accordance with the Arrangement Agreement.

ARTICLE 6
FURTHER ASSURANCES

Notwithstanding that the transactions and events set out in this Plan of Arrangement shall occur and shall be deemed to occur in the order set out in this Plan of Arrangement without any further act or formality, each of Nanotech, META and Purchaser shall make, do and execute, or cause to be made, done and executed, all such further acts, deeds, agreements, transfers, assurances, instruments or documents as may reasonably be required by any of them to document or evidence any of the transactions or events set out in this Plan of Arrangement.

ARTICLE 7
NOTICE

Any notice to be given by META or Purchaser to Nanotech Shareholders, Nanotech Optionholders or holders of Nanotech RSUs pursuant to the Arrangement will be deemed to have been properly given if it is mailed by first class mail, postage prepaid, to registered Nanotech Shareholders, Nanotech Optionholders or holders of Nanotech RSUs, as the case may be, at their addresses as shown on the applicable register of such holders maintained by Nanotech and will be deemed to have been received on the first day following the date of mailing which is a Business Day.

The provisions of this Plan of Arrangement, the Arrangement Agreement and the Letter of Transmittal apply notwithstanding any accidental omission to give notice to any one or more Nanotech Shareholders, Nanotech Optionholders or holders of Nanotech RSUs and notwithstanding any interruption of mail services in Canada, the United States or elsewhere following mailing. In the event of any interruption of mail service following mailing, META intends to make reasonable efforts to disseminate any notice by other means, such as dissemination by press release.

Notwithstanding the provisions of the Arrangement Agreement, this Plan of Arrangement and the Letter of Transmittal, cheques, if any, issuable, pursuant to the Arrangement need not be mailed if Purchaser determines that delivery thereof by mail may be delayed. Persons entitled to cheques which are not mailed for the foregoing reason may take delivery thereof at the office of the Transfer Agent in respect of which the certificates being issued were deposited, upon application to the Depositary, until such time as Purchaser has determined that delivery by mail will no longer be

delayed. Notwithstanding the provisions of the Arrangement Agreement, this Plan of Arrangement and the Letter of Transmittal, the deposit of cheques with the Depositary in such circumstances will constitute delivery to the persons entitled thereto and the Nanotech Shares will be deemed to have been paid for immediately upon such deposit.

SCHEDULE B
NANOTECH ARRANGEMENT RESOLUTION

BE IT RESOLVED AS A SPECIAL RESOLUTION THAT:

1. the arrangement (the "**Arrangement**") under Division 5 of Part 9 of the *Business Corporations Act* (British Columbia) (the "**BCBCA**") involving Meta Materials Inc. ("**META**"), Nanotech Security Corp. ("**Nanotech**"), 1315115 BC Inc. ("**Purchaser**") and the securityholders of Nanotech, as more particularly described and set forth in the management information circular of Nanotech (the "**Circular**") dated [●], 2021 accompanying the notice of this meeting, as the Arrangement may be, or may have been, modified, amended or supplemented in accordance with the definitive arrangement agreement (as it may be amended, the "**Arrangement Agreement**") made as of August 4, 2021 between META, Purchaser and Nanotech, and all transactions contemplated thereby, are hereby authorized, approved and adopted;

2. the plan of arrangement of Nanotech, as may be, or may have been, modified, amended or supplemented in accordance with its terms and the terms of the Arrangement Agreement (the "**Plan of Arrangement**"), implementing the Arrangement, the full text of which is set out in Appendix "[●]" to the Circular, is hereby authorized, approved and adopted;

3. the (i) Arrangement Agreement and related transactions, (ii) actions of the directors of Nanotech in approving the Arrangement Agreement, and (iii) actions of the directors and officers of Nanotech in executing and delivering the Arrangement Agreement, and any amendments, modifications or supplements thereto, are hereby ratified and approved;

4. Nanotech be and is hereby authorized and directed to apply for a final order from the Supreme Court of British Columbia (the "**Court**") to approve the Arrangement on the terms set forth in the Arrangement Agreement and the Plan of Arrangement (as they may be modified, amended or supplemented as described in the Circular);

5. notwithstanding that this resolution has been passed (and the Arrangement approved) by the shareholders of Nanotech or that the Arrangement has been approved by the Court, the directors of Nanotech are hereby authorized and empowered, without further notice to, or approval of, the shareholders of Nanotech to (i) modify, amend or supplement the Arrangement Agreement or the Plan of Arrangement to the extent permitted by the terms of the Arrangement Agreement or the Plan of Arrangement; and (ii) subject to the terms of the Arrangement Agreement, not to proceed with the Arrangement and related transactions;

6. any one director or officer of Nanotech is hereby authorized and directed for and on behalf of Nanotech to execute, whether under corporate seal of Nanotech or otherwise, and to deliver to the Registrar under the BCBCA any documents, if any, as are necessary or desirable to give effect to the Arrangement and the Plan of Arrangement in accordance with the Arrangement Agreement, such determination to be conclusively evidenced by the execution and delivery of such articles of arrangement and any such documents;

7. any one director or officer of Nanotech is hereby authorized and directed, for and on behalf and in the name of Nanotech, to execute or cause to be executed and to deliver or cause to be delivered, whether under corporate seal of Nanotech or otherwise, all such agreements, forms, waivers, notices, certificates, confirmations and other documents and instruments, and to perform or cause to be performed all such other acts and things, as in the opinion of such director or officer may be necessary, desirable or useful for the purpose of giving effect to these resolutions and the matters authorized thereby, the Arrangement Agreement, and completion of the Plan of Arrangement including:

   (a) all actions required to be taken by or on behalf of Nanotech, and all necessary filings and obtaining the necessary approvals, consents and acceptances of appropriate regulatory authorities; and

   (b) the signing of the certificates, consents and other documents or declarations required under the Arrangement Agreement or otherwise to be entered into by Nanotech;

such determination to be conclusively evidenced by the execution and delivery of such document, agreement or instrument or the doing of any such act or thing.

SCHEDULE C
REPRESENTATIONS AND WARRANTIES OF NANOTECH

Nanotech represents and warrants to and in favour of META and the Purchaser as follows, and acknowledges that META and the Purchaser are relying upon such representations and warranties in connection with the completion of the transactions contemplated herein:

(a) Schedule C(a) of the Nanotech Disclosure Letter sets forth the name and jurisdiction of incorporation and the directors and executive officers of Nanotech. (i) Nanotech is duly incorporated, validly existing and in good standing under the laws of its jurisdiction of incorporation and is up-to-date in respect of all material corporate filings; and (ii) has all requisite corporate power and capacity to carry on its business as now conducted and to own or lease and operate its assets and properties;

(b) Nanotech does not beneficially own, or exercise control or direction over, directly or indirectly, any interest in any other Person or any agreement, option or commitment to acquire any such investment.

(c) No steps or proceedings have been taken, instituted or, to the knowledge of Nanotech, are pending for the dissolution, liquidation or winding up of Nanotech. Nanotech: (i) is not insolvent or bankrupt under or pursuant to any corporate, insolvency, winding-up, restructuring, reorganization, administration or other Laws applicable to it; (ii) has not commenced, approved, authorized or taken any action in furtherance of proceedings in respect of it under any applicable bankruptcy, insolvency, restructuring, reorganization, administration, winding up, liquidation, dissolution, or similar Law; (iii) has not proposed a compromise or arrangement with its creditors generally, and is not or has not been subject to any actions taken, orders received or proceedings commenced by creditors or other Persons for or in respect of the bankruptcy, receivership, insolvency, restructuring, reorganization, administration, winding-up, liquidation or dissolution of it, or any of its property or assets; (iv) has not had any encumbrancer take possession of any of its property, or (v) has not had any execution or distress become enforceable or become levied upon any of its property. Nanotech is not unable to pay its liabilities as they become due and the realizable value of the assets of Nanotech are not less than the aggregate of its liabilities.

(d) Except as disclosed in Schedule C(d) of the Nanotech Disclosure Letter, Nanotech is, in all material respects, conducting its business in compliance with all applicable Laws (including all material applicable federal, provincial, state, municipal and local laws, regulations and other lawful requirements of any Governmental Entity) of each jurisdiction in which its business is carried on and is licensed, registered or qualified in all jurisdictions in which it owns, leases or operates its property or carries on business to enable its business to be carried on as now conducted and its property and assets to be owned or leased and operated and all such licenses, registrations and qualifications are valid, subsisting and in good standing and it has not received a notice of non-compliance, nor knows of, nor has reasonable grounds to know of, any facts that could

give rise to a notice of non-compliance with any such Laws, regulations or Permits which would reasonably be expected to result in a Nanotech Material Adverse Effect.

(e) Nanotech has the requisite corporate power and capacity to enter into this Agreement, and all other agreements and instruments to be executed by Nanotech as contemplated by this Agreement, and to perform its obligations hereunder and under such agreements and instruments. The execution and delivery of this Agreement and performance by Nanotech of its obligations under this Agreement and the consummation of the Arrangement and other transactions contemplated hereby have been duly authorized by all necessary corporate action of Nanotech and no other corporate proceedings on the part of Nanotech are necessary to authorize the execution, delivery and performance of this Agreement or the consummation of the Arrangement and the other transactions contemplated hereby other than the approval by the Nanotech Board of the Nanotech Circular, the approval by the Nanotech Securityholders in the manner required by the Interim Order, applicable Law and the approval of the Arrangement by the Court.

(f) This Agreement has been duly and validly executed and delivered by Nanotech and, assuming due authorization, execution and delivery by META and the Purchaser, constitutes a legal, valid and binding obligation of Nanotech, enforceable against Nanotech in accordance with its terms, subject however, to limitations with respect to enforcement imposed by Law in connection with bankruptcy, insolvency, reorganization or other Laws affecting creditors' rights generally and to the extent that equitable remedies such as specific performance and injunctions are only available in the discretion of the court from which they are sought.

(g) Other than the Interim Order and any approvals required by the Interim Order, the Final Order, filings with the BC Registrar under the BCBCA and such filings and other actions required under applicable Securities Laws and the Key Regulatory Approvals set out in Schedule F to the Agreement, no authorization, approval, order, license, filing, permit or consent of any Governmental Entity, and no notice, registration, declaration or filing by Nanotech with any such Governmental Entity is required in connection with the execution and delivery of, and performance by Nanotech of its obligations under, this Agreement or the consummation of the Arrangement and the other transactions contemplated in this Agreement.

(h) There is no requirement under any Nanotech Material Contract (as defined below) to which Nanotech is a party or by which Nanotech is bound or has any rights to make a filing with, give any notice to, or to obtain the consent or approval of, or make a payment to, any party to such Nanotech Material Contract or any other Person relating to the transactions contemplated by this Agreement.

(i) The execution and delivery of this Agreement by Nanotech, the performance by Nanotech of its obligations hereunder and the consummation of the transactions contemplated hereby do not and will not (whether after notice or lapse of time or both) (i) conflict with or result in a breach or violation of any of the terms or provisions of, or

constitute a default under (whether after notice or lapse of time or both) or give rise to any right of termination or acceleration of any obligations or indebtedness or payment, and Nanotech is not currently in material breach or default of, (A) any Law applicable to Nanotech; (B) the constating documents, by-laws or resolutions of Nanotech; (C) any Contract or Debt Instrument to which Nanotech is a party or by which it is bound, or (D) any judgment, decree or order binding Nanotech, or the assets or properties thereof; (ii) allow any Person to exercise any rights, require any consent or other action by any Person or permit the termination, cancellation, acceleration or other change of any right or other obligation or the loss of any benefit to which Nanotech is entitled (including by triggering any rights of first refusal or first offer, change in control provision or other restriction or limitation) under any Material Contract; or (iii) result in the creation or imposition of any Encumbrance up on any of Nanotech's assets.

(j) Schedule C(j) of the Nanotech Disclosure Letter sets forth the authorized, issued and outstanding share capital of Nanotech. All of the issued and outstanding shares in the capital of, or other equity or voting interests in, Nanotech has been duly authorized and validly issued in compliance with applicable Laws and, is fully paid and non-assessable, were not issued in violation of any pre-emptive rights, purchase options, call options, rights of first refusal, first offer, co-sale or participation or subscription rights or other similar rights. Schedule C(n) of the Nanotech Disclosure Letter sets forth a list of all other securities of Nanotech.

(k) Nanotech is not aware of any legislation or proposed legislation published by a legislative body, which it anticipates will result in a Nanotech Material Adverse Effect.

(l) To the knowledge of Nanotech, none of Nanotech's executive officers is now, or in the last ten (10) years has been, subject to an order or ruling of any securities regulatory authority or securities exchange prohibiting such individual from acting as an officer of a public company or of a company listed on a particular securities exchange.

(m) No order, ruling or determination having the effect of suspending the sale or ceasing the trading in any securities of Nanotech has been issued by any regulatory authority and is continuing in effect and no proceedings for that purpose have been instituted or, to the knowledge of Nanotech, are pending, contemplated or threatened by any regulatory authority.

(n) Except for the securities set forth in Schedule C(n) of the Nanotech Disclosure Letter, no Person now has any agreement or option or right or privilege (whether at law, pre-emptive or contractual) capable of becoming an agreement for the purchase, subscription, redemption, repurchase or issuance of, or conversion or exchange into, any shares, securities, warrants or convertible obligations of any nature of Nanotech and a sufficient number of Nanotech Shares are reserved for issuance pursuant to outstanding options, warrants, share incentive plans, convertible, exercisable and exchangeable securities and other rights to acquire Nanotech Shares. Schedule C(n) of the Nanotech Disclosure Letter sets forth all issued and outstanding securities of

Nanotech convertible into Nanotech Shares, their grant and expiration date, exercise price and number of Nanotech Shares into which they are exercisable, as applicable.

(o) The Nanotech Financial Statements (i) have been prepared in accordance with IFRS applied on a consistent basis throughout the periods involved (except as may be indicated in the notes thereto) and (ii) fairly present, in all material respects, the consolidated financial position (including the assets and liabilities, whether absolute, contingent or otherwise as required by IFRS) of Nanotech as at the respective dates thereof and the consolidated results of their operations and cash flows for the periods indicated and contain and reflect adequate provisions for all reasonably anticipated liabilities, expenses and losses of Nanotech in accordance with IFRS and there has been no change in accounting policies or practices of Nanotech since October 1, 2020, that would be required to be disclosed in the Nanotech Financial Statements in accordance with IFRS, except as described in the notes thereto. There has been no material adverse change in the consolidated financial position of Nanotech since the date of the latest balance sheet included in the Nanotech Financial Statements. There are no material off-balance sheet transactions, arrangements, obligations (including contingent obligations) or other relationships of Nanotech with unconsolidated entities or other Persons. Since October 1, 2020, there have been no formal investigations regarding financial reporting or accounting policies and practices discussed with, reviewed by or initiated at the direction of the chief executive officer or chief financial officer of Nanotech, the Nanotech Board or any committee thereof. Since October 1, 2020, neither Nanotech nor its independent auditors have identified (i) any significant deficiency or material weakness in the system of internal accounting controls utilized by Nanotech, (ii) any fraud, whether or not material, that involves Nanotech's management or other employees who have a role in the preparation of financial statements or the internal accounting controls utilized by Nanotech, or (iii) any claim or allegation regarding any of the foregoing. Except as disclosed in the Nanotech Financial Statements, Nanotech does not have any liabilities, indebtedness, obligation, expense, claim, deficiency, guaranty, or endorsement, whether accrued, absolute, contingent, matured, or unmatured of the kind required to be disclosed on a balance sheet or in the related notes to the consolidated financial statements prepared in accordance with IFRS which are, individually or in the aggregate, material to the business, results of operations or financial condition of Nanotech taken as a whole, except liabilities (i) identified in the balance sheet of Nanotech as of March 31, 2021 or the notes thereto, (ii) described on Schedule C(o) of the Nanotech Disclosure Letter, (iii) executory obligations under any Contract or (iv) incurred since the date of the balance sheet of Nanotech as of March 31, 2021 in the ordinary course of business consistent with past practices. Nanotech does not intend to correct or restate, nor is there any basis for any correction or restatement of, any aspect of the Nanotech Financial Statements.

(p) Since October 1, 2020 through the date of this Agreement and other than with respect to the negotiation, execution and performance of this Agreement, Nanotech has conducted its business only in the ordinary course of business consistent with past practice, and there has not been: (a) any event that has had a Nanotech Material Adverse Effect, or (b) any material change by Nanotech in its accounting methods, principles or

practices, except as required by concurrent changes in IFRS or as disclosed in the notes to the Nanotech Financial Statements.

(q) Nanotech does not have any material liabilities or obligations of any nature, whether or not accrued, contingent or otherwise, except for: (i) liabilities and obligations that are adequately presented or reserved on the Nanotech Financial Statements or disclosed in the notes thereto; or (ii) liabilities and obligations incurred in the ordinary course of business consistent with past practice that are not and would not, individually or in the aggregate with all other liabilities and obligations of Nanotech (other than those disclosed on the Nanotech Financial Statements), be material to Nanotech. Without limiting the foregoing, the Nanotech Financial Statements reflects reasonable reserves in accordance with IFRS for contingent liabilities of Nanotech.

(r) Nanotech maintains a system of internal accounting controls sufficient to provide reasonable assurances that (i) transactions are executed in accordance with management's general or specific authorization; and (ii) transactions are recorded as necessary to permit preparation of financial statements in conformity with IFRS and to maintain accountability for assets.

(s) There are no actions, proceedings or, to Nanotech's knowledge, investigations (whether or not purportedly by or on behalf of Nanotech) commenced or, to the knowledge of Nanotech, threatened or pending against or relating to Nanotech or the business thereof or affecting any of their assets and properties or against any current officer or director relating to such individual's role with Nanotech at law or in equity (whether in any court, arbitration or similar tribunal) or before or by any Governmental Entity.

(t) Nanotech is not party to any Contract or arrangement, nor to the knowledge of Nanotech, is there any shareholders agreement or other Contract, which in any manner affects the voting control of any of the securities of Nanotech.

(u) All Taxes due and payable by Nanotech, have been paid. All Tax Returns required to be filed by Nanotech have been filed with all appropriate Governmental Entities and all such Tax Returns did not contain a misrepresentation as at the respective dates thereof. To the knowledge of Nanotech, no examination of any Tax Return of Nanotech is currently in progress and there are no issues or disputes outstanding with any Governmental Entity respecting any Taxes that have been paid, or may be payable, by Nanotech. Nanotech has timely and properly collected all material sales, use, value-added and similar Taxes required to be collected, and has remitted such amounts on a timely basis to the appropriate Governmental Entity. Nanotech has not been, is not, and immediately prior to the Effective Date will not be, treated as an "investment company" within the meaning of Section 368(a)(2)(F) of the U.S. Tax Code. Nanotech has not taken any action, nor to the knowledge of Nanotech are there any facts or circumstances not set forth in this Agreement or the Plan of Arrangement, that could reasonably be expected to prevent the Arrangement from qualifying as a "reorganization" within the meaning of Section 368(a) of the U.S. Tax Code.

(v) Neither Nanotech nor, to Nanotech's knowledge, any other Person, is in default or breach in any material respect in the observance or performance of any term, covenant or obligation to be performed by Nanotech or such other Person under any Nanotech Material Contract, and there exists no condition, event or act which, with notice or lapse of time or both, would constitute such a default or breach by Nanotech or, to Nanotech's knowledge, any other party, under any Nanotech Material Contract or which would give rise to a right of termination on the part of any other party to a Nanotech Material Contract, except where such default or event would not reasonably be expected to result in a Nanotech Material Adverse Effect.

(w) Since October 1, 2020, through the date of this Agreement and other than with respect to the negotiation, execution and performance of this Agreement and the transactions contemplated herein:

(i) Except as disclosed in Schedule C(w)(i) of the Nanotech Disclosure Letter or the Nanotech Financial Statements, there has not been any material change in the assets, liabilities, obligations (absolute, accrued, contingent or otherwise), business, condition (financial or otherwise) or results of operations of Nanotech;

(ii) Except as disclosed in Schedule C(w)(ii) of the Nanotech Disclosure Letter or the Nanotech Financial Statements, there has not been any material change in the share capital of Nanotech;

(iii) Except as disclosed in Schedule C(w)(iii) of the Nanotech Disclosure Letter or the Nanotech Financial Statements, there has not been any incurrence, assumption or guarantee by Nanotech of any material debt for borrowed money, any creation or assumption by Nanotech of any Encumbrance (other than a Permitted Encumbrance) or any making by Nanotech of any material loan, advance or capital contribution or investment in any other Person;

(iv) There has been no dividend or distribution of any kind declared, paid or made by Nanotech on any Nanotech Shares;

(v) There has not been any acquisition or sale by Nanotech of any material property or assets;

(vi) Nanotech has not effected or passed any resolution to approve a split, consolidation or reclassification or any of the outstanding Nanotech Shares;

(vii) No Nanotech Material Contract (as defined below) has been entered into or amended other than (A) in the ordinary course of business consistent with past practice, or (B) renewals of any such contract, as set out in Schedule C(w)(vii) of the Nanotech Disclosure Letter;

(viii) There has not been any satisfaction or settlement of any material claims or material liabilities, other than the settlement of such claims or such liabilities in the ordinary course of business consistent with past practice;

(ix) Except as set out in Schedule C(w)(ix) of the Nanotech Disclosure Letter and except for ordinary course adjustments to salary, bonus, or other remuneration payable to any officers or senior or executive officers, there has not been any increase in the salary, bonus, severance, termination pay, change of control entitlements or other remuneration payable to any senior or executive officers of Nanotech; and

(x) Nanotech has carried on its business in the ordinary course consistent with past practice.

(x) There has been no interruption to or discontinuity in any supplier or distributor arrangement or relationship of Nanotech with its principal suppliers and distributors and the relationships of Nanotech with its principal suppliers and distributors are satisfactory, and there are no unresolved disputes with any such supplier or distributor. No supplier or distributor of Nanotech has notified Nanotech that such supplier or distributor will not continue dealing with Nanotech on substantially the same terms as presently conducted, and to the knowledge of Nanotech, there is no reason to believe that, any such supplier or distributor will not continue dealing with Nanotech on substantially the same terms as presently conducted, in each case subject to changes in pricing and volume in the ordinary course.

(y) The relationships of Nanotech with its customers are satisfactory, and there are no unresolved disputes with any such customer.

(z) Nanotech possesses permits, licenses, approvals, consents and other authorizations issued by a federal, provincial, state, local or foreign regulatory agencies or bodies (in this Schedule C, collectively, "**Governmental Licenses**") required by Law to conduct the business now operated by it, except where the failure to hold such Governmental Licenses would not, individually or in the aggregate, result in a Nanotech Material Adverse Effect. Each Governmental License is valid and in full force and effect, and is renewable by its terms or in the ordinary course without the need for Nanotech to comply with any special rules of procedures, agree to any materially different terms or conditions or pay any amounts other than routine filing fees. To the knowledge of Nanotech, Nanotech is in compliance in all material respects with the terms and conditions of all such Governmental Licenses. No consent, licence, order, authorization, approval, permit, registration or declaration of, or filing with, any Governmental Entity or other Person (including without limitation any consent, approval, order or filing pursuant to any applicable bulk sales laws or similar laws) is required in connection with: (i) the closing of the Arrangement; (ii) the execution and delivery by Nanotech of this Agreement or any document delivered by Nanotech at the closing of the Arrangement to which it is a party; (iii) the observance and performance by Nanotech

of its obligations under this Agreement or any document delivered by Nanotech at the closing of the Arrangement to which it is a party; or (iv) avoiding the loss of any Governmental Licenses relating to Nanotech, any of their properties and assets, or the business now operated by them.

(aa) To the knowledge of Nanotech, no event has occurred that, with or without notice or lapse of time or both, would reasonably be expected to result in the revocation, suspension, lapse or limitation of any Governmental License.

(bb) There are no actions, proceedings or, to Nanotech's knowledge, investigations commenced or, to the knowledge of Nanotech, pending in respect of or regarding any such Governmental License. Nanotech has not received any written notice of revocation or non-renewal of any Governmental License, or of any intention of any Person to revoke or refuse to renew any of such Governmental License.

(cc) Other than as disclosed in Schedule C(cc) of the Nanotech Disclosure Letter, none of the directors, officers or employees of Nanotech, any known holder of more than five percent (5%) of any class of shares of Nanotech, or any known associate or affiliate of any of the foregoing Persons, has had any material interest, direct or indirect, in any material transaction or any proposed material transaction with Nanotech which, as the case may be, materially affected, is material to or will materially affect Nanotech.

(dd) Other than the Nanotech Financial Advisor, there is no Person acting or purporting to act at the request of Nanotech who is entitled to any brokerage, agency or other fiscal advisory or similar fee in connection with the transactions contemplated by this Agreement and the Plan of Arrangement.

(ee) The Nanotech Financial Advisor is not entitled receive a success or any other type of contingent fee or payment in connection with the Arrangement.

(ff) Nanotech does not have any loan or other indebtedness outstanding which has been made to any of its securityholders, officers, directors or employees, past or present, or any Person not dealing at arm's length with it, other than for the reimbursement of ordinary course business expenses.

(gg) Except for (i) employment, consulting or employment compensation agreements entered into in the ordinary course of business, (ii) customary director and officer indemnification arrangements on market terms, or (iii) financing agreements or shareholder agreements with the shareholders of Nanotech entered into in connection with financings or other transactions to which Nanotech shareholders are generally parties and that will terminate at or prior to the Effective Time as a result of the Arrangement, there are no current contracts or other transactions (including relating to indebtedness by Nanotech) between Nanotech on the one hand, and (a) any officer or director of Nanotech, (b) any holder of record or beneficial owner of five percent (5%)

or more of the voting securities of Nanotech, or (c) any affiliate or associate of any officer, director or beneficial owner, on the other hand, except as disclosed in Schedule C(gg) of the Nanotech Disclosure Letter.

(hh) To the knowledge of Nanotech, none of Nanotech's directors or officers is now, or in the last ten (10) years has been, subject to an order or ruling of any securities regulatory authority or securities exchange prohibiting such individual from acting as a director or officer of a public company or of a company listed on a particular securities exchange.

(ii) The assets and properties of Nanotech and its business and operations are insured against loss or damage with responsible insurers on a basis consistent with insurance obtained by reasonably prudent participants in comparable businesses, and such coverage is in full force and effect, and Nanotech has not failed to promptly give any notice or present any material claim thereunder. Schedule C(ii) of the Nanotech Disclosure Letter sets out a true and complete summary of the insurance policies of Nanotech.

(jj) Schedule C(jj) of the Nanotech Disclosure Letter includes a complete and accurate list of all real or immovable property owned by Nanotech (the "**Nanotech Owned Real Property**"). Except for Nanotech Owned Real Property, Nanotech does not own any real or immovable property, and has not agreed to acquire any real or immovable property or any interest in any immovable property. Except for the Nanotech Owned Real Property, over the past seven years Nanotech has never owned any real or immovable property, Nanotech is the only occupant of the Nanotech Owned Real Property.

(kk) Except as disclosed in Schedule C(kk) of the Nanotech Disclosure Letter, the Nanotech Owned Real Property is in good operating condition, ordinary wear and tear excepted.

(ll) Nanotech has good and marketable title to all Nanotech Owned Real Property (as both registered and beneficial owner), free and clear of all Encumbrances or restrictions of any kind (except Permitted Encumbrances), except such as do not materially affect the value of such property and do not materially interfere with the use made and proposed to be made of such property by Nanotech. There are no outstanding options or right of first refusal to purchase the Nanotech Owned Real Property, or any portion thereof or interest therein, and Nanotech holds all rights of occupation, easements, rights of way and such other real property interests as are required for the location, access, construction, ownership, maintenance and operation of the business Nanotech. Except as disclosed in Schedule C(ll) of the Nanotech Disclosure Letter, Nanotech is not party to, or bound by, any agreement to sell, transfer or acquire any interest in any real property, including the Nanotech Owned Real Property, and there is no other Person in possession of all or any portion of the Nanotech Owned Real Property.

(mm) The Nanotech Owned Real Property does not violate, contravene or breach, and the Nanotech Owned Real Property is used in compliance with, Laws and Permits

applicable thereto, in all material respects, including but not limited to zoning by-laws and regulations. All Permits necessary in connection with the present use and operation by Nanotech of the Nanotech Owned Real Property and the lawful occupancy by Nanotech thereof have been issued by the appropriate Governmental Entity. To the knowledge of Nanotech, Nanotech is not in breach of any of the obligations which may be imposed upon itself with respect to the operation of the Nanotech Owned Real Property.

(nn) Nanotech has not received any written notice of claims, summons, order, direction or other written communication relating to Nanotech's non-compliance with any Laws from any Governmental Entity or other third party with respect to the Nanotech Owned Real Property.

(oo) Except as disclosed in Schedule C(oo) of the Nanotech Disclosure Letter, none of the facilities currently existing on any of the Nanotech Owned Real Property encroaches upon, and any facilities under construction on any of the Nanotech Owned Real Property will not encroach upon, the real or immovable property of any other Person. No facility of any other Person encroaches upon any of the Nanotech Owned Real Property.

(pp) Each facility currently existing on any of the Nanotech Owned Real Property is supplied with utilities and other services (including gas, electricity, water, drainage, sanitary sewer, storm sewer, fire protection and telephone) necessary for the operation of such facility as the same is currently operated. The Nanotech Owned Real Property has a valid and enforceable right to access by Persons or vehicles to a public road.

(qq) Except as disclosed in Schedule C(qq) of the Nanotech Disclosure Letter, Nanotech is the registered and beneficial owner of the lands and buildings located on the Quebec Nanotech Owned Real Property, no servitude has been created which would charge the Quebec Nanotech Owned Real Property and impede the operation of business as currently conducted and no new construction or modification to the existing buildings has been undertaken and no new construction has been erected by a neighbour which would be situate on or within the limits of the Quebec Nanotech Owned Real Property.

(rr) The Quebec Nanotech Owned Real Property has not received any notice of any title claims over the past seven years in respect of the property.

(ss) The certificate of location prepared by Daniel Lacroix, Quebec land surveyor, dated April 27, 2010 and issued under his minute number 11543, reference number 2010-03-40 (the "**Certificate of Location**"), accurately describes the current state of the Quebec Nanotech Owned Real Property and the location of the buildings and constructions erected thereon, save and except for the cadastral designation of the Quebec Nanotech Owned Real Property which has changed pursuant to a cadastral renovation.

(tt) To the knowledge of Nanotech, the Quebec Owned Real Property is not a recognized or a classified cultural property and is not situated in a historical or natural district, within a classified historic site or in a protected area within the meaning of any applicable Law, nor is it subject to any restriction under the *Cultural Heritage Act* (Québec).

(uu) To the knowledge of Nanotech, except as disclosed in Schedule C(uu) of the Nanotech Disclosure Letter, the Quebec Nanotech Owned Real Property is not part of land protected for agricultural purposes under the *Act to Preserve Agricultural Land and Agricultural Activities* (Québec). Nanotech does not owe any monies to any Person for labour, materials, work or services performed, rendered or supplied to or in connection with the Nanotech Owned Real Property for which such Person could claim an Encumbrance, and there are no legal hypothec or similar lien, including but not limited to legal hypothec(s) for persons having taken part in the construction or renovation of an immovable, registered or threatened to be registered against the Nanotech Owned Real Property.

(vv) To the knowledge of Nanotech, except as disclosed in Schedule C(vv), there are no facts relevant to the Nanotech Owned Real Property which could significantly increase the expenses for its maintenance and upkeep and no event has occurred and no circumstance exists that might give rise to any of the foregoing.

(ww) There have been no transfers of ownership by the Corporation in respect of the Quebec Nanotech Owned Real Property or any portion thereof which have not been published or registered at the land registry office for the registration division in which the Quebec Nanotech Owned Real Property is situated.

(xx) Except as disclosed in Schedule C(xx), no business or operations are conducted at or on any of the Nanotech Owned Real Property other than those of Nanotech. The Nanotech Owned Real Property is zoned to permit all of its current uses, including uses by any lessee, and the buildings, plants, structures, erections, improvements, appurtenances and fixtures located thereon comply in all material respects with the by-laws and building codes of the municipality in which it is situated. No part of the Nanotech Owned Real Property is subject to any building or use restriction that would restrict or prevent the use and operation of the Nanotech Owned Real Property for its current use. The Corporation has no outstanding application for a re-zoning of the Nanotech Owned Real Property and, to the knowledge of Nanotech, no proposed change to any zoning affecting the Nanotech Owned Real Property was publicly announced by any Governmental Entity.

(yy) All mutation or transfer duties applicable to the acquisition by Nanotech of all or any portion of the Quebec Nanotech Owned Real Property pursuant to the provisions of the *Act respecting Duties on Transfers of Immovables* (Québec), have been previously invoiced by the relevant municipality or Governmental Entity and have been entirely paid, without subrogation, or, if they have not yet been invoiced, a provision has been

taken in the financial statements therefor. There have been no transfers (whether published or not) in favour of Nanotech of any of the Nanotech Owned Real Property made in reliance upon an exemption from transfer duties (mutation taxes) pursuant to the *Act respecting Duties on Transfers of Immovables* (Québec).

(zz) To the knowledge of Nanotech, all Taxes with respect to the Nanotech Owned Real Property that are due have been paid in full, and there are no local improvement charges or special levies outstanding in respect of the Nanotech Owned Real Property and Nanotech has not received any written notice of proposed local improvement charges or special levies.

(aaa) To the knowledge of Nanotech, there are no ongoing contestations of any Taxes or municipal assessments with respect to the Nanotech Owned Real Property by Nanotech.

(bbb) There are no claims judicial or administrative, by any party, pending or, to the knowledge of Nanotech, threatened, by or against or affecting Nanotech with respect to the Nanotech Owned Real Property.

(ccc) No order has been issued, or to the knowledge of Nanotech, is threatened, with respect to any of the Nanotech Owned Real Property, the use thereof by Nanotech, or any buildings, plants, structures, fixtures and improvements located thereon including any order advising of any defects in the construction or state of repair thereof, or advising of any other non-compliance with any applicable Law, including with respect to fire, safety, land use planning, zoning, construction, occupancy or otherwise which could require performance of work or expenditure of money to correct.

(ddd) The Nanotech Owned Real Property is not subject to any expropriation in respect of which Nanotech has received any written notice, and there is no condemnation, expropriation or other similar proceedings pending, or the knowledge of Nanotech, threatened in respect of the Nanotech Owned Real Property or any part thereof.

(eee) Copies of all written contracts in force with respect to the Nanotech Owned Real Property have been remitted to META, including but not limited to any and all service agreements, supplying agreements, construction agreements, enterprise agreements or any other agreements with respect to the Nanotech Owned Real Property.

(fff) Copies of all deeds and other instruments by which Nanotech acquired the Nanotech Owned Real Property, and copies of all title insurance policies and certificates of location or opinions on title in the possession of Nanotech relating to the Nanotech Owned Real Property have been delivered to META.

(ggg) Schedule C(ggg) of the Nanotech Disclosure Letter includes a completed an accurate list of each real or immovable property or premise currently leased by Nanotech as well as the agreements governing such leases, together with any amendments, extensions and

waivers thereto and sets out, in respect of each such lease, the identity of the landlord and of the tenant, a description of the leased premises (by municipal address and proper legal description), the term of the lease (specifying the current expiration date), the space occupied, the rental payments under the lease (specifying any breakdown of base rent and additional rents and the date through which such payments have been made), any security deposit, any rights of renewal or termination and the terms thereof, any "continuous operation" requirements and any restrictions on use of any leased premises or on assignment or change of control of the tenant. Each real or immovable property currently leased by Nanotech (the "**Nanotech Leased Property**") is occupied by Nanotech as tenant is in actual possession and Nanotech has the right to occupy and use the Nanotech Leased Property, subject to the terms of the respective leases, and each of the leases pursuant to which Nanotech occupies such Nanotech Leased Property is valid, legally binding and enforceable against Nanotech, and to the knowledge of Nanotech, the other parties in accordance with its terms is in good standing and in full force and effect, and Nanotech is not in breach of, or default under, such lease, sublease, license or occupancy agreement, and no event has occurred which, with notice, lapse of time or both, would constitute such a breach or default by Nanotech or permit termination, modification or acceleration by any third party thereunder. No third party has repudiated or has the right to terminate or repudiate any such lease (except for the normal exercise of remedies in connection with a default thereunder or any termination rights set forth in the lease) or any provision thereof. None of the aforementioned leases has been assigned by Nanotech or by the landlord, as the case may be, in favour of any Person or sublet or sublicensed. There exists no claim of any kind or right of set-off against Nanotech, as the case may be, as tenant by the landlord or against the landlord by Nanotech, as the case may be, as tenant as of the date hereof. Nanotech is not in arrears of rent required to be paid pursuant to any applicable lease, including but not limited under the terms of any COVID-19-related rent abatement, reduction or other set-off agreement. Nanotech owns, leases or licences all personal or movable property as is necessary to conduct its business as presently conducted, and Nanotech has good and valid title to, or a valid and enforceable interest (whether a leasehold interest or otherwise) in, all of such personal or movable property.

(hhh) The minute books and records of Nanotech made available to META and its counsel in connection with their due diligence investigation in respect of the Arrangement contain full, true and correct copies of all constating documents, including all amendments thereto, and contain copies of all proceedings of securityholders and directors (and committees thereof) and are complete in all material respects.

(iii) Schedule C(iii) of the Nanotech Disclosure Letter sets out separately all Intellectual Property owned by Nanotech that has been registered or for which applications for registration have been filed and all other material Intellectual Property that is owned by Nanotech (in this Schedule C, the "**Nanotech Owned Intellectual Property**") and the Intellectual Property that is duly licensed by Nanotech as part of its business as presently conducted (in this Schedule C, the "**Nanotech Licensed Intellectual Property**", and together with the Nanotech Owned Intellectual Property, the "**Nanotech Intellectual Property**"). Nanotech is the sole and exclusive owner of the Nanotech Owned

Intellectual Property and all other Intellectual Property that it owns or purports to own with good, valid and marketable title thereto, free and clear of all Encumbrances (other than Permitted Encumbrances). Schedule C(iii) of the Nanotech Disclosure Letter lists all license agreements to which Nanotech is a party or by which it is bound (whether as licensor, licensee or otherwise) with respect to the Intellectual Property, excluding any licenses for unmodified, commercially-available, off-the-shelf software, for which Nanotech pays a license fee of more than $1,000 in the aggregate annually. Nanotech has valid and enforceable licenses to use all of the Nanotech Licensed Intellectual Property used by it in connection with, and as required for, its business as presently conducted. Nanotech has no knowledge to the effect that it will be unable to obtain or maintain any rights or licenses to use all Intellectual Property necessary for the conduct of its business. To the knowledge of Nanotech, the Nanotech Owned Intellectual Property and the Nanotech Licensed Intellectual Property constitute all of the Intellectual Property required by Nanotech to conduct its business as currently conducted. To the knowledge of Nanotech, no third parties have rights to any Nanotech Intellectual Property, except for the ownership rights of the owners of the Nanotech Licensed Intellectual Property which is licensed to Nanotech. Except as disclosed in Schedule C(iii) of the Nanotech Disclosure Letter, to the knowledge of Nanotech, there is no infringement, misappropriation or misuse by third parties of any Nanotech Owned Intellectual Property. There is no pending or, to the knowledge of Nanotech, threatened action, suit, proceeding or claim by third parties challenging the rights in or to any Nanotech Owned Intellectual Property, and Nanotech is not aware of any facts which form a reasonable basis for any such claim. The Nanotech Owned Intellectual Property that is the subject of an application or registration is valid, in full force and effect. There is no pending or, to the knowledge of Nanotech, threatened action, suit, proceeding or claim by others challenging the validity or enforceability of any Nanotech Owned Intellectual Property, and Nanotech is not aware of any allegations or finding of unenforceability or invalidity of the Nanotech Owned Intellectual Property or any facts which form a reasonable basis for any such claim. All applications, registrations, filings, renewals and payments necessary to preserve the rights of Nanotech in and to Nanotech Owned Intellectual Property have been duly filed, made, prosecuted, maintained, paid, are in good standing and are recorded in the name of Nanotech. There is no pending or, to the knowledge of Nanotech, threatened action, suit, proceeding or claim by third parties that Nanotech infringes, misappropriates or otherwise violates any patent, trademark, copyright, trade secret or other proprietary rights of others. To the knowledge of Nanotech, neither the conduct of the business of Nanotech nor the products, services or processes of Nanotech infringe, misappropriate or otherwise violate any patent, trademark, copyright, trade secret or other proprietary rights of third parties and, without limiting the foregoing, to the knowledge of Nanotech, there is no patent or patent application by third parties that contains claims that interfere with the issued or pending claims of any Nanotech Owned Intellectual Property.

(jjj) Except in respect of the Intellectual Property set forth in Schedule C(jjj) of the Nanotech Disclosure Letter, no licenses or other rights have been granted to any third party in, to and in respect of the Nanotech Owned Intellectual Property.

(kkk) Other than in respect of those contracts disclosed in Schedule C(kkk) of the Nanotech Disclosure Letter, Nanotech is not a party to or bound by any Contract or other obligation that limits or impairs its ability to use, sell, transfer, assign or convey, or that otherwise affects any Nanotech Intellectual Property.

(lll) Except as set forth in Schedule C(lll) of the Nanotech Disclosure Letter, Nanotech is not obligated to pay any royalties, fees or other compensation to any third party in respect of its ownership, use, practice, exploitation or commercialization of any Intellectual Property.

(mmm) Except as disclosed in Schedule C(mmm) of the Nanotech Disclosure Letter, Nanotech has not received any funding from a Governmental Entity that impacts or has the potential to impact Nanotech's ownership, use, practice, exploitation or commercialization of the Nanotech Owned Intellectual Property. Except as disclosed in Schedule C(mmm) of the Nanotech Disclosure Letter, to the knowledge of Nanotech, no employee, contractor, consultant or other service provider of Nanotech, who was involved in, or who contributed to, the creation or development of the Nanotech Owned Intellectual Property, has performed services for any government, university, college or other educational institution or research centre or government funded institution during a period of time during which such Person worked for Nanotech.

(nnn) Except as disclosed in Schedule C(nnn) of the Nanotech Disclosure Letter, no permits, licenses, approvals, consents or other authorizations issued by any federal, provincial, state, local or foreign regulatory agency or body are required to import or sell the products of Nanotech.

(ooo) All current and former employees of, and current and former consultants (excluding consultants who have exclusively provided financial services) to, Nanotech have entered into proprietary rights or similar agreements with Nanotech, whereby any Intellectual Property created by them in the course of the performance of their employment or engagement has been fully and irrevocably assigned to Nanotech without additional consideration and (ii) such employees and consultants have waived in favour of Nanotech and its successors and assigns all moral rights which they may possess in any copyright works which they may have authored as part of the Intellectual Property created by them in the course of the performance of their employment or engagement, and, to the knowledge of Nanotech, no employee of, or consultant to, Nanotech is in violation of such agreements.

(ppp) All Persons having access to or knowledge of the Intellectual Property or any information of a confidential nature, in each case that is necessary or required or otherwise used for or in connection with the conduct or operation or proposed conduct or operation of Nanotech's business, have entered into non-disclosure agreements with Nanotech preventing the disclosure of such Intellectual Property or information, and there has been no breach of any such agreement. To the knowledge of Nanotech, the

employment or engagement by Nanotech of such Persons does not violate any non-disclosure or non- competition agreement between any such Person and a third party.

(qqq) Nanotech has taken all reasonably necessary and appropriate steps (including but not limited to appropriately marking and labelling Intellectual Property) to protect the secrecy, confidentiality and proprietary nature of all Nanotech Intellectual Property.

(rrr) Nanotech has at all times (i) complied with the Privacy Requirements in all material respects, (ii) made all necessary and appropriate notifications and registrations, paid all required fees and charges, and had a data protection officer where required, under DP Laws, (iii) maintained complete, accurate and up-to-date records of all processing activities undertaken by it or by a processor on its behalf as required under DP Laws (iv) had in place appropriate technical, contractual and organizational measures designed to ensure the security of its systems and of personal data, including protection against any loss, theft, or unauthorized, accidental or unlawful destruction, alteration, disclosure of or access to any personal data, as required under Privacy Requirements; and (v) had in place all necessary data protection policies and procedures to comply in all material respects with all Privacy Requirements, and retained sufficient documentation to evidence such compliance.

(sss) Except as disclosed in Schedule C(sss) of the Nanotech Disclosure Letter, during the three (3) years ending on the date of this Agreement, there has been no material breach of security leading to any loss, theft, or unauthorized, accidental or unlawful destruction, alteration, disclosure of or access to, any personal data transmitted, stored or otherwise processed by Nanotech or by any processor on its behalf (a "Data Incident"), and no such breaches have been suspected or threatened and there are no circumstances likely to give rise to any such breach. Nanotech has not been subject to any requirement to notify affected individuals of any Data Incident under the Privacy Requirements or applicable Law.

(ttt) All service providers of Nanotech, to which Nanotech has provided personal data, have executed agreements pursuant to which the service providers agree to use and disclose such personal data only to provide services to Nanotech, to limit access to the personal data to its personnel and contractors who have a need to access such personal data in order to provide the services to Nanotech and who are bound by a duty of confidentiality.

(uuu) The conduct of Nanotech in carrying on the Nanotech Business and the operation of the Nanotech Business by Nanotech have been and is in compliance with all Environmental Laws, in all material respects, and there are no existing events, conditions, or circumstances that would reasonably be expected to materially and adversely affect the ability of Nanotech to comply with Environmental Laws.

(vvv) Except as disclosed in Schedule C(vvv) of the Nanotech Disclosure Letter, Nanotech has obtained all licenses, permits, approvals, consents, certificates, registrations and

other authorizations under all applicable Environmental Laws (in this Schedule C, the "**Environmental Permits**") necessary as at the date hereof for the operation of the business carried by Nanotech, and each Environmental Permit is valid, subsisting and in good standing in all material respects and Nanotech is not in default or breach of any Environmental Permit in any respect and no proceeding is outstanding or, to the knowledge of Nanotech, has been threatened or is pending to revoke or limit any Environmental Permit.

(www) To the knowledge of Nanotech, Nanotech has not used, except in compliance in all respects with all Environmental Laws and Environmental Permits, any property or facility which it owns, controls manages, operates or leases or previously owned, controlled, operated, managed or leased, to generate, manufacture, process, distribute, use, treat, store, dispose of, transport or handle any Hazardous Substance and, to the knowledge of Nanotech, there have been no releases of Hazardous Substances at any property or facility which it owns, controls, manages, operates or leases or previously owned, controlled, operated, managed or leased.

(xxx) To the knowledge of Nanotech, none of the Nanotech Owned Real Property and Nanotech Leased Real Property has ever been used by the Nanotech or any Person under its control as a waste disposal site and none of the Nanotech Owned Real Property and Nanotech Leased Real Property has ever been used by the Nanotech or any Person under its control for any use which would trigger an obligation under Environmental Laws on the part of Nanotech to perform a clean-up of the Nanotech Owned Real Property or Nanotech Leased Real Property or take corrective action under Environmental Laws that would reasonably be expected to result in a Nanotech Material Adverse Effect.

(yyy) Nanotech has not received any notice of, or been prosecuted for, an offence alleging, non- compliance in any material respect with any Environmental Laws, and has not settled any allegation of non-compliance short of prosecution. There are no orders or directions issued against each of Nanotech under Environmental Laws including those requiring any material work, repairs, construction or capital expenditures to be made with respect to any of the assets of Nanotech, nor has Nanotech received notice of any of the same.

(zzz) There are no past unresolved or, to the knowledge of Nanotech, any threatened or pending claims, complaints, notices or requests for information received by Nanotech with respect to any alleged violation of any Environmental Laws, and to the knowledge of Nanotech, no conditions exist at, on or under any property now or previously owned, operated, optioned or leased by Nanotech which, with the passage of time, or the giving of notice or both, would give rise to liability under Environmental Laws that, individually or in the aggregate, would reasonably be expected to result in a Nanotech Material Adverse Effect.

(aaaa) Nanotech has not received any notice wherein it is alleged or stated that it is potentially responsible for a federal, provincial, state, municipal or local clean-up site or corrective

action under Environmental Laws that would reasonably be expected to result in a Nanotech Material Adverse Effect.

(bbbb) There are no environmental audits, evaluations, assessments, studies or tests relating to Nanotech.

(cccc) Nanotech has not agreed by contract or other agreement to indemnify or be responsible for any liabilities or obligations under Environmental Laws.

(dddd) To the knowledge of Nanotech, Nanotech is and has been in compliance in all material respects with all applicable Laws pertaining to employment and employment practices, including all Laws relating to labour relations, equal employment opportunities, fair employment practices, employment discrimination, harassment, retaliation, reasonable accommodation, disability rights or benefits, immigration, wages, hours, overtime compensation, child labour, hiring, promotion and termination of employees, working conditions, meal and break periods, privacy, health and safety, workers' compensation, leaves of absence and unemployment insurance. All individuals characterized and treated by Nanotech as independent contractors or consultants are properly treated as independent contractors under all applicable Laws. There are no actions against Nanotech pending or, to the knowledge of Nanotech, threatened to be brought or filed, by or with any Governmental Entity or arbitrator in connection with the employment of any current or former applicant, employee, consultant or independent contractor of Nanotech, including, without limitation, any claim relating to unfair labour practices, employment discrimination, harassment, retaliation, equal pay, wage and hours or any other employment related matter arising under applicable Laws.

(eeee) Schedule C(eeee) of the Nanotech Disclosure letter sets out a complete and accurate list of all current employees and consultants engaged or employed by Nanotech and includes names and titles of such employees and consultants together with their position/role and location of their employment or provision of services. All of the employees and consultants listed in Schedule C(eeee) of the Nanotech Disclosure Letter are engaged pursuant to a written contract of employment or provision of services and all such contracts have been disclosed to the legal counsel of META in the virtual data room maintained by Nanotech for the purposes of facilitating the Parties due diligence investigations.

(ffff) Nanotech is not subject to any claim for wrongful dismissal, constructive dismissal or any other tort claim, actual or threatened, or any litigation actual or threatened, relating to employment or termination of employment of employees or independent contractors.

(gggg) Each plan for retirement, bonus, stock purchase, profit sharing, stock option, deferred compensation, severance or termination pay, insurance, medical, hospital, dental, vision care, drug, sick leave, disability, salary continuation, legal benefits, unemployment benefits, vacation, incentive or otherwise contributed to or required to be contributed to, by Nanotech for the benefit of any current or former director, officer, employee or

consultant of Nanotech (in this Schedule C, the "**Nanotech Employee Plans**") has been maintained in compliance with its terms and with the requirements prescribed by any and all Laws that are applicable to such Nanotech Employee Plans, in each case in all material respects and has been publicly disclosed to the extent required by Securities Laws.

(hhhh) All material accruals for unpaid vacation pay, premiums for unemployment insurance, health premiums, federal or state pension plan premiums, accrued wages, salaries and commissions and employee benefit plan payments have been reflected in the books and records of Nanotech.

(iiii) There is not currently any labour disruption, dispute, slowdown, stoppage, complaint or grievance or, to the knowledge of Nanotech, threatened or pending which is adversely affecting or would reasonably be expected to adversely affect, in a material manner, the carrying on of the business of Nanotech, and, to the knowledge of Nanotech, there is no proposal to unionize its employees and no collective bargaining agreements are in place or currently being negotiated by Nanotech.

(jjjj) Other than as set out in Schedule C(jjjj) of the Nanotech Disclosure Letter, neither the execution and delivery of this Agreement, shareholder or other approval of this Agreement nor the consummation of the transactions contemplated by this Agreement could, either alone or in combination with another event, (i) entitle any employee, director, officer or independent contractor of Nanotech to severance pay, termination pay, change of control payment or benefits, or any material increase in severance pay, (ii) accelerate the time of payment or vesting, or materially increase the amount of compensation due to any such employee, director, officer or independent contractor, (iii) directly or indirectly cause Nanotech to transfer or set aside any assets to fund any material benefits under any Employee Plan, (iv) otherwise give rise to any material liability under any Employee Plan, or (v) limit or restrict the right to merge, materially amend, terminate or transfer the assets of any Employee Plan on or following the consummation of the transactions contemplated by this Agreement.

(kkkk) Nanotech is, in all material respects, conducting its business in compliance with all applicable Laws of each jurisdiction in which it carries on its business and has not received a notice of material non-compliance, and, to the knowledge of Nanotech, there are no facts that would give rise to a notice of material non-compliance with any such Laws.

(llll) Other than as set out in the Agreement and in Schedule C(llll) of the Nanotech Disclosure Letter, Nanotech is not currently party to any agreement in respect of: (i) the purchase of any material property or assets or any interest therein or the sale, transfer or other disposition of any material property or assets or any interest therein currently owned, directly or indirectly, by Nanotech whether by asset sale, transfer of shares or otherwise; or (ii) the change of control of Nanotech (whether by sale or transfer of shares or otherwise).

(mmmm) Nanotech has a minimum of $5,000,000 in cash on hand.

(nnnn) Nanotech is not a party to any Material Contract, other than as set forth on Schedule C(nnnn) of the Nanotech Disclosure Letter (in this Schedule C, collectively, the "**Nanotech Material Contracts**").

(oooo) All Nanotech Material Contracts are in good standing in all material respects and in full force and effect.

(pppp) Nanotech is not in material default or breach of any Nanotech Material Contract and, to the knowledge of Nanotech, there exists no condition, event or act which, with the giving of notice or lapse of time or both, would constitute a material default or breach under any Nanotech Material Contract and/or which would give rise to a right of termination on the part of any other party to a Nanotech Material Contract.

(qqqq) Nanotech is a "reporting issuer" (as that term is defined under applicable Securities Laws) or equivalent thereof and not on the list of reporting issuers in default under applicable Securities Laws in British Columbia, Ontario and Alberta, and is not in default of any material requirements of any Securities Laws or the rules and regulations of the TSXV. Nanotech has not taken any action to cease being a reporting issuer in any province nor has Nanotech received notification from any Securities Authority seeking to revoke the reporting issuer status of Nanotech. No delisting, suspension of trading in or cease trading order with respect to any of its securities and, to the knowledge of Nanotech, no inquiry or investigation of any Securities Authority, is pending, in effect or ongoing or threatened. The Nanotech Shares are listed on the TSXV and trading of the Nanotech Shares is not currently halted or suspended. Nanotech does not have any securities listed or quoted for trading on any securities exchange or market other than the TSXV and the OTC. Nanotech is not subject to any cease trade or other order of the TSXV or any Securities Authority, and, to the knowledge of Nanotech, no investigation or other proceedings involving Nanotech that may operate to prevent or restrict trading of any securities of Nanotech are currently in progress or pending before the TSXV or any Securities Authority. Nanotech has timely filed or furnished all Nanotech Disclosure Documents required to be filed or furnished by Nanotech under applicable Securities Laws. Each of the Nanotech Disclosure Documents complied in all material respects with applicable Securities Laws and did not, as of the date filed (or, if amended or superseded by a subsequent filing prior to the date of this Agreement, on the date of such filing), contain any misrepresentation (as defined under applicable Securities Laws). Nanotech has not filed any confidential material change report (which at the date of this Agreement remains confidential) or any other confidential filings (including redacted filings) filed to or furnished with, as applicable, any Securities Authority. There are no outstanding or unresolved comments in comment letters from any Securities Authority with respect to any of the Nanotech Disclosure Documents and, to the knowledge of Nanotech, neither Nanotech nor any of the Nanotech Disclosure Documents is the subject of an ongoing audit, review, comment or investigation by any Securities Authority or the TSXV.

(rrrr) The operations of Nanotech are and have been conducted, at all times, in material compliance with all applicable Anti-Money Laundering Laws, and no action by or before any Governmental Entity against Nanotech with respect to the Anti-Money Laundering Laws is pending. Nanotech has not, directly or indirectly: (i) made or authorized any contribution, payment or gift of funds or property to any official, employee or agent of any governmental agency, authority or instrumentality of any jurisdiction in violation of applicable Laws; or (ii) made any contribution to any candidate for public office, in either case where either the payment or the purpose of such contribution, payment or gift was, is or would be prohibited under the *Corruption of Foreign Public Officials Act* (Canada), the *Proceeds of Crime (Money Laundering) and Terrorist Financing Act* (Canada) or the Uniting and Strengthening America by Providing Appropriate Tools Required to Intercept and Obstruct Terrorism Act (United States) or the rules and regulations promulgated thereunder or under any other Laws of any relevant jurisdiction covering a similar subject matter applicable to Nanotech and its operations. Nanotech, or, to the knowledge of Nanotech, any director, officer, agent, employee, affiliate or Person acting on behalf of Nanotech has been or is currently subject to any United States sanctions administered by the Office of Foreign Assets Control of the United States Treasury Department.

(ssss) Neither Nanotech nor, to the knowledge of Nanotech, any of its officers, directors or employees acting on behalf of Nanotech, has violated the United States' Foreign Corrupt Practices Act (and the regulations promulgated thereunder), the *Corruption of Foreign Public Officials Act* (Canada) (and the regulations promulgated thereunder) or any other applicable Law covering a similar subject matter applicable to Nanotech and its operations, and to the knowledge of Nanotech, no such action has been taken by any of its agents, representatives or other Persons acting on behalf of Nanotech.

(tttt) Except for the representations and warranties expressly made by Nanotech in this Schedule C or in any certificate delivered pursuant to this Agreement, neither Nanotech nor any other Person makes or has made any representation or warranty of any kind whatsoever, express or implied, at law or in equity, with respect to Nanotech or its business, operations, assets, liabilities, condition (financial or otherwise), notwithstanding the delivery or disclosure to META or any of its affiliates or Representatives of any documentation, forecasts or other information with respect to any one or more of the foregoing. Without limiting the generality of the foregoing, neither Nanotech nor any other Person makes or has made any express or implied representation or warranty to META or any of its Representatives with respect to (a) any financial projection, forecast, estimate, or budget relating to Nanotech or its business or, (b) except for the representations and warranties made by Nanotech in this Schedule C, any oral or written information presented to META or any of its Representatives in the course of their due diligence investigation of Nanotech, the negotiation of this Agreement or the course of the Arrangement.

(uuuu) Nanotech is not a party to or bound or affected by any commitment, agreement or document containing any covenant which expressly limits the freedom of Nanotech to compete or operate in any line of business, transfer or move any of its assets or

operations or which materially or adversely affects the business practices, operations or condition of Nanotech.

(vvvv) Except as disclosed in Schedule C(vvvv) of the Nanotech Disclosure Letter, Nanotech is not party to, bound by or subject to any indenture, mortgage, lease, agreement, license, permit, authorization, certification, instrument, statute, regulation, order, judgment, decree or law that would be violated or breached by, or under which default would occur or which could be terminated, cancelled or accelerated, in whole or in part, or that would require consent or notice, as a result of the execution, delivery and performance of this Agreement or the consummation of any of the transactions provided for in this Agreement and the Plan of Arrangement (except as would not, individually or in the aggregate, have or reasonably be expected to have, individually or in the aggregate, a Nanotech Material Adverse Effect or as set out in the Key Regulatory Approvals).

SCHEDULE D
REPRESENTATIONS AND WARRANTIES OF META AND THE PURCHASER

META and the Purchaser jointly and severally represent and warrant to and in favour of Nanotech as follows, and acknowledges that Nanotech is relying upon such representations and warranties in connection with the completion of the transactions contemplated herein:

(a) Each of META and the Purchaser (i) has been duly incorporated and is validly existing and in good standing under the laws of its jurisdiction of incorporation and is up-to-date in respect of all material corporate filings; and (ii) has all requisite corporate power and capacity to carry on its business as now conducted and to own or lease and operate its assets and properties.

(b) The Purchaser is a wholly-owned direct subsidiary of META.

(c) No steps or proceedings have been taken, instituted or, to the knowledge of META, are pending for the dissolution, liquidation or winding up of META or the Purchaser. Neither META nor any subsidiary of META: (i) is insolvent or bankrupt under or pursuant to any corporate, insolvency, winding-up, restructuring, reorganization, administration or other Laws applicable to it; (ii) has commenced, approved, authorized or taken any action in furtherance of proceedings in respect of it under any applicable bankruptcy, insolvency, restructuring, reorganization, administration, winding up, liquidation, dissolution, or similar Law; (iii) has proposed a compromise or arrangement with its creditors generally or is or has been subject to any actions taken, orders received or proceedings commenced by creditors or other Persons for or in respect of the bankruptcy, receivership, insolvency, restructuring, reorganization, administration, winding-up, liquidation or dissolution of it, or any of its property or assets; (iv) had any encumbrancer take possession of any of its property, or (v) had any execution or distress become enforceable or become levied upon any of its property.

(d) Each of META and the Purchaser has the requisite corporate power and capacity to enter into this Agreement, and all other agreements and instruments to be executed by META or the Purchaser as contemplated by this Agreement, and to perform their respective obligations hereunder and under such agreements and instruments. The execution and delivery of this Agreement and performance by META and the Purchaser of their obligations under this Agreement and the consummation of the Arrangement and other transactions contemplated hereby have been duly authorized by all necessary corporate action of META and the Purchaser, and no other corporate proceedings on the part of META or the Purchaser are necessary to authorize the execution, delivery and performance of this Agreement, the consummation of the Arrangement and the other transactions contemplated hereby, except for obtaining the Key Regulatory Approvals.

(e) This Agreement has been duly and validly executed and delivered by each of META and the Purchaser and, assuming due authorization, execution and delivery by Nanotech,

constitutes a legal, valid and binding obligation of each of META and the Purchaser, enforceable against META and the Purchaser in accordance with its terms, subject however, to limitations with respect to enforcement imposed by Law in connection with bankruptcy, insolvency, reorganization or other Laws affecting creditors' rights generally and to the extent that equitable remedies such as specific performance and injunctions are only available in the discretion of the court from which they are sought.

(f) Other than the actions required under applicable Securities Laws and the Key Regulatory Approvals set out in Schedule F to this Agreement, no authorization, approval, order, license, filing, permit or consent of any Governmental Entity, and no notice, registration, declaration or filing by META or any subsidiary of META with any such Governmental Entity is required in connection with the execution and delivery of, and performance by META or any subsidiary of META (including the Purchaser) of their obligations under, this Agreement or the consummation of the Arrangement and the other transactions contemplated in this Agreement.

(g) There is no requirement under any material Contract to which META or any subsidiary of META is a party or by which META or any subsidiary of META is bound or has any rights to make a filing with, give any notice to, or to obtain the consent or approval of, any party to such contract relating to the transactions contemplated by this Agreement.

(h) The execution and delivery of this Agreement by each of META and the Purchaser, the performance by each of META and the Purchaser of their obligations hereunder and the consummation of the transactions contemplated hereby do not and will not (whether after notice or lapse of time or both) conflict with or result in a breach or violation of any of the terms or provisions of, or constitute a default under (whether after notice or lapse of time or both) or give rise to any right of termination or acceleration of any obligations or indebtedness, and neither META nor the Purchaser of META is currently in material breach or default of, (A) any Law applicable to META or the Purchaser; (B) the constating documents, by-laws or resolutions of META or any subsidiary of META, as applicable, (C) any contract or debt instrument to which META or any subsidiary of META is a party or by which it is bound,or (D) any judgment, decree or order binding META or any subsidiary of META, as applicable, or the assets or properties thereof.

(i) There are no actions, proceedings or, to META's knowledge, investigations (whether or not purportedly by or on behalf of META) commenced or, to the knowledge of META, threatened or pending against or relating to META or any subsidiary of META at law or in equity (whether in any court, arbitration or similar tribunal) or before or by any Governmental Entity, that would reasonably be expected to prevent or materially delay the consummation of the Arrangement.

(j) META has, and the Purchaser will have at the Effective Time, sufficient cash or cash equivalents in the aggregate, including META's cash-on-hand at the date of this Agreement and the Purchaser's cash-on-hand at the Effective Time, to satisfy the aggregate Consideration payable by the Purchaser pursuant to the Arrangement in accordance with

the terms of this Agreement and the Plan of Arrangement and to satisfy all other obligations payable by META or the Purchaser under this Agreement. The obligations of META and the Purchaser under this Agreement are not subject to any conditions regarding the ability of META, the Purchaser or any other Person to obtain financing for the Arrangement and the other transactions contemplated by this Agreement.

(k) Except as provided in this Agreement or any Nanotech Voting Agreement, neither META nor any of its affiliates has entered into any "connected transaction" to the Arrangement, as defined in MI 61-101, with any Nanotech Shareholder.

(l) Except for the representations and warranties expressly made by META in this Schedule D or in any certificate delivered pursuant to this Agreement, neither META nor any other Person makes or has made any representation or warranty of any kind whatsoever, express or implied, at law or in equity, with respect to META or any of its subsidiaries or their respective business, operations, assets, liabilities, condition (financial or otherwise), notwithstanding the delivery or disclosure to Nanotech or any of its affiliates or Representatives of any documentation, forecasts or other information with respect to any one or more of the foregoing. Without limiting the generality of the foregoing, neither META nor any other Person makes or has made any express or implied representation or warranty to Nanotech or any of its Representatives with respect to (a) any financial projection, forecast, estimate, or budget relating to META, any of its subsidiaries or their respective businesses or, (b) except for the representations and warranties made by META in this Schedule D, any oral or written information presented to Nanotech or any of its Representatives in the course of their due diligence investigation of META and its subsidiaries, the negotiation of this Agreement or the course of the Arrangement.

SCHEDULE E
SIGNATORIES OF NANOTECH VOTING AGREEMENTS

Douglas Blakeway

Bozena Kaminska

Clinton Landrock

Troy Bullock

Bernhard Zinkhofer

Iginatius Leroux

Monika Russell

Ronan McGrath

D. Neil McDonnell

Brian Donnelly

Richard Rowe

Andrew Green

SCHEDULE F
KEY REGULATORY APPROVALS

Canada

- TSX approval of the Nanotech Circular.

Exhibit 4.1

THE WARRANTS EVIDENCED BY THIS CERTIFICATE ARE EXERCISABLE AT ANY TIME AND FROM TIME TO TIME UNTIL 24 MONTHS FROM THE DATE OF THE RTO (DEFINED HEREIN), AFTER WHICH TIME THEY SHALL EXPIRE AND BE OF NO FURTHER FORCE OR EFFECT.

WARRANTS TO PURCHASE
COMMON SHARES OF
METAMATERIAL TECHNOLOGIES INC.

Certificate No. W-[ ]

THIS CERTIFIES that, for value received,

[ ] (the "**Holder**"),

is the registered holder of [ ] half-warrants (the "**Warrants**"), with every two Warrants entitling the Holder, subject to the terms and conditions set forth in this Warrant certificate (the "**Warrant Certificate**"), to purchase from Metamaterial Technologies Inc. (the "**Corporation**"), one common share of the Corporation (a "**Common Share**") at any time and from time to time until 24 months from date of RTO (defined below) (the "**Expiry Date**"), on payment of $2.475 per Common Share (the "**Exercise Price**").

1. Exercise of Warrants

(a) Election to Exercise. The rights evidenced by this Warrant Certificate may be exercised by the Holder in whole or in part and in accordance with the provisions hereof by delivery of an Election to Exercise in substantially the form attached hereto as Schedule "A", properly completed and executed, together with payment of the aggregate Exercise Price by bank draft, certified cheque or wire transfer payable to or to the order of the Corporation in the amount of the Exercise Price multiplied by the number of Common Shares specified in the Election to Exercise at the office of the Corporation at 1 Research Drive, Suite 215, Dartmouth, Nova Scotia, B2Y 4M9 or such other address as the Holder may be notified of in writing by the Corporation. In the event that the rights evidenced by this Warrant Certificate are exercised in part, the Corporation shall, contemporaneously with the issuance of the Common Shares issuable on the exercise of the Warrants so exercised, issue to the Holder a Warrant Certificate on identical terms in respect of that number of Common Shares in respect of which the Holder has not exercised the rights evidenced by this Warrant Certificate.

(b) Exercise. The Corporation shall, on the date it receives a duly executed Election to Exercise and funds equal to the Exercise Price by bank draft, certified cheque or wire transfer payable to or to the order of the Corporation for the number of Common Shares specified in the Election to Exercise (the "**Exercise Date**"), issue that number of Common Shares specified in the Election to Exercise as fully paid and non-assessable shares.

(c) Share Issuance. As promptly as practicable after the Exercise Date and, in any event, within ten business days of receipt of the Election to Exercise, the Corporation shall cause to be issued to the Holder, registered in such name or names as the Holder may direct or if no such direction has been given, in the name of the Holder, Common Shares to which the Holder is entitled based on the number of Common Shares specified in the Election to Exercise to be issued to the Holder, or in such other form as may be acceptable to the Corporation and the Holder, each acting reasonably. To the extent permitted by law, such exercise shall be deemed to have been effected as of the close of business on the Exercise

Date, and at such time the rights of the Holder with respect to the number of Warrants which have been exercised as such shall cease, and the person or persons in whose name or names any share or warrant shall then be issuable upon such exercise shall be deemed to have become the holder or holders of record of the Common Shares represented thereby.

(d) Fractional Common Shares. No fractional Common Shares shall be issued upon exercise of the Warrants, and in such case, the number of Common Shares issuable upon the exercise of any Warrants shall be rounded down to the nearest whole number.

(e) Corporate Changes. If, prior to the Expiry Date, there shall occur:

(i) a reclassification or redesignation of the Common Shares, any change of the Common Shares into other shares or securities or any other capital reorganization involving the Common Shares, other than a Common Share Reorganization (as defined herein);

(ii) a consolidation, amalgamation or merger of the Corporation with or into any other body corporate which results in a reclassification or redesignation of the Common Shares or a change of the Common Shares into other shares or securities; or

(iii) the transfer of the undertaking or assets of the Corporation as an entirety or substantially as an entirety to another corporation or entity;

(any of such events being herein called a "**Capital Reorganization**"), after the effective date of the Capital Reorganization the Holder shall be entitled to receive, and shall accept, for the same aggregate consideration, upon exercise of the Warrants, in lieu of the number of Common Shares to which the Holder was theretofore entitled upon the exercise of the Warrants, the kind and aggregate number of shares and other securities or property resulting from the Capital Reorganization which the holder would have been entitled to receive as a result of the Capital Reorganization if, on the effective date thereof, the Holder had been the registered holder of the number of Common Shares to which the holder was theretofore entitled to purchase or receive upon the exercise of the Warrants. If necessary, as a result of any Capital Reorganization, appropriate adjustments shall be made in the application of the provisions of this Warrant Certificate with respect to the rights and interest thereafter of the Holder to the end that the provisions of this Warrant Certificate shall thereafter correspondingly be made applicable as nearly as may reasonably be possible in relation to any shares or other securities or property thereafter deliverable upon the exercise of this Warrant Certificate.

(f) Subdivision, Consolidation, etc. of Common Shares. If, prior to the Expiry Date, the Corporation shall:

(i) fix a record date for the issue of, or issue, Common Shares to the holders of all or substantially all of the outstanding Common Shares by way of a stock dividend;

(ii) fix a record date for the distribution to, or make a distribution to, the holders of all or substantially all of the Common Shares payable in Common Shares or securities exchangeable for or convertible into Common Shares;

(iii) subdivide the outstanding Common Shares into a greater number of Common Shares; or

(iv) consolidate the outstanding Common Shares into a lesser number of Common Shares;

(any of such events in subclauses (i), (ii), (iii) and (iv) above being herein called a "**Common Share Reorganization**"), the Exercise Price shall be adjusted on the earlier of the record date on which holders of Common Shares are determined for the purposes of the Common Share Reorganization and the effective date of the Common Share Reorganization to the amount determined by multiplying the Exercise Price in effect immediately prior to such record date or effective date, as the case may be, by a fraction:

(i) the numerator of which shall be the number of Common Shares outstanding on such record date or effective date before giving effect to such Common Share Reorganization; and

(ii) the denominator of which shall be the number of Common Shares which will be outstanding immediately after giving effect to such Common Share Reorganization (including in the case of a distribution of securities exchangeable for or convertible into Common Shares the number of Common Shares that would be outstanding had such securities all been exchanged for or converted into Common Shares on such date).

To the extent that any adjustment in the Exercise Price occurs pursuant to this clause 1(f) as a result of the fixing by the Corporation of a record date for the distribution of securities exchangeable for or convertible into Common Shares, the Exercise Price shall be readjusted immediately after the expiry of any relevant exchange or conversion right to the Exercise Price which would then be in effect based upon the number of Common Shares actually issued and remaining issuable after such expiry and shall be further readjusted in such manner upon the expiry of any further such right. Any Common Shares owned by or held for the account of the Corporation shall be deemed not to be outstanding for the purpose of any such calculation.

(g) Offering to Shareholders. If, prior to the Expiry Date, the Corporation shall fix a record date or if a date of entitlement to receive is otherwise established (any such date being hereinafter referred to in this paragraph 1(g) as the "record date") for the issuance of rights, options or warrants to all or substantially all the holders of the outstanding Common Shares entitling them, for a period expiring not more than 45 days after such record date, to subscribe for or purchase Common Shares or securities convertible into or exchangeable for Common Shares at a price per share or, as the case may be, having a conversion or exchange price per share less than 95% of the Current Market Value (as defined herein) on such record date (any such event being hereinafter referred to as a "**Rights Offering**"), the Exercise Price shall be adjusted immediately after such record date so that it shall equal the price determined by multiplying the Exercise Price in effect on such record date by a fraction, of which (i) the numerator shall be the total number of Common Shares outstanding on such record date plus a number equal to the number arrived at by dividing the aggregate subscription or purchase price of the total number of additional Common Shares offered for subscription or purchase or, as the case may be, the aggregate conversion or exchange price of the convertible or exchangeable securities so offered by such Current Market Value, and (ii) the denominator of which shall be the total number of Common Shares outstanding on such record date plus the total number of additional Common Shares so offered (or, as the case may be, into which the convertible or exchangeable securities so offered are convertible or exchangeable). Common Shares owned by or held for the account of the Corporation or any subsidiary of the Corporation shall be deemed not to be outstanding for the purpose of any such computation; such adjustment shall be made

successively whenever such a record date is fixed. To the extent that any rights or warrants are not so issued or any such rights or warrants are not exercised prior to the expiration thereof, the Exercise Price shall then be readjusted to the Exercise Price which would then be in effect if such record date had not been fixed or to the Exercise Price which would then be in effect based upon the number of Common Shares or conversion or exchange rights contained in convertible or exchangeable securities actually issued upon the exercise of such rights or warrants, as the case may be.

(h) Special Distribution. If, prior to the Expiry Date, the Corporation shall fix a record date (hereinafter referred to in this paragraph 1(h) as the "record date") for the distribution to all or substantially all the holders of the outstanding Common Shares of:

(i) shares of any class, whether of the Corporation or any other corporation;

(ii) rights, options or warrants to acquire Common Shares or securities exchangeable for or convertible into Common Shares (other than rights, options or warrants pursuant to which holders of Common Shares are entitled, during a period expiring not more than forty-five (45) days after the record date for such issue, to subscribe for or purchase Common Shares at a price per Common Share (or in the case of securities exchangeable for or convertible into Common Shares at an exchange or conversion price per share at the date of issue of such securities) of at least 95% of the Current Market Value of the Common Shares on such record date);

(iii) evidences of indebtedness of the Corporation; or

(iv) other assets or property of the Corporation,

and if such distribution does not constitute (A) a Capital Reorganization, (B) a Rights Offering, or (C) a Common Share Reorganization (any such non-excluded event being hereinafter referred to as a "**Special Distribution**") the Exercise Price shall be adjusted immediately after such record date so that it shall equal the price determined by multiplying the Exercise Price in effect on such record date by a fraction: (A) the numerator of which shall be the amount by which (1) the amount obtained by multiplying the number of Common Shares outstanding on such record date by the Current Market Value on such record date, exceeds (2) the fair market value (as reasonably determined by the directors of the Corporation in good faith, which determination shall be conclusive) to the holders of such Common Shares of such Special Distribution; and (B) the denominator of which shall be the total number of Common Shares outstanding on such record date multiplied by such Current Market Value. Any Common Shares owned by or held for the account of the Corporation or any subsidiary of the Corporation shall be deemed not to be outstanding for the purpose of any such computation. Such adjustment shall be made successively whenever such a record date is fixed. To the extent that such Special Distribution is not so made or any such rights, options or warrants are not exercised prior to the expiration thereof, the Exercise Price shall then be readjusted to the Exercise Price which would then be in effect if such record date had not been fixed or if such expired rights, options or warrants had not been issued.

(i) Carry Over of Adjustments. No adjustment of the Exercise Price shall be made if the amount of such adjustment shall be less than 1% of the Exercise Price in effect immediately prior to the event giving rise to the adjustment, provided, however, that in such case any adjustment that would otherwise be required then to be made shall be carried forward and shall be made at the time of and together with the next subsequent adjustment which,

together with any adjustment so carried forward, shall amount to at least 1% of the Exercise Price.

(j) Adjustment to Number of Shares. If any adjustment in the Exercise Price shall occur as a result of: (A) the fixing by the Corporation of a record date for an event referred to in paragraph 1(g); or (B) the fixing by the Corporation of a record date for an event referred to in either of paragraph 1(h)(i) or paragraph 1(h)(ii) if either such event constitutes the issue or distribution to the holders of all or substantially all of its outstanding Common Shares of (A) Equity Shares, or (B) securities exchangeable for or convertible into Equity Shares at an exchange or conversion price per Equity Share less than the Current Market Value on such record date, or (C) rights, options or warrants to acquire Equity Shares at an exercise, exchange or conversion price per Equity Share less than the Current Market Value on such record date, then the number of Common Shares issuable upon any subsequent exercise of a Warrant shall be simultaneously adjusted by multiplying the number of Common Shares issuable upon the exercise of a Warrant immediately prior to such adjustment by a fraction which shall be the reciprocal of the fraction employed in the adjustment of the Exercise Price. To the extent that any adjustment in subscription rights occurs pursuant to this paragraph 1(j) as a result of the fixing by the Corporation of a record date for the distribution of exchangeable or convertible securities referred to in paragraph 1(f); or rights, options or warrants referred to in paragraph 1(g), then the number of Common Shares issuable upon exercise of a Warrant shall be readjusted immediately after the expiration of any relevant exchange, conversion or exercise right to the number of Common Shares which would be issuable based upon the number of shares actually issued immediately after such expiration, and shall be further readjusted in such manner upon expiration of any further such right. To the extent that any adjustment in subscription rights occurs pursuant to this paragraph 1(j) as a result of the fixing by the Corporation of a record date for the distribution of exchangeable or convertible securities or rights, options or warrants referred to in paragraph 1(h), the number of Common Shares issuable upon exercise of the Warrant shall be readjusted immediately after the expiration of any relevant exchange, conversion or exercise right to the number which would be purchasable pursuant to this paragraph 1(j) if the fair market value of such securities or such rights, options or warrants had been determined for purposes of the adjustment pursuant to this subsection on the basis of the number of shares issued immediately after such expiration.

(k) Common Shares to be Reserved. The Corporation will at all times keep available, and reserve if necessary, out of its authorized shares, solely for the purpose of issue upon the exercise of the Warrants, such number of Common Shares as shall then be issuable upon the exercise of the Warrants. The Corporation covenants and agrees that all Common Shares issuable upon exercise of Warrants will, upon issuance, be duly authorized and issued as fully paid and non-assessable shares of the Corporation. The Corporation will take all such actions as are within its power to ensure that all such Common Shares may be so issued without violation of any applicable requirements of any exchange upon which the shares of the Corporation may be listed. The Corporation will take all such actions as are within its power to ensure that all such Common Shares may be so issued without violation of any applicable law.

(l) Issue Tax. The issuance of Common Shares upon the exercise of Warrants shall be made without charge to the Holder, provided that the Corporation shall not be required to pay any tax which may be payable in respect of any transfer involved in the issuance and delivery of any certificate in a name other than that of the Holder.

(m) Definitions. For the purposes of any computation hereunder:

(i) "**Current Market Value**" at any date shall be the volume weighted average trading price per share for the Common Shares for the 15 consecutive trading days ending immediately before such date on the Canadian Securities Exchange or such other stock exchange on which the Common Shares may then be listed, or, if the Common Shares or any other security in respect of which a determination of Current Market Value is being made are not listed on any stock exchange, the Current Market Value shall be determined by a firm of independent chartered accountants retained to audit the financial statements of the Corporation, which determination shall be conclusive; and

(ii) "**Equity Shares**" means the Common Shares and any shares of any other class or series of the Corporation which may from time to time be authorized for issue if by their terms such shares confer on the holders hereof the right to participate in the distribution of assets upon the voluntary or involuntary liquidation, dissolution or winding up of the Corporation beyond a fixed sum or a fixed sum plus accrued dividends.

(n) Directors Determination. If at any time prior to the Expiry Date, the Corporation shall take any action affecting the Common Shares, other than an action or an event otherwise described in section 1 hereof, which would have a material adverse effect upon the rights of the holder under this Warrant Certificate, the Exercise Price and/or the number of Common Shares purchasable under this Warrant Certificate shall be adjusted in such manner and at such time as the directors may determine, acting reasonably and in good faith, to be equitable in the circumstances.

(o) Mutatis Mutandis. No adjustment in the Exercise Price or in the number or kind of securities purchasable on the exercise of this Warrant shall be made in respect of any event described in this section 1 hereof if the Holder is entitled to participate in such event on the same terms *mutatis mutandis* as if the Holder had exercised the Warrants prior to or on the record date or effective date, as the case may be, of such event.

(p) No Adjustment. If the Corporation sets a record date to determine holders of Common Shares for the purpose of entitling such holders to receive any dividend or distribution or any subscription or purchase rights and shall thereafter and before the distribution to such holders of any such dividend, distribution or subscription or purchase rights legally abandon its plan to pay or deliver such dividend, distribution or subscription or purchase rights, no adjustment in the Exercise Price or the number of Common Shares purchasable upon the exercise of the Warrants shall be required by reason of the setting of such record date.

(q) Dispute. If a dispute shall at any time arise with respect to any adjustment of the Exercise Price or the number of Common Shares purchasable pursuant to this Warrant Certificate, such dispute shall be conclusively determined by the auditors of the Corporation or if they are unable or unwilling to act by such other firm of independent chartered accountants as may be selected by the directors.

2. Rights Upon Completion of Reverse Takeover

(a) Notwithstanding any provisions in Section 1, the Warrants shall have the following rights upon completion of the proposed reverse take-over transaction the ("**RTO**") of Continental Precious Minerals Inc.("**CPM**") pursuant to an Amalgamation Agreement dated August 16, 2019:

(i) the Warrants shall become exercisable to acquire a number of common shares of CPM to be determined based on the number of Common Shares to which the Holder is entitled, multiplied by an exchange ratio of 2.75 common shares of CPM for each Common Share; and

(ii) if, in the event that CPM's common shares have a volume weighted average closing price greater than $1.25 over any ten consecutive trading days, the expiry date of the Warrants may be reduced to 21 days from the date of notice of such early termination (the "**Acceleration**").

3. Replacement

Upon receipt of evidence satisfactory to the Corporation of the loss, theft, destruction or mutilation of this Warrant Certificate and, if requested by the Corporation, upon delivery of a bond of indemnity satisfactory to the Corporation (or, in the case of mutilation, upon surrender of this Warrant Certificate), the Corporation will issue to the Holder a replacement certificate containing the same terms and conditions as this Warrant Certificate.

4. Expiry Date

Subject to the Acceleration described in section 2(a)(ii), the Warrants shall expire and all rights to purchase Common Shares hereunder shall cease and become null and void on the Expiry Date.

5. Covenant

So long as any Warrants remain outstanding, the Corporation covenants that it shall do or cause to be done all things necessary to maintain its corporate existence.

6. Inability to Deliver Common Shares

If for any reason, other than the failure or default of the Holder, the Corporation is unable to issue and deliver the Common Shares as contemplated herein to the Holder upon the proper exercise by the Holder of the right to purchase any of the Common Shares covered by this Warrant Certificate, the Corporation may pay, at its option and in complete satisfaction of its obligations hereunder, to the Holder, in cash, an amount equal to the difference between the Exercise Price and the Current Market Value of such Common Shares on the Exercise Date.

7. Limitations on Transfer

The Warrants are non-transferable and non-assignable.

8. Not a Shareholder

Nothing in this Warrant Certificate or in the holding of a Warrant evidenced hereby shall be construed as conferring upon the Holder any right or interest whatsoever as a shareholder of the Corporation.

9. Governing Law

The laws of the Province of Ontario and the laws of Canada applicable therein shall govern the Warrants. Any and all disputes arising under this Warrant Certificate, whether as to interpretation, performance or otherwise, shall be subject to the non-exclusive jurisdiction of the courts of the Province of Ontario and the Holder shall be deemed to have irrevocably attorned to the jurisdiction of the courts of such Province.

10. Successors

This Warrant Certificate shall enure to the benefit of and shall be binding upon the Holder and the Corporation and their respective successors.

11. General

This Warrant Certificate may be executed by a digital signature, delivered by e-mail in PDF, which will be deemed to be an original.

Remainder of page intentionally left blank.

IN WITNESS WHEREOF the Corporation has caused this Warrant Certificate to be signed by its duly authorized officer.

DATED as of [ ].

SCHEDULE "A"
ELECTION TO
EXERCISE

Capitalized terms used herein have the meanings ascribed thereto in the Warrant Certificate (the "**Certificate**") to which this schedule is attached.

The undersigned Holder hereby irrevocably elects to exercise the Warrants granted by the Corporation pursuant to the Certificate for the number of Common Shares (or other property or securities contemplated in the Certificate) as set forth below:

(a) Number of Common Shares to be acquired _____

(b) Exercise Price (per Common Share) $ 2.475___

(c) Aggregate Exercise Price $___

The Holder hereby tenders a certified cheque, bank draft or wire transfer for such aggregate Exercise Price and directs the Common Shares and Warrants underlying the Common Shares to be registered with CDS & Co. and to be issued as directed below.

The undersigned hereby certifies that the undersigned (i) is not (and is not exercising the Warrants for the account or benefit of) a "U.S. Person", (ii) did not execute or deliver this exercise form in the United States and (iii) has in all other aspects complied with the terms of Regulation S of the United States Securities Act of 1933, as amended (the "**1933 Act**") or any successor rule or regulation of the United States Securities and Exchange Commission in effect. The term "U.S. Person" is as defined in Regulation S under the 1933 Act and includes, but is not limited to, any natural person resident in the United States and any partnership or corporation organized or incorporated under the laws of the United States. "United States" means the United States of America, its territories and possessions, any state of the United States and the District of Columbia.

Direction as to Registration

Name of Registered Holder: _____

Address of Registered Holder: _____

DATED this____day of___2020.

Per: _____

Name: _____

Title: _____

Exhibit 4.2

THE WARRANTS EVIDENCED BY THIS CERTIFICATE ARE EXERCISABLE AT ANY TIME AND FROM TIME TO TIME UNTIL 24 MONTHS FROM THE DATE OF THE RTO (DEFINED HEREIN), AFTER WHICH TIME THEY SHALL EXPIRE AND BE OF NO FURTHER FORCE OR EFFECT.

BROKER WARRANTS TO PURCHASE
COMMON SHARES OF
METAMATERIAL TECHNOLOGIES INC.

Certificate No. WB-[ ]

THIS CERTIFIES that, for value received,

[ ] (the "**Holder**"),

is the registered holder of [ ] warrants (the "**Warrants**"), with every Warrant entitling the Holder, subject to the terms and conditions set forth in this warrant certificate (the "**Warrant Certificate**"), to purchase from Metamaterial Technologies Inc. (the "**Corporation**"), one common share of the Corporation (a "**Common Share**") at any time and from time to time until 24 months from date of RTO (defined below) (the "**Expiry Date**"), on payment of $1.70 per Common Share (the "**Exercise Price**").

1. Exercise of Warrants

(a) Election to Exercise. The rights evidenced by this Warrant Certificate may be exercised by the Holder in whole or in part and in accordance with the provisions hereof by delivery of an Election to Exercise in substantially the form attached hereto as Schedule "A", properly completed and executed, together with payment of the aggregate Exercise Price by bank draft, certified cheque or wire transfer payable to or to the order of the Corporation in the amount of the Exercise Price multiplied by the number of Common Shares specified in the Election to Exercise at the office of the Corporation at 1 Research Drive, Suite 215, Dartmouth, Nova Scotia, B2Y 4M9 or such other address as the Holder may be notified of in writing by the Corporation. In the event that the rights evidenced by this Warrant Certificate are exercised in part, the Corporation shall, contemporaneously with the issuance of the Common Shares issuable on the exercise of the Warrants so exercised, issue to the Holder a Warrant Certificate on identical terms in respect of that number of Common Shares in respect of which the Holder has not exercised the rights evidenced by this Warrant Certificate.

(b) Exercise. The Corporation shall, on the date it receives a duly executed Election to Exercise and funds equal to the Exercise Price by bank draft, certified cheque or wire transfer payable to or to the order of the Corporation for the number of Common Shares specified in the Election to Exercise (the "**Exercise Date**"), issue that number of Common Shares specified in the Election to Exercise as fully paid and non-assessable shares.

(c) Share Issuance. As promptly as practicable after the Exercise Date and, in any event, within ten business days of receipt of the Election to Exercise, the Corporation shall cause to be issued to the Holder, registered in such name or names as the Holder may direct or if no such direction has been given, in the name of the Holder, Common Shares to which the Holder is entitled based on the number of Common Shares specified in the Election to Exercise to be issued to the Holder, or in such other form as may be acceptable to the Corporation and the Holder, each acting reasonably. To the extent permitted by law, such exercise shall be deemed to have been effected as of the close of business on the Exercise

Date, and at such time the rights of the Holder with respect to the number of Warrants which have been exercised as such shall cease, and the person or persons in whose name or names any share or warrant shall then be issuable upon such exercise shall be deemed to have become the holder or holders of record of the Common Shares represented thereby.

(d) Fractional Common Shares. No fractional Common Shares shall be issued upon exercise of the Warrants, and in such case, the number of Common Shares issuable upon the exercise of any Warrants shall be rounded down to the nearest whole number.

(e) Corporate Changes. If, prior to the Expiry Date, there shall occur:

(i) a reclassification or redesignation of the Common Shares, any change of the Common Shares into other shares or securities or any other capital reorganization involving the Common Shares, other than a Common Share Reorganization (as defined herein);

(ii) a consolidation, amalgamation or merger of the Corporation with or into any other body corporate which results in a reclassification or redesignation of the Common Shares or a change of the Common Shares into other shares or securities; or

(iii) the transfer of the undertaking or assets of the Corporation as an entirety or substantially as an entirety to another corporation or entity;

(any of such events being herein called a "**Capital Reorganization**"), after the effective date of the Capital Reorganization the Holder shall be entitled to receive, and shall accept, for the same aggregate consideration, upon exercise of the Warrants, in lieu of the number of Common Shares to which the Holder was theretofore entitled upon the exercise of the Warrants, the kind and aggregate number of shares and other securities or property resulting from the Capital Reorganization which the holder would have been entitled to receive as a result of the Capital Reorganization if, on the effective date thereof, the Holder had been the registered holder of the number of Common Shares to which the holder was theretofore entitled to purchase or receive upon the exercise of the Warrants. If necessary, as a result of any Capital Reorganization, appropriate adjustments shall be made in the application of the provisions of this Warrant Certificate with respect to the rights and interest thereafter of the Holder to the end that the provisions of this Warrant Certificate shall thereafter correspondingly be made applicable as nearly as may reasonably be possible in relation to any shares or other securities or property thereafter deliverable upon the exercise of this Warrant Certificate.

(f) Subdivision, Consolidation, etc. of Common Shares. If, prior to the Expiry Date, the Corporation shall:

(i) fix a record date for the issue of, or issue, Common Shares to the holders of all or substantially all of the outstanding Common Shares by way of a stock dividend;

(ii) fix a record date for the distribution to, or make a distribution to, the holders of all or substantially all of the Common Shares payable in Common Shares or securities exchangeable for or convertible into Common Shares;

(iii) subdivide the outstanding Common Shares into a greater number of Common Shares; or

(iv) consolidate the outstanding Common Shares into a lesser number of Common Shares;

(any of such events in subclauses (i), (ii), (iii) and (iv) above being herein called a "**Common Share Reorganization**"), the Exercise Price shall be adjusted on the earlier of the record date on which holders of Common Shares are determined for the purposes of the Common Share Reorganization and the effective date of the Common Share Reorganization to the amount determined by multiplying the Exercise Price in effect immediately prior to such record date or effective date, as the case may be, by a fraction:

(i) the numerator of which shall be the number of Common Shares outstanding on such record date or effective date before giving effect to such Common Share Reorganization; and

(ii) the denominator of which shall be the number of Common Shares which will be outstanding immediately after giving effect to such Common Share Reorganization (including in the case of a distribution of securities exchangeable for or convertible into Common Shares the number of Common Shares that would be outstanding had such securities all been exchanged for or converted into Common Shares on such date).

To the extent that any adjustment in the Exercise Price occurs pursuant to this clause 1(f) as a result of the fixing by the Corporation of a record date for the distribution of securities exchangeable for or convertible into Common Shares, the Exercise Price shall be readjusted immediately after the expiry of any relevant exchange or conversion right to the Exercise Price which would then be in effect based upon the number of Common Shares actually issued and remaining issuable after such expiry and shall be further readjusted in such manner upon the expiry of any further such right. Any Common Shares owned by or held for the account of the Corporation shall be deemed not to be outstanding for the purpose of any such calculation.

(g) Offering to Shareholders. If, prior to the Expiry Date, the Corporation shall fix a record date or if a date of entitlement to receive is otherwise established (any such date being hereinafter referred to in this paragraph 1(g) as the "record date") for the issuance of rights, options or warrants to all or substantially all the holders of the outstanding Common Shares entitling them, for a period expiring not more than 45 days after such record date, to subscribe for or purchase Common Shares or securities convertible into or exchangeable for Common Shares at a price per share or, as the case may be, having a conversion or exchange price per share less than 95% of the Current Market Value (as defined herein) on such record date (any such event being hereinafter referred to as a "**Rights Offering**"), the Exercise Price shall be adjusted immediately after such record date so that it shall equal the price determined by multiplying the Exercise Price in effect on such record date by a fraction, of which (i) the numerator shall be the total number of Common Shares outstanding on such record date plus a number equal to the number arrived at by dividing the aggregate subscription or purchase price of the total number of additional Common Shares offered for subscription or purchase or, as the case may be, the aggregate conversion or exchange price of the convertible or exchangeable securities so offered by such Current Market Value, and (ii) the denominator of which shall be the total number of Common Shares outstanding on such record date plus the total number of additional Common Shares so offered (or, as the case may be, into which the convertible or exchangeable securities so offered are convertible or exchangeable). Common Shares owned by or held for the account

of the Corporation or any subsidiary of the Corporation shall be deemed not to be outstanding for the purpose of any such computation; such adjustment shall be made successively whenever such a record date is fixed. To the extent that any rights or warrants are not so issued or any such rights or warrants are not exercised prior to the expiration thereof, the Exercise Price shall then be readjusted to the Exercise Price which would then be in effect if such record date had not been fixed or to the Exercise Price which would then be in effect based upon the number of Common Shares or conversion or exchange rights contained in convertible or exchangeable securities actually issued upon the exercise of such rights or warrants, as the case may be.

(h) Special Distribution. If, prior to the Expiry Date, the Corporation shall fix a record date (hereinafter referred to in this paragraph 1(h) as the "**record date**") for the distribution to all or substantially all the holders of the outstanding Common Shares of:

(i) shares of any class, whether of the Corporation or any other corporation;

(ii) rights, options or warrants to acquire Common Shares or securities exchangeable for or convertible into Common Shares (other than rights, options or warrants pursuant to which holders of Common Shares are entitled, during a period expiring not more than forty-five (45) days after the record date for such issue, to subscribe for or purchase Common Shares at a price per Common Share (or in the case of securities exchangeable for or convertible into Common Shares at an exchange or conversion price per share at the date of issue of such securities) of at least 95% of the Current Market Value of the Common Shares on such record date);

(iii) evidences of indebtedness of the Corporation; or

(iv) other assets or property of the Corporation,

and if such distribution does not constitute (A) a Capital Reorganization, (B) a Rights Offering, or (C) a Common Share Reorganization (any such non-excluded event being hereinafter referred to as a "**Special Distribution**") the Exercise Price shall be adjusted immediately after such record date so that it shall equal the price determined by multiplying the Exercise Price in effect on such record date by a fraction: (A) the numerator of which shall be the amount by which (1) the amount obtained by multiplying the number of Common Shares outstanding on such record date by the Current Market Value on such record date, exceeds (2) the fair market value (as reasonably determined by the directors of the Corporation in good faith, which determination shall be conclusive) to the holders of such Common Shares of such Special Distribution; and (B) the denominator of which shall be the total number of Common Shares outstanding on such record date multiplied by such Current Market Value. Any Common Shares owned by or held for the account of the Corporation or any subsidiary of the Corporation shall be deemed not to be outstanding for the purpose of any such computation. Such adjustment shall be made successively whenever such a record date is fixed. To the extent that such Special Distribution is not so made or any such rights, options or warrants are not exercised prior to the expiration thereof, the Exercise Price shall then be readjusted to the Exercise Price which would then be in effect if such record date had not been fixed or if such expired rights, options or warrants had not been issued.

(i) Carry Over of Adjustments. No adjustment of the Exercise Price shall be made if the amount of such adjustment shall be less than 1% of the Exercise Price in effect immediately

prior to the event giving rise to the adjustment, provided, however, that in such case any adjustment that would otherwise be required then to be made shall be carried forward and shall be made at the time of and together with the next subsequent adjustment which, together with any adjustment so carried forward, shall amount to at least 1% of the Exercise Price.

(j) Adjustment to Number of Shares. If any adjustment in the Exercise Price shall occur as a result of: (A) the fixing by the Corporation of a record date for an event referred to in paragraph 1(g); or (B) the fixing by the Corporation of a record date for an event referred to in either of paragraph 1(h)(i) or paragraph 1(h)(ii) if either such event constitutes the issue or distribution to the holders of all or substantially all of its outstanding Common Shares of (A) Equity Shares, or (B) securities exchangeable for or convertible into Equity Shares at an exchange or conversion price per Equity Share less than the Current Market Value on such record date, or (C) rights, options or warrants to acquire Equity Shares at an exercise, exchange or conversion price per Equity Share less than the Current Market Value on such record date, then the number of Common Shares issuable upon any subsequent exercise of a Warrant shall be simultaneously adjusted by multiplying the number of Common Shares issuable upon the exercise of a Warrant immediately prior to such adjustment by a fraction which shall be the reciprocal of the fraction employed in the adjustment of the Exercise Price. To the extent that any adjustment in subscription rights occurs pursuant to this paragraph 1(j) as a result of the fixing by the Corporation of a record date for the distribution of exchangeable or convertible securities referred to in paragraph 1(f); or rights, options or warrants referred to in paragraph 1(g), then the number of Common Shares issuable upon exercise of a Warrant shall be readjusted immediately after the expiration of any relevant exchange, conversion or exercise right to the number of Common Shares which would be issuable based upon the number of shares actually issued immediately after such expiration, and shall be further readjusted in such manner upon expiration of any further such right. To the extent that any adjustment in subscription rights occurs pursuant to this paragraph 1(j) as a result of the fixing by the Corporation of a record date for the distribution of exchangeable or convertible securities or rights, options or warrants referred to in paragraph 1(h), the number of Common Shares issuable upon exercise of the Warrant shall be readjusted immediately after the expiration of any relevant exchange, conversion or exercise right to the number which would be purchasable pursuant to this paragraph 1(j) if the fair market value of such securities or such rights, options or warrants had been determined for purposes of the adjustment pursuant to this subsection on the basis of the number of shares issued immediately after such expiration.

(k) Common Shares to be Reserved. The Corporation will at all times keep available, and reserve if necessary, out of its authorized shares, solely for the purpose of issue upon the exercise of the Warrants, such number of Common Shares as shall then be issuable upon the exercise of the Warrants. The Corporation covenants and agrees that all Common Shares issuable upon exercise of Warrants will, upon issuance, be duly authorized and issued as fully paid and non-assessable shares of the Corporation. The Corporation will take all such actions as are within its power to ensure that all such Common Shares may be so issued without violation of any applicable requirements of any exchange upon which the shares of the Corporation may be listed. The Corporation will take all such actions as are within its power to ensure that all such Common Shares may be so issued without violation of any applicable law.

(l) Issue Tax. The issuance of Common Shares upon the exercise of Warrants shall be made without charge to the Holder, provided that the Corporation shall not be required to pay any tax which may be payable in respect of any transfer involved in the issuance and delivery of any certificate in a name other than that of the Holder.

(m) Definitions. For the purposes of any computation hereunder:

(i) "**Current Market Value**" at any date shall be the volume weighted average trading price per share for the Common Shares for the 15 consecutive trading days ending immediately before such date on the Canadian Securities Exchange or such other stock exchange on which the Common Shares may then be listed, or, if the Common Shares or any other security in respect of which a determination of Current Market Value is being made are not listed on any stock exchange, the Current Market Value shall be determined by a firm of independent chartered accountants retained to audit the financial statements of the Corporation, which determination shall be conclusive; and

(ii) "**Equity Shares**" means the Common Shares and any shares of any other class or series of the Corporation which may from time to time be authorized for issue if by their terms such shares confer on the holders hereof the right to participate in the distribution of assets upon the voluntary or involuntary liquidation, dissolution or winding up of the Corporation beyond a fixed sum or a fixed sum plus accrued dividends.

(n) Directors Determination. If at any time prior to the Expiry Date, the Corporation shall take any action affecting the Common Shares, other than an action or an event otherwise described in section 1 hereof, which would have a material adverse effect upon the rights of the holder under this Warrant Certificate, the Exercise Price and/or the number of Common Shares purchasable under this Warrant Certificate shall be adjusted in such manner and at such time as the directors may determine, acting reasonably and in good faith, to be equitable in the circumstances.

(o) Mutatis Mutandis. No adjustment in the Exercise Price or in the number or kind of securities purchasable on the exercise of this Warrant shall be made in respect of any event described in this section 1 hereof if the Holder is entitled to participate in such event on the same terms *mutatis mutandis* as if the Holder had exercised the Warrants prior to or on the record date or effective date, as the case may be, of such event.

(p) No Adjustment. If the Corporation sets a record date to determine holders of Common Shares for the purpose of entitling such holders to receive any dividend or distribution or any subscription or purchase rights and shall thereafter and before the distribution to such holders of any such dividend, distribution or subscription or purchase rights legally abandon its plan to pay or deliver such dividend, distribution or subscription or purchase rights, no adjustment in the Exercise Price or the number of Common Shares purchasable upon the exercise of the Warrants shall be required by reason of the setting of such record date.

(q) Dispute. If a dispute shall at any time arise with respect to any adjustment of the Exercise Price or the number of Common Shares purchasable pursuant to this Warrant Certificate, such dispute shall be conclusively determined by the auditors of the Corporation or if they are unable or unwilling to act by such other firm of independent chartered accountants as may be selected by the directors.

2. Rights Upon Completion of Reverse Takeover

Notwithstanding any provisions in Section 1, the Warrants shall have the following rights upon completion of the proposed reverse take-over transaction the ("**RTO**") of Continental Precious Minerals Inc.("**CPM**")

pursuant to an Amalgamation Agreement dated August 16, 2019 the Warrants shall be replaced with new broker warrants having substantially the same terms as the Warrant and that are exercisable to acquire the number of common shares of CPM that equals the number of Common Shares to which the Holder is entitled under the Warrant, multiplied by the exchange ratio of 2.75, with such new warrants being exercisable at a price per CPM common share equal to $1.70, divided by 2.75.

3. Replacement

Upon receipt of evidence satisfactory to the Corporation of the loss, theft, destruction or mutilation of this Warrant Certificate and, if requested by the Corporation, upon delivery of a bond of indemnity satisfactory to the Corporation (or, in the case of mutilation, upon surrender of this Warrant Certificate), the Corporation will issue to the Holder a replacement certificate containing the same terms and conditions as this Warrant Certificate.

4. Expiry Date

The Warrants shall expire and all rights to purchase Common Shares hereunder shall cease and become null and void on the Expiry Date.

5. Covenant

So long as any Warrants remain outstanding, the Corporation covenants that it shall do or cause to be done all things necessary to maintain its corporate existence.

6. Inability to Deliver Common Shares

If for any reason, other than the failure or default of the Holder, the Corporation is unable to issue and deliver the Common Shares as contemplated herein to the Holder upon the proper exercise by the Holder of the right to purchase any of the Common Shares covered by this Warrant Certificate, the Corporation may pay, at its option and in complete satisfaction of its obligations hereunder, to the Holder, in cash, an amount equal to the difference between the Exercise Price and the Current Market Value of such Common Shares on the Exercise Date.

7. Limitations on Transfer

The Warrants are non-transferable and non-assignable.

8. Not a Shareholder

Nothing in this Warrant Certificate or in the holding of a Warrant evidenced hereby shall be construed as conferring upon the Holder any right or interest whatsoever as a shareholder of the Corporation.

9. Governing Law

The laws of the Province of Ontario and the laws of Canada applicable therein shall govern the Warrants. Any and all disputes arising under this Warrant Certificate, whether as to interpretation, performance or otherwise, shall be subject to the non-exclusive jurisdiction of the courts of the Province of Ontario and the Holder shall be deemed to have irrevocably attorned to the jurisdiction of the courts of such Province.

10. Successors

This Warrant Certificate shall enure to the benefit of and shall be binding upon the Holder and the Corporation and their respective successors.

11. General

This Warrant Certificate may be executed by a digital signature, delivered by e-mail in PDF, which will be deemed to be an original.

Remainder of page intentionally left blank.

IN WITNESS WHEREOF the Corporation has caused this Warrant Certificate to be signed by its duly authorized officer.

DATED as of [ ] .

SCHEDULE "A"
ELECTION TO
EXERCISE

Capitalized terms used herein have the meanings ascribed thereto in the Warrant Certificate (the "**Certificate**") to which this schedule is attached.

The undersigned Holder hereby irrevocably elects to exercise the Warrants granted by the Corporation pursuant to the Certificate for the number of Common Shares (or other property or securities contemplated in the Certificate) as set forth below:

(a)	Number of Common Shares to be acquired	_____
(b)	Exercise Price (per Common Share)	$ 1.70
(c)	Aggregate Exercise Price	$ _____

The Holder hereby tenders a certified cheque, bank draft or wire transfer for such aggregate Exercise Price and directs the Common Shares and Warrants underlying the Common Shares to be registered with CDS & Co. and to be issued as directed below.

The undersigned hereby certifies that the undersigned (i) is not (and is not exercising the Warrants for the account or benefit of) a "U.S. Person", (ii) did not execute or deliver this exercise form in the United States and (iii) has in all other aspects complied with the terms of Regulation S of the United States Securities Act of 1933, as amended (the "**1933 Act**") or any successor rule or regulation of the United States Securities and Exchange Commission in effect. The term "U.S. Person" is as defined in Regulation S under the 1933 Act and includes, but is not limited to, any natural person resident in the United States and any partnership or corporation organized or incorporated under the laws of the United States. "United States" means the United States of America, its territories and possessions, any state of the United States and the District of Columbia.

Direction as to Registration

Name of Registered Holder: _____

Address of Registered Holder: _____

DATED this_____day of_____, 20___.

Per: _____
Name: _____
Title: _____

EXHIBIT 4.6

DESCRIPTION OF CAPITAL STOCK

The following description of capital stock of Meta Materials Inc. (the "Company," "we," "us" and "our") summarizes certain provisions of our articles of incorporation, as amended (the "Articles of Incorporation"), and our amended and restated bylaws (the "Bylaws"). The description is intended as a summary, and is qualified in its entirety by reference to our Articles of Incorporation and our Bylaws, copies of which have been filed as exhibits to the Annual Report on Form 10-K of which this Exhibit 4.6 is a part.

General

Our authorized capital stock consists of 1,000,000,000 shares of common stock, par value $0.001 per share (the "Common Stock"), and 200,000,000 shares of preferred stock, par value $0.001 per share (the "Preferred Stock"). As of December 31, 2021, there were approximately 284,573,316 shares of Common Stock outstanding (including 1,872,750 shares of unvested restricted stock), and 164,923,363 shares of Preferred Stock which consist of 164,923,363 designated shares of Series A Non-Voting Preferred Stock and 0 designated shares of Series B Special Voting Preferred Stock, each as described below. Additionally, we currently have warrants and stock options outstanding that are exercisable into a total of approximately 18,509,876 shares of Common Stock.

Common Stock

Voting Rights

The rights of all holders of the Common Stock are identical in all respects. Each stockholder is entitled to one vote for each share of Common Stock held on all matters submitted to a vote of the stockholders.

Right to Receive Liquidation Distributions

Upon liquidation, dissolution or winding up of the Company, the holders of the Common Stock are entitled to share ratably in all aspects of the Company that are legally available for distribution, after payment of or provision for all debts and liabilities and after payment to the holders of Preferred Stock, if any.

No Preemptive or Similar Rights

The holders of the Common Stock do not have preemptive subscription, redemption or conversion rights under our Articles of Incorporation.

No Cumulative Voting

Cumulative voting in the election of Directors is not permitted. There are no sinking fund provisions applicable to the Common Stock.

Fully Paid

The outstanding shares of Common Stock are validly issued, fully paid and nonassessable.

Preferred Stock

Our Board of Directors can, without approval of our stockholders, issue one or more series of Preferred Stock and determine the number of shares of each series and the rights, preferences, and limitations of each series. The following description of the terms of the Preferred Stock sets forth certain general terms and provisions of our authorized Preferred Stock. If we offer Preferred Stock, a more specific description will be filed with the SEC, and the designations and rights of such Preferred Stock will be described in a prospectus supplement, including the following terms:

- the series, the number of shares offered, and the liquidation value of the Preferred Stock;
- the price at which the Preferred Stock will be issued;
- the dividend rate, the dates on which the dividends will be payable, and other terms relating to the payment of dividends on the Preferred Stock;
- the liquidation preference of the Preferred Stock;
- the voting rights of the Preferred Stock;
- whether the Preferred Stock is redeemable, or subject to a sinking fund, and the terms of any such redemption or sinking fund;
- whether the Preferred Stock is convertible, or exchangeable for any other securities, and the terms of any such conversion or exchange; and
- any additional rights, preferences, qualifications, limitations, and restrictions of the Preferred Stock.

The description of the terms of the Preferred Stock that will be set forth in an applicable prospectus supplement will not be complete and will be subject to and qualified in its entirety by reference to the certificate of designation relating to the applicable series of Preferred Stock. The registration statement, of which this prospectus forms a part, will incorporate by reference the certificate of designation as an exhibit.

Undesignated Preferred Stock may enable our Board of Directors to render more difficult or to discourage an attempt to obtain control of us by means of a tender offer, proxy contest,

merger, or otherwise and to thereby protect the continuity of our management. The issuance of shares of Preferred Stock may adversely affect the rights of the holders of our Common Stock. For example, any Preferred Stock issued may:

- rank prior to our Common Stock as to dividend rights, liquidation preference, or both;
- have full or limited voting rights; and
- be convertible into shares of Common Stock.

As a result, the issuance of shares of Preferred Stock may:

- discourage bids for our Common Stock; or
- otherwise adversely affect the market price of our Common Stock or any then existing Preferred Stock.

Any Preferred Stock will, when issued, be fully paid and non-assessable.

Series A Preferred Stock

In connection with the Arrangement Agreement with Meta, on June 11, 2021, our Board of Directors of directors formally declared a dividend, or the Preferred Dividend, on a one-for-one basis, of shares of our Series A Preferred Stock to the holders of Common Stock as of the close of business on June 24, 2021 (subject to adjustment for any reverse split of our Common Stock after the record date but before the dividend is paid). On June 14, 2021, we filed the Certificate of Designation of Preferences, Rights and Limitations of Series A Non-Voting Preferred Stock, as modified by a Certificate of Correction filed on June 15, 2021, or the Series A Certificate of Designation, with the Secretary of State of the State of Nevada, and designated 199,500,000 shares of Preferred Stock as Series A Preferred Stock. Pursuant to the Series A Certificate of Designation, following the Effective Time, the holders of Series A Preferred Stock may become entitled to certain dividends based on the net proceeds from the sale of any O&G Assets, subject to certain holdbacks. Such asset sales must occur prior to the Sale Expiration Date. Following the Sale Expiration Date, subject to certain conditions, the combined company will effect a spin-off of any remaining O&G Assets to the holders of Series A Preferred Stock. A more detailed description of the preferences, rights and limitations of the Series A Preferred Stock is set forth in the Definitive Proxy Statement we filed with the SEC on May 7, 2021. The foregoing description of the Series A Certificate of Designation does not purport to be complete and is qualified in its entirety by reference to the full text thereof, a copy of which is filed as Exhibit 3.2 to the Current Report on Form 8-K filed with the SEC on June 16, 2021.

Series B Preferred Stock

On June 14, 2021, we also filed the Certificate of Designation of Preferences, Rights and Limitations, or the Series B Certificate of Designation, of Series B Preferred Special Voting Preferred Stock, or the Special Voting Share, with the Secretary of State of the State of Nevada,

and designated one share of Preferred Stock as the Special Voting Share. In connection with the Arrangement, Meta shareholders may elect to receive either shares of Common Stock or Exchangeable Shares in exchange for such holder's Meta common shares. Immediately prior to the Effective Time, the Special Voting Share will be issued to a trustee and, while it is outstanding, will enable holders of Exchangeable Shares to cast votes on matters for which holders of the stockholders of the combined company are entitled to vote, and to receive dividends that are economically equivalent to any dividends declared with respect to the Common Stock of the combined company. A more detailed description of the preferences, rights and limitations of the Special Voting Share is set forth in the Definitive Proxy Statement we filed with the SEC on May 7, 2021. The foregoing description of the Series B Certificate of Designation does not purport to be complete and is qualified in its entirety by reference to the full text thereof, a copy of which is filed as Exhibit 3.3 to the Current Report on Form 8-K filed with the SEC on June 16, 2021.

No Cumulative Voting

Holders of shares of Common Stock are entitled to one vote per share on all matters which shareholders are entitled to vote upon at all meetings of shareholders. The holders of shares of Common Stock do not have cumulative voting rights, which mean that the holders of more than 50% of our outstanding voting securities can elect all of the directors of the Company.

Dividend Policy

The holders of the Common Stock are entitled to receive ratably such dividends, if any, as may be declared by the Board of Directors of directors out of legally available funds.

The payment by us of dividends, if any, in the future rests within the discretion of our Board of Directors and will depend, among other things, upon our earnings, capital requirements and financial condition, as well as other relevant factors.

We have neither declared nor paid any cash dividends on our preferred or Common Stock. For the foreseeable future, we intend to retain any earnings to finance the development and expansion of our business, and do not anticipate paying any cash dividends on our preferred or Common Stock.

Anti-Takeover Provisions

Our Bylaws and Nevada law include certain provisions which may have the effect of delaying or deterring a change in control or in our management or encouraging persons considering unsolicited tender offers or other unilateral takeover proposals to negotiate with our Board of Directors of directors rather than pursue non-negotiated takeover attempts. These provisions include authorized blank check Preferred Stock, restrictions on business combinations, and the availability of authorized but unissued Common Stock.

Listing

Our Common Stock is listed on the NASDAQ Capital Market under the symbol "MMAT."

Transfer Agent

The transfer agent for our Common Stock is American Stock Transfer & Trust Company, LLC.

Exhibit 4.3.1

Atlantic Canada Opportunities Agency | **Agence de promotion èconomique du Canada atlantique**

Project No.: 200804

Nova Scotia Office
P.O. Box 2284
Station "C"
Halifax, N.S.
B3J 3C8

Bureau de la Nouvelle-Écosse
Gassier postal 2284
Succ. "C"
Halifax (N.-È.)
B3J 3C8

AUG 13 2012

Lamda Guard Canada Inc.
Suite 1700, Tower 1
1959 Upper Water Street
Halifax, Nova Scotia
B3J 3N2

Attention: Mr. Paul McLaughlin

Dear Mr. McLaughlin:

Re: ACOA Business Development Program (BDP)

THIS LETTER CANCELS AND REPLACES THE LETTER OF OFFER PREVIOUSLY SENT DATED JULY 30, 2012.

In response to your application received April 10, 2012, the Atlantic Canada Opportunities Agency ("the Agency"), hereby offers to make a repayable contribution to Lamda Guard Canada Inc. ("the Applicant") upon the following Terms and Conditions:

1.00 Contribution

1.01 Subject to all other provisions of this Agreement, the Agency will make a repayable contribution ("the Contribution") to the Applicant to assist in the execution by the Applicant of the Project as described and defined in Annex 1 (Statement of Work) calculated as the lesser of (a) and (b) as follows:

(a) 75% of eligible costs, estimated to be $333,000; or

(b) $249,750.

2.00 Disbursements

2.01 Advance Payment

At the discretion of the Agency, an advance payment may be made to the Applicant.

To request an advance payment, the Applicant must submit a completed copy of the Advance Payment Request Form (provided by the Agency), including a monthly cash flow forecast of requirements for the

Eligible Costs to be incurred during the advance period. Such documentation must demonstrate that an advance payment is essential to the successful completion of the project. Each advance payment must be accounted for, to the satisfaction of the Agency, within forty-five (45) days of the end of the advance period for which that advance was made.

Should the Agency determine that an advance payment will be made, such payment will be made in accordance with the Treasury Board Policy on Transfer Payments.

Progress Payments
At the request of the Applicant, the Agency may make progress payments to the Applicant based on claims for eligible costs which have been incurred. Each claim shall be completed in accordance with instructions to be provided by the Agency to the Applicant.

Joint Payments
At the discretion of the Agency or at the request of the Applicant, the Agency may make payments jointly to the Applicant and the supplier for eligible costs which have been incurred.

Final Payment
Notwithstanding the foregoing, 10% of the Contribution will normally be reserved for a final payment to be based on a claim submitted by the Applicant at the time of Project Completion and normally after all eligible costs have been incurred and paid.

2.02 It is a requirement of this agreement that the Applicant shall keep the original invoices and proof of payment for all claimed costs readily avai1able for examination by the Agency during any payment verification or audit and until thirty-six (36) months following the end of the Control Period.

3.00 Repayment Terms

3.01 The Applicant shall repay the Contribution to the Agency in accordance with the repayment schedule attached to this offer.

These amounts are calculated to repay the outstanding balance of the Contribution; however, the last installment will be adjusted to include all sums owing.

3.02 The first repayment installment is due and payable on **July 1, 2013.**

Subsequent repayment installments are due and payable at intervals of one (1) month thereafter until the Contribution shall be fully repaid.

3.03 **Prior to any disbursement of this Contribution by the Agency,** the Applicant shall arrange pre-authorized payments for scheduled repayments for the period until full repayment of the Contribution is completed. Please complete the attached Pre-Authorized Repayment/Direct Deposit Authorization form and return it, together with a voided cheque, with your acceptance to this offer.

3.04 The Applicant shall pay, where the account is overdue and in addition to any amount payable, interest on that amount. The interest, calculated daily and compounded monthly, shall accrue from the due date until payment is received. The rate of interest shall be equal to 3% higher than the average Bank of Canada discount rate for the previous month.

3.05 A $15 administration fee will be charged on every payment for which insufficient funds were available in the account identified for payment.

3.06 The Applicant may, at any time, make prepayments on account of repayment installments and each such prepayment will be applied first to interest owing and secondly to repayment installments in reverse order of maturity.

4.00 Conditions

4.01 The Agency shall not contribute to any cost incurred by the Applicant prior to **April 10, 2012.**

4.02 As a condition of the Agency's assistance,

(a) the Applicant shall carry out the Project at **HALIFAX, Nova Scotia;**

(b) the Applicant shall ensure the Project commences on or before **August 31, 2012;** and

(c) the Applicant shall ensure the Project is completed as described in the Statement of Work on or before **March 31, 2013.**

4.03 The Applicant shall comply with environmental protection measures in relation to the Project that satisfy the requirements of all regulatory bodies of appropriate jurisdiction.

4.04 The Applicant shall inform the Agency promptly in writing of any assistance, other than the federal Scientific Research and Experimental Development Tax Credit, from other federal, provincial or municipal sources which had been received or is to be received for the Project, and the Agency shall have the right to adjust the amount of the assistance to take into account the amount of any such further assistance received.

4.05 The Applicant shall attain equity, satisfactory to the Agency, in the total amount of $83,250 **on or before the date of first disbursement by the Agency** to the Applicant. Unless otherwise authorized by the Agency in writing, this level of equity shall be maintained until the end of the Control Period.

In addition, the Applicant shall not withdraw funds from the operation in the form of management fees, bonuses/dividends, etc which would be considered as excessive by the Agency. (Excessive: level of payment above normal levels that could impair the viability of the Applicant).

4.06 **Prior to the first disbursement by the Agency,** the Applicant shall provide confirmation of the balance of project financing, satisfactory to the Agency. Amounts to be confirmed are:
- $83,250 in the form of an equity injection;
- $250,000 in the form of an operating line of credit.

4.07 With respect to communication requirements, the Applicant agrees to comply with Clauses 3, 4, and 5 of Annex 3 (General Conditions) regarding any public announcements of the Project.

5.00 Reporting

5.01 From the date of Project Commencement until the Project Completion Date the Applicant shall submit **semi-annual** status reports on the progress and results of the Project in a form satisfactory to the Agency.

5.02 The Applicant shall submit to the Agency, within **120** days of the end of each fiscal year which commences before the end of the Control Period, as defined in the attached General Conditions, a copy of its **independently prepared** financial statements.

6.00 Notice

6.01 Any notice or correspondence to the Agency, including the attached duplicate copy of this Agreement signed by the Applicant, shall be addressed to:

Atlantic Canada Opportunities Agency
P.O. Box 2284, Station Central
Halifax, Nova Scotia
B3J 3C8

Attention: Lauren MacDonald

or to such address as is designated by the Agency in writing.

7.00 Entire Contract

7.01 This offer, if accepted, including all Annexes, will constitute the entire agreement between the parties with respect to its subject matter. No amendments shall be made to the resulting contract unless confirmed in writing.

This offer is open for acceptance for sixty (60) days from the date that appears on its face. The date of acceptance shall be the date the duplicate copy of this offer, unconditionally accepted and duly executed by the Applicant is received by the Agency.

If further information is required, please contact Lauren MacDonald, the officer assigned to your project, at (800) 565-1228, (902) 426-2508 or via e-mail at lauren.macdonald@acoa-apeca.gc.ca.

Yours truly,

Chuck Maillet
Director General
Regional Operations

Attachments:

- Pre-authorized Repayment/Direct Deposit Form
- Annex 1 - The Project - Statement of Work
- Annex 2 - Project Fact Sheet for News Release
- Annex 3 - General Conditions
- Repayment Schedule
- Claims Package

The foregoing offer is hereby accepted this _____ day of _____ 20__.

(Project No.: 200804)
Lamda Guard Canada Inc.

Per: _____
(Signature)

_____
(Title)

(Corporate Seal)

ANNEX 1
Project No: 200804

Statement Of Work

Project Description
This project will assist the Applicant with using state-of-the-art patented technology to develop a transparent thin film based on nanotechnology that is able to block selected frequencies of light. Eligible costs include research salaries and wages, equipment and materials.

Project Location
Halifax, Nova Scotia

Project Costs		**Financing**	
Special Equipment	$112,000	ACOA BDP Repayable	$249,750
Salaries/Wages	126,000	Shareholders' Injection	83,250
Consultants	55,000		
Product Development	40,000		
Total Project Costs	**$333,000**	**Total Financing**	**$333,000**
Eligible Costs			
Special Equipment	$112,000		
Salaries/Wages	126,000		
Consultants	55,000		
Product Development	40,000		
Total Eligible Costs	**$333,000**		

Expected Results from the Project

The federal government requires that results from projects receiving federal funding be identified. ACOA will thus follow-up on the following expected results identified for your project.

Expected Project Results
The Proponent shall develop one new product (goggles) with its state of the art transparent thin film technology.

Means of Verification
Project final report and product demonstration.

ANNEX 2

PROJECT FACT SHEET

FOR NEWS RELEASE

Program:	**Project No.:**
ACOA Business Development Program (BDP)	200804

Name and Address of Applicant:	**Applicant Contact:**
Lamda Guard Canada Inc. Suite 1700, Tower 1 19556 Upper Water Street Halifax, Nova Scotia B3J 3N2	**Name:** Paul McLaughlin **Title:** **Telephone:** (506) 451-8202 **Fax:**

Project Location:	**Project Type:**
Halifax, Nova Scotia	Innovation

Project Description:
This project will assist the Applicant with using state-of-the-art patented technology to develop a transparent thin film based on nanotechnology that is able to block selected frequencies of light. Eligible costs include research salaries and wages, equipment and materials.

Total Project Costs: $333,000 **Eligible Costs:** $333,000

Authorized Assistance: $249,750 **Total Government Funding:** $249,750

Job Creation/Maintenance: This project will create 6 jobs

Estimated Sales Resulting from Project: N/A

Estimated Commencement Date: August 31, 2012

Estimated Completion Date: March 31, 2013

ANNEX 3

General Conditions (Revised August, 2006)

1. The Agreement resulting from the acceptance of this offer ("this Agreement") is made pursuant to the Business Development Program. This offer embodies and is subject to the Terms and Conditions of the Atlantic Canada Opportunities Agency's Business Development Program as approved by Treasury Board. This Agreement is that which is referred to as the "Contribution Agreement" in the Terms and Conditions, and should there be a conflict between the conditions included in this Agreement and the Terms and Conditions as approved by Treasury Board, the latter shall prevail.

2. In this Agreement, the following definitions shall apply:

   "**Control Period**" For commercial projects, this refers to the period beginning on the date of first disbursement and ending on the date on which all amounts due by the Applicant to the Agency under this Agreement have been paid in full or until that obligation is otherwise discharged to the satisfaction of the Agency. For non-commercial projects, the Control Period ends two (2) years after the date of Project Completion.

   "**Project Commencement Date**" means the date on which, in the opinion of the Agency, the first major commitment is made by the Applicant to implement the Project.

   "**Project Completion Date**" means the date on which, in the opinion of the Agency, all the eligible costs have been incurred and the work completed to the satisfaction of the Agency.

3. The Applicant shall obtain the approval of the Agency before preparing any announcements, brochures, advertisements or other materials that will display the Agency logo or otherwise make reference to the Agency.

4. The Applicant consents to a public announcement of the Project, by or on behalf of the Agency. The Agency shall inform the Applicant of the date on which the announcement is to be made and the Applicant shall keep this offer confidential until such date. After official announcement of the Project by the Agency, or sixty (60) days after the Applicant's acceptance of this offer, whichever is earlier, information appearing on the Project Fact Sheet, as attached hereto, will be considered to be in the public domain.

5. The Applicant will advise the Agency at least thirty (30) days in advance of any special event, (official opening, ribbon cutting, sod-turning, etc), the Applicant wishes to organize in connection with the Project. A ceremony shall only be held on a date which is mutually acceptable to the Minister and the Applicant. Furthermore, the Applicant consents to having the Minister or designate participate in any such ceremony.

6. The Applicant consents to the placement of a site sign, at the start of construction, which recognizes federal participation in the Project. The sign, to be provided by the Agency, shall be erected by the Applicant on or near the Project site, using a solid backing made of plywood, presswood or similar material. The sign must be in a highly visible location where it can be easily seen by passing traffic and not be overshadowed by other signs. It shall be removed by the Applicant after construction is completed and a wall plaque will be provided by the Agency to be placed by the Applicant in a visible location inside the facility.

7. The Applicant shall not alter the scope of the Project without the prior written consent of the Agency.

8. The Agency shall not contribute to any cost that is not a reasonable and proper direct cost of the Project, nor to any cost which is not substantiated by satisfactory supporting documentation.

9. The Applicant shall obtain the prior written consent of the Agency to any material change in the ownership, management, financing, location, size of facilities, timing, job creation, federal, provincial or municipal assistance with respect to the Project.

10. It is understood that the Agency may set-off any amount due and payable to the Applicant under this agreement against any amounts that the Applicant owes to Her Majesty in Right of Canada under legislation or other contribution agreements. The Applicant shall declare to the Agency details of any such amounts owed when making any claim for payment under this Agreement.

11. Upon request by the Agency, the Applicant shall provide elaboration of any report required under this Agreement, promptly and at no cost to the Agency.

12. The Applicant shall obtain insurance coverage on assets acquired for the Project, satisfactory to the Agency, and maintain this insurance until the end of the Control Period.

13. The Applicant shall not, prior to the end of the Control Period, cease to use, sell or otherwise dispose of eligible assets without the written consent of the Agency except where the assets disposed of are immediately replaced by comparable assets of equal or greater value and used in the assisted facility. Any funds recovered by the Agency pursuant to the sale or disposal of assisted assets, will be applied first to interest owing and secondly to repayment installments in reverse order of maturity.

14. For a period of thirty-six (36) months after the end of the Control Period, the Applicant shall permit any authorized representative of the Agency reasonable access to its premises to: (1) assess the progress and results of the Project, and (2) to audit the books, accounts, and records of the costs of the Project.

15. (a) The following constitute Events of Default:

    (i) the Applicant becomes bankrupt or insolvent, goes into receivership, or takes the benefit of any statute from time to time in force relating to bankrupt or insolvent debtors;

    (ii) an order is made or resolution passed for the winding up of the Applicant, or the Applicant is dissolved;

    (iii) in the opinion of the Agency the Applicant ceases to carry on business;

    (iv) the Applicant has submitted false or misleading information to the Agency;

    (v) the Applicant makes a false or misleading statement concerning assistance by the Agency in a prospectus or other document related to raising funds;

    (vi) the Applicant has not met or satisfied a term or condition to which the Contribution is subject; or

    (vii) the Applicant has not met or satisfied a term or condition under any other contribution agreement, or agreement of any kind, with the Agency.

    (b) If an Event of Default has occurred, or in the opinion of the Agency is likely to occur, the Agency may exercise either or both of the following remedies:

    (i) terminate any obligation by the Agency to contribute or continue to contribute to the costs of the Project, including any obligation to pay an amount owing prior to the date of such termination; and/or

    (ii) require the Applicant to repay part of or all of the Contribution forthwith to the Agency, and that amount is a debt due to Her Majesty in right of Canada and may be recovered as such.

    (c) The Applicant acknowledges the policy objectives served by the Minister's agreement to make the Contribution, that the Contribution comes from the public monies, and that the amount of damages sustained by the Crown in an Event of Default is difficult to ascertain and therefore that it is fair and reasonable that the Minister be entitled to exercise any or all of their remedies provided for in this Agreement and to do so in the manner provided for in this Agreement if an event of default occurs.

16. The Applicant shall pay, in addition to any amount payable as a result of an Event of Default, interest on that amount. The interest, calculated daily and compounded monthly, shall accrue commencing upon the date which, in the opinion of the Agency, the Event of Default occurred. The rate of interest shall be equal to three percent (3%) higher than the average Bank of Canada discount rate for the previous month.

17. The Applicant shall, no later than sixty (60) days following the Project Completion, submit to the Agency a satisfactory claim for all Eligible Project Costs pertaining to goods received, or services performed prior to the Project Completion Date and which have not already been claimed. Any costs not claimed in accordance with the foregoing shall be deleted from the Authorized Project Costs.

18. The Applicant must repay to the Agency any amount of the Contribution which exceeds the amount to which the Applicant is entitled, within thirty (30) days of written notification by the Agency.

19. When any payment is received from the Applicant on account of a repayable Contribution or an Event of Default, the Agency shall apply that payment first to reduce any accrued interest owing and then, if any part of the payment remains, to reduce the outstanding principal balance.

20. Any notice required to be given with respect to this Agreement shall be in writing and shall be effectively given if delivered or if sent by ordinary or registered mail, telegram, fax or telex addressed to the party for whom the notice is intended. Any notice shall be deemed to have been received on delivery; any notice sent by telegram, fax or telex shall be deemed to have been received one working day after being sent; any notice mailed shall be deemed to have been received eight (8) calendar days after being mailed.

21. This Agreement shall not be assigned by the Applicant without the prior written consent of the Agency.

22. No member of the House of Commons of Canada or the Senate of Canada shall be admitted to any share or part of this Agreement or to any benefit to arise therefrom.

23. No current or former public office holder or public servant who is not in compliance with the Federal Conflict of Interest and Post-employment Code for Public Office Holders or the Conflict of Interest and Post-employment Code for Public Servants shall derive a direct benefit from this Agreement.

24. The Applicant represents and warrants that any person who lobbies on their behalf to obtain this Agreement, or any benefit thereunder, and who is required to be registered pursuant to the Lobbyist Registration Act is registered pursuant to that Act.

25. This Agreement is binding on the Applicant and its successors and assigns.

26. The Agency and the Applicant declare that nothing in this Agreement shall be construed as creating a partnership, joint venture or Agency relationship between the Agency and the Applicant. The Applicant is not in any way authorized to make a promise, agreement or contract and to incur any liability on behalf of Canada, nor shall the Applicant make a promise, agreement or contract and incur any liability on behalf of Canada, and shall be solely responsible for any and all payments and deductions required by the applicable laws. The Recipient shall indemnify and save harmless ACOA in respect of any claims arising from failure to comply with the foregoing.

27. Any payment by the Agency under this Agreement is subject to there being an appropriation for the fiscal year in which the payment is to be made.

28. The Applicant shall obtain all necessary licenses and permits in relation to the Project that satisfy the requirements of all regulating bodies of appropriate jurisdiction.

29. The Applicant declares that no contingency fee for the solicitation, negotiation or obtaining of this agreement has been paid, agreed to be paid or will be paid directly or indirectly to any person other than to an employee of the Applicant acting within the scope of their employment.

30. The Agency may, at any time, by thirty (30) days notice to the Applicant, cancel this agreement if, in the Agency's opinion, the Statement of Work has not been executed in a satisfactory manner, or if the progress and objectives outlined in the contract have not been met.

31. The Applicant shall indemnify and save harmless, Agency from and against all claims, losses, damages, costs and expenses relating to any injury to, or death of, a person or loss or damage to property caused or alleged to be caused by the Applicant or its servants or agents in carrying out the Applicant's activities.

32. The Applicant shall proceed in a good and workmanlike manner and using qualified personnel to carry out the Project described in the Statement of Work.

33. All information obtained by the Agency from the Applicant pursuant to an application or during the course of this agreement will be kept confidential unless otherwise required by the law.

Client Name: Lamda Guard Canada Inc.
Account Manager: Lauren MacDonald **QA File ID:** 200804

REPAYMENT SCHEDULE

Applicant: Lamda Guard Canada Inc. **Start Date:** 2013/07/01
Account Number: 200804 **End Date:** 2023/06/01
Number of Repayments: 120
Total Repayable: $249,750.00

Payment#	Due Date	P/I/C	Amount Due	Amount Paid to Date	*Amount Outstanding
					$249,750.00
				$0.00	**$249,750.00**
1	2013/07/01	Principal	$2,081.25		$247,668.75
2	2013/08/01	Principal	$2,081.25		$245,587.50
3	2013/09/01	Principal	$2,081.25		$243,506.25
4	2013/10/01	Principal	$2,081.25		$241,425.00
5	2013/11/01	Principal	$2,081.25		$239,343.75
6	2013/12/01	Principal	$2,081.25		$237,262.50
7	2014/01/01	Principal	$2,081.25		$235,181.25
8	2014/02/01	Principal	$2,081.25		$233,100.00
9	2014/03/01	Principal	$2,081.25		$231,018.75
10	2014/04/01	Principal	$2,081.25		$228,937.50
11	2014/05/01	Principal	$2,081.25		$226,856.25
12	2014/06/01	Principal	$2,081.25		$224,775.00
13	2014/07/01	Principal	$2,081.25		$222,693.75
14	2014/08/01	Principal	$2,081.25		$220,612.50
15	2014/09/01	Principal	$2,081.25		$218,531.25
16	2014/10/01	Principal	$2,081.25		$216,450.00
17	2014/11/01	Principal	$2,081.25		$214,368.75
18	2014/12/01	Principal	$2,081.25		$212,287.50
19	2015/01/01	Principal	$2,081.25		$210,206.25
20	2015/02/01	Principal	$2,081.25		$208,125.00
21	2015/03/01	Principal	$2,081.25		$206,043.75
22	2015/04/01	Principal	$2,081.25		$203,962.50
23	2015/05/01	Principal	$2,081.25		$201,881.25
24	2015/06/01	Principal	$2,081.25		$199,800.00
25	2015/07/01	Principal	$2,081.25		$197,718.75
26	2015/08/01	Principal	$2,081.25		$195,637.50
27	2015/09/01	Principal	$2,081.25		$193,556.25
28	2015/10/01	Principal	$2,081.25		$191,475.00
29	2015/11/01	Principal	$2,081.25		$189,393.75
30	2015/12/01	Principal	$2,081.25		$187,312.50
31	2016/01/01	Principal	$2,081.25		$185,231.25
32	2016/02/01	Principal	$2,081.25		$183,150.00
33	2016/03/01	Principal	$2,081.25		$181,068.75
34	2016/04/01	Principal	$2,081.25		$178,987.50
35	2016/05/01	Principal	$2,081.25		$176,906.25
36	2016/06/01	Principal	$2,081.25		$174,825.00
37	2016/07/01	Principal	$2,081.25		$172,743.75
38	2016/08/01	Principal	$2,081.25		$170,662.50
39	2016/09/01	Principal	$2,081.25		$168,581.25
40	2016/10/01	Principal	$2,081.25		$166,500.00
41	2016/11/01	Principal	$2,081.25		$164,418.75
42	2016/12/01	Principal	$2,081.25		$162,337.50
43	2017/01/01	Principal	$2,081.25		$160,256.25
44	2017/02/01	Principal	$2,081.25		$158,175.00

45	2017/03/01	Principal	$2,081.25	$156,093.75
46	2017/04/01	Principal	$2,081.25	$154,012.50
47	2017/05/01	Principal	$2,081.25	$151,931.25
48	2017/06/01	Principal	$2,081.25	$149,850.00
49	2017/07/01	Principal	$2,081.25	$147,768.75
50	2017/08/01	Principal	$2,081.25	$145,687.50
51	2017/09/01	Principal	$2,081.25	$143,606.25
52	2017/10/01	Principal	$2,081.25	$141,525.00
53	2017/11/01	Principal	$2,081.25	$139,443.75
54	2017/12/01	Principal	$2,081.25	$137,362.50
55	2018/01/01	Principal	$2,081.25	$135,281.25
56	2018/02/01	Principal	$2,081.25	$133,200.00
57	2018/03/01	Principal	$2,081.25	$131,118.75
58	2018/04/01	Principal	$2,081.25	$129,037.50
59	2018/05/01	Principal	$2,081.25	$126,956.25
60	2018/06/01	Principal	$2,081.25	$124,875.00
61	2018/07/01	Principal	$2,081.25	$122,793.75
62	2018/08/01	Principal	$2,081.25	$120,712.50
63	2018/09/01	Principal	$2,081.25	$118,631.25
64	2018/10/01	Principal	$2,081.25	$116,550.00
65	2018/11/01	Principal	$2,081.25	$114,468.75
66	2018/12/01	Principal	$2,081.25	$112,387.50
67	2019/01/01	Principal	$2,081.25	$110,306.25
68	2019/02/01	Principal	$2,081.25	$108,225.00
69	2019/03/01	Principal	$2,081.25	$106,143.75
70	2019/04/01	Principal	$2,081.25	$104,062.50
71	2019/05/01	Principal	$2,081.25	$101,981.25
72	2019/06/01	Principal	$2,081.25	$99,900.00
73	2019/07/01	Principal	$2,081.25	$97,818.75
74	2019/08/01	Principal	$2,081.25	$95,737.50
75	2019/09/01	Principal	$2,081.25	$93,656.25
76	2019/10/01	Principal	$2,081.25	$91,575.00
77	2019/11/01	Principal	$2,081.25	$89,493.75
78	2019/12/01	Principal	$2,081.25	$87,412.50
79	2020/01/01	Principal	$2,081.25	$85,331.25
80	2020/02/01	Principal	$2,081.25	$83,250.00
81	2020/03/01	Principal	$2,081.25	$81,168.75
82	2020/04/01	Principal	$2,081.25	$79,087.50
83	2020/05/01	Principal	$2,081.25	$77,006.25
84	2020/06/01	Principal	$2,081.25	$74,925.00
85	2020/07/01	Principal	$2,081.25	$72,843.75
86	2020/08/01	Principal	$2,081.25	$70,762.50
87	2020/09/01	Principal	$2,081.25	$68,681.25
88	2020/10/01	Principal	$2,081.25	$66,600.00
89	2020/11/01	Principal	$2,081.25	$64,518.75
90	2020/12/01	Principal	$2,081.25	$62,437.50
91	2021/01/01	Principal	$2,081.25	$60,356.25
92	2021/02/01	Principal	$2,081.25	$58,275.00
93	2021/03/01	Principal	$2,081.25	$56,193.75
94	2021/04/01	Principal	$2,081.25	$54,112.50
95	2021/05/01	Principal	$2,081.25	$52,031.25
96	2021/06/01	Principal	$2,081.25	$49,950.00
97	2021/07/01	Principal	$2,081.25	$47,868.75
98	2021/08/01	Principal	$2,081.25	$45,787.50
99	2021/09/01	Principal	$2,081.25	$43,706.25
100	2021/10/01	Principal	$2,081.25	$41,625.00

101	2021/11/01	Principal	$2,081.25	$39,543.75
102	2021/12/01	Principal	$2,081.25	$37,462.50
103	2022/01/01	Principal	$2,081.25	$35,381.25
104	2022/02/01	Principal	$2,081.25	$33,300.00
105	2022/03/01	Principal	$2,081.25	$31,218.75
106	2022/04/01	Principal	$2,081.25	$29,137.50
107	2022/05/01	Principal	$2,081.25	$27,056.25
108	2022/06/01	Principal	$2,081.25	$24,975.00
109	2022/07/01	Principal	$2,081.25	$22,893.75
110	2022/08/01	Principal	$2,081.25	$20,812.50
111	2022/09/01	Principal	$2,081.25	$18,731.25
112	2022/10/01	Principal	$2,081.25	$16,650.00
113	2022/11/01	Principal	$2,081.25	$14,568.75
114	2022/12/01	Principal	$2,081.25	$12,487.50
115	2023/01/01	Principal	$2,081.25	$10,406.25
116	2023/02/01	Principal	$2,081.25	$8,325.00
117	2023/03/01	Principal	$2,081.25	$6,243.75
118	2023/04/01	Principal	$2,081.25	$4,162.50
119	2023/05/01	Principal	$2,081.25	$2,081.25
120	2023/06/01	Principal	$2,081.25	$0.00

Exhibit EX4.3.2

Atlantic Innovation Fund
Articles of Agreement

Project Number: 203260

This Agreement made

BETWEEN: **ATLANTIC CANADA OPPORTUNITIES AGENCY**

(hereinafter referred to as "the **Agency**")

AND: **METAMATERIAL TECHNOLOGIES INC.,** a corporation duly incorporated under the laws of ***Canada***, having its head office located at 1 Research Drive, Dartmouth, Nova Scotia, B2Y 4M9

(hereinafter referred to as "**MTI**")

AND: ***LAMDA GUARD INC.*,** a corporation duly incorporated under the laws of ***Canada***, having its head office located at 1 Research Drive, Dartmouth, Nova Scotia, B2Y 4M9

(hereinafter referred to as "**LGI**")

[**MTI** and **LGI** herein collectively referred together as "the **Recipient**"]

WHEREAS the Agency has established a program, the Atlantic Innovation Fund (AIF), to strengthen the economy of Atlantic Canada by supporting the development of knowledge-based industry. The AIF will help increase the region's capacity to carry out leading-edge research and development that directly contributes to the development of new technology-based economic activity in Atlantic Canada; and

WHEREAS the Recipient submitted a project proposal in response to the Agency's Request for Letters of Intent and Project Proposals, dated November 6, 2013.

IN CONSIDERATION of their respective obligations set out below, the parties hereto agree as follows.

ARTICLES OF AGREEMENT

Article 1 - Documents Forming Part of this Agreement

1.1 The following documents form an integral part of this Agreement:

These Articles of Agreement
Schedule 1 - General Conditions
Schedule 2 - Statement of Work
Schedule 3 - Claims and Project Cost Principles
Schedule 4 - Commercialization
Schedule 5 - Reporting Requirements
Schedule 6 - Project Fact Sheet for News Release
Schedule 7 - Special Equipment
Schedule 8 – Pre-Authorized Debit/Direct Deposit Authorization (PAD)

1.2 In the event of conflict or inconsistency, the order of precedence amongst the documents forming part of this Agreement shall be:

These Articles of Agreement
Schedule 1 - General Conditions
Schedule 2 - Statement of Work
Other Schedules

Article 2 - The Recipient's Obligations

2.1 The Recipient will carry out the ***NANOLIFT – Nanostructured Laser Interference Filter Technologies*** Project ("the Project") as described in Schedule 2 - Statement of Work, will make claims in accordance with Schedule 3 – Claims and Project Costs Principles, will commercialize as mentioned in Schedule 4 - Commercialization, will provide the reports required under Schedule 5 – Reporting Requirements and will fulfill all of its other obligations hereunder, in a diligent and professional manner using qualified personnel.

2.2 The Recipient shall ensure that the Project is completed on or before ***June 30, 2017*** ("**Project Completion Date**"), unless otherwise agreed to in writing by the Agency.

2.3 In the event the carrying out of the Project involves collaboration with other parties, the Recipient shall provide, prior to first disbursement of funds, satisfactory evidence to the Agency that appropriate agreements exist to ensure the roles and responsibilities of each party are defined.

Article 3 - The Contribution

3.1 Subject to all the other provisions of this Agreement, the Agency will make a Contribution to the Recipient in respect of the Project, of the lesser of:

(a) **75** % of Eligible Costs (estimated to be ***$4,000,000***);

OR

(b) ***$3,000,000***.

3.2 The Agency will pay the Contribution to the Recipient in respect of Eligible Costs as set out in Schedule 2 – Statement of Work; and incurred on the basis of itemized claims submitted in accordance with the procedures set out in Schedule 3 – Claims and Costs Principles.

3.3 The Agency will not contribute to any Eligible Costs incurred by the Recipient prior to November 6, 2013. The Agency will not accept any cost incurred after the Project Completion Date, unless otherwise agreed to in writing, by the Agency, prior to the costs being incurred.

3.4 Notwithstanding any other terms or conditions of this Agreement, if the Recipient does not submit a claim for payment or does not provide documentation with the claim that is satisfactory to the Agency within six (6) months after the Date of Execution of the Agreement ("the **Lapsing Date"),** the Agreement will terminate.

3.5 Notwithstanding any other terms or conditions of this Agreement, the Agency may cancel any outstanding balance of the Contribution that has not been fully disbursed by ***September 30, 2017*** ("the **Cancellation Date**").

3.6 Prior to first disbursement of this Contribution by the Agency, the Recipient shall arrange pre-authorized payments for scheduled repayments by completing a Pre- Authorized Debit/Direct Deposit Authorization form, in the form set out in Schedule 8 (and available on the Agency's website).

3.7 The Agency may withhold up to ten percent (10%) of the Contribution prior to the completion of the Project or until such audit as the Agency may require has been performed. In the event that no audit has been performed twelve (12) months after receipt of the final claim, any amount so withheld shall be released to the Recipient.

3.8 At the discretion of the Agency or at the request of the Recipient, the Agency may make payment(s) jointly to the Recipient and a third party for Eligible Costs which have been incurred.

Article 4 – Fiscal Year

4.1 The Recipient agrees that its Fiscal Year presently begins on ***January 1*** and ends on ***December 31*** and there shall be no change of that Fiscal Year except with the prior approval of the Agency.

Article 5 - Repayment

5.1 The Recipient shall repay the Contribution to the Agency by annual instalment calculated as a percentage of the Gross Revenues of the Fiscal Year(s) immediatly preceding the Due Date of the respective payment. This means, the annual installement will be calculated as a percentage of the Gross Revenues reported on the consolidated audited financial statements (i.e. Recipient and entities it controls) as described in Schedule 5 – Reporting Requirements.

5.2 (a) The annual amount due shall be calculated as follows:

(i) if Gross Revenues are less than One Million Dollars ($1,000,000) and cumulative Gross Revenues of prior completed fiscal years since the Date of Execution of this Agreement are less than Five Million Dollars ($5,000,000), then NIL;

(ii) if Gross Revenues are less than One Million Dollars ($1,000,000) and cumulative Gross Revenues of prioir completed fiscal years since the Date of Execution of this Agreement are Five Million Dollars ($5,000,000) or greater, then Five Percent (5%) of the cumulative Gross Revenues;

(iii) if Gross Revenues are more than One Million Dollars ($1,000,000) but less than or equal to Ten Million Dollars ($10,000,000), then Five Percent (5%) of Gross Revenues; and

(iv) if Gross Revenues are greater than Ten Million Dollars ($10,000,000) then Five Hundred Thousand Dollars ($500,000) plus One Percent (1%) of Gross Revenues above Ten Million Dollars ($10,000,000).

(b) Notwithstanding paragraph 5.2(a) above, in the event the Recipient earns Gross Revenues prior to the Project Completion Date, such Gross Revenues shall be included in the calculations of the first repayment.

5.3 The first repayment is due on ***September 1, 2018*** and subsequent repayments are due annually until the Contribution has been repaid in full.

5.4 MTI shall retain 100% ownership of all class of shares of its subsidiaries. Any sale of shares or Special Equipment of any subsidiary will constitue a material change to this Agreement.

5.5 MTI shall cause its subsidiaries to provide it financial assistance, where needed, in making payment of the amount due to the Agency.

Article 6 – Equity

6.1 The Recipient shall attain Equity, satisfactory to the Agency, in the total amount of $710,293 on or before the date of the first disbursement by the Agency to the Recipient. The basis of the Equity calculations is defined in the General Conditions (Schedule 1).

6.2 In order to comply with the required Equity level, the Recipient shall submit supporting documentation confirming an injection of Equity in the amount of $***1,000,000***.

6.3 Unless otherwise authorized by the Agency in writing, this level of Equity shall be maintained until all amounts due by the Recipient to the Agency under this Agreement have been paid in full or until that obligation is otherwise discharged to the satisfaction of the Agency.

Article 7 - Other Government Assistance

7.1 The Recipient hereby acknowledges that, no other federal, provincial or municipal government financial assistance other than that described in Section ***8.1*** of Schedule 2 has been requested or received by the Recipient for the Eligible Costs of the Project.

7.2 The Recipient will inform the Agency promptly in writing of any other federal, provincial or municipal government assistance to be received for the Eligible Costs of the Project and the Agency will have the right to reduce the Contribution under this Agreement to the extent of any such assistance.

Article 8 - Environmental Requirements

8.1 The Agency has determined that the *Canadian Environmental Assessment Act*, 2012, S.C. 2012, c. 19, s. 52 (CEAA, 2012) does not apply to the Project and that an environmental assessment (EA) or a determination under section 67 of CEAA, 2012 are not required for the Project.

8.2 If, as a result of changes to the Project or otherwise, the Agency is of the opinion that CEAA, 2012 applies to the Project, the Recipient agrees that construction of the Project, including site preparation, will not be undertaken or will be suspended and no funds or additional funds will become or will be payable by the Agency to the Recipient for the Project unless, and until:

(a) in the case of an EA, a decision statement has been issued to the Recipient; or

(b) in the case of a determination under section 67 of CEAA, 2012, the Agency determines that the Project is not likely to cause significant adverse environmental effects or is likely to cause significant adverse environmental effects that are justified in the circumstances.

8.3 For any EA or determination made under CEAA, 2012 as a result of changes to the Project or otherwise:

(a) the Recipient will comply with, to the satisfaction of the Agency and at the Recipient's own expense, all conditions included in the decision statement issued under CEAA, 2012 or other conditions that the Agency may require in coming to a determination under section 67 of CEAA, 2012.

(b) the Recipient will allow the Agency and its agents, employees, servants or contractors to access and enter at any time during reasonable hours upon any real property under the ownership or control of the Recipient for the purpose of ensuring that any conditions and mitigation measures are implemented for the Project.

Article 9 - Official Languages

9.1 The Recipient agrees that any public acknowledgment of the Agency's support for the Project will be expressed in both official languages.

9.2 The Recipient agrees:

(a) that basic project information, such as project description, will be developed and made available to the public in both official languages;

(b) to invite members of the official-language minority community to participate in any public event relating to the Project, where appropriate; and

(c) that main signage components related to the Project will be in both official languages.

Article 10 - Notice

10.1 Any notice to the Agency will be addressed to:

Atlantic Canada Opportunities Agency
Nova Scotia Regional Office
PO Box 2284, Station "Central"
Halifax, Nova Scotia
B3J 3C8
Attn: Ms. Dina Kalogeropoulos, Manager, Innovation
Email: Dina.Kalogeropoulos@acoa-apeca.gc.ca

Fax No.: 902-426-2054

10.2 Any notice to the Recipient will be addressed to:

Metamaterial Technoligies Inc.
1 Research Drive, Bay 8
Dartmouth, Nova Scotia
B2Y 4M9
Attn: Dr. George Palikaras, President & CEO
Email: info@metamaterial.com

Fax No.: NA

Article 11 - Entire Agreement

11.1 This Agreement constitutes the entire agreement between the parties and supersedes all previous documents, negotiations, arrangements, undertakings and understandings related to its subject matter.

IN WITNESS WHEREOF the parties hereto have executed this Agreement through duly authorized representatives.

ATLANTIC CANADA OPPORTUNITIES AGENCY,

ATLANTIC CANADA OPPORTUNITIES AGENCY,

Per: _____ _____

Signature Date

Peter Hogan Vice-President (Nova Scotia)

Name Title

METAMATERIAL TECHNOLOGIES INC.

Per: _____ _____

Signature Date

_____ _____

Name Title

Per: _____ _____

Signature Date

_____ _____

Name Title

Atlantic Innovation Fund
Schedule 1

GENERAL CONDITIONS

1. Definitions

For the purposes of this Agreement,

"Agreement" means the agreement to which these General Conditions relate, consisting of Articles of Agreement and the Schedules referred to in these Articles.

"Background Intellectual Property" means the intellectual property rights in the technology developed prior to the beginning of the Project and required for the carrying out of the Project or the exploitation of the Foreground Intellectual Property.

"Cancellation Date" means the date that any outstanding balance of the Contribution will be cancelled and no longer available for payment under this Agreement.

"Certificate of Incumbency" is a document which certifies which officials of the Recipient have the authority to execute documents as required under this Agreement. The Certificate of Incumbency is completed on a form provided by the Agency.

"Contribution" means the funding, in Canadian dollars, payable by the Agency under the Agreement.

"Date of Execution" means the date when the Agreement has been signed by all of the parties and only takes effect upon the signature of the last party.

"Due Date" in relation to an amount owing to the Agency, means: (i) the day on which a scheduled repayment is to be made; or, (ii) where no repayment schedule has been arranged, the day that is normally thirty (30) calendar days after the date on which a demand for payment is issued.

"Eligible Costs" means the Project cost elements specified in the Statement of Work in Schedule 2 and incurred by the Recipient in accordance with Schedule 3, Section B, Project Cost Principles, excluding but not limited to those Project cost elements that may be specifically mentioned in the Statement of Work as not being supported by the Agency.

"Equity" is to be calculated as the aggregate of:

(a) the Recipient's share capital;
(b) contributed surplus and other surplus accounts;
(c) retained earnings (added) or accumulated deficit (subtracted);
(d) subordinated shareholder(s)' loan(s). In order to be considered in this calculation, a duly signed Subordination Agreement must be on file; and
(e) loans from other parties that are subordinated (reduced in priority of payment) to all other liabilities for a certain period, at the satisfaction of the Agency. In order to be considered in this calculation, a duly signed Subordination Agreement must be on file.

LESS:

(f) advances to shareholders; and
(g) any other asset account that, in the opinion of the Agency, unreasonably inflates the Recipient's Equity.

"Fiscal Year" means the Recipient's fiscal year as set out in the Articles of Agreement.

"Foreground Intellectual Property" means all technical data, including without limitation, all designs, specifications, software, data, drawings, plans, reports, patterns, models, prototypes, demonstration units, practices, inventions, methods, applicable special equipment and related technology, processes or other information or know-how conceived, produced, developed or reduced to practice in carrying out the Project, and all rights therein, including without limitation, patents, copyrights, industrial designs, trade-marks, and any registrations or applications for the same and all other rights of intellectual property therein, including any rights which arise from the above items being treated by the Recipient as trade secrets or confidential information.

"Gross Revenues" means all revenues, receipts, monies and other considerations of whatever nature earned or received by the Recipient or by any entity it controls (as that is defined by the *IFRS10 Consolidated Financial Statements*), whether in cash, or by way of benefit, advantage, or concession, and without deductions of any nature, net of any returns or discounts actually credited and any sales, excise, ad valorem or similar taxes paid but without deduction for bad debts or doubtful accounts, as determined in accordance

with generally accepted accounting principles, applied on a consistent basis. Transactions with related persons (as this is defined in the Income Tax Act) will be deemed made in an amount equal to the fair market value for a similar product at the time of the transaction.

"Interest Rate" means the rate of interest equal to a rate three percent (3%) higher than the average Bank of Canada discount rate for the previous month.

"Key Project Collaborators" means a person or persons listed in section 3 of Schedule 2.

"Lapsing Date" means the date that this Agreement terminates because the Recipient failed to submit a claim for payment or provide documentation with the claim satisfactory to the Agency.

"Project" means the project described in Schedule 2.

"Project Completion Date" means the date set in the Articles of Agreement for the completion of the Project.

"Quarterly" means where documents are required to be submitted on a quarterly basis pursuant to this Agreement, they shall be submitted in accordance with the dates set out in Schedule 5, section 2.

"Resulting Products" means the Foreground Intellectual Property or any products or services resulting from the use of the Foreground Intellectual Property or any one or combination of these.

"Schedule" means a schedule to the Agreement.

"Special Equipment" means any prototype, pilot plant or other equipment acquired or manufactured for the purpose of the Project.

"Statement of Work" refers to the document in Schedule 2 containing the description of the Project.

2. Material Changes

No material changes will be made to the estimated total scope or nature of any element of the Project without the prior written consent of the Agency. Without limiting the generality of the foregoing, a material change will have occurred if:

(a) a Project performance milestone is not expected to be achieved within six (6) months of the projected completion date mentioned in the Statement of Work for that element;

(b) the estimated Eligible Costs and/or the total Project costs mentioned in the Statement of Work are expected to be exceeded by 20% or more;

(c) the Project is carried out at locations other than those mentioned in the Statement of Work;

(d) a change to to key Project personnel (as set out in Schedule 2), or to Key Project Collaborators, or to the Project financing, or to ownership of the Recipient has occurred; or

(e) a change in respect of any other aspect of the Project that has been specifically identified in another part of the Agreement as a "material change" for the purpose of this provision, has occurred.

3. Disposal of Assets

The Recipient shall retain possession and control of the Project assets, the cost of which has been contributed to by the Agency under the Agreement, and shall not dispose of the same without the prior approval of the Agency. In the event disposal is approved, it shall be conducted in accordance with Schedule 7 of this Agreement.

4. Claims for Payment

4.1 Overpayment

Where for any reason:

(a) the Recipient is not entitled to the Contribution; or

(b) the Agency determines that the amount of the Contribution disbursed exceeds the amount to which the Recipient is entitled,

the Recipient will repay to the Agency, promptly and no later than thirty (30) days from notice from the Agency, the amount of the Contribution disbursed or the amount of the overpayment, as the case may be, together with interest at the Interest Rate from the date of the notice to the day of repayment to the Agency in full. Any such amount is a debt due to Her Majesty in Right of Canada and is recoverable as such.

4.2 Right to Set-off
Without limiting the scope of set-off rights available to the Crown at Common Law, under the *Financial Administration Act* or otherwise, the Agency may:

(a) set-off against any portion of the Contribution that is payable to the Recipient pursuant to the Agreement, any amount that the Recipient owes to Her Majesty under legislation or any other agreement of any kind; and

(b) set-off against any amounts that are owed to the Agency by the Recipient, any amount that is payable by Her Majesty under legislation or any other agreements of any kind to the Recipient.

5. Monitoring

5.1 Agency's Right to Audit Accounts and Records
The Recipient will, at its own expense, preserve and make available for audit and examination by the Agency or the Agency's representatives the books, accounts and records of the Project and the information necessary to ensure compliance with the terms and conditions of this Agreement, including payment of amounts to the Agency and to assess the success of the Project and the AIF Program. The Agency will have the right to conduct such additional audits at the Agency's expense as may be considered necessary using the audit staff of the Agency, the Audit Services Group of Consulting and Audit Canada, an independent auditing firm or the Recipient's external auditors. The Recipient will ensure that any licence agreement it enters into for the exploitation of the Foreground Intellectual Property will contain provisions to enable the Recipient to obtain audit certificates from the licencees' accounts and records in respect of amounts that may be used by the Recipient to calculate the payment due to the Agency under this Agreement.

5.2 Access to Premises
The Recipient will provide the representatives of the Agency reasonable access to the Recipient's premises to inspect and assess the progress of the Agreement or any element thereof and supply promptly on request such data as the Agency may reasonably require for statistical or project evaluation purposes.

5.3 Access to Third-Party Information and Premises
The Recipient will assist the Agency with the implementation of the Agreement and facilitate access by the Agency to information from third parties and to the premises of third parties, relating to the Agreement.

6. Representations, Warranties and Undertakings

6.1 Representations, Warranties and Undertakings by the Recipient
The Recipient hereby certifies that the representations, warranties and undertakings are, and will be as of the Date of Execution of the Contribution Agreement, true and correct in all material respects. The Recipient undertakes to advise the Agency of any changes that materially affect the following representations, warranties and undertakings.

6.2 Power and Authority of Recipient
The Recipient represents and warrants that it is duly incorporated and validly existing and in good standing and has the power and authority to carry on its business, to hold property and to enter into this Agreement and undertakes to take all necessary action to maintain itself in good standing and to preserve its legal capacity.

6.3 Authorized Signatories
Each party represents and warrants that the signatories to the Agreement have been duly authorized to execute and deliver the Agreement.

6.4 Binding Obligations
Each party represents and warrants that the execution, delivery and performance of the Agreement have been duly and validly authorized and that when executed and delivered, the Agreement will constitute a legal, valid and binding obligation enforceable in accordance with its terms.

6.5 No Pending Suits or Actions
The Recipient warrants that it is under no obligation or prohibition, nor is it subject to or threatened by any actions, suits or proceedings which could or would prevent compliance with the Agreement. The Recipient will advise the Agency forthwith of any such occurrence during the term of the Agreement.

6.6 No Gifts or Inducements
The Recipient represents and warrants that it has not, nor has any person offered or promised to any official or employee of Her Majesty the Queen in Right of Canada, for or with a view to obtaining the Agreement, any bribe, gift or other inducement, and it has not nor has any person on its behalf employed any person to solicit the Agreement for a commission, contingency fee or any other consideration dependent upon the execution of the Agreement.

6.7 Intellectual Property
The Recipient shall provide the Agency, prior to first disbursement of funds, a certificate of a knowledgeable and authorized officer of the Recipient setting out the following representations and warranties and certifying that they are true and correct:

(a) that it has taken appropriate steps to ensure that the Recipient either owns the Background Intellectual Property or holds sufficient rights in the same to permit the Project to be carried out and the Foreground Intellectual Property to be exploited;

(b) that the title to the Foreground Intellectual Property is to be vested and, unless otherwise agreed to in writing by the Agency, to remain exclusively with the Recipient; and

(c) that it shall take appropriate steps to protect the Foreground Intellectual Property and shall, upon request, provide information to the Agency in that regard.

6.8 Compliance with Environmental Protection Requirements
The Recipient shall apply, in relation to the Project, in all material respects, the requirements of all applicable environmental laws, regulations, orders and decrees and regulatory bodies having jurisdiction over the Recipient or the Project.

6.9 Other Agreements
The Recipient represents and warrants that it has not entered, and undertakes not to enter, without the Agency's written consent, into any agreement that would prevent the full implementation of the Agreement by the Recipient.

6.10 Restriction on Dividends and Advances Paid
The Recipient will not make any dividend payments or other distributions to directors, officers, shareholders or related parties (as defined in the Income Tax Act) that would, in the opinion of the Agency, prevent it from implementing the Project and other Recipient's obligations under the Agreement, including the making of payments to the Agency as required under the Agreement.

6.11 Other Financing
The Recipient remains solely responsible for providing or obtaining the funding, in addition to the Contribution, required for the carrying out of the Project and the fulfilment of the Recipient's other obligations under the Agreement.

6.12 Lobbying Act
The Recipient represents and warrants that any person that has lobbied, or who lobbies on its behalf to obtain the Agreement, or any benefit thereunder, is in compliance with the *Lobbying Act*.

7. Term of Agreement

7.1 Term

(a) The Agreement will terminate when all amounts due by the Recipient to the Agency under this Agreement have been paid in full or until that obligation is otherwise discharged to the satisfaction of the Agency.

(b) In the event all of the Recipient's undertakings in regard to commercialization mentioned in Schedule 4 have been fulfilled and the Recipient has demonstrated to the satisfaction of the Agency that Gross Revenues have not been or will not continue to be generated, notwithstanding 7.1(a), the Agreement will terminate.

7.2 Audit
The audit rights of the Agency under section 5 above will survive for three years following the termination date established under subsection 7.1 above.

8. Default and Remedies

8.1 Events of Default
The following constitute Events of Default:

(a) the Recipient is, in the Agency's opinion, insolvent, adjudged or declared bankrupt or if it goes into receivership or takes the benefit of any statute from time to time in force relating to bankrupt or insolvent debtors;

(b) an order is made or appealed by the Recipient or a resolution is passed for the winding-up of the Recipient or it is dissolved;

(c) the Recipient submits false or misleading information to the Agency or makes a false or misleading representation;

(d) the Recipient makes a false or misleading statement concerning assistance by the Agency in a prospectus or other document related to raising funds;

(e) the Recipient fails to comply with any term, condition or undertaking in the Agreement;

(f) the Recipient neglects or fails to pay to the Agency any amount due in accordance with this Agreement;

(g) in the opinion of the Agency the Recipient ceases to carry on business;

(h) in the opinion of the Agency a material adverse change occurs in the financial condition, business operations of the Recipient(s), or any subsidiaries of the Recipient(s); or

(i) the Recipient is in default under the terms of any other agreement with the Agency or any other financial institution, bank or creditor, including those with rights to the property or asset of the Recipient.

8.2 Remedies on Default
If an Event of Default has occurred, or in the opinion of the Agency is likely to occur, the Agency may exercise one or more of the following remedies:

(a) suspend any obligation by the Agency to contribute or continue to contribute to the Eligible Costs, including any obligation to pay any amount owing prior to the date of such suspension;

(b) terminate any obligation of the agency to contribute or continue to contribute to the Eligible Costs, including any obligation to pay any amount owing prior to the date of such termination; or

(c) require the Recipient to repay to the Agency all or part of the Contribution paid by the Agency to the Recipient, and pay the Agency any amounts due under the Agreement, together with interest at the Interest Rate. The interest, calculated daily and compounded monthly, shall accrue commencing upon the date which, in the opinion of the Agency, the Event of Default occurred.

8.3 Remedies Fair and Reasonable
The Recipient acknowledges that in view of the policy objectives served by the Agency's agreement to make the Contribution, the fact that the Contribution comes from public monies, and that the amount of damages sustained by the Crown in the Event of Default is difficult to ascertain, that it is fair and reasonable that the Agency be entitled to exercise any or all of the remedies provided for in this section 8 and to do so in the manner provided for in this section if an Event of Default occurs; provided that in exercising any remedy in accordance with subsection 8.2(c) other than for a breach of subsection 8.1(e), the Agency will credit the Recipient for any amounts paid to the Agency pursuant to Article 5 Repayment of this Agreement.

8.4 No Waiver
The fact that the Agency refrains from exercising a remedy it is entitled to exercise under the Agreement will not constitute a waiver of such right and any partial exercise of a right will not prevent the Agency in any way from later exercising any other right or remedy under the Agreement or other applicable law.

9. Indemnity
The Recipient shall indemnify and save harmless the Agency from and against all liability, actions, claims, losses, damages, costs and expenses that may be brought against or suffered by the Agency and that the Agency may incur, sustain or pay arising out of or relating to any injury to, or death of, a person or loss or damage to property or other loss or damage caused or alleged to be caused by

the Recipient or its servants, agents, subcontractors, or independent contractors in the course of carrying out the obligations of the Agreement.

10. Repayment

10.1 Application of Payment
When any payment is received from the Recipient on account of a repayable Contribution or an Event of Default, the Agency shall apply that payment first to reduce any accrued interest owing and then, if any part of the payment remains, to reduce the outstanding principal balance.

10.2 Prepayment
The Recipient may, at any time, make prepayments on account of repayment instalments and each such prepayment will be applied first to interest owing and secondly to repayment instalments in reverse order of maturity.

10.3 Overdue
The Recipient shall pay, where the account is overdue, and in addition to any amount payable, interest on that amount at the Interest Rate, in accordance with the *Interest and Administrative Charges Regulation*. The interest, calculated daily and compounded monthly, shall accrue from the Due Date until payment is received.

10.4 Fee
An administrative fee shall be charged on every payment rejected by the Recipient's financial institution for any reason, in accordance with the *Interest and Administrative Charges Regulation* which may be amended from time to time. The current fee is set at fifteen dollars ($15).

11. Force Majeure

11.1 Event of Force Majeure
The Recipient will not be in default by reason only of any failure in performance of the Project in accordance with Schedule 2 if such failure arises without the fault or negligence of the Recipient and is caused by any event of force majeure.

11.2 Definition of Force Majeure
Force majeure means any cause that is unavoidable or beyond the reasonable control of the Recipient, including war, riot, insurrection, orders of government, strikes or any Act of God or other similar circumstance which is beyond the Recipient's control, and which could not have been reasonably circumvented by the Recipient without incurring unreasonable cost.

12. Communications

12.1 Consent to Public Announcements
The Recipient hereby consents to public announcements by or on behalf of the Agency containing any of the information contained in Schedule 6 entitled "Project Fact Sheet for News Release".

12.2 Confidentiality Obligation
ACOA will inform the Recipient of the date on which the first public announcement is to be made and the Recipient will not disclose the existence of this Agreement until such date.

12.3 Public Domain
After official announcement of the Project by the Agency, or sixty (60) days after execution of this Agreement by the Recipient, whichever is earlier, information appearing on the Project Fact Sheet, as attached hereto, will be considered to be in the public domain.

12.4 Public Communications
The Recipient shall acknowledge the Agency's contribution in any public communication of the Project and shall obtain the approval of the Agency before preparing any announcements, brochures, advertisements or other materials that will display the ACOA logo or otherwise make reference to the Agency

12.5 Reporting under Security Laws
Nothing in this Agreement shall be interpreted as preventing the fulfilment by the Recipient of its reporting obligations under applicable security laws.

13. Notice

13.1 Form and Timing of Notice
Any notice, information or document provided for under the Agreement shall be effectively given if delivered or sent by letter or facsimile, postage or other charges prepaid. Any notice that is delivered shall have been received on delivery; any notice sent by facsimile shall be deemed to have been received one working day after having been sent, and any notice mailed shall be deemed to have been received eight (8) calendar days after being mailed.

13.2 Change of Address
A party may change the address, which that party has stipulated in the Agreement, by notifying in writing the other party of the new address.

14. Compliance with Laws
In implementing the Agreement, the Recipient will comply with all applicable federal, provincial and municipal laws, including but not limited to statutes, regulations, by-laws, ordinances and decrees.

15. Members of Parliament
No member of the House of Commons will be admitted to any share or part of this Agreement or to any benefit to arise there from. No person who is a member of the Senate will, directly or indirectly, be a party to or be concerned in the Agreement.

16. Annual Appropriations

16.1 Parliamentary Allocation
Any payment by the Agency under this Agreement is subject to there being an appropriation for the fiscal year of the Agency , beginning on April 1 and ending on the following March 31, in which the payment is to be made and to cancellation or reduction in the event that departmental funding levels are changed by Parliament.

16.2 Lack of Appropriation
In the event that the Agency is prevented from disbursing the full amount of the Contribution due to a lack or reduction of appropriation or departmental funding levels, the parties agree to review the effects of such a shortfall in the Contribution on the implementation of the Agreement and to adjust, as appropriate, the Commercialization requirements specified in Schedule 4.

17. Confidentiality

17.1 Consent Required
Subject to section 12 and the *Access to Information Act*, each party shall keep confidential and shall not, without the consent of all parties, disclose the contents of the Agreement and the documents pertaining thereto, whether provided before or after the Agreement was entered into, or of the transactions contemplated herein.

17.2 International Dispute
The Agency is hereby authorized to disclose any of the information referred to in subsection 17.1 above where, in the opinion of the Agency, such disclosure is required to an international trade panel for the purposes of the conduct of a dispute in which Canada is a party or a third party intervener. The Agency shall give prior notice to the Recipient of such disclosure.

18. Consent of ACOA

Whenever the Agreement provides for the Recipient obtaining the consent or agreement of the Agency, it is understood that such consent or agreement shall not be unreasonably withheld and that the Agency may make the issuance of such consent or agreement subject to reasonable conditions.

19. No Assignment of Agreement

The Recipient shall not assign the Agreement nor any part thereof without the prior written consent of the Agency.

20. Compliance with Post-Employment Provisions

No current or former public office holder or public servant, who is not in compliance with the *Conflict of Interest Act* and the *Value and Ethics Code for Public Service*, shall derive a direct benefit from this Agreement.

21. Contribution Agreement Only

The Agreement is a contribution agreement only, not a contract for services or a contract of service or employment, and nothing in the Agreement, the parties relationship or actions is intended to create, nor shall be construed as creating, a partnership, joint venture, employment or agency relationship between them. The Recipient is not in any way authorized to make a promise, agreement or contract and to incur any liability on behalf of Canada, nor shall the Recipient make a promise, agreement or contract and incur any liability on behalf of Canada, and shall be solely responsible for any and all payments and deductions required by the applicable laws. The Recipients shall indemnify and save harmless the Minister in respect of any claims arising from failure to comply with the foregoing.

22. Binding Agreement

This Agreement is binding on the parties and their successors and permitted assigns.

23. Severability

Any provision of this Agreement prohibited by law or otherwise ineffective will be ineffective only to the extent of such prohibition or ineffectiveness and will be severable without invalidating or otherwise affecting the remaining provisions of the Agreement.

24. Applicable Law

The Agreement shall be interpreted in accordance with the laws in force in the province from which the contract is issued.

25. Insurance Coverage

The Recipient shall obtain appropriate insurance coverage until all amounts due by the Recipient to the Agency under this Agreement have been paid in full or until that obligation is otherwise discharged to the satisfaction of the Agency.

26. Signature in Counterparts

This Agreement may be signed in counterparts, each of which when taken together, will constitute an original Agreement.

27. Aboriginal Consultation

The Recipient acknowledges that the Agency's obligation to pay the Contribution is conditional upon the Agency satisfying any obligation that it may have to consult with or to accommodate any Aboriginal groups that may be affected by the terms of this Agreement.

Atlantic Innovation Fund
Schedule 2

STATEMENT OF WORK (SOW)

1. Description of the Work

Light from hand-held lasers have been interfering with aircraft during the approach and landing phase of flight over the past several years. Despite the implicit and explicit costs associated with these laser attacks, there is a lack of solutions to address this growing threat. This 3 year project, will enable the Recipient to develop metaAIR, which is a thin film that can be added to the windscreen in order to reflect the harmful laser light aimed at the cockpit crew at a distance of fifty metres up to 5 km.

This new optically transparent film will be made of nano-composite materials that can be applied on hard or soft (flexible) surfaces such as glass (e.g. windscreens and windows). Unlike current nanotechnology-based optical solutions, the proposed project will develop a new enabling platform technology ensuring that the resulting products will be cheaper, scalable, safer, and produced for the first time with sustainable quality on meter-scale surfaces.

The films will be effective with laser beams that have the following characteristics:

- 532nm wavelength light (green) and IR wavelength (tbd),
- Optionally 635nm (red) and 445nm (blue) wavelengths,
- Any beam shapes,
- Emitted power starting from 5mW up to a maximum power of a 2000 mW,
- Aimed at the cockpit crew at a distance between 50m and up to 5000m.

The films used in the cockpit to filter the laser beams will have to meet several performance characteristics in order to be commercially adopted. The cockpit laser filter shall:

- Attenuate laser beams below a threshold of down to 5uW/cm2 in any flight deck location,
- Maintain the required attenuation performance under steady or multiple laser illuminations,
- Maintain the required attenuation performance under a vertical beam incidence angle axis comprise between -70 degrees to +0 degrees with regards to the normal direction of the filter surface,
- Maintain the required attenuation performance under a horizontal beam incidence angle axis comprise between -55 degrees to +55 degrees with regards to the normal direction of the filter surface,
- Not alter the flight crew visual perception (colors and geometries) of external references during all flight phases and at any daytime and night-time,
- Not alter the flight crew visual perception (colors and geometries) of external references under static or repeated normal glass deformation,
- Not alter the display of cockpit equipment during all flight phases and at any day- time and night-time,
- Allow the aircrew to detect the presence of any laser light aimed at the cockpit during all flight phases and at any day-time and night-time, and
- Allow to be manually removed by a single person in less than 10 seconds in case of abnormal or emergency situations.

The Recipient has an R&D agreement with Airbus, which will become a commercial agreement to commercialize metaAIR™ on the A300 family of planes.

It is expected that this project will lead to the development and commercialization of the metaAIR™ product. This project will also develop a proprietary platform technology and manufacturing capacity. Assembly will be accomplished regionally, with the future potential to issue commercial use licenses to other manufacturers (e.g. for military use). This enabling platform technology can be further harnessed beyond this project to develop other optical applications such as super-bright LED lights and efficient solar panels.

2. Key Project Personnel

Project Manager (PM) – TBA The PM will be responsible for managing the project and its financial control. This person will also be responsible for coordinating the key members of the project team and ensuring the project deadlines and milestones are met. The Project Manager should ideally have an engineering or other quantitative and/or science degree, along with practical project management experience and/or an MBA.

Project Manager Advisor – Dr. George Palikaras (Ph.D. in electrical and electronic engineering). Dr. Palikaras will continue to remain directly involved with the issue of laser attacks against aircraft (i.e. committees, white papers, etc) and utilize his network of contacts to bring together key stakeholders from the aviation industry, the security authorities, pilots and airlines. Given Dr. Palikaras's education and knowledge of the subject matter, he will advise and support the Project Manger.

Chief Science Officer – Dr. Themos Kallos (Ph.D. in Electrical Engineering and Applied Physics). Dr. Kallos will coordinate the research efforts of the project for the company and liase with academia. He will also be responsible for setting up the manufacturing facility to ensure the required processes conform to the optical performance requirements. Dr. Kallos will also be responsible for building the capacity of the Recipient's research team as the project proceeds.

Chief Technology Officer – Dr. Andrew Yick (Ph.D. in Electrical Engineering). Dr. Yick will be respsonsible for the methodology to develop the filters. Dr. Yick, in collaboration with the project team, will setup the manufacturing process for the filter to meet the performance specifications outlined by Airbus.

Principal Chemical and Materials Scientist – Dr. Gisia Beydaghyan (Ph.D. in Physics). Dr. Beydaghyan will develop the necessary large-scale chemical processes and methodologies for the facbrication of the films. In particular, Dr. Beydaghyan will research the necessary reicpes and modifications in order to optimize the optical performance on a large scale.

3. Key Project Collaborator(s)

Université de Moncton

The Recipient has partnered with Université de Moncton. In particular, Proffessor Pandurang Ashrit and Abdelaziz Nait Ajjou are the two individuals at the Université who have the knowledge and expertise in optical systems design and chemical processing methodologies (such as spin coating and sol-gel). UdeM will be involved in the preparation of the prototype filter samples and the development of the sol-gel process, as detailed in the tasks below.

Airbus S.A.S.

The Recipient has recently signed strategic R&D collaborative agreements with Airbus with the intention that upon successful outcome of this AIF project the relationships will continue into commercial agreements as specified in the existing MoU partnership agreement. Airbus provides technology support and know-how, including: the optical specifications of the filters; the environmental specifications of the filters; aircraft windscreens to deposit the filters on (substrate material); access to testing facilities and aircraft personnel to evaluate the filtering performance; guidance and advice in the development strategy of the filters; and aid in the regulatory process to approve the metaAIR product.

4. Description of Project Activities

Activity 1: Filter Design Optimization. In this activity the Recipient will optimize the optical performance of the filters. The Recipient will improve the angle for which the bandgap appears, the transparency, minimize their thickness (for optimal use of materials), and achieve the narrowest possible bandgap for optimal performance. The samples here will be produced on a small scale, using the GLAD method for quick turnaround time. The filtering performance of nanoparticle-based filters (which can enhance the angle of incidence) will also be assessed.

Activity 2: Identification of Large Scale Filter Fabrication Methods. In this research activity the Recipient will investigate and optimize the fabrication methodologies that will allow the manufacturing of large-scale filters. The main focus will be on the sol-gel, holography, nanoparticle and sputtering processes, researching the necessary materials and recipes required for coating substrates with multiple dielectric layers. In this activity the Recipient will decide which fabrication method is most appropriate, based on the following criteria:

1) Successful optical performance, as defined in section 2.2 (page 11) of the Memorandum of Understanding between Airbus S.A.S. and Lamda Guard Inc. dated February 7, 2014;
2) Successful testing for environmental specifications and certification standards, as defined in section 2.3 (page 12) of the Memorandum of Understanding between Airbus S.A.S. and Lamda Guard Inc. dated February 7, 2014;
3) Minimum expected cost of manufactured products; (less than $10,000 per windscreen film); and
4) Reduced complexity and cost in setting up manufacturing facilities (initial target production volume is 10 windscreens per month and can scale up based on volume demand).

If the proposed fabrication method (sol-gel holography, or nanoparticles) fails to meet these criteria, the sputtering fabrication method will be used, mitigating the risk. This method is widely used in the industry but does not offer necessarily cost-effective large-scale films.

Activity 3: Customization and Upscaling for Industrial Fabrication & Testing. In this activity the Recipient will transition towards an industrial setting. The Recipient will investigate the methods and equipment required to transfer the fabrication methods to a pilot facility and perform the necessary quality control. This will require purchasing equipment, customizing the operation of this equipment, and possibly prepare the Recipient's own manufacturing and testing processes that are designed specifically for its

products. Great care will be taken to research all the available manufacturing options and then identify the necessary components, while incorporating the customizations suited for its filter production methodologies.

Activity 4: Setup of Pilot Manufacturing and Testing Facility. In this activity the equipment that would have been identified in activity 2 and optimized in activity 3 will be installed. The manufacturing process flow will be streamlined, and any issues will be properly addressed. The Recipient will test the repeatability of the runs, troubleshoot any specialized equipment functions, setup the test stations, and generally optimize the process to operate with minimum cost and maximum efficiency. This includes the installation of the coating systems and testing stations.

2.1 Major Activities

Activity 1: Filter Design Optimization [the Recipient, University de Moncton (UdeM), AIRBUS, ESL Technology Inc. (ESL), Ondax Inc. (Ondax), Months 01 – 12]

Task 1.1: Filter design and specifications

- Description: The optimized filter design will be simulated in advanced electromagnetics and optics software to verify the optical filtering performance.
- Risks: Achieving good angle performance; AIRBUS engineers provide feedback only after they evaluate fabricated films; simulations take too long to produce.
- Risk mitigation strategies: Implement advanced filter design techniques (also in collaboration with NRC labs) to improve the angle performance; produce visual simulator software to evaluate the film performance ahead of manufacturing; invest on faster computer equipment.
- Anticipated performance goals: A specification sheet (transparency, attenuation, bandgap, angle dependence will be finalized in collaboration with AIRBUS aircraft safety engineers).
- Milestones: *Milestone M1.1: Filter specification sheet*

Task 1.2: Fabrication of filters with optimized transparency & multi-wavelength filtering

- Description: Using existing fabrication methods (GLAD & sputtering) the filter will be optimized in terms of transparency and their operational wavelengths on a small scale. These effects will be demonstrated via optical testing and performance characterization. AIRBUS will provide aircraft commercial grade cockpit glass panes, which will be used as base substrates for the deposition process.
- Risks: Samples take too long to be fabricated; samples fail performance testing; transparency is not adequate.
- Risk mitigation strategies: Hire enough people to run fabrication shifts in parallel (GLAD and sputtering); incorporate intermediate optical testing (when only a section of a sample is finished) to minimize wasted time in fabrication; include materials and anti-reflection coatings.
- Anticipated performance goals: Small-scale (up to 10 cm^2 surface area) green-blocking films with OD at least equal to 2 and transparency >50%.
- Milestones: N/A

Task 1.3: Fabrication of filters on transparent substrates

- Description: The optimized versions of the filters will be deposited on small-scale transparent substrates instead of the traditional glass. The substrates will be retrieved from Activity 2.
- Risks: Polycarbonate substrates cannot be coated (typically because they cannot withstand high temperatures); other transparent substrates cannot be sourced on time.
- Risk mitigation strategies: Utilize fabrication processes at lower temperatures (GLAD, holography); place orders early to ensure sample sourcing.
- Anticipated performance goals: Green filter small scale samples on polycarbonate and/or other transparent bendable substrates.
- Milestones: *Milestone M1.2: Filter sample with optimized transparency, multi-angle performance on a transparent substrate.*

Task 1.4: Characterization of filters

- Description: The optimized small-scale transparent films and deposited on transparent substrates will be examined. Both optical as well as environmental (UV, heat, humidity) properties will be examined. The filter performance will be assessed AIRBUS aircraft test pilots and safety engineers.
- Risks: Optical testing equipment is not available on time; testing equipment is inadequate to fully quantify performance; testing is not completed on time; samples are destroyed during environmental testing.
- Risk mitigation strategies: Testing equipment is purchased early; sections of the testing are outsourced to well-established facilities; multiple samples are fabricated or larger samples are diced into smaller pieces before testing.
- Anticipated performance goals: Adequate testing characterization of filters to ensure its long-term volume production outlook. Assessment of film performance against AIRBUS milestones.
- Milestones: *Milestone M1.3: Filter characterization report on optical and environmental performance.*

Task 1.5: Assessment of regulatory and safety standards

- Description: The various aviation standards will be surveyed in collaboration with AIRBUS aircraft safety engineers to ensure that the films are compatible with existing regulatory requirements. This includes hazardous materials, UV resistance requirements, environmental regulations, etc.
- Risks: Regulatory and aviation standards are not readily available publicly.
- Risk mitigation strategies: AIRBUS safety experts will provide the necessary information.
- Anticipated performance goals: Assessment of timelines and effort required for the regulatory approval and certification of the product.
- Milestones: N/A

Task 1.6: Intellectual property development (design)

- Description: If applicable, the necessary steps will be taken to protect the intellectual property generated in this activity, including patenting the optimized filter design and its properties.
- Risks: IP developed is too complex or not adequate to establish a patent.
- Risk mitigation strategies: The Recipient will engage with the experienced patent attorneys (Kilburn and Strode) to verify clarity of the developed IP and decide on the strategy.
- Anticipated performance goals: Evaluation of intellectual property developed during Activity 1.
- Milestones: Slidedeck presentation and/or report on developed IP
- **Go/no-go decision:** An optimized filter that meets optical and environmental specifications and satisfies the performance matrix as set by the Recipient and AIRBUS.

Activity 2: Identification of Large Scale Filter Fabrication Methods [the Recipient, UdeM, AIRBUS, ESL, Ondax, Months 01 – 12]

Task 2.1: Fabrication of optimized scalable filter

- Description: The optimized multi-layer filter design from activity 1 will be fabricated now on a small scale using a scalable method (sputtering or sol-gel or nanoparticles or holography). The exact fabrication process will be identified and optimized to reduce coating and drying times. This task will be completed partly in-house and partly via technology transfer from the University of Moncton, UNB and Ondax. AIRBUS will provide aircraft commercial grade cockpit glass panes that will be used as base substrates for the deposition process.
- Risks: Identifying the most promising scalable technology early for activities 3 & 4; difficulty in optimizing the speeds and processing times.
- Risk mitigation strategies: Simultaneously run projects in parallel so that the scalability progress evolves in parallel; plan ahead with equipment necessary to optimize processing times.
- Anticipated performance goals: OD2 green blocking filter of at least 1x1 cm^2 with one of the scalable fabrication methods. The method should demonstrate at least 70% integrated transmission.
- Milestones: *Milestone M2.1: Optimized filter fabricated via scalable method.*

Task 2.2: Upscaling to 10cm x 10cm surface areas

- Description: The fabrication processes identified in this activity so far will now be augmented to larger scales. The smoothness and quality (transparency, lack of bubbling, etc.) of the new large films will be assessed.
- Risks: Process does not scale successfully to larger areas; scaling is too expensive.
- Risk mitigation strategies: The processes will be run in parallel in order to choose the best performing one in terms of scalability; we will identify the most affordable scaling method.
- Anticipated performance goals: Test runs of scaling processes, evaluating their performance, time, cost, and difficulty. A summary report will compare the different methods. A 10 x 10 cm^2 filter will be presented.
- Milestones: *Milestone M2.2: 10cm x 10cm optimized filter fabricated via sol-gel, nanoparticles, holography or sputtering.*

Task 2.3: Optical performance testing of large-scale samples

- Description: The large-scale films will be thoroughly tested and measured to ensure the optical filtering is maintained throughout their surface. If necessary, the upscaling fabrication process of the previous task will be modified to produce optimal results.
- Risks: Quality control is inadequate; testing cannot be completed on time.
- Risk mitigation strategies: The Recipient will invest in state-of-the-art aviation-grade quality control measures; The Recipient will hire the necessary testing engineers to obtain the quickest testing results.
- Anticipated performance goals: Test report that quantifies the performance of the films produced with each scalable method. The measurement of success will be against the criteria defined in Activity 1.
- Milestones: N/A

Task 2.4: Environmental testing

- Description: The large scale films will be tested in collaboration with AIRBUS and ESL for reliability in varying environmental conditions: temperature gradients, pressure variation, humidity control, UV resistance, heat, coloration effects.
- Risks: Long lead time in environmental testing; not all environmental tests can be completed at a single location; material fails testing requirements.
- Risk mitigation strategy: Engage early with environmental testing partners; utilize different materials for testing; test with raw materials quickly before fabricating the filters with them.
- Anticipated performance goals: Environmental report characterizing the materials against the AIRBUS-approved specifications.
- Milestones: *Milestone M2.3: Characterization report on optical and environmental performance for 10cm x 10cm filters on transparent substrates.*

Task 2.5: Visual performance testing

- Description: The filters will be tested to get end-user (pilots) feedback on the desired visual performance of the filters. The task will include testing the Recipient's proprietary 3D visual simulator. The AIRBUS test pilots and safety engineers will assist in designing realistic scenarios and assessing the visual performance of the Recipient's filters.
- Risks: Long lead time in arranging sessions with pilots; 3D simulator hardware is not readily available; visual simulator is not accurate.
- Risk mitigation strategies: Accurate color simulations will provide identical images as if the pilot is using the actual filters; the 3D simulators will be designed with the strictest standards in visual accuracy.
- Anticipated performance goals: Feedback from pilots and users about the optical quality (coloration, transparency, visual acuity) of the films.
- Milestones: Slidedeck presentation and/or report on visual testing

Task 2.6: Physiological testing

- Description: The filters will be tested to get immediate feedback on any potentially adverse physiological effects to end-users. The task will include testing with realistic handheld lasers, i.e. shining a variety of laser power levels, angles and distances against the metaAIR™ filters. The AIRBUS test pilots and safety engineers will assist in simulating realistic scenarios and assessing the performance of the Recipient's filters.
- Risks: Long lead time in arranging sessions with pilots and users.
- Risk mitigation strategies: Engage early with AIRBUS collaborators to ensure availability of the users.
- Anticipated performance goals: Positive feedback on the visual performance of the filters which will be incorporated into the subsequent filter design iterations.
- Milestones: N/A

Task 2.7: Intellectual property development (fabrication)

- Description: If applicable, the necessary steps will be taken to protect the intellectual property generated in this activity, including patenting the optimized filter design and its properties.
- Risks: IP developed is too complex or not adequate to establish a patent.
- Risk mitigation strategies: The Recipient will engage with the experienced patent attorneys (Kilburn and Strode) to verify clarity of the developed IP and decide on the strategy.
- Anticipated performance goals: Evaluation of intellectual property developed during Activity 2.
- Milestones: Slidedeck presentation and/or report on developed IP

Go/no-go decision: Identification of the optimal fabrication methodology based on the following success criteria: 1) Successful optical performance; 2) Successful testing for environmental specifications and certification standards; 3) Minimum expected cost of manufactured products; 4) Reduced complexity and cost in setting up manufacturing facilities. If the proposed fabrication methods (sol-gel or holography) fail to meet these criteria, the sputtering fabrication method will be used. This method is widely used in the industry but does not offer necessarily cost-effective large-scale films.

Activity 3: Customization and Upscaling for Industrial Fabrication [the Recipient, AIRBUS, Months 13 – 24]

Task 3.1: Scalability assessment to 1m x 1m surface areas

- Description: Based on the results of activity 2, it will be assessed if and how the processes need to be modified to produce at least 1m x 1m film surfaces (cockpit windscreen size) on a roll to roll basis. This is a planning task that will identify at that stage any potential risks and modifications.
- Risks: A definite winning strategy is not clear; data for performing the assessment are not available on time.
- Risk mitigation strategies: The Recipient will compile a table of all the advantages and disadvantages of each technology and their overall outlook will be assessed by the management team and the board.
- Anticipated performance goals: Report evaluating the different methodologies for scalable fabrication of laser filters.
- Milestones: N/A

Task 3.2: Large scale manufacturing equipment research

- Description: In this task the exact equipment necessary to fabricate the large-scale films will be researched. Any customizations necessary to apply existing equipment to the planned product line will be outlined at his stage.

- Risks: Long lead times; might need to license technology; expertise to evaluate equipment might not be found within the existing team.
- Risk mitigation strategies: Suppliers will be contacted way ahead in advance; the legal team will be informed early about the licensing approach; the necessary hires will be added to the team.
- Anticipated performance goals: Report with proposed equipment purchases.
- Milestones: N/A

Task 3.3: Pilot manufacturing facility planning

- Description: Once all the equipment is settled from the previous task, the manufacturing facility will be planned. This includes electrical planning, mechanical planning, establishing the various fabrication and test stations, etc.
- Risks: Long lead times; might need to license technology; expertise to evaluate equipment might not be found within the existing team.
- Risk mitigation strategies: Suppliers will be contacted way ahead in advance; the legal team will be informed early about the licensing approach; the necessary hires will be added to the team.
- Anticipated performance goals: Report with proposed equipment purchases.
- Milestones: Milestone 3.1: Detailed facility plan layout including all equipment, modifications and engineering specifications.

Task 3.4: Sourcing of raw materials

- Description: This task identifies the raw materials required for the large-scale coating fabrication. Suppliers will be contacted at this stage to ensure all the materials (coatings and substrates) can arrive on time.
- Risks: Long lead times; expertise to evaluate equipment might not be found within the existing team.
- Risk mitigation strategies: Suppliers will be contacted way ahead in advance; the necessary hires will be added to the team; quotes from multiple suppliers will be obtained.
- Anticipated performance goals: Delivery of required raw materials.
- Milestones: N/A

Task 3.5: Research & purchase of clean room class 10,000 installation

- Description: It has been estimated that a clean room class 1000 will be required for the fabrication and coating of the films. All the fabrication and coating stations will be enclosed in greenhouse-type clean room sections to ensure quality control.
- Risks: Long lead times to delivery; installation might be complex.
- Risk mitigation strategies: Quotes from multiple suppliers indicate that the lead times are only a few weeks; installation will be performed by the supplier.
- Anticipated performance goals: Completed installation and operation of clean room.
- Milestones: N/A

Task 3.6: Purchase & customization of large scale fabrication stations

- Description: In this task the necessary equipment for filter fabrication identified in earlier tasks in this activity will be purchased and customized as required.
- Risks: Long lead times; might need to license technology; expertise to install and customize equipment might not be found within the existing team; installation and setting up might be too complex.
- Risk mitigation strategies: Suppliers will be contacted way ahead in advance; the legal team will be informed early about the licensing approach; the necessary hires will be added to the team; installation and setting up timelines will be evaluated with supplier ahead of time to ensure timeliness.
- Anticipated performance goals: Functional test run of filter fabrication system.
- Milestones: N/A

Task 3.7: Purchase & customization of optical & environmental testing stations

- Description: In this task the necessary equipment for optical and environmental characterization stations identified in earlier tasks in this activity will be purchased and customized to meet AIRBUS aircraft manufacturing standards.
- Risks: Long lead times; environmental testing stations might not be adequate; expertise to install and customize equipment might not be found within the existing team; installation and setting up might be too complex.

- Risk mitigation strategies: Suppliers will be contacted way ahead in advance; testing sections will be outsourced to ESL; the necessary hires will be added to the team; installation and setting up timelines will be evaluated with supplier ahead of time to ensure timeliness.
- Anticipated performance goals: Completed purchase and installation of optical and environmental testing stations.
- Milestones: Milestone M3.2: Completion of all equipment purchases

Go/no-go decision: *Identification, purchase, and initial testing of all the necessary manufacturing equipment required for delivering the metaAIR™ product in accordance to AIRBUS aircraft manufacturing standards and quality controls.*

Activity 4: Setup of Pilot Manufacturing Facility [the Recipient, AIRBUS, ESL, Months 25 – 36]

Task 4.1: Installation of fabrication systems

Task 4.2: Installation of coating stations

Task 4.3: Installation of optical testing stations

Task 4.4: Installation of environmental testing stations

Task 4.5: System operation testing

- Description of tasks 4.1 – 4.5: These tasks involve the mechanical installation of the equipment in the fabrication facility. Task 4.5 tests the operation of all systems and subsystems to ensure a smooth operation of the whole facility.
- Risks: Delays due to installation problems; issues in the interaction between systems; low yield.
- Risk mitigation strategies: Detailed planning of the installation steps will be assessed ahead of delivery of the systems; extensive testing will ensure good system interoperability; yield is expected to be low at start but will improve as the fabrication processes are refined.
- Anticipated performance goals: Fabricated & tested laser filter.
- Milestones: Milestone M4.1: Successful completion of all installations and systems operation.

Task 4.6: Repeatability testing for all stations & sub-stations

- Description: In these runs the repeatability of the stations will be assessed and any necessary modifications will be made. It will be ensured that the optical performance of the films is consistent among runs.
- Risks: Filter performance is not consistent; runs take too long to complete; stations fail during fabrication.
- Risk mitigation strategies: Performance issues will be recorded diligently and assessed by the whole engineering team; the Recipient will be in close contact with suppliers to ensure failures are minimized.
- Anticipated performance goals: Repeatable functional test run of filter fabrication and testing systems.
- Milestones: N/A

Task 4.7: Prepare design verification sheet & product reliability report

- Description: These are necessary before the commercial sales of the products for the customer's information.
- Risks: Report is not up to quality (Airbus) standards.
- Risk mitigation strategies: The Recipient will liaise with Airbus and other customers to ensure the format and content of the report is satisfactory.
- Anticipated performance goals: Delivery of report and verification sheet.
- Milestones: Milestone M4.2: Pilot facility delivered ready for fabrication of filters at consistent quality.

Task 4.8: ISO 9001:2008 compliance

- Description: All the necessary steps will be taken to conform the facility and the company overall with ISO specifications in collaboration with AIRBUS and ESL partners.
- Risks: Certification is too expensive and/or not achieved on time; the processes and procedures are not up to ISO standards.
- Risk mitigation strategies: The Recipient will cooperate with organizations that are proficient in ISO certifications to ensure timely planning of the certification activities; processes and procedures will be updated on time ahead of the evaluation.
- Anticipated performance goals: Achievement of ISO certification.
- Milestones: N/A

Task 4.9: Product validation activities & pre-sales

- Description: This includes contacting the identified customers and key stakeholders, advertise the product, and organize demo activities in collaboration with Airbus and other commercial partners, resulting in product pre-sales.
- Risks: The Recipient currently does not have a sales team in place; customers take long to issue purchase orders.
- Risk mitigation strategies: A strong sales and pre-sales team will be out in place; sales exist within the Recipient's board.
- Anticipated performance goals: Confirmation of pre-sales in the form of purchase order or expression of interest.

Milestones: Slidedeck presentation and/or report on product validation activities

5. Project Location(s)

Metamaterial Technologies Inc.
1 Research Drive, Dartmouth, Nova Scotia, B2Y 4M9, Canada

Université de Moncton
18 Antonine-Maillet Ave, Moncton, New Brunswick, B E1A 3E9, Canada

Environmental Simulation Labs (ESL) Technology Inc.
101 Research Drive, Bldg 101C, Dartmouth, Nova Scotia, B2Y 4T6, Canada

Airbus S.A.S.
1, Rond Point Maurice Bellonte, 31707 Blagnac Cedex, France

Ondax Inc.
850 E Duarte Rd, Monrovia, California, 91016, United States

6. Project Schedule

	ACTIVITY DESCRIPTION	START DATE	FINISH DATE
1.1	Filter design and specifications	1/1/14	31/7/14
1.2	Fabrication of filters with optimized transparency & multi-wavelength filtering	1/1/14	31/7/14
1.3	Fabrication of filters on transparent substrates	1/1/14	31/10/14
1.4	Characterization of filters	1/1/14	31/1/15
1.5	Assessment of regulatory and safety standards	1/1/14	31/1/15
1.6	Intellectual property development (design)	1/10/14	31/1/15
1.7	Meeting to review Activities 1.1 to 1.7 and the Go/ No-go decision		31/1/15
2.1	Fabrication of optimized scalable filter	1/1/14	31/10/14
2.2	Upscaling to 10cm x 10cm surface areas	1/7/14	31/3/15
2.3	Optical performance testing of large-scale samples	1/7/14	31/3/15
2.4	Environmental testing	1/7/14	3/3/15
2.5	Visual performance testing	1/7/14	31/1/15
2.6	Physiological testing	1/7/14	31/1/15
2.7	Intellectual property development (fabrication)	1/10/14	31/1/15
2.8	Meeting to review Activities 2.1 to 2.7 and the Go/ No-go decision		31/1/15
3.1	Scalability assessment to 1m x 1m surface areas	1/1/15	30/4/15
3.2	Large scale manufacturing equipment research	1/4/15	31/7/15
3.3	Pilot manufacturing facility planning	1/1/15	31/1/16
3.4	Sourcing of raw materials	1/4/15	31/1/16
3.5	Research & purchase of clean room class 1000 installation	1/7/15	31/1/16
3.6	Purchase & customization of fabrication stations	1/7/15	31/1/16
3.7	Purchase & customization of optical & environmental testing stations	1/7/15	31/1/16
3.8	Meeting to review Activities 3.1 to 3.7 and the Go/ No-go decision		31/1/16
4.1	Installation of fabrication systems	1/1/16	31/7/16
4.2	Installation of coating stations	1/1/16	31/7/16
4.3	Installation of optical testing stations	1/1/16	31/7/16
4.4	Installation of environmental testing stations	1/1/16	31/7/16
4.5	System operation testing	1/7/16	31/1/17
4.6	Repeatability testing for all stations & sub-stations	1/7/16	31/1/17
4.7	Prepare design verification sheet & product reliability report	1/10/16	31/1/17
4.8	ISO 9001:2008 compliance	1/10/16	31/1/17
4.9	Product validation activities & pre-sales	1/1/16	31/1/17
4.10	Meeting to review Activities 4.1 to 4.9 and the Go/ No-go decision		31/1/17

7. Milestones and Indicators of Achievement/Deliverables

PROJECT MILESTONE		INDICATOR OF ACHIEVEMENT	DATE
1.1	*Filter specification sheet*	Delivery of report	31/7/14
1.2	*Filter sample with optimized transparency, multi- angle performance on a transparent substrate.*	Successful fabrication of filter	31/10/14
1.3	*Filter characterization report on optical and environmental performance.*	Delivery of report. An optimized filter that meets optical and environmental specifications and satisfies the performance matrix as set by Lamda Guard and AIRBUS.	31/1/15
2.1	*Optimized filter fabricated via scalable method*	Successful fabrication of filter	31/10/14
2.2	*10cm x 10cm optimized filter fabricated via sol- gel, nanoparticles, holography or sputtering*	Successful fabrication of filter	31/3/15
2.3	*Characterization report on optical and environmental performance for 10cm x 10cm filters on transparent substrates.*	Identification of the optimal fabrication methodology based on the following successive criteria: 1) Successful optical performance (refer to Airbus requirements in Description of Work); 2) Successful testing for environmental specifications and certification standards (refer to Airbus requirements in Description of Work); 3) Minimum expected cost of manufactured products (less than $10,000 per windscreen film); 4) Reduced complexity and cost in setting up manufacturing facilities (initial target production volume is 10 windscreens per month with scale up depending on demand).	31/3/15
2.4	*Report on visual testing*	Delivery of report	30/6/15
2.5	*Report on developed IP of activity 2*	Delivery of report	30/6/15
3.1	*Detailed facility plan layout including all equipment, modifications and engineering specifications.*	Delivery of plan	31/1/16
3.2	*Completion of all equipment purchases.*	Completion of purchases	31/1/16
4.1	*Successful completion of all installations and systems operation*	Test report of successful equipment operation	31/1/17
4.2	*Pilot facility delivered ready for fabrication of filters at consistent quality*	Demo of filter prototypes according to Airbus spec	31/1/17
4.3	*Report on product validation activities*	Delivery of report	30/6/17

8. Eligible Costs

8.1 Project Costs and Financing

PROJECT COSTS		PROJECT FINANCING	
Eligible Costs:	**Total**	**Cash Contributions:**	**Total**
Wages and Salaries, including payroll burden	$ 2,091,104	AIF Contribution	$ 3,000,000
Other Operating Expenses	$ 1,272,896	Recipient Contribution	$ 1,000,000
Other Capital Assets	$ 636,000		
Total Eligible Cost	**$ 4,000,000**	**Total Cash Contributions**	**$ 4,000,000**
Total Non-Eligible Costs	$ 0	**Total Non-Cash Contributions**	$ 0
Total Project Costs	**$ 4,000,000**	**Total Project Financing**	**$ 4,000,000**

8.2 Detailed Breakdown of Eligible Costs

DESCRIPTION	ORIGIN OF NON-CASH TRANSACTIONS*	TOTAL ESTIMATED ELIGIBLE COSTS
Other Capital Assets:		
Computer Equipment		$ 140,000
Machinery/Equipment		$ 410,000
Technology Rights		$ 86,000
Sub-total Other Capital Assets:		**$ 636,000**
Wages and Salaries, including payroll burden:		
Salaries/Wages		$ 1,818,351
Payroll Benefits		$ 272,753
Sub-total Wages and Salaries, including payroll burden:		**$2,091,104**
Other Operating Expenses:		
Materials/Supplies		$ 160,000
Sub-contracting		$ 259,643
Travel		$ 75,000
Evaluation		$ 400,000
Consultants		$ 64,588
Other direct incremental costs		$ 313,665
Sub-total Other Operating Expenses:		**$ 1,272,896**
TOTAL ELIGIBLE EXPENSES:		**$ 4,000,000**

Note:
Other Capital Costs:
- Computer Equipment: costs for $60,000 include 8 computers, printers and misc. IT equipment; and $80,000 for software and user licenses for CST Microwave Studio (simulation software).
- Machinery/Equipment:
Manufacturing Systems - Sputtering Coating System, Sol-gel systems or 3D Hologaphy machines - $170,000
Optical testing Equipment - Ellipsometry Equipment - $67,500
Optical Characterization equipment – Optical tables, lab set-up and testing lasers - $171,912 Sub-total: $410,000

Technology Rights:
- Costs associated with preparing and filing patents for intellectual property resulting from this project.

Wages & Salaries:
- Chief Science Officer - $322,941total - 75% of his annual wage over the 3 years.
- Chief Technology Officer - $276,274 - 50% of annual wage in year 1 (75% in year 2 and 3).
- MetaMaterial Engineer - $185,446 - 75% of his annual wage over the 3 years.
- Lab Manager & Chemical Engineer - $171,106 - 75% of her annual wage over 2 years & 100% in year 3.
- Principal Chemical & Materials Scientist - $156,523 - 50%, 75% & 100% of her annual wage over the 3 years, respectively.

- Product Quality Manager - $156,523 - 50%, 75% & 100% of her annual wage over the 3 years, respectively.
- Principal Manufacturing Engineer - $109,163 - 75% of annual wage in year 2 and 100% of annual wage in year 3.
- Materials & Mechanical Engineer - $90,969 - 75% of annual wage in year 2 and 100% of annual wage in year 3.
- Test and Measurement Technician - $63,678 - 75% of annual wage in year 2 and 100% of annual wage in year 3.
- Thin Film Coating technician - $76,708 - 50%, 75% & 100% of her annual wage over the 3 years, respectively.
- Project Manager - $168,264 - 50%, 70% & 70% of her time over the 3 years, respectively.
- CEO: Project Manager Advisor - $40,756 - 10%, 5% and 5% of his time over the 3 years respectively.
- Payroll benefits - $272,753 - 15% of total wages & salaries and includes group insurance, pension plans, and employer's share of federal deductions.

Other Operating Expenses:
- Materials/supplies - $60,000 for chemical compounds and photorefractive materials i.e. oxides, silicon, acrylic, substrates, nanoparticles and metals.
- R&D Sub-contracting - $259,643 is split between 1) ONDAX and DMT Microsystems and 2) environmental testing & certification for product demonstrations (i.e. ESL)
- Evaluation - $400,000 for flight and ground test engineering of prototypes. Company TBD.
- Consultants - Costs for Mr. Maurice Guitton to advise and support project manager.
- Other direct incremental costs - $313,666 includes costs for office supplies,courier charges, telephone, fax, internet and electricity. Estimated based on 15% of total wages and salaries, including payroll burden.

Atlantic Innovation Fund
Schedule 3

CLAIMS AND PROJECT COSTS PRINCIPLES

A. CLAIMS

1. The Agency will pay the Contribution to the Recipient, in respect of Eligible Costs incurred, on the basis of claims which will:

(a) be submitted on a quarterly basis ("**Claim Period**");

(b) be submitted on claim forms provided by the Agency, within forty-five (45) days of the end of each Claim Period;

(c) be accompanied with details of all costs being claimed, which will be substantiated by such documents as may be required by the Agency and presented in accordance with the Eligible Costs contained in the Statement of Work in Schedule 2;

(d) be certified by a person authorized to sign on behalf of the Recipient.

(e) include a declaration of any overdue amounts owed to Her Majesty the Queen in Right of Canada pursuant to any obligation other than this Agreement and provide details of any such amounts.

2. Unless specified in the Articles of Agreement, supporting documents do not need to be included when submitting a claim. However, purchase orders, cancelled cheques, invoices, receipts and all other supporting documentation must be retained and readily available for an examination by the Agency at any time.

3. The total amount of the Contribution paid to the Recipient, in respect to Eligible Costs that have been incurred but not yet paid to suppliers, shall not exceed fifty per cent (50%) of the total authorized Contribution.

4. With the submission of the final claim, the Recipient shall submit a final payment certificate, on a form provided by the Agency, certified by a person authorized to sign on behalf of the Recipient, attesting that the Eligible Costs for the entire Project have been incurred and paid.

5. Payments to the Recipient will be withheld if there are any outstanding reports, as required in Schedule 5 – Reporting Requirements.

B. AIF PROJECT COST PRINCIPLES

1. General Principles

The total Eligible Costs of the Project shall be the sum of the applicable direct costs, which are or will be reasonably and properly incurred in the performance of the Project, less any applicable credits. These costs shall be determined in accordance with the Recipient's cost accounting system as accepted by the Agency and applied consistently over time.

2. Definition of Reasonable Cost

A cost is reasonable if, in nature and amount, it does not exceed that which would be incurred by an ordinary prudent person in the conduct of a competitive business.

In determining the reasonableness of a particular cost, consideration shall be given to:

(a) whether the cost is of a type generally recognized as normal and necessary for the conduct of the performance of the Project;

(b) the restraints and requirements by such factors as generally accepted sound business practices, arm's length bargaining, federal, provincial and local laws and regulations, and Agreement terms;

(c) the action that prudent business persons would take in the circumstances, considering their responsibilities to the owners of the business, their employees, customers, the Government and public at large;

(d) significant deviations from the established practices of the Recipient which may unjustifiably increase the Eligible Costs; and

(e) the specifications, delivery schedule and quality requirements of the particular Project as they affect costs.

3. Eligible Costs and Cost Categories

Eligible costs have been classified under four categories: Buildings and Major Renovations; Other Capital Costs; Wages and Salaries; and Other Operating Expenses.

Eligible costs include all reasonable direct and incremental costs deemed essential for the implementation of the project and that are not specifically identified as being ineligible by ACOA. These include the following:

(a) Buildings and Renovations

Buildings and major renovations include costs related to a new construction and costs related to renovations to an existing building whether owned or leased (i.e. leasehold improvements).

Building and major renovation costs may be eligible under the AIF, but only on a very selective basis and only if absolutely essential for the project. Recipients are required to clearly demonstrate the requirement for an investment in new infrastructure as opposed to utilization of existing facilities. It should be noted that AIF assistance for eligible building and major renovation costs would not normally exceed thirty percent (30%) of the Recipient's costs.

(b) Other Capital Costs

This category includes capital assets other than those included in Buildings and Major Renovations and that are considered essential for the project. These include assets such as testing equipment, computers, furniture, machinery and any other equipment that is considered essential for the project. Technology rights, also covered under this category, include the costs incurred for the acquisition of the rights to use technology up to the completion date of the project.

(c) Wages and Salaries, including payroll burden

Since remuneration for the cost of human resources is usually a significant portion of project costs, these are presented separately from Other Operating Expenses.

The acceptable wages and salary costs will be those considered essential for the project and may include the services of engineers, scientists, technologists, technicians, draftspersons and market researchers. The AIF will support the hiring of incremental research expertise, including faculty whose principal focus is the funded initiative, and whose research, teaching and outreach, while directly related to the objectives of the funded initiative, will also strengthen faculties and enhance graduate opportunities. Incremental wages and salary costs of faculty must be above and beyond the normal paid wages and salaries paid by the university.

At no time will the AIF fund teaching activity. However, in cases where existing faculty is assigned to an AIF project, the backfilling cost (i.e. salary of the replacement personnel) is an eligible cost under the program. Recipients should be careful not to double claim, by claiming both the R&D position and the backfilled position of faculty. The salary of the replacement personnel is the only eligible cost allowable.

In order to properly manage and exercise financial control of a project, a Recipient may have to assign qualified management and administrative personnel to a project. These costs may be eligible provided that incremental resources are required.

Payroll burden associated with the eligible wages and salaries, which includes items such as group insurance, pension plans, employer's share of federal deductions, etc., is also eligible for personnel directly associated with the project.

(d) Other Operating Expenses

This category includes all other costs that are not included in the previous three cost categories.

(i) Direct Materials and Consumables

Direct materials include those consumed in carrying out the project, including those utilized in the production of models, prototypes or pilot plants. Direct materials may be purchased solely for the project or issued from the Recipient's inventory at cost.

(ii) Lease/Rent of Facilities

The project may be located in facilities that are leased or rented. Lease and rental payments are eligible if incremental. These costs are only acceptable up to the completion date of the project. Furthermore, cost allocation for the use of existing space owned by the Recipient is not eligible.

(iii) Professional Fees and Consultants

Legal fees for patent searches and patent filing fees are acceptable. Patent filing fees will only be allowed for countries that are identified as necessary for the success of the project. Patent costs will be charged at actual cost. Maintenance fees and all expenses incurred protecting a patent are not acceptable.

Also eligible are the cost of consultants engaged to carry out additional market research, technical searches, financial analyses or other investigations which, in the opinion of the Agency, are desirable to determine the specifications and characteristics of the product and are required for determining the course of the development activities. The eligible cost acceptable for a consultant is the actual incurred and paid contract amount.

(iv) R&D Subcontracts and Services

This category is strictly related to research and development activities of the project. The amount acceptable from a subcontract is the actual incurred and paid contract amount. If the subcontract is to be done by a related party to the Recipient, or by a Key Project Collaborator, the expense will be eligible at cost as this is a non-arm's-length transaction. Any such case must be fully disclosed by the Recipient. The cost related to the preparation of the first engineering draft of a user manual or related to defining or refining the specifications of a product, process or service under development are acceptable.

Testing services fees, that are conducted by testing organizations or accredited laboratories (e.g., Canadian Standards Association, Underwriters Laboratories or Canada Mortgage and Housing Corporation) and that are essential to the success of the project, will be eligible. Testing services will be charged at actual cost. Regulatory costs, where required, will be accepted.

(v) Travel Costs

Travel costs include transportation, accommodations and meals that are directly attributable to the Project and included in Schedule 2 – Statement of Work. The Agency will reimburse the Recipient's travel expenditures in accordance to the National Joint Council Directive (www.njc-cnm.gc.ca). While the Recipient may travel by any means that it deems appropriate and incur any related costs, the Agency will only reimburse travel costs according to the principles, guidelines and rates prescribed by the Travel Directive.

(vi) Other Direct Incremental Costs

Cost for expenditures such as office supplies, courier charges, utilities/telecommunications (e.g., telephone, fax, internet, electricity), and other office expenses are eligible if directly attributable to the proposed project. Only the incremental cost is acceptable. Recipients must provide a detailed budget of such costs.

Certain Recipients may not be able to individually track and account for expenses at a project level basis. In these cases, an allocation based on an appropriate factor (e.g., salary, square footage or other cost) may be calculated by the Recipient and used to claim for such costs.

4. List of Non-Eligible Costs

Non-Eligible costs include, but are not necessarily restricted to, such items as:

(a) costs of land, goodwill and asset costs in excess of fair market value;

(b) in-kind goods or services

(c) cost allocation for the use of existing space owned by the Recipient;

(d) motor vehicles and vessels not used exclusively for the project;

(e) fixed/period charges: recurring charges such as property taxes, rentals and reasonable provision for depreciation;

(f) insurance, dues and other membership fees;

(g) interest costs, bond discount, and other financing costs;

(h) promotion and selling expenses;

(i) professional fees, salaries, overhead or other costs incurred in the normal course of operations;

(j) non-incremental expenditures; and

(k) expenditures incurred and cost commitments made before proposal receipt date; and

(l) costs related to activities undertaken by federal and provincial government departments.

4. Credits

The applicable portion of any income, rebate, allowance, or other credit relating to any applicable direct cost, received by or accruing to the Recipient, shall be credited to the eligible costs.

Atlantic Innovation Fund
Schedule 4

COMMERCIALIZATION

1. Work in Atlantic Canada

Unless otherwise agreed to in writing by the Agency, the Recipient will ensure that the Resulting Products are exploited through their production in Atlantic Canada until all amounts due by the Recipient to the Agency under this Agreement have been paid in full or until that obligation is otherwise discharged to the satisfaction of the Agency.

2. Licensing Agreement

In the event the Recipient enters into a licensing agreement to fulfill the obligations set out in subsection 1 above, the Recipient shall provide the Agency with a copy of the licensing agreement when it is executed with evidence to satisfy the Agency that the transaction was completed at fair market value.

Atlantic Innovation Fund
Schedule 5

REPORTING REQUIREMENTS

1. Initial Report

The Recipient shall submit, prior to first disbursement of funds, the Estimated Cost Breakdown Update (template provided by the Agency). This document will be updated annually, as per the annual reporting requirements in section 3 below.

2. Quarterly Progress Reports

The Recipient shall submit progress reports on a quarterly basis, within forty-five (45) days of each quarter, with quarterly periods ending on the following dates: ***June 30 (due August 15), September 30 (due November 15), and December 31 (due February 15).***

Quarterly progress reports shall be completed using the Atlantic Innovation Fund Progress Report Form (template provided by the Agency) and will contain the following:

(a) a description of the progress made during the quarter toward completion of Project activities in comparison with the Project schedule, and report on any other changes to the Statement of Work;

(b) a statement of milestones achieved (and/or in progress) during the quarter;

(c) an assessment of any unforeseen challenges with the Project, along with the mitigation measures undertaken or proposed; and

(d) the Recipient's revised Estimated Cost Breakdown Update, if any significant change is expected.

3. Annual Reporting

3.1 Annual Report

The Recipient shall submit annual reports within forty-five (45) days of the period ending March 31.

The first report is required **May 15, 2015**, and shall be provided by the same date each year thereafter until this Agreement ends, in accordance with section 7 of the General Conditions (Schedule 1).

Annual report requirements will vary based on whether the reporting period covered is before or after the Project Completion Date.

3.1.1 Prior to the Project Completion Date

Annual reports shall contain:

(a) Atlantic Innovation Fund Progress Report Form, which includes:

- a description of the progress made during the quarter in completion of the Project activities in comparison with the Project schedule, and a report on any other changes to the Statement of Work;

- a statement of milestones achieved (and/or in progress); and

- an assessment of any unforeseen challenges in completing the Project, and mitigation measures undertaken or proposed.

(b) the Recipient's revised Estimated Cost Breakdown Update.

(c) Information for Annual Report (Annex 1) – (template provided by the Agency), which contains:

- an update on results;

- a description of commercialization efforts and challenges;

-a description of any new scientific/technical developments in the industry (e.g., new discoveries, new patents) that may affect the commercialization potential;

- the identification of any planned or completed transfer to commercial production, transfer outside of Atlantic Canada, sale, lease, or other disposal of Special Equipment;

- a certification to the Agency that the Recipient is maintaining the required environmental protection measures in relation to the Project; and

- a confirmation that the Certificate of Incumbency is still valid.

3.1.2 After the Project Completion Date

Annual reports shall contain:

Information for Annual Report (Annex 1) - (template provided by the Agency), which contains:

- an update on results;

- an update on commercialization efforts and challenges;

- a description of any new scientific/technical developments in the industry (e.g., new discoveries, new patents) that may affect the commercialization potential;

- the identification of any planned or completed transfer to commercial production, transfer outside of Atlantic Canada, sale, lease, or other disposal of Special Equipment;

- a certification to the Agency that the Recipient is maintaining the required environmental protection measures in relation to the Project; and

- A confirmation that the Certificate of Incumbency is still valid.

3.2 Annual Financial Statements

The Recipient shall provide the Agency with a copy of its annual audited financial statements on a consolidated basis with those entities it controls within one hundred and twenty (120) days after the end of each fiscal year.

MTI and LGI shall provide the Agency with a copy of their respective annual audited financial statements where available within one hundred and twenty (120) days after the end of each fiscal year.

3.3 Cessation of Sales of Resulting Products

The Recipient shall provide the Agency written notice at least six (6) months prior to the cessation of sales of the Resulting Products.

4. Project Review

A Project Review Committee shall be established. The Committee shall consist of ***a representative of ACOA, a representative of NRC, a representative of the Recipient and the Key Project Collaborator(s)***. Unless otherwise agreed to by all parties, the Project Review Committee will meet at least ***annually*** during the Project Period, at a mutually agreeable time, to review the progress of the Project.

Atlantic Innovation Fund
Schedule 6

PROJECT FACT SHEET FOR NEWS RELEASE

Program: Atlantic Innovation Fund	**Project No.:** 203260
Name & Address of Recipient: Metamaterial Technologies Inc. 1 Research Drive Dartmouth, Nova Scotia B2Y 4M9	**Recipient Contact:** **Name:** George Palikaras, President & CEO **Telephone:** 902-482-5729 **Email:** george.palikaras@metamaterial.com
Project Location: Dartmouth, Nova Scotia	
Sector of Activity: Physcial Sciences	**Project Purpose:** Develop the metaAIR product, which is a film added to the cockpit windscreen in order to reflect harmful laser light used in aircraft attacks
Total Costs: $4,000,000	**Eligible Costs:** $4,000,000
Authorized Assistance: $3,000,000	**Other Assistance:** N/A
Project Start Date: January 1, 2014	**Project Completion Date:** June 30, 2017
Project Description and Anticipated Results: NANOLIFT will develop a platform technology that will enable the Recipient to develop products for three sectors including security and defense, energy and aviation. The initial commercial focus of this project will be on the metaAIRTM product an optically transparent thin film filter that can selectively block narrow light frequencies to protect flight crews against laser strikes. The metaAIR™ filter will consist of nano-composites of specific geometry and can be adhesively applied on existing surfaces, such as the inner surface of cockpit windows or windshields. The Recipient has recentlry received the 2014 Global Product Leadership award by Frost & Sullivan recognising the Recipient as a global innovator in the Aerospace Industry. The Recipient also recently announced a strategic partnership with Airbus in the project, to test its thin film technology and to bring this innovative product to the commercial aviation market. metaAIR™ will be certified for airworthiness starting with all Airbus types (e.g. A320, A350, A380 etc.) and quickly moving to other aircraft manufacturers..	

Atlantic Innovation Fund
Schedule 7

SPECIAL EQUIPMENT

1. (a) The Recipient shall notify the Agency promptly in writing of any sale, lease or other disposition of Special Equipment, or transfer to commercial use of said Equipment within its own production capability or otherwise

   (b) If so directed by the Agency, the Recipient shall pay the Agency forthwith the greater of 75% of the:

      (i) proceeds of disposition of the Special Equipment; or

      (ii) fair market value of the Special Equipment.

2. The total amount payable by the Recipient pursuant to subsection 1(b) shall not exceed the Contribution.

Atlantic Innovation Fund
Schedule 8

Pre-authorized Debit / Direct Deposit Authorization (PAD)

Applicant Name: _____

ACOA Project Number: _____

A- Pre-authorized Debits - Please attach a voided cheque and complete the following:

Name of Account Holder(s) (If different from above)

_____ _____

If you are not providing a voided cheque, please have the following information completed and confirmed by your financial institution:

Branch No.: _____ Institution No.: _____

Account No.: _____

Name(s) of Account Holder(s): _____

Financial Institution: _____

Address: _____

_____

Telephone No.: _____

_____ _____

Signature of Financial Institution Official Date

All information obtained by the Atlantic Canada Opportunities Agency (the Agency) will be treated in accordance with the *Access to Information Act* and the *Privacy Act.*

B- Direct Deposit:
Progress and final payments of the contribution can be deposited directly in the above-mentioned bank account. Do you wish to take advantage of this service?

____ No ____ Yes If yes, Email Address: _____

I/We hereby authorize the Agency to debit the bank account identified above, as per the repayment terms of the contribution agreement(s) and any subsequent amendments. If I/we have checked YES for the Direct Deposit Service, I/we hereby authorize the Agency to credit the bank account identified above.

Atlantic Innovation Fund
Schedule 8

I/We herby authorize the Agency to debit the bank account identified above with a service fee of $15.00 if a PAD is returned due to insufficient funds.

I/We may revoke my/our authorization at any time, subject to providing written notification from me/us of its change or termination. This notification must be received by the 15th day of the month prior to the next scheduled payment. To obtain a sample cancellation form, or for more information on my/our right to cancel a PAD agreement I/we may contact my/our financial institution or visit www.cdnpay.ca. I/we acknowledge that this cancellation does not terminate any obligation that I/we may have with the Agency.

I/we acknowledge that I/we must continue to make payments according to the contribution agreement by a method acceptable to the Agency until the contribution is repaid in full. Should I/we stop making payments, I/we will be in default of the contribution agreement(s).

I/We have certain recourse rights if any debit does not comply with this agreement. For example, I/we have the right to receive reimbursement for any debit that is not authorized or is not consistent with this PAD agreement. To obtain more information on my/our recourse rights, I/we may contact my/our financial institution or visit www.cdnpay.ca.

Signature of Authorized Signing Officer(s)	Date
Signature of Authorized Signing Officer(s)	Date

ACOA Head Office
Blue Cross Centre, 3rd Floor
644 Main Street
PO Box 6051
Moncton, New Brunswick, Canada
E1C 9J8 (Courier Address: E1C 1E2)
General Enquiries: 506-851-2271
Toll Free (In Canada and the United States): 1-800-561-7862
Facsimile: 506-851-7403

Nova Scotia Regional Office
1801 Hollis Street, Suite 700
PO Box 2284 STN C
Halifax, Nova Scotia, Canada
B3J 3C8 (Courier Address: B3J 3N4)
General Enquiries: 902-426-8361
Facsimile: 902-426-2054
Toll Free: 1-800-565-1228

New Brunswick Regional Office
570 Queen Street, 3rd Floor
PO Box 578
Fredericton, New Brunswick, Canada
E3B 5A6 (Courier Address: E3B 6Z6)
General Enquiries: 506-452-3184
Facsimile: 506-452-3285
Toll Free: 1-800-561-4030

Newfoundland and Labrador Regional Office
John Cabot Building, 11th Floor
10 Barter's Hill
PO Box 1060 STN C
St. John's,
Newfoundland and Labrador, Canada
A1C 5M5 (Courier Address: A1C 6M1)
General Enquiries: 709-772-2751
Facsimile: 709-772-2712
Toll Free: 1-800-668-1010

Prince Edward Island Regional Office
Royal Bank Building, 3rd floor
100 Sydney Street
PO Box 40
Charlottetown, Prince Edward Island, Canada
C1A 7K2 (Courier Address: C1A 1G3)
General Enquiries: 902-566-7492
Facsimile: 902-566-7098
Toll Free: 1-800-871-2596

Exhibit 4.3.3

Atlantic Canada Opportunities Agency **Agence de promotion économiquc du Canada atlantique**

Nova Scotia Office
P.O. Box 2284
Station "C"
Halifax, N.S.
B3J 3C8

Bureau de la Nouvelle-Écosse
CP. 2284
Succ. "C"
Halifax (N.-É.)
B3J 3C8

MAR 27 2018 **Project No.: 211326**

Metamaterial Technologies Inc.
Suite 215
1 Research Drive
Dartmouth, Nova Scotia
B2Y 4M9

Attention: Dr. George Palikaras

Dear Dr. Palikaras:

RE: Offer of Assistance under the Business Development Program

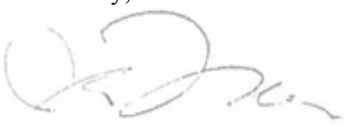
Please find attached a contribution agreement for funding under the Business Development Program for your review and signature. **This agreement is open for acceptance for sixty (60) calendar days from the date that appears on this letter.**

We have also included a Pre-authorized Debit/Direct Deposit Authorization (PAD) form for your completion and signature. Please return one signed copy of the contribution agreement and the completed PAD form.

Once we receive the signed forms, we will provide you with information on how to submit claims under the project. We recommend using ACOA Direct, the Agency's web-based client portal, where you can submit claims online, share documents, collaborate with members of the secure site and access your ACOA account 24 hours a day, 7 days a week. ACOA Direct is the most effective way for you to submit claims. Included with this letter is an ACOA Direct Client Registration form for your convenience. You can use it to enroll or to make changes if you are already enrolled.

If you have any questions, please contact Shane Fleming, the Program Officer assigned to your project, at (800) 565-1228 or (902) 426-8676. or via e-mail at shane.fleming@canada.ca

Yours truly,



Chuck Maillet
Vice-President (Nova Scotia)

Attachments

Agency Copy

Business Development Program

Project Number: 211326

MAR 27 2018

This Contribution Agreement

BETWEEN: **ATLANTIC CANADA OPPORTUNITIES AGENCY, having an office in Nova Scotia**

(hereinafter referred to as "**the Agency"**)

AND:

Metamatcrial Technologies Inc., an organization duly incorporated under the laws of Canada, having its office located at:
Suite 215
1 Research Drive
Dartmouth, Nova Scotia
B2Y 4M9

(hereinafter referred to as **"the Recipient"**)

WHEREAS the Agency has established a program, the Business Development Program, to increase opportunities for economic development in Atlantic Canada,

(hereinafter referred to as **"the Program"**)

WHEREAS the Recipient submitted an application for assistance pursuant to the Program,

WHEREAS this Agreement sets out the terms and conditions under which the Agency agrees to provide a contribution to the Recipient,

IN CONSIDERATION of their respective obligations set out below, the parties hereto agree as follows:

1.0 Documents Forming Part of this Agreement

1.1 The following documents form an integral part of this Agreement:

These Articles of Agreement
Schedule 1 – General Conditions
Schedule 2 – Statement of Work
Schedule 3 – Claims and Costs Principles
Schedule 4 – Reporting Requirements
Schedule 5 – Project Fact Sheet for News Release
Schedule 6 – Repayment Schedule

1.2 In the event of conflict or inconsistency, the order of precedence among the documents forming part of this Agreement shall be:

These Articles of Agreement
Schedule 1 – General Conditions
Schedule 2 – Statement of Work
Other Schedules

ARTICLES OF AGREEMENT

2.0 The Project

2.1 The Recipient will carry out the Project as described in Schedule 2 – Statement of Work, will make claims in accordance with Schedule 3 – Claims and Costs Principles, will issue the reports required under Schedule 4 – Reporting Requirements, will make repayments in accordance with Schedule 6 – Repayment Schedule, and will fulfill its other obligations hereunder in a diligent and professional manner using qualified personnel.

2.2 The Recipient shall commence the Project on or before March 31, 2018 (hereinafter referred to as **"the Project Commencement Date"**).

2.3 The Recipient shall complete the Project on or before February 28, 2019 (hereinafter referred to as **"the Project Completion Date"**).

3.0 The Contribution

3.1 Subject to all other provisions of this Agreement, the Agency shall make a Contribution **("the Contribution")** to the Recipient, with respect to the Project, calculated as the lesser of:

(a) the assistance rate percentage of the Eligible Costs as stated on Schedule 2 – Statement of Work; and

(b) $3,000,000.00.

4.0 Fiscal Year

4.1 The Recipient agrees that its fiscal year ends on December 31, and there shall be no change to that fiscal year without the prior consent of the Agency.

5.0 Payments

5.1 The Agency will pay the Contribution to the Recipient in respect of Eligible Costs that are Costs Incurred, as defined in Schedule 1, on the basis of itemized claims submitted in accordance with Schedule 3 – Claims and Costs Principles.

5.2 The Agency will not contribute to any Costs Incurred by the Recipient prior to October 18, 2017. The Agency will not accept any Cost Incurred after the Project Completion Date, unless otherwise agreed to in writing, by the Agency.

5.3 Prior to the initial payment, the Recipient shall provide the Agency with the following information:

(a) the completed and signed *Pre-authorized Debit/Direct Deposit Authorization* (PAD) form as provided by the Agency.

5.4 The Recipient shall, no later than sixty (60) calendar days following the Project Completion Date, submit to the Agency a final claim in accordance with Schedule 3 – Claims and Costs Principles. The Recipient must be able to demonstrate, at the request of the Agency, that all Costs Incurred that have been submitted for payment to the Agency have effectively been paid by the Recipient by monetary payment.

5.5 At the discretion of the Agency, an advance payment may be made to the Recipient. To request an advance payment, the Recipient must submit a completed and signed copy of the Request for an Advance Payment form provided by the Agency, and include a monthly cash flow forecast of requirements with respect to the Agency's share of the Eligible Costs to be incurred during the advance period. Such documentation must demonstrate that the advance payment is essential to the successful completion of the Project.

The Recipient must demonstrate that the advance payment was applied to the payment of Costs Incurred, to the satisfaction of the Agency, within forty-five (45) calendar days of the end of the period for which the advance was made.

5.6 At the discretion of the Agency or at the request of the Recipient, the Agency may make payments jointly to the Recipient and a third party for Costs Incurred.

5.7 Notwithstanding the foregoing, ten percent (10%) of the Contribution may, at the sole discretion of the Agency, be reserved for the final payment, to be made based on the final claim by the Recipient.

6.0 Repayment

6.1 The Recipient shall repay the Contribution to the Agency in accordance with Schedule 6 – Repayment Schedule.

These amounts are calculated to repay the outstanding balance of the Contribution; however, the last installment may be adjusted to include all sums owing.

7.0 Special Condition(s)

7.1 Notwithstanding any other terms or conditions of this Agreement, if the Recipient does not submit a claim for payment or does not provide documentation with the claim that is satisfactory to the Agency within six (6) months from the date of execution of this Agreement by the Recipient ("the **Lapsing Date**"), the Agreement will terminate. The Agency may extend the Lapsing Date at its complete discretion and will advise the Recipient of its decision.

Notwithstanding any other terms or conditions of this Agreement, the Agency may cancel any outstanding balance of the Contribution that has not been fully claimed within six (6) months from the Project Completion Date ("the **End Date").** The Agency may extend the End Date at its complete discretion and will advise the Recipient of its decision.

7.2 The Recipient shall retain 51 % ownership of all class of shares of its subsidiaries. Any sale of shares or Special Equipment of any subsidiary will constitute a material change to this Agreement. In the event that the Recipient is not able to meet its repayment obligation and its subsidiaries are generating revenues, the Recipient shall cause its subsidiaries to provide it financial assistance, where needed, in making payment of the amount due to the Agency.

7.3 Prior to first disbursement, the Recipient shall provide the Agency with confirmation of Lufthansa Technik Agreement. Project disbursements will be capped at what the Recipient has secured in shareholder and angel investments. For example, initially the Agency will disburse up to $1.1 million once the confirmation of shareholder investments has been secured. As the Recipient confirms that its additional share of the project financing has been secured, the Agency will disburse at a 1:1 ratio, until the total project costs have been reached.

7.4 The Recipient shall submit invoices and proof of payment with each claim.

8.0 Official Languages

8.1 The Recipient agrees that any public acknowledgment of the Agency's support for the Project will be expressed in both official languages.

8.2 The Recipient agrees:

(a) that basic project information, such as project description, will be developed and made available to the public in both official languages;

(b) to invite members of the official-language minority community to participate in any public event relating to the Project, where appropriate; and

(c) that main signage components related to the Project will be in both official languages.

9.0 Project Financing

9.1 The Recipient shall provide the Agency with confirmation of the Project financing commitments specified in Schedule 2 – Statement of Work. These commitment letters shall be satisfactory to the Agency at its sole discretion.

The following table sets out the details and the time frame for the confirmation of the Project financing:

Financing Source	Amount	Confirmation Date
Shareholders and Angel Investors	$1,100,000	Prior to initial disbursement

9.2 The Recipient hereby acknowledges that no federal, provincial or municipal government assistance, other than that described in Schedule 2 – Statement of Work, has been requested or received by the Recipient for the Project. The Recipient shall promptly inform the Agency of the receipt of such assistance as described in Schedule 1 – General Conditions, Other Government Assistance.

10.0 Commercialization

l0.1 Work in Atlantic Canada
Unless otherwise agreed to in writing by the Agency, the Recipient will ensure that the Resulting Product(s) are exploited through their production in Atlantic Canada until the end of the Control Period.

10.2 Licensing Agreement
In the event the Recipient enters into a licensing agreement, which the Agency shall approve, to fulfill the obligations set out in Project Financing above, the Recipient shall provide the Agency with a copy of the licensing agreement when it is executed, with evidence to satisfy the Agency that the transaction was completed al fair market value.

11.0 Equity

11.1 The Recipient shall attain Equity, in a form satisfactory to the Agency, in the total amount of $738,937.60 on or before the date of the initial disbursement by the Agency to the Recipient.

11.2 Unless authorized by the Agency in writing, this level of Equity shall be maintained until the end of the Control Period.

11.3 Equity is to be calculated as the aggregate of:

(a) the Recipient's share capital (incorporated company), the partner's capital accounts (incorporated partnerships), the Recipient's net worth (individual);

(b) contributed surplus and other surplus accounts;

(c) retained earnings (added) or accumulated deficit (subtracted);

(d) subordinated shareholder(s)' loan(s) or partner(s)' loan(s). In order to be considered in this calculation, a duly signed Subordination Agreement must be on file; and

(e) loans from other parties that are subordinated (reduced in priority of payment) to all other liabilities for a certain period, at the satisfaction of the Agency. In order to be considered in this calculation, a duly signed Subordination Agreement must be on file.

LESS:

(f) advances to shareholders; and

(g) any other asset account that, in the opinion of the Agency, unreasonably inflates the Recipient's Equity.

11.4 The Recipient shall not make corporate distributions unless otherwise approved by the Agency. Corporate distributions are defined, for the purpose of this Agreement, as any payments to any shareholder, director, officer or associate company of the Recipient, including, without limitation, bonuses, dividends, salaries or repayment or granting of debt to any of the aforementioned parties, excluding salaries to officers or other employees in the ordinary course of business.

12.0 Environmental Requirements

12.1 The Parties agree that the *Canadian Environmental Assessment Act,* 2012, S.C. 2012, c. 19, s. 52 (CEAA, 2012) does not apply to the Project and that an environmental assessment (EA) or a determination under section 67 of CEAA, 2012 are not required for the Project.

12.2 If, as a result of changes to the Project or otherwise, the Agency is of the opinion that CEAA, 2012 applies to the Project, the Recipient agrees that construction of the Project, including site preparation, will not be undertaken or will be suspended and no funds or additional funds will become or will be payable by the Agency to the Recipient for the Project unless, and until:

(a) in the case of an EA, a decision statement has been issued to the Recipient; or

(b) in the case of a determination under section 67 of CEAA, 2012, the Agency determines that the Project is not likely to cause significant adverse environmental effects or is likely to cause significant adverse environmental effects that are justified in the circumstances.

12.3 For any EA or determination made under CEAA, 2012 as a result of changes to the Project or otherwise:

(a) the Recipient will comply with, to the satisfaction of the Agency and at the Recipient's own expense, all conditions included in the decision statement issued under CEAA, 2012 or other conditions that the Agency may require in coming to a determination under section 67 of CEAA, 2012.

(b) the Recipient will allow the Agency and its agents, employees, servants or contractors to access and enter at any time during reasonable hours upon any real property under the ownership or control of the Recipient for the purpose of ensuring that any conditions and mitigation measures are implemented for the Project.

13.0 Communications

13.l The Recipient must consult with the Agency regarding communication activities relating to the Project in accordance with Schedule 1 – General Conditions, Communications.

14.0 Notice

14.1 Any notice or correspondence to the Agency, including the attached duplicate copy of this Agreement signed by the Recipient, shall be addressed to:

Atlantic Canada Opportunities Agency
P.O. Box 2284, Station Central
Halifax, Nova Scotia
B3J 3C8

Attention: Shane Fleming

or to such address as is designated by the Agency in writing.

14.2 Any notice or correspondence to the Recipient shall be addressed to:

Metamaterial Technologies Inc.
Suite 215
1 Research Drive
Dartmouth, Nova Scotia
B2Y 4M9

Attention: Dr. George Palikaras

15.0 Entire Agreement

15.1 This Agreement, if accepted, will constitute the entire Agreement between the Parties with respect to its subject matter. No amendments shall be made to the Agreement unless confirmed in writing.

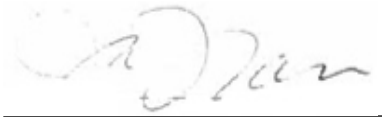
16.0 Joint and Several Obligations

16.1 Where this Agreement has been executed by more than one Recipient, the liability of each Recipient is joint and several, and every reference in this Agreement to the "Recipient" or "it" or "its" in the context of referring to the Recipient shall be construed as meaning each person named as a Recipient, as well as all of them. Without limiting the generality of the foregoing, all covenants, representations and warranties of the Recipient in this Agreement shall be construed as having been made by each Recipient and by all of them considered as a single person.

ARTICLES OF AGREEMENT

IN WITNESS WHEREOF the parties hereto have executed this Agreement through duly authorized representatives.

ATLANTIC CANADA OPPORTUNITIES AGENCY



Chuck Maillet
Vice-President (Nova Scotia)

March 26/18
Date

Project No.: 211326

The Agreement is hereby signed and accepted by the Recipient this 29 day of March, 2018.

This Agreement may be executed in separate counterparts, each of which shall be deemed to be an original, and such separate counterparts shall together constitute one and the same instrument. The executed Agreement may be communicated to the Agency by facsimile transmission, by ACOA Direct, or as otherwise agreed to by the Agency and such will be deemed to be an original for all purposes.

Metamaterial Technologies Inc.

Signature

Name: George Palikaras
(please print)

Title/Position: President & CEO
(please print)

Signature

Name:
(please print)

Title/Position:
(please print)

SCHEDULE 1

GENERAL CONDITIONS

1.0 Definitions

Average Bank Rate means the weighted arithmetic average of the Bank of Canada rates that are established weekly during the month preceding the month in respect of which interest is being calculated.

Background Intellectual Property means the intellectual property rights in all information of a scientific, technical or artistic nature, whether oral or recorded, that is required to carry out the Project or exploit the Foreground Intellectual Property.

Control Period means the period commencing on the Project Commencement Date and ending at the later of two years after the Project Completion Date or the end of any applicable repayment of the Contribution by the Recipient.

Costs Incurred means the Eligible Costs for goods and/or services that have been received by the Recipient and that the Recipient has paid for by monetary payment or has a legal obligation to pay for by monetary payment in the future. Any Eligible Costs received that have been paid or will be paid for by means other than monetary payment, including, without limitations, in-kind and non-cash transactions, do not qualify as Costs Incurred for which the Agency can pay the Contribution.

Due Date, in relation to an amount owing to the Agency, means: (i) the day on which a scheduled repayment is to be made; or (ii) where no repayment schedule has been arranged, the day that is normally thirty (30) calendar days after the date on which a demand for payment is issued.

Eligible Costs means those costs listed in Schedule 2 – Statement of Work, that comply with the principles of Schedule 3 – Claims and Costs Principles and that are necessary to carry out the Project.

Equity means the ownership interest or value in the assets of a business, net of all debts, claims and any asset account that, in the opinion of the Agency, unreasonably inflates the Recipient's net worth (i.e. assets minus liabilities equals Equity). Negative Equity exists when the value of the total assets is less than the total liabilities. The Recipient's Equity will be calculated as stated in Equity in the Articles of Agreement.

Foreground Intellectual Property means all information of a scientific, technical or artistic nature first conceived, developed or reduced to practise as part of the Project.

I**nterest Rate** means the rate of interest equal to three percent (3%) higher than the Average Bank Rate.

Parties mean the Agency and the Recipient.

Project means the undertaking this Agreement is based on and that is further described in Schedule 2 – Statement of Work.

Project Assets means the assets that have been contributed to by the Agency. These are listed in Schedule 2 – Statement of Work.

Project Commencement Date means the date on which, in the opinion of the Agency, the first major commitment is made by the Recipient to implement the Project.

Project Completion Date means the date on which, in the opinion of the Agency, all Eligible Costs have been incurred and/or the work completed in accordance with Schedule 2 – Statement of Work.

Resulting Products means products that, at the sole determination of the Agency, are produced or result from the Project, incorporate results of the Project, or use a method, process, equipment or information resulting from the Project and, without restricting the generality of the foregoing, that include all inventions, works, foreground intellectual property, writings, designs, devices and adaptations together with all modifications or improvements.

GENERAL CONDITIONS

2.0 Representations, Warranties and Undertakings

2.1 Representations. Warranties and Undertakings by the Recipient
The Recipient hereby certifies that the representations, warranties and undertakings set out below are, and will be as of the date of execution of the Contribution Agreement, true and correct in all material respects and undertakes to advise the Agency of any changes that materially affect them.

2.2 Power and Authority of Recipient
Where the Recipient is not an individual, the Recipient represents and warrants that it is duly incorporated, validly existing, in good standing, and has the power and authority to carry on its business, to hold property and to enter into this Agreement. The Recipient undertakes to initiate all the necessary actions required to remain in good standing and to preserve its legal capacity.

2.3 Authorized Signatories
The Recipient represents and warrants that the signatories to the Agreement have been duly authorized to execute and deliver the Agreement.

2.4 Binding Obligations
The Recipient represents and warrants that the execution, delivery and performance of the Agreement have been duly and validly authorized and that when executed and delivered, the Agreement will constitute a legal, valid and binding obligation enforceable in accordance with its terms.

2.5 No Pending Suits or Actions
The Recipient warrants that it is under no obligation or prohibition, nor is it subject to or threatened by any actions, suits or proceedings that could or would prevent compliance with this Agreement. The Recipient will advise the Agency forthwith of any such occurrence during the Term of the Agreement.

2.6 No Gifts or Inducements
The Recipient represents and warrants that it has not, nor has any person on its behalf, offered or promised to any official or employee of Her Majesty the Queen in Right of Canada any bribe, gift or other inducement for or with a view to obtaining the Agreement. And it has not, nor has any person on its behalf, employed any person to solicit the Agreement for a commission, contingency fee or any other consideration dependant upon the execution of the Agreement.

2.7 Compliance
The Recipient shall apply, in relation to the Project, in all material respects, the requirements of all applicable laws, regulations, orders and decrees of any regulatory bodies having jurisdiction over the Recipient or the Project.

2.8 Other Agreements
The Recipient represents and warrants that it has not entered, and undertakes not to enter, into any agreement, without the Agency's written consent that would prevent the full implementation of this Agreement by the Recipient.

2.9 Intellectual Properties
The Recipient represents and warrants that:

(a) it has taken appropriate steps to ensure that it either owns the Background Intellectual Property or holds sufficient rights in the same to permit the Project to be carried out and the Foreground Intellectual Property to be exploited;

(b) the title to the Foreground Intellectual Property is to be vested and, unless otherwise agreed to in writing by the Agency, to remain exclusively with the Recipient;

(c) it shall take appropriate steps to protect the Foreground Intellectual Property and shall, upon request, provide information to the Agency in that regard; and

(d) it has obtained written permission from every author who will contribute to any Foreground Intellectual Property that may be subject to copyright protection and that will form part of the Project. The Agency may request that the Recipient provide it with a copy of the written waiver(s) of moral rights.

3.0 Other Financing

3.1 The Recipient remains solely responsible for providing or obtaining the funding, in addition to the Contribution, required to carry out the Project and fulfill the Recipient's other obligations under this Agreement.

4.0 Other Government Assistance

4.1 Until the end of the Control Period, the Recipient will promptly inform the Agency, in writing, of any assistance received or to be received from federal, provincial or municipal sources other than those identified in Schedule 2 – Statement of Work. The Agency shall have the right to adjust the Contribution to take into account the amount of any such assistance and may require repayment from the Recipient.

5.0 Values and Ethics

5.1 Members of the Senate and House of Commons
No member of the Senate or House of Commons shall be allowed to derive any financial advantage resulting from the Contribution that would not be permitted under the *Parliament of Canada Act*.

5.2 Members of a Provincial or Territorial Legislature
Members of a provincial or territorial legislature shall be governed by provincial or territorial conflict-of-interest guidelines in effect during the Term of this Agreement.

5.3 Conflict of Interest
The Recipient acknowledges that individuals who are subject to the provisions of the *Conflict of Interest Act,* 2006, c. 9, s. 2, the *Conflict of Interest Code for Members of the House of Commons,* the *Conflict of Interest Code for Senators,* the *Values and Ethics Code for the Public Service,* or any other values and ethics codes applicable within provincial or territorial governments or specific organizations cannot derive any direct benefit resulting from this Agreement unless the provision or receipt of such benefit is in compliance with such legislation and codes.

6.0 Dispute Resolution

6.1 If a dispute arises concerning the application or interpretation of the Agreement, the Agency and the Recipient shall attempt to resolve the matter through good faith negotiations, and may, if necessary and if the Agency and the Recipient consent in writing, resolve the matter through mediation or arbitration by a mutually acceptable mediator or arbitrator in accordance with the Commercial Arbitration Code set out in the schedule to the *Commercial Arbitration Act* (Canada) and all regulations made pursuant to that Act.

7.0 Lobbying

7.1 The Recipient shall ensure that any person lobbying, as defined in the federal *Lobbying Act,* on its behalf in relation to this Agreement and to the Project is registered pursuant to the Act.

8.0 Relationship with the Agency

8.1 The Agency and the Recipient declare that nothing in this Agreement shall be construed as creating employment, a partnership, joint venture or agency relationship between the Agency and the Recipient. The Recipient is not in any way authorized to make a promise, agreement or contract or to incur any liability on behalf of Her Majesty in Right of Canada, and shall be solely responsible for any and all payments and deductions required by all applicable laws. The Recipient shall indemnify and save harmless the Agency in respect of any claims arising from failure to comply with the foregoing.

GENERAL CONDITIONS

9.0 Termination

9.1 The Agreement will terminate at the end of the Control Period, when all amounts due from the Recipient to the Agency under this Agreement have been paid in full or until that obligation is otherwise discharged to the satisfaction of the Agency.

10.0 Force Majeure

10.1 Event of Force Majeure
The Recipient will not be in default by reason only of any failure in performance of the Project in accordance with Schedule 2 – Statement of Work if such failure arises through no fault or negligence of the Recipient and is caused by an event of force majeure.

10.2 Definition of Force Majeure
Force majeure means any cause that is unavoidable or beyond the reasonable control of the Recipient, including war, riot, insurrection, orders of government or any act of God or other similar circumstance beyond the Recipient's control and that could not have been reasonably circumvented by the Recipient without incurring unreasonable cost.

11.0 Communications

11.1 The Recipient consents to public announcements of the Project, by or on behalf of the Agency. The Recipient shall also acknowledge the Agency's Contribution in any public communications of the Project and shall obtain the approval of the Agency before preparing any announcements, brochures, advertisements, web content or other materials that will display the Agency logo or otherwise make reference to the Agency.

11.2 The Agency shall inform the Recipient of the date on which the announcement is to be made and the Recipient shall keep this Agreement confidential until such date. After official announcement of the Project by the Agency or sixty (60) calendar days after the Recipient's acceptance of this Agreement, whichever is earlier, information appearing in Schedule *5* – Project Fact Sheet, herein, will be considered to be in the public domain.

11.3 The Recipient will advise the Agency at least thirty (30) calendar days in advance of any special event such as, but not limited to, an official opening, ribbon cutting or other like event that the Recipient organizes in connection with the Project. A ceremony shall be held on a date that is mutually acceptable to the Agency and the Recipient. The Recipient consents to having the Minister responsible for the Agency, or a designate, participate in any such ceremony.

11.4 The Recipient agrees to the distribution by the Agency of information about the Project as part of public communication initiatives including, but not limited to, feature stories, news releases, speeches, web content, Agency promotional materials and special publications.

11.5 The Agency may, at its sole discretion, withdraw the requirements of the Recipient's acknowledgement of the Agency's Contribution in all public communications of the Project.

12.0 Material Changes

12.1 No material changes shall be made to the estimated total scope, the nature or any element of the Project or to any element of the Recipient's operation without the prior written consent of the Agency. A material change includes, but is not limited to, change in the ownership or control of the Recipient or the assets, management, financing, location of the Project or facilities, size of the facilities, timing, expected results, or other government contributions. When consent is requested from the Agency in regard to any material change the Recipient shall provide, in a timely manner, all documentation and information as may be required by the Agency, at its discretion.

13.0 Disposal of Assets

13.1 The Recipient shall retain possession and control of the Project Assets, the cost of which the Agency contributed to under the Agreement, and shall not, prior to the end of the Control Period, sell, dispose of, cease to use or transfer to commercial use Project Assets without the written consent of the Agency.

GENERAL CONDITIONS

13.2 Any funds recovered by the Recipient pursuant to the sale or disposal of Project Assets shall be paid to the Agency, except where the Project Assets disposed of are immediately replaced by comparable assets of equal or greater value that are used for the Project.

13.3 If so directed by the Agency, the Recipient shall pay the Agency forthwith the greater of the percentage of assistance rate, as specified in Schedule 2 – Statement of Work, of the:

(a) proceeds of disposition of the Project Asset(s); or

(b) fair market value of the Project Asset(s).

13.4 The total amount payable by the Recipient pursuant to, the Disposal of Assets, shall not exceed the amount of the Contribution.

14.0 Insurance Coverage

14.1 The Recipient is responsible for deciding the appropriate insurance coverage required to fulfill its obligations herein and to ensure compliance with any applicable laws. Any insurance acquired or maintained by the Recipient is at its own expense and for its own benefit and protection. It does not release the Recipient from or reduce its liability under this Agreement.

15.0 Monitoring, Rights to Audit and Physical Access

15.1 During the term of the Agreement, the Recipient will provide, to the Agency, the books, accounts and records of the Project and all information necessary to ensure compliance with this Agreement and for audit examination.

15.2 The Recipient will provide representatives of the Agency reasonable access to its premises to inspect and assess the progress of the Project, or any element thereof, and will supply, promptly on request, such data as the Agency may reasonably require for statistical or Project evaluation purposes.

15.3 The Recipient will, at its own expense, preserve and make available for audit and examination by the Agency or its representatives, for a period of thirty-six (36) months after the end of the Control Period, the books, accounts and records of the Project and all information necessary to ensure compliance with the terms and conditions of this Agreement, including payment of amounts to the Agency, and to assess the success of the Project and the Program. The Agency will have the right to conduct such additional audits and evaluations at its own expense as may be considered necessary, using the staff of the Agency, an independent firm or the Recipient's external auditors.

15.4 The Recipient shall also make records and information available to the Auditor General of Canada when requested by the Auditor General for the purpose of an inquiry under subsection 7.1(1) of the *Auditor General Act.*

15.5 The Recipient will assist the Agency with the monitoring of the Agreement and will facilitate access by the Agency to information from third parties and to the premises of third parties relating to the Agreement.

16.0 Overpayment

16.1 Where, for any reason:

(a) the Recipient is not entitled to the Contribution; or

(b) the Agency determines that the amount of the Contribution disbursed exceeds the amount to which the Recipient is entitled,

the Recipient will repay to the Agency, promptly and no later than thirty (30) calendar days from the date of the notice from the Agency, the amount of the overpayment. Any such amount is a debt due to Her Majesty in Right of Canada and may be recovered as such.

GENERAL CONDITIONS

17.0 Right to Set-off

17.1 Without limiting the scope of set-off rights available to the Crown at Common Law, under the *Financial Administration Act* or otherwise, the Agency may:

(a) set-off against any portion of the Contribution that is payable to the Recipient pursuant to the Agreement, any amount that the Recipient owes to Her Majesty under legislation or any other agreement of any kind; and

(b) set-off against any amounts that are owed to the Agency by the Recipient, any amount that is payable by Her Majesty under legislation or any other agreements of any kind to the Recipient.

18.0 Interest and Administrative Charges

18.1 Payments
When any payment is received from the Recipient on account of a prepayment of a repayment instalment, an overpayment, a disposal of asset or an event of default, the Agency shall apply that payment first to reduce any accrued interest and/or administrative charges owing and then, if any part of the payment remains, to reduce the outstanding principal balance.

18.2 Overdue Accounts
The Recipient shall pay, where the account is overdue and in addition to any amount payable, interest on that amount at the Interest Rate, in accordance with the *Interest and Administrative Charges Regulation.* The interest, calculated daily and compounded monthly, shall accrue starting on the Due Date and ending on the day before the date on which the payment is received by the Agency.

18.3 Fee
An administrative fee shall be charged on every payment rejected by the Recipient's financial institution for any reason, in accordance with the *Interest and Administrative Charges Regulation,* which may be amended from time to time. The current fee is set at fifteen dollars ($15).

19.0 Events of Default

19.1 The following constitute events of default:

(a) the Recipient is, in the opinion of the Agency, bankrupt or insolvent, goes into receivership or takes the benefit of any statute from time to time in force relating to bankrupt or insolvent debtors;

(b) an order is made or resolution passed for the winding up of the Recipient, or the Recipient is dissolved;

(c) the Recipient, during the term of the Agreement, has defaulted under the terms and conditions of any agreement or arrangement, with any financial institution or creditor with rights to the property or assets of the Recipient;

(d) in the opinion of the Agency, the Recipient ceases to carry on business;

(e) the Recipient submits false or misleading information to the Agency;

(f) the Recipient is no longer eligible under the "eligibility criteria" of the Program;

(g) the Recipient makes a false or misleading statement concerning assistance by the Agency in a prospectus or other document related to raising funds;

(h) the Recipient has not met or satisfied a term or condition of this Agreement; or

(i) the Recipient has not met or satisfied a term or condition under any other contribution agreement, or agreement of any kind, with the Agency.

GENERAL CONDITIONS

20.0 Remedies on Default

20.1 If an event of default has occurred or, in the opinion of the Agency is likely to occur, the Agency may exercise one or more of the following remedies:

(a) suspend or terminate any obligation by the Agency to contribute to the Costs Incurred, including any obligation to pay any amount owing prior to the date of such suspension or termination;

(b) require the Recipient to repay to the Agency all or part of the Contribution paid by the Agency to the Recipient, together with interest at the Interest Rate in accordance with the *Interest and Administrative Charges Regulations*. The interest, calculated daily and compounded monthly, shall accrue commencing upon the date of the event of default as specified in the demand for payment issued by the Agency and ending on the day before the date on which the payment is received by the Agency.

20.2 The Recipient acknowledges that, in view of the policy objectives served by the Agency's agreement to make the Contribution, the fact that the Contribution comes from public monies and that the amount of damages sustained by the Crown in the event of default is difficult to ascertain, it is fair and reasonable that the Agency be entitled to exercise any or all of the remedies provided for in, Remedies on Default, of these General Conditions, and to do so in the manner provided for in this section if an event of default occurs.

20.3 The fact that the Agency refrains from exercising a remedy it is entitled to exercise under the Agreement will not constitute a waiver of such right and any partial exercise of a right will not prevent the Agency in any way from later exercising any other right or remedy under the Agreement or other applicable law.

21.0 Annual Appropriations

21.1 Parliamentary Allocation
Any payment by the Agency under this Agreement is subject to there being a sufficient appropriation for the fiscal year, beginning on April 1 and ending on the following March 31, in which the payment is to be made and is subject to cancellation or reduction in the event that departmental funding levels are changed by Parliament.

21.2 Lack of Appropriation
In the event the Agency is prevented from disbursing the full amount of the Contribution due to a lack or reduction of appropriation or departmental funding levels, the Parties agree to review the effects of such a shortfall in the Contribution on the implementation of the Agreement and to adjust, as appropriate, the expected results from the Project specified in Schedule 2 – Statement of Work.

22.0 Notice

22.1 Any notice required to be given with respect to this Agreement shall be in writing and shall be effectively given if delivered or if sent by ordinary or registered mail, ACOA Direct, courier or fax, addressed to the party for whom the notice is intended. Any notice shall be deemed to have been received on delivery. Any notice sent by ACOA Direct or fax shall be deemed to have been received one (I) working day after being sent. Any notice sent by mail shall be deemed to have been received eight (8) calendar days after being sent.

23.0 No Assignment of Agreement

23.1 The Recipient shall not assign the Agreement or any part thereof without the prior written consent of the Agency.

24.0 Indemnity

24.1 The Recipient shall indemnify and save harmless the Agency from and against all claims, losses, damages, costs and expenses that may be brought against or suffered by the Agency, and that the Agency may incur, sustain or pay arising out of or relating to any injury to or death of a person or loss to property or other loss or damage caused or alleged to be caused by the Recipient or its servants, agents, subcontractors or independent contractors in the course of carrying out the obligations of the present Agreement.

GENERAL CONDITIONS

25.0 Cancellation of Agreement

25.1 The Agency, by thirty (30) calendar days' notice duly given to the Recipient in accordance with, Notice, of these General Conditions, may cancel this Agreement at any time if, in the Agency's opinion, Schedule 2 – Statement of Work has not been executed in a satisfactory manner or if the progress and objectives outlined in the Agreement have not been met.

26.0 *Access to Information Act* and *Privacy Act*

26.1 All information obtained by the Agency from the Recipient pursuant to an application or during the course of this Agreement will be treated in accordance with the *Access to Information Act* and the *Privacy Act.*

27.0 Aboriginal Consultation

27.1 The Recipient acknowledges that the Agency's obligation to pay the Contribution is conditional upon the Agency satisfying any obligation that it may have to consult with or to accommodate any Aboriginal groups that may be affected by the terms of this Agreement.

28.0 Applicable Law

28.l This Agreement shall be interpreted in accordance with the laws in force in the province in which the office of the Agency is located.

SCHEDULE 2

STATEMENT OF WORK

Project Description
This project will assist the Recipient to commercially launch the metaVISOR product and acquire and operationalize advanced manufacturing equipment to produce it in high volume.

Project Location
HALIFAX, NOVA SCOTIA

Project Financing

Project Costs		$		Financing	$
Special Equipment		$ 1,777,451		ACOA BDP Repayable Contribution	$ 3,000,000
Salaries/Wages		2,917,439		Shareholders' Injection	1,100,000
Consultants		241,570		Shareholders' Injection	1,900,000
Other (operating)		163,540		**Total Project Financing:**	**$ 6,000,000**
Material		900,000			
Total Project Costs		**$ 6,000,000**			
Eligible Costs	**Assistance: Rate 50.000%**	**$**			
Special Equipment		$ 1,777,451			
Salaries/Wages		2,917,439			
Consultants		241,570			
Other (operating)		163,540			
Material		900,000			
Total Eligible Costs		**$ 6,000,000**			

Expected Results from the Project

The federal government requires that results from projects receiving federal funding be identified. The Agency will thus follow-up on the following expected results identified from your project.

Expected Project Results
This project will result in the acquisition of equipment and the development of a proprietary manufacturing process required for the Recipient to manufacture and deliver its first commercial product, metaVISOR.

Means of Verification
Expected project results will be verified through progress reports with each claim, site visits, discussions with the Recipient, company prepared statements, annual audited financial statements, and the annual Client Information Update form.

SCHEDULE 3

CLAIMS AND COSTS PRINCIPLES

1.0 Claims

1.1 The Agency will pay the Contribution to the Recipient, in respect of Costs Incurred, on the basis of claims that:

(a) are submitted on claim forms provided by the Agency and include the details of all Costs Incurred being claimed;

(b) are completed and certified by an authorized signing officer of the Recipient; and

(c) if applicable include a declaration of any overdue amounts owed to Her Majesty the Queen in Right of Canada pursuant to any obligation other than this Agreement and provide details of any such amounts.

1.2 The total amount of the Contribution paid to the Recipient in respect to Costs Incurred but not yet paid to suppliers shall not exceed fifty percent (50%) of the total authorized Contribution.

1.3 Unless specified in the Articles of Agreement – Payments, supporting documents do not need to be included when submitting a claim. However, purchase orders, cancelled cheques, invoices, receipts and all other supporting documentation must be retained and readily available for examination by the Agency during or after any payment in accordance with Schedule 1 – General Conditions, Monitoring, Rights to Audit and Physical Access.

1.4 With the submission of the final claim, the Recipient shall submit a final payment certificate, on the form provided by the Agency for that purpose attesting that the Costs Incurred for the entire Project have been paid to the suppliers. The term "paid" herein and in the certification means paid by monetary payment. This certificate shall be certified by a person authorized to sign on behalf of the Recipient.

1.5 Payments to the Recipient will be withheld if there are any outstanding reports, as required in Schedule 4 – Reporting Requirements.

2.0 Project Costs Principles

2.1 Total Eligible Costs of the Project
The total Eligible Costs of the Project, as listed in Schedule 2 – Statement of Work, shall be the sum of the applicable direct costs that are or will reasonably and properly be incurred in the performance of the Project, less any applicable credits.

2.2 Incremental Costs
Eligible Costs, as identified in Schedule 2 – Statement of Work, include only incremental costs deemed essential for the implementation of the Project. Incremental costs are those that are new or additional or costs that would not have otherwise been incurred if not for the implementation of the Project.

2.3 Reasonable Costs
Eligible Costs, as identified in Schedule 2 – Statement of Work, include only those costs that are reasonable. A cost is reasonable if, in nature and amount, it does not exceed what would be incurred by an ordinary, prudent person in the conduct of competitive business. In determining the reasonableness of a particular cost, consideration shall be given to:

(a) whether the cost is at fair market value;

(b) the restraints and requirements of factors such as generally accepted sound business practices, arm's-length bargaining, federal, provincial and local laws and regulations, and agreement terms;

(c) the action that prudent business persons would take in the circumstances, considering their responsibilities to the owners of the business, their employees, customers, stakeholders, the Government and the public at large;

(d) significant deviations from the established practices of the Recipient that may unjustifiably increase Eligible Costs; and

(e) the specifications, delivery schedule and quality requirements of the particular Project as they affect costs.

CLAIMS AND COSTS PRINCIPLES

2.4 Travel Costs

Travel costs include transportation, accommodations and meals that are directly attributable to the Project and included in Schedule 2 – Statement of Work. The Agency will reimburse the Recipient's travel costs incurred up to the maximum applicable to such travel costs according to the principles, guidelines and rates prescribed by the National Joint Council Directive (the Directive) (www.njc-cnm.gc.ca), as may be amended from time to time. Without limiting the generality of the foregoing, meal costs incurred by the Recipient during eligible travel will be reimbursed by way of meal allowances at the applicable per diem rates set forth in Appendix C or D of the Directive. No allowance will be allocated for any meals provided to the traveler at no cost or as part of other costs (i.e. accommodation, conference, etc.).

2.5 General Administrative Costs

General administrative costs include expenditures for office supplies, courier charges, utilities/telecommunications (e.g. telephone, fax, internet, electricity), and other office expenses identified as being directly attributable to the Project and included in Schedule 2 – Statement of Work. Incremental costs are only acceptable when they can be substantiated by the Recipient.

2.6 Salary and Wages Costs

Salary costs must be incremental and essential for the Project. Such wages or salaries must be for employees on the Recipient's payroll and included in Schedule 2 – Statement of Work. The acceptable payroll rate shall be the regular pay rate for the period, excluding premiums paid for overtime or shift work.

Salary and wages costs must be claimed on the same basis as they are incurred and paid to employees (i.e. weekly, bi-weekly, monthly), as supported by payroll records.

In certain cases, a salaried employee may not work exclusively on the Project. In those instances, only the proportion of their salary based on the actual time spent on the Project, as supported by timesheets or other satisfactory form of time recording may be considered as an Eligible Cost of the Project. In order to determine the proportion of the employee salary for the time spent on the Project (a daily or hourly pay rate), the total amount of work days during a salary year can be reduced by the number of vacation days and statutory holidays to which the employee is entitled during that year, as applicable. No other deduction or mechanisms for increasing the proportion of the time spent on the Project will be allowed without the prior consent of the Agency.

When it has been expressly included in Schedule 2 – Statement of Work, salary costs for the performance of an authorized and incremental role of qualified management personnel may be claimed in accordance with this Schedule.

2.7 Payroll Burden

Payroll burden associated with eligible wages and salaries included in Schedule 2 – Statement of Work, which includes items such as group insurance, pension plans and the employer's share of federal deductions, is also eligible for personnel directly associated with the Project. The Recipient can claim a rate of fifteen per cent (15%) of salaries and wages for the payroll burden.

2.8 Non-Eligible Costs

The Agency considers certain categories of costs as non-eligible. These may include, but are not necessarily restricted to, items such as:

(a) the cost of land and goodwill;

(b) cost allocation for the use of existing space owned by the Recipient;

(c) fixed period costs (for example, recurring costs such as property taxes, rentals and a reasonable provision for depreciation);

(d) entertainment expenses (does not include networking receptions) and first-class airfare;

(e) insurance, except if the cost is directly related to construction and is capitalized (in accordance with Generally Accepted Accounting Principles or International Financial Reporting Standards) as part of the Project;

(f) dues and other membership fees;

(g) severance pay, cash-out of unused vacation, bonuses, overtime premium for salaried employees and commissions;

(h) interest costs, bond discounts, and other financing costs; and

(i) any costs, such as amortization and in-kind, that would not necessitate an expenditure of cash by the Recipient.

2.9 Credits

Credits are defined as the applicable portion of any income, rebate, allowance or other credit relating to any incurred cost received by or accruing to the Recipient. This includes the input tax credit or the reimbursement of sales taxes paid by the Recipient for goods and services. These credits shall be taken into consideration in calculating Eligible Costs.

SCHEDULE 4

REPORTING REQUIREMENTS

1.0 General

1.1 Progress Report with Each Claim
The Recipient shall submit a progress report with each claim for payment, on the form provided by the Agency for that purpose, detailing the progress and results of the Project. Each progress report shall contain the following information in relation to the Project:

(a) a description of the progress made in the fulfillment of Schedule 2 – Statement of Work during the reporting period;

(b) an assessment of any significant delay in completing the Project or in attaining any expected result identified in Schedule 2 – Statement of Work, the reasons for such delay, and mitigation measures being taken; and

(c) the Recipient's revised projection of Project cash flows for the current fiscal year, if any significant change is expected.

1.2 Annual Financial Statements

(a) The Recipient shall provide the Agency with a copy of its annual audited financial statements within one hundred and eighty (180) days after the end of each fiscal year.

(b) The Recipient shall provide its annual financial statements or other above requested information until the end of the Control Period.

1.3 Internal Financial Statements
The Recipient shall provide a copy of its quarterly internally prepared financial statements, for monitoring purposes, within sixty (60) days following the respective quarter. The Agency also reserves the right to change the interval of monitoring and of receipt of internally prepared financial statements, when deemed necessary by the Agency, and the Recipient shall provide them, upon written requests.

1.4 Report on Project Results
After the final payment of the Contribution by the Agency and until the end of the Control Period, the Recipient shall submit, upon request by the Agency, a report detailing the actual results of the Project as compared to the expected results in Schedule 2 – Statement of Work, using the means of verification identified therein. All deviations should be explained. The report must be satisfactory to the Agency, at its sole discretion. The Agency may request independent third-party verification of this report or of the project results, and the Recipient shall provide such independent verification upon written request and at its own expense.

REPORTING REQUIREMENTS

2.0 Other Reports

2.1 Prior to any payment exceeding ninety percent (90%) of the total Contribution, the Recipient shall provide a statement of the total funding from all sources for the Project, including total Canadian government funding received.

2.2 The Recipient shall provide a progress report to the Agency with each submitted claim.

SCHEDULE 5

FACT SHEET FOR NEWS RELEASE

Program:
The Agency's Business Development Program

Project No:
211326

Name and Address of Recipient:
Metamaterial Technologies Inc.
Suite 215
1 Research Drive
Dartmouth, Nova Scotia
B2Y 4M9

Recipient Contact:
Name: Dr. George Palikaras
Title: Founder & CEO
Telephone: (902) 482-5729
Fax:

Project Location:
HALIFAX, NOVA SCOTIA

Project Type:
Commercialization

Project Description:
This project will assist the Recipient to commercially launch the metaVISOR product and acquire and operationalize advanced manufacturing equipment to produce it in high volume.

Total Project Costs:
$6,000,000.00

Eligible Costs:
$6,000,000.00

Authorized Assistance:
$3,000,000.00

Total Government Funding:
$3,000,000.00

Estimated Project Commencement Date: March 31, 2018

Estimated Project Completion Date: March 31, 2019

Repayment Schedule Schedule 6

Client: Metamaterial Technologies Inc. **Start Date:** 2020/01/01
Account Number: 211326 **End Date:** 2027/12/01
Number of Repayments: 96
Total Repayable: $3,000,000 00

Payment#	Due Date	P/1/C	Amount Due	Amount Paid to Date	Amount Outstanding
					$ 3,000,000.00
				$ 0.00	$ 3,000,000.00
1	2020/01/01	Principal	$ 31,250.00		$ 2,968,750.00
2	2020/02/01	Principal	$ 31,250.00		$ 2,937,500.00
3	2020/03/01	Principal	$ 31,250.00		$ 2,906,250.00
4	2020/04/01	Principal	$ 31,250.00		$ 2,875,000.00
s	2020/05/01	Principal	$ 31,250.00		$ 2,843,750.00
6	2020/06/01	Principal	$ 31,250.00		$ 2,812,500.00
7	2020/07/01	Principal	$ 31,250.00		$ 2,781,250.00
8	2020/08/01	Principal	$ 31,250.00		$ 2,750,000.00
9	2020/09/01	Principal	$ 31,250.00		$ 2,718,750.00
10	2020/10/01	Principal	$ 31,250.00		$ 2,687,500.00
11	2020/11/01	Principal	$ 31,250.00		$ 2,656,250.00
12	2020/12/01	Principal	$ 31,250.00		$ 2,625,000.00
13	2021/01/01	Principal	$ 31,250.00		$ 2,593,750.00
14	2021/02/01	Principal	$ 31,250.00		$ 2,562,500.00
15	2021/03/01	Principal	$ 31,250.00		$ 2,531,250.00
16	2021/04/01	Principal	$ 31,250.00		$ 2,500,000.00
17	2021/05/01	Principal	$ 31,250.00		$ 2,468,750.00
18	2021/06/01	Principal	$ 31,250.00		$ 2,437,500.00
19	2021/07/01	Principal	$ 31,250.00		$ 2,406,250.00
20	2021/08/01	Principal	$ 31,250.00		$ 2,375,000.00
21	2021/09/01	Principal	$ 31,250.00		$ 2,343,750.00
22	2021/10/01	Principal	$ 31,250.00		$ 2,312,500.00
23	2021/11/01	Principal	$ 31,250.00		$ 2,281,250.00
24	2021/12/01	Principal	$ 31,250.00		$ 2,250,000.00
25	2022/01/01	Principal	$ 31,250.00		$ 2,218,750.00
26	2022/02/01	Principal	$ 31,250.00		$ 2,187,500.00
27	2022/03/01	Principal	$ 31,250.00		$ 2,156,250.00
28	2022/04/01	Principal	$ 31,250.00		$ 2,125,000.00
29	2022/05/01	Principal	$ 31,250.00		$ 2,093,750.00
30	2022/06/01	Principal	$ 31,250.00		$ 2,062,500.00
31	2022/07/01	Principal	$ 31,250.00		$ 2,031,250.00
32	2022/08/01	Principal	$ 31,250.00		$ 2,000,000.00
33	2022/09/01	Principal	$ 31,250.00		$ 1,968,750,00
34	2022/10/01	Principal	$ 31,250.00		$ 1,937,500.00
35	2022/11/01	Principal	$ 31,250.00		$ 1,906,250.00
36	2022/12/01	Principal	$ 31,250.00		$ 1,875,000.00
37	2023/01/01	Principal	$ 31,250.00		$ 1,843,750.00
38	2023/02/01	Principal	$ 31,250.00		$ 1,812,500.00
39	2023/03/01	Principal	$ 31,250.00		$ 1,781,250.00
40	2023/04/01	Principal	$ 31,250.00		$ 1,750,000.00
41	2023/05/01	Principal	$ 31,250.00		$ 1,718,750.00
42	2023/06/01	Principal	$ 31,250.00		$ 1,687,500.00
43	2023/07/01	Principal	$ 31,250.00		$ l,656,250.00
44	2023/08/01	Principal	$ 31,250.00		$ l,625,000.00
45	2023/09/01	Principal	$ 31,250.00		$ 1,593,750.00
46	2023/10/01	Principal	$ 31,250.00		$ 1,562,500.00
47	2023/11/01	Principal	$ 31,250.00		$ 1,531,250.00
48	2023/12/01	Principal	$ 31,250.00		$ 1,500,000.00
49	2024/01/01	Principal	$ 31,250.00		**$** 1,468,750.00
50	2024/02/01	Principal	$ 31,250.00		$ 1,437,500.00

Repayment Schedule Schedule 6

51	2024/03/01	Principal	$	31,250.00	$	1,406,250.00
52	2024/04/01	Principal	$	31,250.00	$	1,375,000.00
53	2024/05/01	Principal	$	31,250.00	$	1,343,750.00
54	2024/06/01	Principal	$	31,250.00	$	1,312,500.00
55	2024/07/01	Principal	$	31,250.00	$	1,281,250.00
56	2024/08/01	Principal	$	31,250.00	$	1,250,000.00
57	2024/09/01	Principal	$	31,250.00	$	1,218,750.00
58	2024/10/01	Principal	$	31,250.00	$	1,187,500.00
59	2024/11/01	Principal	$	31,250.00	$	1,156,250.00
60	2024/12/01	Principal	$	31,250.00	$	1,125,000.00
61	2025/01/01	Principal	$	31,250.00	$	1,093,750.00
62	2025/02/01	Principal	$	31,250.00	$	1,062,500.00
63	2025/03/01	Principal	$	31,250.00	$	1,031,250.00
64	2025/04/01	Principal	$	31,250.00	$	1,000,000.00
65	2025/05/01	Principal	$	31,250.00	$	968,750.00
66	2025/06/0l	Principal	$	31,250.00	$	937,500.00
67	2025/07/01	Principal	$	31,250.00	$	906,250.00
68	2025/08/01	Principal	$	31,250.00	$	875,000.00
69	2025/09/01	Principal	$	31,250.00	$	843,750.00
70	2025/10/01	Principal	$	31,250.00	$	812,500.00
71	2025/11/01	Principal	$	31,250.00	$	781,250.00
72	2025/12/01	Principal	$	31,250.00	$	750,000.00
73	2026/01/01	Principal	$	31,250.00	$	718,750.00
74	2026/02/01	Principal	$	31.250.00	$	687,500.00
75	2026/03/01	Principal	$	31,250.00	$	656,250.00
76	2026/04/01	Principal	$	31,250.00	$	625,000.00
77	2026/05/01	Principal	$	31,250.00	$	593,750.00
78	2026/06/01	Principal	$	31,250.00	$	562,500.00
79	2026/07/01	Principal	$	31,250.00	$	531,250.00
80	2026/08/01	Principal	$	31,250.00	$	500,000.00
81	2026/09/01	Principal	$	31,250.00	$	468,750.00
82	2026/\0/01	Principal	$	31,250.00	$	437,500.00
83	2026/11/01	Principal	$	31,250.00	$	406,250.00
84	2026/12/01	Principal	$	31,250.00	$	375,000.00
85	2027/01/01	Principal	$	31,250.00	$	343,750.00
86	2027/02/01	Principal	$	31,250.00	$	312,500.00
87	2027/03/01	Principal	$	31,250.00	$	281,250.00
88	2027/04/01	Principal	$	31,250.00	$	250,000.00
89	2027/05/01	Principal	$	31,250.00	$	218,750.00
90	2027/06/01	Principal	$	31,250.00	$	187,500.00
91	2027/07/01	Principal	$	31,250.00	$	156,250.00
92	2027/08/01	Principal	$	31,250.00	$	125,000.00
93	2027/09/01	Principal	$	31,250.00	$	93,750.00
94	2027/10/01	Principal	$	31,250.00	$	62,500.00
95	2027/11/01	Principal	$	31,250.00	$	31,250.00
96	2027/12/01	Printipal	$	31,250.00	$	0.00

Atlantic Canada Opportunities Agency | Agence de promotion économique du Canada atlantique

Canada

Pre-authorized Debit (PAD) / Direct Deposit Authorization

Applicant Name: Metamaterial Technologies Inc
ACOA Project Number: 211326

A- Pre-authorized Debits - Please attach a voided cheque and complete the following:

Name of Account Holder(s) (If different from above)

If you are not providing a voided cheque, please have the following information completed and confirmed by your financial institution:

Branch No.: 01793 Institution No.: 003

Account No.: 100-840-8
Name(s) of Account Holder(s): Georgios Palikaras / Metamaterial Technologies Inc.
Financial Institution: Royal Bank of Canada
Address: 202 Brownlow Ave., Suite 100
Dartmouth, B3B 1T5
Telephone No.: 902 421 8374

Signature of Financial Institution Official Date

A II in fonnation obtained by the Atlantic Canada Opponunities Agency (the Agency) will be treated in accordance with the Access to Information Act and the Prfracy Act.

B- Direct Deposit Authorization:
Progress and final payments of the contribution can be deposited directly in the above-mentioned bank account. Do you wish to take advantage of this service?

____**No** ✓ **Yes** **If yes, Email Address:** george.palikaras@metamaterial.com

Dale modified: July 2014

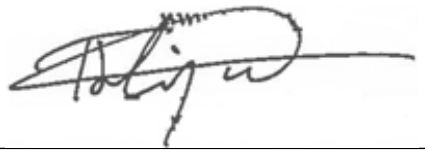
I/We hereby authorize the Agency to debit the bank account identified above, as per the repayment terms of the contribution agreement(s) and any subsequent amendments. If I/we have checked YES for the Direct Deposit it Service, I/we hereby authorize the Agency to credit the bank account identified above.

I/We hereby authorize the Agency to debit the bank account identified above with a service fee of $15.00 if a PAD is returned due to insufficient funds.

I/We may revoke my/our authorization at any time, subject to providing written notification from me/us of its change or termination. This notification must be received by the 15th day of the month prior to the next scheduled payment. To obtain a sample cancellation form, or for more information on my/our right to cancel a PAD agreement I/we may contact my/our financial institution or visit www.cdnpay.ca. I/we acknowledge that this cancellation does not terminate any obligation that I/we may have with the Agency.

I/we acknowledge that I/we must continue to make payments according to the contribution agreement by a method acceptable to the Agency until the contribution is repaid in full. Should I/we stop making payments, I/we will be in default of the contribution agreement(s).

I/We have certain recourse rights if any debit does not comply with this agreement. For example, I/we have the right to receive reimbursement for any debit that is not authorized or is not cons is tenth this PAD agreement. To obtain more information on my/our recourse rights, 1/we may contact my/our financial institution or visit www.cdnpay.ca.



Signature of Authorized Signing Officer(s) — Date: 03/29/18

Signature of Authorized Signing Officer(s) — Date

ACOA Head Office
Blue Cross Centre, 3rd Floor
644 Main Street
PO Box 6051
Moncton, New Brunswick, Canada
E1C 9J8
(Courier Address: E1C 1E2)
General Enquiries: 506-851-2271
Toll Free (In Canada and the Unites States); 1-800-561-7862
Facsimile: 506-851-7403

Nova Scotia Regional Office
1801 Hollis Street, Suite 700
PO Box 2284 STNC
Halifax, Nova Scotia, Canada
B3J 3C8 (Courier Address: B3J 3N4)
General Enquires: 902-426-8361
Facsimile: 902-426-2054
Toll Free: 1-800-565-1228

New Brunswick Regional Office
570 Queen Street, 3rd Floor
PO Box 578
Fredericton, New Brunswick, Canada
E3B 5A6
(Courier Address: E3B 6Z6)
General Enquiries: 506-452-3184
Facsimile: 506-452-3285
Toll Free: 1-800-561-4030

Newfoundland and Labrador Regional office
John Cabot Building, 11th Floor
10 Barter's Hill
PO Box 1060 STNC
St. John's
Newfoundland and Labrador, Canada
A1C 5M5 (Courier Address: A1C 6M1)
General Enquiries: 709-772-2751
Facsimile: 709-772-2712
Toll Free: 1-800-668-1010

Prince Edward Island Regional Office
Royal Bank Building, 3rd floor
100 Sydney Street
PO Box 40
Charlottetown, Prince Edward Island, Canada
C1A 7K2 (Courier Address: C1A 1G3)
General Enquiries: 902-566-7492
Facsimile: 902-566-7098
Toll Free: 1-800-871-2596

Dale modified: July 2014

Exhibit 4.3.4

NOV 28 2018

Business Development Program

Project Number: 212622

This Contribution Agreement

BETWEEN: **ATLANTIC CANADA OPPORTUNITIES AGENCY, having an office in Nova Scotia**

(hereinafter referred to as "the **Agency")**

AND:

"Metamateria Technologies Inc., an organization duly incorporated under the laws of Canada, having its office located at:
Suite 215
1 Research Drive
Dartmouth, Nova Scotia
B2Y 4M9

(hereinafter referred to as "the **Recipient")**

WHEREAS the Agency has established a program, the Business Development Program, to increase opportunities for economic development in Atlantic Canada,

(hereinafter referred to as "the **Program")**

WHEREAS the Recipient submitted an application for assistance pursuant to the Program,

WHEREAS this Agreement sets out the terms and conditions under which the Agency agrees to provide a contribution to the Recipient,

IN CONSIDERATION of their respective obligations set out below, the parties hereto agree as follows:

1.0 Documents Forming Part of this Agreement

1.1 The following documents form an integral part of this Agreement:

These Articles of Agreement
Schedule 1 – General Conditions
Schedule 2 – Statement of Work
Schedule 3 – Claims and Costs Principles
Schedule 4 – Reporting Requirements

Schedule 5 – Project Fact Sheet for News Release
Schedule 6 – Repayment Schedule

1.2 In the event of conflict or inconsistency, the order of precedence among the documents forming part of this Agreement shall be:

These Articles of Agreement
Schedule 1 – General Conditions
Schedule 2 – Statement of Work
Other Schedules

2.0 The Project

2.1 The Recipient will carry out the Project as described in Schedule 2 – Statement of Work, will make claims in accordance with Schedule 3 – Claims and Costs Principles, will issue the reports required under Schedule 4 – Reporting Requirements, will make repayments in accordance with Schedule 6 – Repayment Schedule, and will fulfill its other obligations hereunder in a diligent and professional manner using qualified personnel.

2.2 The Recipient shall commence the Project on or before December 3, 2018 (hereinafter referred to as "the **Project Commencement Date").**

2.3 The Recipient shall complete the Project on or before March 31, 2020 (hereinafter referred to as "the **Project Completion Date'').** **3.0 The Contribution**

3.1 Subject to all other provisions of this Agreement, the Agency shall make a Contribution ("the **Contribution")** to the Recipient, with respect to the Project, calculated as the lesser of:

(a) the assistance rate percentage of the Eligible Costs as stated on Schedule 2 – Statement of Work; and

(b) $100,000.00.

4.0 Fiscal Year

4.1 The Recipient agrees that its fiscal year ends on December 31, and there shall be no change to that fiscal year without the prior consent of the Agency.

5.0 Payments

5.1 The Agency will pay the Contribution to the Recipient in respect of Eligible Costs that are Costs Incurred, as defined in Schedule 1, on the basis of itemized claims submitted in accordance with Schedule 3 – Claims and Costs Principles.

5.2 The Agency will not contribute to any Costs Incurred by the Recipient prior to October 5, 2018. The Agency will not accept any Cost Incurred after the Project Completion Date, unless otherwise agreed to in writing, by the Agency.

5.3 Prior to the initial payment, the Recipient shall provide the Agency with the following information:

(a) the completed and signed *Pre-auJhorized Debit/Direct Deposit Authorization* (PAD) form as provided by the Agency.

5.4 The Recipient shall, •no later than sixty (60) calendar days following the Project Completion Date, submit to the Agency a final claim in accordance with Schedule 3 – Claims and Costs Principles. The Recipient must be able to demonstrate, at the request of the Agency, that all Costs Incurred that have been submitted for payment to the Agency-have-effectively-been-paid-by-the Recipient-by monetary payment.

5.5 At the discretion of the Agency, an advance payment may be made to the Recipient. To request an advance payment, the Recipient must submit a completed and signed copy of the Request for an Advance Payment form provided by the Agency, and include a monthly cash flow forecast of requirements with respect to the Agency's share of the Eligible Costs to be incurred during the advance period. Such documentation must demonstrate that the advance payment is essential to the successful completion of the Project.

The Recipient must demonstrate that the advance payment was applied to the payment of Costs Incurred, to the satisfaction of the Agency, within forty-five (45) calendar days of the end of the period for which the advance was made.

5.6 At the discretion of the Agency or at the request of the Recipient, the Agency may make payments jointly to the Recipient and a third party for Costs Incurred.

5.7 Notwithstanding the foregoing, ten percent (I 0%) of the Contribution may, at the sole discretion of the Agency, be reserved for the final payment, to be made based on the final claim by the Recipient.

6.0 Repayment

6.1 The Recipient shall repay the Contribution to the Agency in accordance with Schedule 6 – Repayment Schedule.

These amounts are calculated to repay the outstanding balance of the Contribution; however, the last installment may be adjusted to include all sums owing.

ARTICLES OF AGREEMENT

7.0 Special Condition(s)

7.1 Notwithstanding any other terms or conditions of this Agreement, if the Recipient does not submit a claim for payment or does not provide documentation with the claim that is satisfactory to the Agency within six (6) months from the date of execution of this Agreement by the Recipient ("the **Lapsing Date"),** the Agreement will terminate. The Agency may extend the Lapsing Date at its complete discretion and will advise the Recipient of its decision.

Notwithstanding any other terms or conditions of this Agreement, the Agency may cancel any outstanding balance of the Contribution that has not been fully claimed within six (6) months from the Project Completion Date ("the **End Date**"). The Agency may extend the End Date at its complete discretion and will advise the Recipient of its decision.

8.0 Official Languages

8.1 The Recipient agrees that any public acknowledgment of the Agency's support for the Project will be expressed in both official languages.

8.2 The Recipient agrees:

(a) that basic project information, such as project description, will be developed and made available to the public in both official languages;

(b) to invite members of the official-language minority community to participate in any public event relating to the Project, where appropriate; and

(c) that main signage components related to the Project will be in both official languages.

9.0 Project Financing

9.1 The Recipient shall provide the Agency with confirmation of the Project financing commitments specified in Schedule 2 – Statement of Work. These commitment letters shall be satisfactory to the Agency at its sole discretion.

9.2 The Recipient hereby acknowledges that no federal, provincial or municipal government assistance, other than that described in Schedule 2 – Statement of Work, has been requested or received by the Recipient for the Project. The Recipient shall promptly inform the Agency of the receipt of such assistance as described in Schedule 1 – General Conditions, Other Government Assistance.

11.0 Equity

11.1 The Recipient shall attain Equity, in a form satisfactory to the Agency, in the total amount of $ 553,709.00 on or before the date of the initial disbursement by the Agency to the Recipient.

11.2 Unless authorized by the Agency in writing, this level of Equity shall be maintained until the end of the Control Period.

11.3 Equity is to be calculated as the aggregate of:

(a) the Recipient's share capital (incorporated company), the partner's capital accounts (incorporated partnerships). the Recipient's net worth (individual);

(b) contributed-surplus and-other-surplus-accounts;

(c) retained earnings (added) or accumulated deficit (subtracted);

(d) subordinated shareholder(s)' loan(s) or partner(s)' loan(s). In order to be considered in this calculation, a duly signed Subordination Agreement must be on file; and

(e) loans from other parties that are subordinated (reduced in priority of payment) to all other liabilities for a certain period, at the satisfaction of the Agency. In order to be considered in this calculation, a duly signed Subordination Agreement must be on file.

LESS:

(f) advances to shareholders; and

(g) any other asset account that, in the opinion of the Agency, unreasonably inflates the Recipient's Equity.

11.5 The Recipient shall not make corporate distributions unless otherwise approved by the Agency. Corporate distributions are defined, for the purpose of this Agreement, as any payments to any shareholder, director, officer or associate company of the Recipient, including, without limitation, bonuses, dividends, salaries or repayment or granting of debt to any of the aforementioned parties, excluding salaries to officers or other employees in the ordinary course of business.

12.0 Environmental Requirements

12.1 The Parties agree that the *Canadian Environmental Assessment Act,* 2012, S.C. 2012, c. 19, s. 52 (CEAA, 2012) does not apply to the Project and that an environmental assessment (EA) or a determination under section 67 of CEAA, 2012 are not required for the Project.

13.0 Communications

13.1 The Recipient must consult with the Agency regarding communication activities relating to the Project in accordance with Schedule 1 – General Conditions, Communications.

14.0 Notice

14.1 Any notice or correspondence to the Agency, including the attached duplicate copy of this Agreement signed by the Recipient, shall be addressed to:

Atlantic Canada Opportunities Agency
P.O. Box 2284, Station Central
Halifax, Nova Scotia
B3J 3C8

Attention: Paul Hayes

or to such address as is designated by the Agency in writing.

14.2 Any notice or correspondence to the Recipient shall be addressed to:

Metamaterial Technologies Inc.
Suite 215
1 Research Drive
Dartmouth, Nova Scotia
B2Y 4M9

Attention: Dr. George Palikaras

15.0 Entire Agreement

15.1 This Agreement, if accepted, will constitute the entire Agreement between the Parties with respect to its subject matter. No amendments shall be made to the Agreement unless confirmed in writing.

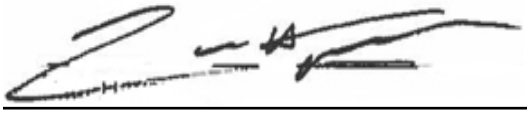
16.0 Joint and Several Obligations

16.1 Where this Agreement has been executed by more than one Recipient, the liability of each Recipient is joint and several, and every reference in this Agreement to the "Recipient" or "it" or "its" in the context of referring to the Recipient shall be construed as meaning each person named ns a Recipient, as well as all of them. Without limiting the generality of the foregoing, all covenants, representations and warranties of the Recipient in this Agreement shall be construed as having been made by each Recipient and by all of them considered as a single person.

ARTICLES OF AGREEMENT

IN WITNESS WHEREOF the parties hereto have executed this Agreement through duly authorized representatives.

ATLANTIC CANADA OPPORTUNITIES AGENCY



Nov 28/18

Paul Hayes
Account Manager

Date

Project No.: 212622

The agreement is hereby signed and accepted by the Recipient this 13 day of December, 2018.

This Agreement may be executed in separate counterparts, each of which shall be deemed to be an original, and such separate counterparts shall together constitute one and the same instrument. The executed Agreement may be communicated to the Agency by facsimile transmission, by ACOA Direct, or as otherwise agreed to by the Agency and such will be deemed to be an original for all purposes.

Metamaterial Technologies Inc.

Signature

Name:
(please print)

Title/Position:
(please print)

Signature

Name:
(please print)

Title/Position:
(please print)

GENERAL CONDITIONS

1.0 Definitions

Average Bank Rate means the weighted arithmetic average of the Bank of Canada rates that are established weekly during the month preceding the month in respect of which interest is being calculated.

Background Intellectual Property means the intellectual property rights in all information of a scientific, technical or artistic nature, whether oral or recorded, that is required to carry out the Project or exploit the Foreground Intellectual Property.

Control Period means the period commencing on the Project Commencement Date and ending at the later of two years after the Project Completion Date or the end of any applicable repayment of the Contribution by the Recipient.

Costs Incurred means the Eligible Costs for goods and/or services that have been received by the Recipient and that the Recipient has paid for by monetary payment or has a legal obligation to pay for by monetary payment in the future. Any Eligible Costs received that have been paid or will be paid for by means other than monetary payment, including, without limitations, in-kind and non-cash transactions, do not qualify as Costs Incurred for which the Agency can pay the Contribution.

Due Date, in relation to an amount owing to the Agency, means: (i) the day on which a scheduled repayment is to be made; or (ii) where no repayment schedule has been arranged, the day that is normally thirty (30) calendar days after the date on which a demand for payment is issued.

Eligible Costs means those costs listed in Schedule 2 - Statement of Work, that comply with the principles of Schedule 3 – Claims and Costs Principles and that are necessary to carry out the Project.

Equity means the ownership interest or value in the assets of a business, net of all debts, claims and any asset account that, in the opinion of the Agency, unreasonably inflates the Recipient's net worth (i.e. assets minus liabilities equals Equity). Negative Equity exists when the value of the total assets is less than the total liabilities. The Recipient's Equity will be calculated as stated in Equity in the Articles of Agreement.

Foreground Intellectual Property means all information of a scientific, technical or artistic nature first conceived, developed or reduced to practise as part of the Project.

Interest Rate means the rate of interest equal to three percent (3%) higher than the Average Bank Rate.

Parties mean the Agency and the Recipient.

Project means the undertaking this Agreement is based on and that is further described in Schedule 2 – Statement of Work.

Project Assets means the assets that have been contributed to by the Agency. These are listed in Schedule 2 – Statement of Work.

Project Commencement Date means the date on which, in the opinion of the Agency, the first major commitment is made by the Recipient to implement the Project.

Project Completion Date means the date on which, in the opinion of the Agency, all Eligible Costs have been incurred and/or the work completed in accordance with Schedule 2 – Statement of Work.

Resulting Products means products that, at the sole determination of the Agency, are produced or result from the Project, incorporate results of the Project, or use a method, process, equipment or information resulting from the Project and, without restricting the generality of the foregoing, that include all inventions, works, foreground intellectual property, writings, designs, devices and adaptations together with all modifications or improvements.

GENERAL CONDITIONS

2.0 Representations, Warranties and Undertakings

2.1 Representations. Warranties and Undertakings by the Recipient
The Recipient hereby certifies that the representations, warranties and undertakings set out below are, and will be as of the date of execution of the Contribution Agreement, true and correct in all material respects and undertakes to advise the Agency of any changes that materially affect them.

2.2 Power and Authority of Recipient
Where the Recipient is not an individual, the Recipient represents and warrants that it is duly incorporated, validly existing, in good standing, and has the power and authority to carry on its business, to hold property and to enter into this Agreement. The Recipient undertakes to initiate all the necessary actions required to remain in good standing and to preserve its legal capacity.

2.3 Authorized Signatories
The Recipient represents and warrants that the signatories to the Agreement have been duly authorized to execute and deliver the Agreement

2.4 Binding Obligations
The Recipient represents and warrants that the execution, delivery and performance of the Agreement have been duly and validly authorized and that when executed and delivered, the Agreement will constitute a legal, valid and binding obligation enforceable in accordance with its terms.

2.5 No Pending Suits or Actions
The Recipient warrants that it is under no obligation or prohibition, nor is it subject to or threatened by any actions, suits or proceedings that could or would prevent compliance with this Agreement. The Recipient will advise the Agency forthwith of any such occurrence during the Term of the Agreement

2.6 No Gifts or Inducements
The Recipient represents and warrants that it has not, nor has any person on its behalf, offered or promised to any official or employee of Her Majesty the Queen in Right of Canada any bribe, gift or other inducement for or with a view to obtaining the Agreement. And it has not, nor has any person on its behalf, employed any person to solicit the Agreement for a commission, contingency fee or any other consideration dependant upon the execution of the Agreement.

2.7 Compliance
The Recipient shall apply, in relation to the Project, in all material respects, the requirements of all applicable laws, regulations, orders and decrees of any regulatory bodies having jurisdiction over the Recipient or the Project.

2.8 Other Agreements
The Recipient represents and warrants that it has not entered, and undertakes not to enter, into any agreement, without the Agency's written consent that would prevent the full implementation of this Agreement by the Recipient.

2.9 Intellectual Properties
The Recipient represents and warrants that:

(a) it has taken appropriate steps to ensure that it either owns the Background Intellectual Property or holds sufficient rights in the same to permit the Project to be carried out and the Foreground Intellectual Property to be exploited;

(b) the title to the Foreground Intellectual Property is to be vested and, unless otherwise agreed to in writing by the Agency, to remain exclusively with the Recipient;

(c) it shall take appropriate steps to protect the Foreground Intellectual Property and shall, upon request, provide information to the Agency in that regard; and

(d) it has obtained written permission from every author who will contribute to any Foreground lntellectual Property that may be subject to copyright protection and that will form part of the Project. The Agency may request that the Recipient provide it with a copy of the written waiver(s) of moral rights.

3.0 Other Financing

3.1 The Recipient remains solely responsible for providing or obtaining the funding, in addition to the Contribution, required to carry out the Project and fulfill the Recipient's other obligations under this Agreement.

4.0 Other Government Assistance

4.1 Until the end of the Control Period, the Recipient will promptly inform the Agency, in writing, of any assistance received or to be received from federal, provincial or municipal sources other than those identified in Schedule 2 – Statement of Work. The Agency shall have the right to adjust the Contribution to take into account the amount of any such assistance and may require repayment from the Recipient.

5.0 Values and Ethics

5.1 Members of the Senate and House of Commons
No member of the Senate or House of Commons shall be allowed to derive any financial advantage resulting from the Contribution that would not be permitted under the *Parliament of Canada Act*.

5.2 Members of a Provincial or Territorial Legislature
Members of a provincial or territorial legislature shall be governed by provincial or territorial conflict-of-interest guidelines in effect during the Term of this Agreement.

5.3 Conflict of Interest
The Recipient acknowledges that individuals who are subject to the provisions of the *Conflict of Interest Act,* 2006, c. 9, s. 2, the *Conflict of Interest Code for Members of the House of Commons,* the *Conflict of Interest Code/or Senators,* the *Values and Ethics Code for the Public Service,* or any other values and ethics codes applicable within provincial or territorial governments or specific organizations cannot derive any direct benefit resulting from this Agreement unless the provision or receipt of such benefit is in compliance with such legislation and codes.

6.0 Dispute Resolution

6.1 If a dispute arises concerning the application or interpretation of the Agreement, the Agency and the Recipient shall attempt to resolve the matter through good faith negotiations, and may, if necessary and if the Agency and the Recipient consent in writing, resolve the matter through mediation or arbitration by a mutually acceptable mediator or arbitrator in accordance with the Commercial Arbitration Code set out in the schedule to the *Commercial Arbitration Act* (Canada) and all regulations made pursuant to that Act.

7.0 Lobbying

7.l The Recipient shall ensure that any person lobbying, as defined in the federal *lobbying Act,* on its behalf in relation to this Agreement and to the Project is registered pursuant to the Act.

8.0 Relationship with the Agency

8.1 The Agency and the Recipient declare that nothing in this Agreement shall be construed as creating employment, a partnership, joint venture or agency relationship between the Agency and the Recipient. The Recipient is not in any way authorized to make a promise, agreement or contract or to incur any liability on behalf of Her Majesty in Right of Canada, and shall be solely responsible for any and all payments and deductions required by all applicable laws. The Recipient shall indemnify and save harmless the Agency in respect of any claims arising from failure to comply with the foregoing.

GENERAL CONDITIONS

9.0 Termination

9.1 The Agreement will terminate at the end of the Control Period, when all amounts due from the Recipient to the Agency under this Agreement have been paid in full or until that obligation is otherwise discharged to the satisfaction of the Agency.

10.0 Force Majeure

l0.1 Event of Force Majeure
The Recipient will not be in default by reason only of any failure in performance of the Project in accordance with Schedule 2 – Statement of Work if such failure arises through no fault or negligence of the Recipient and is caused by an event of force majeure.

10.2 Definition of Force Majeure
Force majeure means any cause that is unavoidable or beyond the reasonable control of the Recipient, including war, riot, insurrection, orders of government or any act of God or other similar circumstance beyond the Recipient's control and that could not have been reasonably circumvented by the Recipient without incurring unreasonable cost.

11.0 Communications

11.1 The Recipient consents to public announcements of the Project, by or on behalf of the Agency. The Recipient shall also acknowledge the Agency's Contribution in any public communications of the Project and shall obtain the approval of the Agency before preparing any announcements, brochures, advertisements, web content or other materials that will display the Agency logo or otherwise make reference to the Agency.

11.2 The Agency shall inform the Recipient of the date on which the announcement is to be made and the Recipient shall keep this Agreement confidential until such date. After official announcement of the Project by the Agency or sixty (60) calendar days after the Recipient's acceptance of this Agreement, whichever is earlier, information appearing in Schedule 5 – Project Fact Sheet, herein, will be considered to be in the public domain.

11.3 The Recipient will advise the Agency at least thirty (30) calendar days in advance of any special event such as, but not limited to, an official opening, ribbon cutting or other like event that the Recipient organizes in connection with the Project. A ceremony shall be held on a date that is mutually acceptable to the Agency and the Recipient. The Recipient consents to having the Minister responsible for the Agency, or a designate, participate in any such ceremony.

11.4 The Recipient agrees to the distribution by the Agency of information about the Project as part of public communication initiatives including, but not limited to feature stories, news releases, speeches, web content, Agency promotional materials and special publications.

11.5 The Agency may, at its sole discretion, withdraw the requirements of the Recipient's acknowledgement of the Agency's Contribution in all public communications of the Project.

12.0 Material Changes

12.l No material changes shall be made to the estimated total scope, the nature or any element of the Project or to any element of the Recipient's operation without the prior written consent of the Agency. A material change includes, but is not limited to, change in the ownership or control of the Recipient or the assets, management, financing, location of the Project or facilities, size of the facilities, timing, expected results, or other government contributions. When consent is requested from the Agency in regard co any material change the Recipient shall provide, in a timely manner, all documentation and information as may be required by the Agency, at its discretion.

GENERAL CONDITIONS

13.0 Disposal of Assets

13.1 The Recipient shall retain possession and control of the Project Assets, the cost of which the Agency contributed to under the Agreement, and shall not, prior to the end of the Control Period, sell, dispose of, cease to use or transfer to commercial use Project Assets without the written consent of the Agency.

13.2 Any funds recovered by the Recipient pursuant to the sale or disposal of Project Assets shall be paid to the Agency, except where the Project Assets disposed of are immediately replaced by comparable assets of equal or greater value that are used for the Project.

13.3 If so directed by the Agency, the Recipient shall pay the Agency forthwith the greater of the percentage of assistance rate, as specified in Schedule 2 – Statement of Work, of the:

(a) proceeds of disposition of the Project Asset(s); or

(b) fair market value of the Project Asset(s).

13.4 The total amount payable by the Recipient pursuant to, the Disposal of Assets, shall not exceed the amount of the Contribution.

14.0 Insurance Coverage

14.1 The Recipient is responsible for deciding the appropriate insurance coverage required to fulfill its obligations herein and to ensure compliance with any applicable laws. Any insurance acquired or maintained by the Recipient is at its own expense and for its own benefit and protection. It does not release the Recipient from or reduce its liability under this Agreement.

15.0 Monitoring, Rights to Audit and Physical Access

15.1 During the term of the Agreement, the Recipient will provide, to the Agency, the books, accounts and records of the Project and all information necessary to ensure compliance with this Agreement and for audit examination.

15.2 The Recipient will provide representatives of the Agency reasonable access to its premises to inspect and assess the progress of the Project, or any element thereof, and will supply, promptly on request, such data as the Agency may reasonably require for statistical or Project evaluation purposes.

15.3 The Recipient will, at its own expense, preserve and make available for audit and examination by the Agency or its representatives, for a period of thirty-six (36) months after the end of the Control Period, the books, accounts and records of the Project and all information necessary to ensure compliance with the terms and conditions of this Agreement, including payment of amounts to the Agency, and to assess the success of the Project and the Program. The Agency will have the right to conduct such additional audits and evaluations at its own expense as may be considered necessary, using the staff of the Agency, an independent firm or the Recipient's external auditors.

15.4 The Recipient shall also make records and information available to the Auditor General of Canada when requested by the Auditor General for the purpose of an inquiry under subsection 7.1 (1) of the *Auditor General Act.*

15.5 The Recipient will assist the Agency with the monitoring of the Agreement and will facilitate access by the Agency to information from third parties and to the premises of third parties relating to the Agreement.

GENERAL CONDITIONS

16.0 Overpayment

16.I Where, for any reason:

(a) the Recipient is not entitled to the Contribution; or

(b) the Agency determines that the amount of the Contribution disbursed exceeds the amount to which the Recipient is entitled,

the Recipient will repay to the Agency, promptly and no later than thirty (30) calendar days from the date of the notice from the Agency, the amount of the overpayment. Any such amount is a debt due to Her Majesty in Right of Canada and may be recovered as such.

17.0 Right to Set-off

17.1 Without limiting the scope of set-off rights available to the Crown at Common Law, under the *Financial Administration Act* or otherwise, the Agency may:

(a) set-off against any portion of the Contribution that is payable to the Recipient pursuant to the Agreement, any amount that the Recipient owes to Her Majesty under legislation or any other agreement of any kind; and

(b) set-off against any amounts that are owed to the Agency by the Recipient, any amount that is payable by Her Majesty under legislation or any other agreements of any kind to the Recipient

18.0 Interest and Administrative Charges

18.1 Payments
When any payment is received from the Recipient on account of a prepayment of a repayment instalment, an overpayment, a disposal of asset or an event of default, the Agency shall apply that payment first to reduce any accrued interest and/or administrative charges owing and then, if any part of the payment remains, to reduce the outstanding principal balance.

18.2 Overdue Accounts
The Recipient shall pay, where the account is overdue and in addition to any amount payable, interest on that amount at the Interest Rate, in accordance with the *Interest and Administrative Charges Regulation.* The interest, calculated daily and compounded monthly, shall accrue starting on the Due Date and ending on the day before the date on which the payment is received by the Agency.

18.3 Fee
An administrative fee shall be charged on every payment rejected by the Recipient's financial institution for any reason, in accordance with the *Interest and Administrative Charges Regulation,* which may be amended from time to time. Toe current fee is set at fifteen dollars ($15).

19.0 Events of Default

19.1 The following constitute events of default:

(a) the Recipient is, in the opinion of the Agency, bankrupt or insolvent, goes into receivership or takes the benefit of any statute from time to time in force relating to bankrupt or insolvent debtors;

(b) an order is made or resolution passed for the winding up of the Recipient, or the Recipient is dissolved;

(c) the Recipient, during the term of the Agreement, has defaulted under the terms and conditions of any agreement or arrangement, with any financial institution or creditor with rights to the property or assets of the Recipient;

(d) in the opinion of the Agency, the Recipient ceases to carry on business;

(e) the Recipient submits false or misleading information to the Agency;

(f) the Recipient is no longer eligible under the "eligibility criteria" of the Program;

(g) the Recipient makes a false or misleading statement concerning assistance by the Agency in a prospectus or other document related to raising funds;

(h) the Recipient has not met or satisfied a term or condition of this Agreement; or

(i) the Recipient has not met or satisfied a term or condition under any other contribution agreement, or agreement of any kind, with the Agency.

20.0 Remedies on Default

20.1 If an event of default has occurred or, in the opinion of the Agency is likely to occur, the Agency may exercise one or more of the following remedies:

(a) suspend or terminate any obligation by the Agency to contribute to the Costs Incurred, including any obligation to pay any amount owing prior to the date of such suspension or termination;

(b) require the Recipient to repay to the Agency all or part of the Contribution paid by the Agency to the Recipient, together with interest at the Interest Rate in accordance with the *Interest and Administrative Charges Regulations.* The interest, calculated daily and compounded monthly, shall accrue commencing upon the date of the event of default as specified in the demand for payment issued by the Agency and ending on the day before the date on which the payment is received by the Agency.

20.2 The Recipient acknowledges that, in view of the policy objectives served by the Agency's agreement to make the Contribution, the fact that the Contribution comes from public monies and that the amount of damages sustained by the Crown in the event of default is difficult to ascertain, it is fair and reasonable that the Agency be entitled to exercise any or all of the remedies provided for in, Remedies on Default, of these General Conditions, and to do so in the manner provided for in this section if an event of default occurs.

20.3 The fact that the Agency refrains from exercising a remedy it is entitled to exercise under the Agreement will not constitute a waiver of such right and any partial exercise of a right will not prevent the Agency in any way from later exercising any other right or remedy under the Agreement or other applicable law.

21.0 Annual Appropriations

21.1 Parliamentary Allocation
Any payment by the Agency under this Agreement is subject to there being a sufficient appropriation for the fiscal year, beginning on April 1 and ending on the following March 31, in which the payment is to be made and is subject to cancellation or reduction in the event that departmental funding levels are changed by Parliament

21.2 Lack of Appropriation
In the event the Agency is prevented from disbursing the full amount of the Contribution due to a lack or reduction of appropriation or departmental funding levels, the Parties agree to review the effects of such a shortfall in the Contribution on the implementation of the Agreement and to adjust, as appropriate, the expected results from the Project specified in Schedule 2 – Statement of Work.

GENERAL CONDITIONS

22.0 Notice

22.1 Any notice required to be given with respect to this Agreement shall be in writing and shall be effectively given if delivered or if sent by ordinary or registered mail, ACOA Direct, courier or fax, addressed to the party for whom the notice is intended. Any notice shall be deemed to have been received on delivery. Any notice sent by ACOA Direct or fax shall be deemed to have been received one (1) working day after being sent. Any notice sent by mail shall be deemed to have been received eight (8) calendar days after being sent.

23.0 No Assignment of Agreement

23.1 The Recipient shall not assign the Agreement or any part thereof without the prior written consent of the Agency.

24.0 Indemnity

24.1 The Recipient shall indemnify and save harmless the Agency from and against all claims, losses, damages, costs and expenses that may be brought against or suffered by the Agency, and that the Agency may incur, sustain or pay arising out of or relating to any injury to or death of a person or loss to property or other loss or damage caused or alleged to be caused by the Recipient or its servants, agents, subcontractors or independent contractors in the course of carrying out the obligations of the present Agreement.

25.0 Cancellation of Agreement

25.1 The Agency, by thirty (30) calendar days' notice duly given to the Recipient in accordance with, Notice, of these General Conditions, may cancel this Agreement at any time if, in the Agency's opinion, Schedule 2 – Statement of Work has not been executed in a satisfactory manner or if the progress and objectives outlined in the Agreement have not been met.

26.0 Access to Information Act and Privacy Act

26.1 All information obtained by the Agency from the Recipient pursuant to an application or during the course of this Agreement will be treated in accordance with the *Access to Information Act* and the *Privacy Act.*

27.0 Aboriginal Consultation

27.1 The Recipient acknowledges that the Agency's obligation to pay the Contribution is conditional upon the Agency satisfying any obligation that it may have to consult with or to accommodate any Aboriginal groups that may be affected by the terms of this Agreement.

28.0 Applicable Law

28.l This Agreement shall be interpreted in accordance with the laws in force in the province in which the office of the Agency is located.

STATEMENT OF WORK

Project Description

This project will assist with marketing rebrand of metaAIR eyewear packaging, new collateral, website design to support product launch, inbound sales and marketing, and support material to launch its premium eyewear product into the global market.

Project Location

Halifax, Nova Scotia

Project Financing

Project and Eligible Costs	Assistance Rate 75.000%	$		Financing	$
Other Operating Expenses				ACOA BDP Repayable	$ 100,000.00
Marketing Activities		$ 23,333.33			
Consultants		110,000,00		Cash flow from operations	$ 33,333.33
Total Project and Eligible Costs		$ 133,333.33		**Total Financing**	$ 133,333.33

Expected Results from the Project

The federal government requires that results from projects receiving federal funding be identified. The Agency will thus follow-up on the following expected results identified from your project.

Expected Project Results

- Develop a brand strategy for Metamaterial, ensuring the brand strategy is aligned with the business strategy and can work with future technology innovations and products.

- Create a logo and brand identity for Metamaterial.

- Develop a product naming and logo convention that will allow for consistent branding across all products and applications.

- Design and develop responsive website to reflect brand strategy and new identity.

Means of Verification

Annual Financial Statements
Annual Client Information Update
Quarterly Progress Reports
Annual Site Visits

CLAIMS AND COSTS PRINCIPLES

1.0 Claims

1.1 The Agency will pay the Contribution lo the Recipient: in respect of Costs Incurred, on the basis of claims that:

(a) are submitted on claim forms provided by the Agency and include the details of all Costs Incurred being claimed;

(b) are completed and certified by an authorized signing officer of the Recipient; and

(c) if applicable include a declaration of any overdue amounts owed to Her Majesty the Queen in Right of Canada pursuant to any obligation other than this Agreement and provide details of any such amounts.

1.2 The total amount of the Contribution paid to the Recipient in respect to Costs Incurred but not yet paid to suppliers shall not exceed fifty percent (50%) of the total authorized Contribution.

1.3 Unless specified in the Articles of Agreement – Payments, supporting documents do not need to be included when submitting a claim. However, purchase orders, cancelled cheques, invoices, receipts and all other supporting documentation must be retained and readily available for examination by the Agency during or after any payment in accordance with Schedule 1 – General Conditions, Monitoring, Rights to Audit and Physical Access.

1.4 With the submission of the final claim, the Recipient shall submit a final payment certificate, on the form provided by the Agency for that purpose attesting that the Costs Incurred for the entire Project have been paid to the suppliers. The term "paid" herein and in the certification means paid by monetary payment. This certificate shall be certified by a person authorized to sign on behalf of the Recipient.

1.5 Payments to the Recipient will be withheld if there are any outstanding reports, as required in Schedule 4 – Reporting Requirements.

2.0 Project Costs Principles

2.1 Total Eligible Costs of the Project
The total Eligible Costs of the Project, as listed in Schedule 2 – Statement of Work, shall be the sum of the applicable direct costs that are or will reasonably and properly be incurred in the performance of the Project, less any applicable credits.

2.2 Incremental Costs
Eligible Costs, as identified in Schedule 2 – Statement of Work, include only incremental costs deemed essential for the implementation of the Project. Incremental costs are those that are new or additional or costs that would not have otherwise been incurred if not for the implementation of the Project.

2.3 Reasonable Costs
Eligible Costs, as identified in Schedule 2 – Statement of Work, include only those costs that are reasonable. A cost is reasonable if, in nature and amount, it does not exceed what would be incurred by an ordinary, prudent person in the conduct of competitive business. In determining the reasonableness of a particular cost, consideration shall be given to:

(a) whether the cost is at fair market value;

(b) the restraints and requirements of factors such as generally accepted sound business practices, arm's-length bargaining, federal, provincial and local laws and regulations, and agreement terms;

(c) the action that prudent business persons would take in the circumstances, considering their responsibilities to the owners of the business, their employees, customers, stakeholders, the Government and the public at large;

(d) significant deviations from the established practices of the Recipient that may unjustifiably increase Eligible Costs; and

(e) the specifications, delivery schedule and quality requirements of the particular Project as they affect costs.

2.4 Travel Costs

Travel costs include transportation, accommodations and meals that are directly attributable to the Project and included in Schedule 2 – Statement of Work. The Agency will reimburse the Recipient's travel costs incurred up to the maximum applicable to such travel costs according to the principles, guidelines and rates prescribed by the National Joint Council Directive (the Directive) (www.njc-cnrn.gc.ca). as may be amended from time to time. Without limiting the generality of the foregoing, meal costs incurred by the Recipient during eligible travel will be reimbursed by way of meal allowances at the applicable per diem rates set forth in Appendix C or D of the Directive. No allowance will be allocated for any meals provided to the traveler at no cost or as part of other costs (i.e. accommodation, conference, etc.).

2.5 General Administrative Costs

General administrative costs include expenditures for office supplies, courier charges, utilities/telecommunications (e.g. telephone, fax, internet, electricity), and other office expenses identified as being directly attributable to the Project and included in Schedule 2- Statement of Work. Incremental costs are only acceptable when they can be substantiated by the Recipient.

2.6 Salary and Wages Costs

Salary costs must be incremental and essential for the Project. Such wages or salaries must be for employees on the Recipient's payroll and included in Schedule 2 – Statement of Work. The acceptable payroll rate shall be the regular pay rate for the period, excluding premiums paid for overtime or shift work.

Salary and wages costs must be claimed on the same basis as they are incurred and paid to employees (i.e. weekly, bi-weekly, monthly), as supported by payroll records.

In certain cases, a salaried employee may not work exclusively on the Project. In those instances, only the proportion of their salary based on the actual time spent on the Project, as supported by timesheets or other satisfactory form of time recording may be considered as an Eligible Cost of the Project. In order to determine the proportion of the employee salary for the time spent on the Project (a daily or hourly pay rate), the total amount of work days during a salary year can be reduced by the number of vacation days and statutory holidays to which the employee is entitled during that year, as applicable. No other deduction or mechanisms for increasing the proportion of the time spent on the Project will be allowed without the prior consent of the Agency.

When it has been expressly included in Schedule 2 – Statement of Work, salary costs for the performance of an authorized and incremental role of qualified management personnel may be claimed in accordance with this Schedule.

2.7 Payroll Burden

Payroll burden associated with eligible wages and salaries included in Schedule 2 – Statement of Work, which includes items such as group insurance, pension plans and the employer's share of federal deductions, is also eligible for personnel directly associated with the Project. The Recipient can claim a rate of fifteen per cent (15%) of salaries and wages for the payroll burden.

2.8 Non-Eligible Costs

The Agency considers certain categories of costs as non-eligible. These may include, but are not necessarily restricted to, items such as:

(a) the cost of land and goodwill;

(b) cost allocation for the use of existing space owned by the Recipient;

(c) fixed period costs (for example, recurring costs such as property taxes, rentals and a reasonable provision for depreciation);

(d) entertainment expenses (does not include networking receptions) and first-class airfare;

(e) insurance, except if the cost is directly related to construction and is capitalized (in accordance with Generally Accepted Accounting Principles or International Financial Reporting Standards) as part of the Project;

(f) dues and other membership fees;

(g) severance pay, cash-out of unused vacation, bonuses, overtime premium for salaried employees and commissions;

(h) interest costs, bond discounts, and other financing costs; and

(i) any costs, such as amortization and in-kind, that would not necessitate an expenditure of cash by the Recipient.

2.9 Credits

Credits are defined as the applicable portion of any income, rebate, allowance or other credit relating to any incurred cost received by or accruing to the Recipient. This includes the input tax credit or the reimbursement of sales taxes paid by the Recipient for goods and services. These credits shall be taken into consideration in calculating Eligible Costs.

REPORTING REQUIREMENTS

1.0 General

1.1 Progress Report with Each Claim

The Recipient shall submit a progress report with each claim for payment, on the form provided by the Agency for that purpose, detailing the progress and results of the Project. Each progress report shall contain the following information in relation to the Project:

(a) a description of the progress made in the fulfillment of Schedule 2 – Statement of Work during the reporting period;

(b) an assessment of any significant delay in completing the Project or in attaining any expected result identified in Schedule 2 – Statement of Work. the reasons for such delay, and mitigation measures being taken; and

(c) the Recipient's revised projection of Project cash ;flows for the current fiscal year, if any significant change is expected.

1.2 Annual Financial Statements

(a) The Recipient shall provide the Agency with a copy of its annual audited financial statements within one hundred and eighty (180) days after the end of each fiscal year.

(b) The Recipient shall provide its annual financial statements or other above requested information until the end of the Control Period.

1.3 Internal Financial Statements

The Recipient shall provide a copy of its semiannual internally prepared financial statements, for monitoring purposes, within sixty (60) days following the respective six month period. The Agency also reserves the right to change the interval of monitoring and of receipt of internally prepared financial statements, when deemed necessary by the Agency, and the Recipient shall provide them, upon written requests.

1.4 Report on Project Results

After the final payment of the Contribution by the Agency and until the end of the Control Period, the Recipient shall submit, upon request by the Agency, a report detailing the actual results of the Project *as* compared to the expected results in Schedule 2 – Statement of Work, using the means of verification identified therein. All deviations should be explained. The report must be satisfactory to the Agency, at its sole discretion. The Agency may request independent third-party verification of this report or of the project results, and the Recipient shall provide such independent verification upon written request and at its own expense.

SCHEDULE 4

REPORTING REQUIREMENTS

SCHEDULE 5

FACT SHEET FOR NEWS RELEASE

Program:
The Agency's Business Development Program

Project No:
212622

Name and Address of Recipient:
Metamaterial Technologies Inc.
Suite 215
1 Research Drive
Dartmouth, Nova Scotia
B2Y 4M9

Recipient Contact:
Name: Dr. George Palikaras
Title: Founder & CEO
Telephone: (902) 482-5729

Project Location:
Halifax, Nova Scotia

Project Type:
Commercialization

Project Description:

Hire expertise to support marketing, sales and website development for product launch

Total Project Costs:
$133,333.33

Eligible Costs:
$133,333.33

Authorized Assistance:
$100,000.00

Total Government Funding:
$100,000.00

Estimated Project Commencement Date: December 3, 2018

Estimated Project Completion Date: March 31, 2020

Repayment Schedule Schedule 6

Client: Metamaterial Technologies Inc.
Account Number: 212622
Number of Repayments: 72
Total Repayable: $100,000.00

Start Date: 2020/10/01
End Date: 2026/09/01

Payment #	Due Date	P/1/C	Amount Due	Amount Paid to Date	Amount Outstanding
					$100,000.00
				$0.00	**$100,000.00**
1	2020/10/01	Principal	$1,400.00		$98,600.00
2	2020/11/01	Principal	$1,400.00		$97,200.00
3	2020/12/01	Principal	$1,400.00		$95,800.00
4	2021/01/01	Principal	$1,400.00		$94,400.00
5	2021/02/01	Principal	$1,400.00		$93,000.00
6	2021/03/01	Principal	$1,400.00		$91,600.00
7	2021/04/01	Principal	$1,400.00		$90,200.00
8	2021/05/01	Principal	$1,400.00		$88,800.00
9	2021/06/01	Principal	$1,400.00		$87,400.00
10	2021/07/01	Principal	$1,400.00		$86,000.00
11	2021/08/01	Principal	$1,400.00		$84,600.00
12	2021/09/01	Principal	$1,400.00		$83,200.00
13	2021/10/01	Principal	$1,400.00		$81,800.00
14	2021/11/01	Principal	$1,400.00		$80,400.00
15	2021/12/01	Principal	$1,400.00		$79,000.00
16	2022/01/01	Principal	$1,400.00		$77,600.00
17	2022/02/01	Principal	$1,400.00		$76,200.00
18	2022/03/01	Principal	$1,400.00		$74,800.00
19	2022/04/01	Principal	$1,400.00		$73,400.00
20	2022/05/01	Principal	$1,400.00		$72,000.00
21	2022/06/01	Principal	$1,400.00		$70,600.00
22	2022/07/01	Principal	$1,400.00		$69,200.00
23	2022/08/01	Principal	$1,400.00		$67,800.00
24	2022/09/01	Principal	$1,400.00		$66,400.00
25	2022/10/01	Principal	$1,400.00		$65,000.00
26	2022/11/01	Principal	$1,400.00		$63,600.00
27	2022/12/01	Principal	$1,400.00		$62,200.00
28	2023/01/01	Principal	$1,400.00		$60,800.00
29	2023/02/01	Principal	$1,400.00		$59,400.00
30	2023/03/01	Principal	$1,400.00		$58,000.00
31	2023/04/01	Principal	$1,400.00		$56,600.00
32	2023/05/01	Principal	$1,400.00		$55,200.00
33	2023/06/01	Principal	$1,400.00		$53,800.00
34	2023/07/01	Principal	$1,400.00		$52,400.00
35	2023/08/01	Principal	$1,400.00		$51,000.00
36	2023/09/01	Principal	$1,400.00		$49,600.00
37	2023/10/01	Principal	$1,400.00		$48,200.00
38	2023/11/01	Principal	$1,400.00		$46,800.00
39	2023/12/01	Principal	$1,400.00		$45,400.00
40	2024/01/01	Principal	$1,400.00		$44,000.00
41	2024/02/01	Principal	$1,400.00		$42,600.00

Repayment Schedule Schedule 6

42	2024/03/01	Principal	$1,400.00	$41,200.00
43	2024/04/01	Principal	$1,400.00	$39,800.00
44	2024/05/01	Principal	$1,400.00	$38,400.00
45	2024/06/01	Principal	$1,400.00	$37,000.00
46	2024/07/01	Principal	$1,400.00	$35,600.00
47	2024/08/01	Principal	$1,400.00	$34,200.00
48	2024/09/01	Principal	$1,400.00	$32,800.00
49	2024/10/01	Principal	$1,400.00	$31,400.00
50	2024/11/01	Principal	$1,400.00	$30,000.00
51	2024/12/01	Principal	$1,400.00	$28,600.00
52	2025/01/01	Principal	$1,400.00	$27,200.00
53	2025/02/01	Principal	$1,400.00	$25,800.00
54	2025/03/01	Principal	$1,400.00	$24,400.00
55	2025/04/01	Principal	$1,400.00	$23,000.00
56	2025/05/01	Principal	$1,400.00	$21,600.00
57	2025/06/01	Principal	$1,400.00	$20,200.00
58	2025/07/01	Principal	$1,400.00	$18,800.00
59	2025/08/01	Principal	$1,400.00	$17,400.00
60	2025/09/01	Principal	$1,400.00	$16,000.00
61	2025/10/01	Principal	$1,400.00	$14,600.00
62	2025/11/01	Principal	$1,400.00	$13,200.00
63	2025/12/01	Principal	$1,400.00	$11,800.00
64	2026/01/01	Principal	$1,400.00	$10,400.00
65	2026/02/01	Principal	$1,400.00	$9,000.00
66	2026/03/01	Principal	$1,400.00	$7,600.00
67	2026/04/01	Principal	$1,400.00	$6,200.00
68	2026/05/01	Principal	$1,400.00	$4,800.00
69	2026/06/01	Principal	$1,400.00	$3,400.00
70	2026/07/01	Principal	$1,400.00	$2,000,00
71	2026/08/01	Principal	$1,400.00	$600.00
72	2026/09/01	Principal	$600.00	$0.00

Exhibit 4.3.5

Atlantic Canada Opportunities Agency
Agence de promotion économique du Canada atlantique

P.O. Box 2284, Station Central
Halifax. Nova Scotia
B3J 3C8

November 18, 2020

Project No.: 217574

Metamaterial Technologies Inc.
1 Research Drive, Suite 215
Dartmouth, Nova Scotia
B2Y 4M9

Attention: Dr. George Palikaras

Dear Dr. Palikaras:

Note: Exceptional Circumstances due to the effects of COVID-19

As part of the Government of Canada's response to the COVID-19 outbreak, ACOA is taking proactive measures to mitigate economic impacts in Atlantic Canada.

ACOA Clients are experiencing unprecedented disruptions affecting their operations, which in turn affect their ability to provide ACOA with required documentation using standard methods. To ensure that program delivery can continue to be done in a timely manner throughout this period, ACOA is implementing temporary measures that will streamline some work processes by providing additional flexibility for electronic signatures, acceptable methods of transmission of information and requirements for initial advance payments. These temporary measures remain at ACOA's discretion and are in addition to all terms and conditions included in the funding agreement.

In regards to document delivery, all delivery methods expressly permitted in the funding agreement continue to be acceptable, including ACOA Direct, which remains the most secure way to transmit protected information. However, it is agreed that, during these exceptional circumstances, email transmission will also be a valid means of sending notices and correspondences to the other party for the purposes of the Notice provisions in the funding agreement. Where a notice or document is communicated to the other party by email, it will be deemed to have been delivered within one (I) working day of being sent.

Canada

That said, by proceeding with an electronic signature and/or an electronic imaging and transmission of a handwritten signature, you agree that such is a reliable signature method and is binding on the Recipient, that it will have the same force and effect as an original handwritten signature, and that it will be deemed an original for all purposes. This applies to any new agreement, any amendment to an existing agreement, and any other notice or correspondence contemplated under the agreement.

In each case, you must preserve the original signed document for the entire term of the funding agreement and must provide such original, as well as any further proof of execution and authorization, to the Agency upon request.

If you do not agree with the above or have questions or concerns with any of the items outlined herein, please communicate with your program officer. If any changes are made to these temporary measures or if additional measures are implemented in the context of the COVID-19 pandemic, they will be communicated to you.

RE: <u>Offer of Assistance under the REGI – Business Scale-up and Productivity (RRRF)</u>

Please find attached a contribution agreement for funding under the REGI – Business Scale-up and Productivity (RRRF) for your review and signature. **This agreement is open for acceptance for sixty (60) calendar days from the date that appears on this letter.**

We have also included a Pre-authorized Debit/Direct Deposit Authorization (PAD) form for your completion and signature. Please return one signed copy of the contribution agreement and the completed PAD form.

Once we receive the signed forms, we will provide you with information on how to submit claims under the project. We recommend using ACOA Direct, the Agency's web-based client portal, where you can submit claims online, share documents, collaborate with members of the secure site and access your ACOA account 24 hours a day, 7 days a week. ACOA Direct is the most effective way for you to submit claims. Included with this letter is an ACOA Direct Client Registration form for your convenience. You can use it to enroll or to make changes if you are already enrolled.

If you have any questions, please contact Paul Hayes, the Program Officer assigned to your project, at (800) 565-1228 or (902) 426-3174, or via e-mail at paul.hayes@canada.ca

Yours truly,

Shaw, Sarah

Digitally signed by Shaw, Sarah
DN: C=CA, O=GC, OU=ACOA-APECA, CN="Shaw, Sarah"
Reason: I am the author of this document
Location: your signing location here
Date: 2020-11-18 10:44:55
Foxit PhantomPDF Version: 10.0.1

Sarah Shaw, Account Assistant

Attachments

REGI – Business Scale-up and Productivity (RRRF)

Project Number: 217574

This Contribution Agreement

BETWEEN: **ATLANTIC CANADA OPPORTUNITIES AGENCY, having an office in NOVA SCOTIA**

(hereinafter referred to as "the **Agency**")

AND:

Metamaterial Technologies Inc., an organization duly incorporated under the laws of "Canada", having its office located at:

1 Research Drive, Suite 215
Dartmouth, Nova Scotia
B2Y 4M9

(hereinafter referred to as "the **Recipient**")

WHEREAS the REGI - Business Scale-up and Productivity (RRRF), is a national innovation program that was established to provide support to business productivity and scale-up,

(hereinafter referred to as "the **Program**")

WHEREAS the Recipient submitted an application for assistance pursuant to the Program,

WHEREAS this Agreement sets out the terms and conditions under which the Agency agrees to provide a contribution to the Recipient,

IN CONSIDERATION of their respective obligations set out below, the parties hereto agree as follows:

ARTICLES OF AGREEMENT

1.0 Documents Forming Part of this Agreement

1.1 The following documents form an integral part of this Agreement:

These Articles of Agreement
Schedule 1 – General Conditions
Schedule 2 – Statement of Work
Schedule 3 – Claims and Costs Principles
Schedule 4 – Reporting Requirements
Schedule 5 – Project Fact Sheet for News Release
Schedule 6 – Repayment Schedule

1.2 In the event of conflict or inconsistency, the order of precedence among the documents forming part of this Agreement shall be:

These Articles of Agreement
Schedule 1 – General Conditions
Schedule 2 – Statement of Work
Other Schedules

2.0 The Project

2.1 The Recipient shall carry out the Project as described in Schedule 2- Statement of Work, shall make claims in accordance with Schedule 3 – Claims and Costs Principles, shall issue the reports required under Schedule 4 – Reporting Requirements, shall make repayments in accordance with Schedule 6 – Repayment Schedule, and shall fulfill its other obligations hereunder in a diligent and professional manner using qualified personnel.

2.2 The Recipient shall commence the Project on or before December 1, 2020 (hereinafter referred to as "the **Project Commencement Date").**

2.3 The Recipient shall complete the Project on or before March 31, 2021 (hereinafter referred to as "the **Project Completion Date").**

3.0 The Contribution

3.1 Subject to all other provisions of this Agreement, the Agency will make a Contribution ("the **Contribution")** to the Recipient, with respect to the Project, calculated as the lesser of:

(a) the amount equal to the assistance rate (%) of the Eligible Costs as stated on Schedule 2 – Statement of Work; and

(b) $390,000.00.

4.0 Fiscal Year

4.1 The Recipient agrees that its fiscal year ends on December 31, and there must be no change to that fiscal year without the prior consent of the Agency.

5.0 Payments

5.1 The Agency will pay the Contribution to the Recipient in respect of Eligible Costs that are Costs Incurred, as defined in Schedule 1, on the basis of itemized claims submitted in accordance with Schedule 3 – Claims and Costs Principles.

5.2 The Agency will not contribute to any Costs Incurred by the Recipient prior to March I 5, 2020. The Agency will not accept any Cost Incurred after the Project Completion Date, unless otherwise agreed to in writing by the Agency.

5.3 Prior to the initial payment, the Recipient must provide the Agency with the following information, at the satisfaction of the Agency:

(a) the completed and signed *Pre-authorized Debit/Direct Deposit Authorization* (PAD) form as provided by the Agency.

5.4 At the discretion of the Agency, an advance payment may be made to the Recipient. The advance will be issued upon receipt of the signed contribution agreement for up to 50% of total eligible project costs. Once the advance payment is substantiated by subsequent progress claim(s), a second advance may be issued. The final 10% of the Contribution shall be withheld until all eligible project costs are incurred and suppliers paid.

5.5 At the discretion of the Agency or at the request of the Recipient, the Agency may make payments jointly to the Recipient and a third party for Costs Incurred.

5.6 Notwithstanding the foregoing, ten percent (I 0%) of the Contribution may, at the sole discretion of the Agency, be reserved for the final payment, to be made based on the final claim by the Recipient.

6.0 Repayment

6.1 The Recipient shall repay the Contribution to the Agency in accordance with Schedule 6 – Repayment Schedule.

The amounts set out in the Repayment Schedule are calculated to repay the entire balance of the Contribution; however, the last installment of the Repayment Schedule may be adjusted to include all sums owing under this Agreement. Notwithstanding the foregoing, if any amounts due under this Agreement remain unpaid fifteen (15) years from the Project Completion Date, those amounts will immediately become fully due and payable to the Agency.

7.0 Special Condition(s)

7.1 Notwithstanding any other terms or conditions of this Agreement, if the Recipient does not submit a claim for payment or does not provide documentation with the claim that is satisfactory to the Agency within six (6) months from the Effective Date of this Agreement ("the **Lapsing Date**"), the Agreement will terminate. The Agency may extend the Lapsing Date at its complete discretion and will advise the Recipient of its decision.

Notwithstanding any other terms or conditions of this Agreement, the Agency may cancel any balance of the Contribution that has not been claimed within six (6) months from the Project Completion Date ("the **End Date**"). The Agency may extend the End Date at its complete discretion and will advise the Recipient of its decision.

8.0 Official Languages

8.1 The Recipient agrees:

(a) that all public acknowledgments of the Agency's support for the Project will be expressed in both official languages;

(b) that basic project information, such as project description, will be developed and made available to the public in both official languages;

(c) to invite members of the official-language minority community to participate in any public event relating to the Project, where appropriate; and

(d) that main signage components related to the Project will be in both official languages.

9.0 Project Financing

9.1 The Recipient shall provide the Agency with confirmation of the Project financing commitments specified in Schedule 2 – Statement of Work. These commitment letters must be satisfactory to the Agency at its sole discretion.

9.2 The Recipient hereby acknowledges that no federal, provincial or municipal government assistance, other than the government assistance specifically described in Schedule 2 – Statement of Work, has been requested or received by the Recipient for the Project. The Recipient must also, until the end of the Control Period, promptly inform the Agency of any changes to such assistance, in accordance with Schedule 1 – General Conditions, Other Government Assistance.

10.0 Environmental Requirements

10.1 The Recipient represents that the Project is not a "designated project" as defined in the *Impact Assessment Act,* S.C. 2019, c. 28, s. I (]AA) and that an impact assessment (IA) or a determination under section 82 of !AA, are not required for the Project.

11.0 Communications

11.1 The Recipient must consult with the Agency regarding communication activities relating to the Project in accordance with Schedule 1 – General Conditions, Communications.

12.0 Notice

12.1 Any notice or correspondence to the Agency, including the attached duplicate copy of this Agreement signed by the Recipient, must be addressed to:

Atlantic Canada Opportunities Agency
P.O. Box 2284, Station Central
Halifax, Nova Scotia
B3J 3C8

Attention: Paul Hayes

or to such address as is designated by the Agency in writing.

12.2 Any notice or correspondence to the Recipient must be addressed to:

Metamaterial Technologies Inc.
1 Research Drive, Suite 215
Dartmouth, Nova Scotia
B2Y 4M9

Attention: Dr. George Palikaras

13.0 Entire Agreement

13.l This Agreement, if accepted, will constitute the entire Agreement between the Parties with respect to its subject matter. No amendments will be made to the Agreement unless agreed upon in writing by both parties.

14.0 Joint and Several Obligations

14.1 Where this Agreement has been executed by more than one Recipient, the liability of each Recipient is joint and several, and every reference in this Agreement to the "Recipient" or "it" or "its" in the context of referring to the Recipient shall be construed as meaning each person named as a Recipient, as well as all of them. Without limiting the generality of the foregoing, all covenants, representations and warranties of the Recipient in this Agreement shall be construed as having been made by each Recipient and by all of them considered as a single person.

15.0 Effective Date

15.1 This Agreement will come into effect on the date of last signature by the parties (the "**Effective Date**"). In the event a party has failed to date a signature, the Effective Date will be the date the Agency receives the Agreement signed by all parties.

ARTICLES OF AGREEMENT

IN WITNESS WHEREOF the parties hereto have executed this Agreement through duly authorized representatives.

ATLANTIC CANADA OPPORTUNITIES AGENCY

jeff.mullen@acoa-apeca.gc.ca Digitally signed by jeff.mullen@acoa-apeca.gc.ca DN: CN=jeff.mullen@acoa-apeca.gc.ca Reason: I am the author of this document Location: your signing location here Date: 2020-11-18 10:23:10 Foxit PhantomPDF Version: 10.0.1

Jeff Mullen, Director Enterprise Development — Date

Project No.: 217574

This Agreement may be executed in separate counterparts, each of which will be deemed to be an original, and such separate counterparts will together constitute one and the same instrument. The executed Agreement may be communicated to the Agency by facsimile transmission, by ACOA Direct, or as otherwise agreed to by the Agency and such will be deemed to be an original for all purposes.

Metamaterial Technologies Inc.

Date: Nov 24, 2020
(Insert date of signature)

Signature

Name: George Palikaras
(please print)

Title/Position: President & CEO
(please print)

Date: , 20
(Insert date of signature)

Signature

Name:
(please print)

Title/Position:
(please print)

SCHEDULE 1

GENERAL CONDITIONS

1.0 Definitions

Average Bank Rate means the weighted arithmetic average of the Bank of Canada rates that are established weekly during the month preceding the month in respect of which interest is being calculated.

Background Intellectual Property means the intellectual property rights in the technology developed prior to the beginning of the Project and required for the carrying out of the Project or the exploitation of the Foreground Intellectual Property.

Control Period means the period commencing on the Effective Date and ending on the date when all amounts due by the Recipient to the Agency under this Agreement have been paid in full or otherwise discharged to the satisfaction of the Agency.

Costs Incurred means the Eligible Costs for goods and/or services that have been received by the Recipient and that the Recipient has paid for by monetary payment or has a legal obligation to pay for by monetary payment in the future. Any Eligible Costs received that have been paid or will be paid for by means other than monetary payment, including, without limitations, in-kind and non-cash transactions, do not qualify as Costs Incurred for which the Agency can pay the Contribution.

Due Date, in relation to an amount owing to the Agency, means: (i) the day on which a scheduled repayment is to be made; or (ii) where no repayment schedule has been arranged, the day that is normally thirty (30) calendar days after the date on which a demand for payment is issued.

Eligible Costs means those costs listed in Schedule 2- Statement of Work, that comply with the principles of Schedule 3 – Claims and Costs Principles and that are necessary to carry out the Project.

Equity means the ownership interest or value in the assets of a business, net of all debts, claims and any asset account that, in the opinion of the Agency, unreasonably inflates the Recipient's net worth (i.e. assets minus liabilities equals Equity). Negative Equity exists when the value of the total assets is less than the total liabilities. The Recipient's Equity will be calculated as stated in Equity in the Articles of Agreement.

Foreground InteHectual Property means all technical data, including without limitation, all designs, specifications, software, data, drawings, plans, reports, patterns, models, prototypes, demonstration units, practices, inventions, methods, applicable special equipment and related technology, processes or other information or know-how conceived, produced, developed or reduced to practice in carrying out the Project, and all rights therein, including without limitation, patents, copyrights, industrial designs, trademarks, and any registrations or applications for the same and all other rights of intellectual property therein, including any rights which arise from the above items being treated by the Recipient as trade secrets or confidential information.

Interest Rate means the rate of interest equal to three percent (3%) higher than the Average Bank Rate.

Parties mean the Agency and the Recipient.

Project means the undertaking this Agreement is based on and that is further described in Schedule 2- Statement of Work.

Project Assets means the assets that have been contributed to by the Agency. These are listed in Schedule 2 – Statement of Work.

GENERAL CONDITIONS

Resulting Products means the Foreground Intellectual Property and/or all products that, at the sole determination of the Agency, are produced or result from the Project, incorporate results of the Project, use a method, process, equipment or information resulting from the Project and/or, without restricting the generality of the foregoing, that include any Foreground Intellectual Property, inventions, works, writings, designs, devices, and any adaptations, modifications or improvements thereto.

2.0 Representations, Warranties and Undertakings

2.1 Representations. Warranties and Undertakings by the Recipient
The Recipient hereby certifies that the representations, warranties and undertakings set out below are, and will be as of the date of execution of the Contribution Agreement, true and correct in all material respects and undertakes to advise the Agency of any changes that materially affect them.

2.2 Power and Authority of Recipient
Where the Recipient is not an individual, the Recipient represents and warrants that it is duly incorporated, validly existing, in good standing, and has the power and authority to carry on its business, to hold property and to enter into this Agreement. The Recipient undertakes to initiate all the necessary actions required to remain in good standing and to preserve its legal capacity.

2.3 Authorized Signatories
The Recipient represents and warrants that the signatory or signatories to the Agreement, as applicable, has or have been duly authorized to execute and deliver the Agreement on behalf of the Recipient.

2.4 Binding Obligations
The Recipient represents and warrants that the execution, delivery and performance of the Agreement have been duly and validly authorized and that upon execution, the Agreement will constitute a legal, valid and binding obligation on the Recipient enforceable in accordance with its terms.

2.5 No Pending Suits or Actions
The Recipient warrants that it is under no obligation or prohibition, nor is it subject to or threatened by any actions, suits or proceedings that could or would prevent compliance with this Agreement. The Recipient will advise the Agency forthwith of any such occurrence during the term of the Agreement.

2.6 No Gifts or Inducements
The Recipient represents and warrants that it has not, nor has any person on its behalf, offered or promised to any official or employee of Her Majesty the Queen in Right of Canada any bribe, gift or other inducement for or with a view to obtaining the Agreement. And it has not, nor has any person on its behalf, employed any person to solicit the Agreement for a commission, contingency fee or any other consideration dependant upon the execution of the Agreement.

2.7 Compliance
The Recipient shall apply, in relation to the Project, in all material respects, the requirements of all applicable laws, regulations, orders and decrees of any regulatory bodies having jurisdiction over the Recipient or the Project.

2.8 Other Agreements
The Recipient represents and warrants that it has not entered, and undertakes not to enter, into any agreement, without the Agency's written consent that would prevent the full implementation of this Agreement by the Recipient.

GENERAL CONDITIONS

3.0 Other Financing

3.1 The Recipient remains solely responsible for providing or obtaining the funding, in addition to the Contribution, required to carry out the Project and fulfill the Recipient's obligations under this Agreement.

4.0 Other Government Assistance

4.1 Until the end of the Control Period, the Recipient will promptly inform the Agency, in writing, of any assistance that has been, will be or could be received from federal, provincial or municipal sources other than those identified in Schedule 2 – Statement of Work. The Agency may adjust the Contribution to take into account the amount of any such assistance and may require repayment from the Recipient.

5.0 Values and Ethics

5.1 Members of the Senate and House of Commons
No member of the Senate or House of Commons shall be allowed to derive any financial advantage resulting from the Contribution that would not be permitted under the *Parliament of Canada Act*.

5.2 Members of a Provincial or Territorial Legislature
Members of a provincial or territorial legislature shall be governed by provincial or territorial conflict-of-interest guidelines in effect during the term of this Agreement.

5.3 Conflict of lnterest
The Recipient acknowledges that individuals who are subject to the provisions of the *Conflict of Interest Act*, 2006, c. 9, s. 2, the *Conflict of Interest Code for Members of the House of Commons, the Conflict of Interest Code for Senators, the Values and Ethics Code for the Public Service*, or any other values and ethics codes applicable within provincial or territorial governments or specific organizations cannot derive any direct benefit resulting from this Agreement unless the provision or receipt of such benefit is in compliance with such legislation and codes.

6.0 Dispute Resolution

6.1 If a dispute arises concerning the application or interpretation of the Agreement, the Agency and the Recipient shall attempt to resolve the matter through good faith negotiations, and may, if necessary and if the Agency and the Recipient consent in writing, resolve the matter through mediation or arbitration by a mutually acceptable mediator or arbitrator in accordance with the Commercial Arbitration Code set out in the schedule to the Commercial Arbitration Act (Canada) and all regulations made pursuant to that Act.

7.0 Restrictions on Distributions

7.1 The Recipient shall not make corporate distributions unless otherwise approved by the Agency.· Corporate distributions are defined for the purpose of this Agreement as any payment to any member, shareholder, director, officer or associate company of the Recipient, including, without limitations, bonuses, dividends, salaries or repayment or granting of debt to any of the aforementioned parties, excluding salaries to officers or other employees in the ordinary course of business.

8.0 Lobbying

8.1 The Recipient shall ensure that any person lobbying, as defined in the federal Lobbying Act, on its behalf in relation to this Agreement or the Project is registered pursuant to the said Act.

GENERAL CONDITIONS

9.0 Relationship with the Agency

9.1 The Agency and the Recipient declare that nothing in this Agreement shall be construed as creating employment, a partnership, joint venture or agency relationship between the Agency and the Recipient. The Recipient is not in any way authorized to make a promise, agreement or contract or to incur any liability on behalf of Her Majesty in Right of Canada, and shall be solely responsible for any and all payments and deductions required by all applicable laws. The Recipient shall indemnify and save harmless the Agency in respect of any claims arising from failure to comply with the foregoing.

10.0 Termination

10.1 The Agreement will terminate at the end of the Control Period.

11.0 Force Majeure

11.1 Event of Force Majeure
The Recipient will not be in default by reason only of any failure in performance of the Project in accordance with Schedule 2 – Statement of Work if such failure arises through no fault or negligence of the Recipient and is caused by an event of force majeure.

11.2 Definition of Force Majeure
Force majeure means any cause that is unavoidable or beyond the reasonable control of the Recipient, including war, riot, insurrection, orders of government or any act of God or other similar circumstance beyond the Recipient's control and that could not have been reasonably circumvented by the Recipient without incurring unreasonable cost.

12.0 Communications

12.1 The Recipient consents to public announcements of the Project, by or on behalf of the Agency. The Recipient shall also acknowledge the Agency's Contribution in any public communications of the Project and shall obtain the approval of the Agency before preparing any announcements, brochures, advertisements, web content or other materials that will display the ACOA corporate identifier and Canada wordmark or otherwise make reference to the Agency.

l2.2 The Agency shall inform the Recipient of the date on which the announcement is to be made and the Recipient shall keep this Agreement confidential until such date. Notwithstanding the foregoing, the information referenced in Schedule 5 – Project Fact Sheet for News Release will be considered to be in the public domain on the earlier of: the public announcement of the Project by the Agency or the Recipient, the public disclosure or publication of the said information by the Agency in accordance with applicable legislation, or the expiration of sixty (60) calendar days after the Recipient's acceptance of this Agreement.

GENERAL CONDITIONS

12.3 The Recipient must advise the Agency at least thirty (30) calendar days in advance of any special event such as, but not limited to, an official opening, ribbon cutting or other like event that the Recipient organizes in connection with the Project. A ceremony will be held on a date that is mutually acceptable to the Agency and the Recipient. The Recipient consents to having the Minister responsible for the Agency, or a designate, participate in any such ceremony.

12.4 The Recipient agrees to the distribution by the Agency of information about the Project as part of public communication initiatives including, but not limited to, feature stories, news releases, speeches, web content, Agency promotional materials and special publications.

12.5 The Agency may, at its sole discretion, withdraw the requirements of the Recipient's acknowledgement of the Agency's Contribution in all public communications of the Project.

13.0 Material Changes

13.1 No material changes will be made to the estimated total scope, the nature or any element of the Project or to any element of the Recipient's operation without the prior written co11sent of the Agency. A material change includes, but is not limited to, change in the ownership or control of the Recipient or the assets, management, financing, location of the Project or facilities, size of the facilities, timing, expected results, or other government contributions. When consent is requested from the Agency in regard to any material change the Recipient shall provide, in a timely manner, all documentation and information as may be required by the Agency, at its discretion.

14.0 Disposal of Assets

14.1 Without limiting the generality of Schedule 1 – General Conditions, Material Changes, the Recipient shall retain possession and control of the Project Assets, the cost of which the Agency contributed to under the Agreement, and shall not, prior to the end of the Control Period, sell, dispose of, cease to use or transfer to commercial use Project Assets without the prior written consent of the Agency.

14.2 The issuance of such consent, if any, may be made subject to conditions the Agency deems appropriate in the circumstances, at its discretion. Such conditions may include, without limitation, the condition(s) that the Recipient replace the Project Asset(s) disposed of with comparable asset(s) of equal or lesser value for use in the Project, that the Recipient pay the Agency forthwith all funds recovered by the Recipient pursuant to the sale or disposal of the Project Asset(s), and/or that the Recipient pay the greater of the percentage of assistance rate, as specified in Schedule 2-Statement of Work, of the:

(a) proceeds of disposition of the Project Asset(s); or

(b) fair market value of the Project Asset(s).

15.0 Insurance Coverage

15.1 The Recipient is responsible for deciding the appropriate insurance coverage required to fulfill its obligations herein and to ensure compliance with any applicable laws. Any insurance acquired or maintained by the Recipient is at its own expense and for its own benefit and protection. It does not release the Recipient from or reduce its liability under this Agreement.

16.0 Monitoring, Rights to Audit and Physical Access

16.1 During the term of the Agreement, the Recipient shall provide, to the Agency, the books, accounts and records of the Project and all information necessary to ensure compliance with this Agreement and for audit examination.

GENERAL CONDITIONS

16.2 The Recipient shall provide representatives of the Agency reasonable access to its premises to inspect and assess the progress of the Project, or any element thereof, and will supply, promptly on request, such data as the Agency may reasonably require for statistical or Project evaluation purposes.

16.3 The Recipient shall, at its own expense, preserve and make available for audit and examination by the Agency or its representatives, for a period of thirty-six (36) months after the end of the Control Period, the books, accounts and records of the Project and all information necessary to verify compliance and ability for compliance with the terms and conditions of this Agreement, including payment of amounts to the Agency, and to assess the success of the Project and the Program. The Agency will have the right to conduct such additional audits and evaluations at its own expense as may be considered necessary, using the staff of the Agency or of other federal departments or agencies, an independent firm or the Recipient's external auditors.

16.4 The Recipient shall also make records and information available to the Auditor General of Canada when requested by the Auditor General for the purpose of an inquiry under subsection 7.1 (1) of the *Auditor General Act.*

16.5 The Recipient will assist the Agency with its monitoring of the Agreement and where applicable, will obtain required information from third parties to provide to the Agency and will facilitate the Agency's access to the information and premises of third parties relating to the Agreement.

17.0 Overpayment

17.1 Where, for any reason:

(a) the Recipient is not entitled to the Contribution; or

(b) the Agency determines that the amount of the Contribution disbursed exceeds the amount to which the Recipient is entitled,

the Recipient shall repay the amount of the overpayment to the Agency promptly and no later than thirty (30) calendar days from the date of the notice of such overpayment from the Agency. Any such amount is a debt due to Her Majesty in Right of Canada and may be recovered as such.

18.0 Right to Set-off

18.1 Without limiting the scope of set-off rights available to the Crown at common law, under the *Financial Administration Act* or otherwise, the Agency may:

(a) set-off against any portion of the Contribution that is payable to the Recipient pursuant to the Agreement, any amount that the Recipient owes to Her Majesty under legislation or any other agreement of any kind; and

(b) set-off against any amounts that are owed to the Agency by the Recipient, any amount that is payable by Her Majesty under legislation or any other agreements of any kind to the Recipient.

19.0 Interest and Administrative Charges

19.1 Payments
When any payment is received from the Recipient on account of a prepayment of a repayment instalment, an overpayment, a disposal of asset or an event of default, the Agency shall apply that payment first to reduce any accrued interest and/or administrative charges owing and then, if any part of the payment remains, to reduce the outstanding principal balance in reverse order of maturity.

GENERAL CONDITIONS

19.2 Overdue Accounts
The Recipient shall pay, where the account is overdue and in addition to any amount payable, interest on that amount at the Interest Rate, in accordance with the *Interest and Administrative Charges Regulations,* which may be amended from time to time. The interest, calculated daily and compounded monthly, will accrue starting on the Due Date and ending on the day before the date on which the payment is received by the Agency.

19.3 Fee
An administrative fee will be charged on every payment rejected by the Recipient's financial institution for any reason, in accordance with the *Interest and Administrative Charges Regulations,* which may be amended from time to time. The current fee is set at fifteen dollars ($15).

20.0 Events of Default

20.1 The following constitute events of default:

(a) the Recipient is, in the opinion of the Agency, bankrupt or insolvent, goes into receivership or takes the benefit of any statute from time to time in force relating to bankrupt or insolvent debtors;

(b) an order is made or resolution passed for the winding up of the Recipient, or the Recipient is dissolved;

(c) the Recipient, during the term of the Agreement, has defaulted under the terms and conditions of any agreement or arrangement, with any financial institution or creditor with rights to the property or assets of the Recipient;

(d) in the opinion of the Agency, the Recipient ceases to carry on business;

(e) the Recipient submits false or misleading information to the Agency;

(f) the Recipient is no longer eligible under the "eligibility criteria" of the Program;

(g) the Recipient makes a false or misleading statement concerning assistance by the Agency in a prospectus or other document related to raising funds;

(h) the Recipient has not met or satisfied a term or condition of this Agreement; or

(i) the Recipient has not met or satisfied a term or condition under any other contribution agreement, or agreement of any kind, with Her Majesty in right of Canada.

21.0 Remedies on Default

21.1 If an event of default has occurred or, in the opinion of the Agency is likely to occur, the Agency may exercise one or more of the following remedies:

(a) suspend or terminate any obligation by the Agency to contribute to the Costs Incurred, including any obligation to pay any amount owing prior to the date of such suspension or termination;

(b) require the Recipient to repay to the Agency all or part of the Contribution paid by the Agency to the Recipient, together with interest at the Interest Rate in accordance with the *Interest and Administrative Charges Regulations,* as may be amended from time to time. The interest, calculated daily and compounded monthly, will accrue commencing upon the date of the event of default as specified in the demand for payment issued by the Agency and ending on the day before the date on which the payment is received by the Agency.

GENERAL CONDITIONS

21.2 The Recipient acknowledges that, in view of the policy objectives served by the Agency's agreement to make the Contribution, the fact that the Contribution comes from public monies and that the amount of damages sustained by the Crown in the event of default is difficult to ascertain, it is fair and reasonable that the Agency be entitled to exercise any or all of the remedies provided for in, Remedies on Default, of these General Conditions, and to do so in the manner provided for in this section if an event of default occurs.

21.3 The fact that the Agency refrains from exercising a remedy it is entitled to exercise under the Agreement will not constitute a waiver of such right and any partial exercise of a right will not prevent the Agency in any way from later exercising any other right or remedy under the Agreement or other applicable law.

22.0 Annual Appropriations

22.1 Parliamentary Allocation
Any payment by the Agency under this Agreement is subject to there being a sufficient appropriation for the fiscal year, beginning on April I and ending on the following March 31, in which the payment is to be made and is subject to cancellation or reduction in the event that departmental funding levels are changed by Parliament.

22.2 Lack of Appropriation
In the event the Agency is prevented from disbursing the full amount of the Contribution due to a lack or reduction of appropriation or departmental funding levels, the Parties agree to review the effects of such a shortfall in the Contribution on the implementation of the Agreement and to adjust, as appropriate, the expected results from the Project specified in Schedule 2 – Statement of Work.

23.0 Notice

23.1 Any notice required to be given with respect to this Agreement must be in writing and will be effectively given if delivered or sent by ordinary or registered mail, ACOA Direct, courier or fax, addressed to the party for whom the notice is intended. Any notice will be deemed to have been received on delivery. Any notice sent by ACOA Direct or fax will be deemed to have been received one (**1)** working day after being sent. Any notice sent by mail will be deemed to have been received eight (8) calendar days after being sent.

24.0 Consent of the Agency

24.1 Where a consent or an agreement is requested from the Agency under this Agreement, the Agency has the right to grant or refuse the consent or agreement, and where it decides to grant the consent or agreement, to do so subject to such conditions the Agency deems appropriate, at its discretion.

25.0 No Assignment of Agreement

25.1 The Recipient shall not assign the Agreement or any part thereof without the prior written consent of the Agency.

26.0 Indemnity

26.1 The Recipient shall indemnify and save harmless the Agency from and against all claims, losses, damages, costs and expenses that may be brought against or suffered by the Agency, and that the Agency may incur, sustain or pay arising out of or relating to any injury to or death of a person or loss to property or other loss or damage caused or alleged to be caused by the Recipient or its servants, agents, subcontractors or independent . contractors in the course of carrying out the obligations of the present Agreement.

GENERAL CONDITIONS

27.0 Cancellation of Agreement

27.1 The Agency may, upon thirty (30) calendar days' notice duly given to the Recipient in accordance with the Notice section of these General Conditions, cancel this Agreement at any time if, in the Agency's opinion, Schedule 2 – Statement of Work has not been executed in a satisfactory manner or if the progress and objectives outlined in the Agreement have not been met.

28.0 *Access to Information Act* and *Privacy Act*

28.1 This Agreement and all information obtained by the Agency in the course of and pursuant to this Agreement and the Recipient's application, will be subject to and treated in accordance with the *Access to Information Act* and the *Privacy Act,* as applicable, and as amended from time to time.

28.2 Without limiting the generality of the preceding paragraph, the Recipient acknowledges and agrees that the Agency will proactively publish information regarding this Agreement in accordance with the *Access to Information Act,* as amended from time to time.

29.0 Sharing of Information

29.1 The Recipient expressly authorizes the Agency to share all information obtained by the Agency in relation to this Agreement with other departments and agencies of the Government of Canada for the purpose of implementing, administering and monitoring the Program. This includes, without limitation, the Recipient's financial reports and business information as provided to the Agency under this Agreement and the Recipient's application.

30.0 Aboriginal Consultation

30.1 The Recipient acknowledges that the Agency's obligation to pay the Contribution is conditional upon the Agency satisfying any obligation that it may have to consult with or to accommodate any Aboriginal groups that may be affected by the terms of this Agreement.

31.0 Applicable Law

31.1 This Agreement must be interpreted in accordance with the laws in force in the province in which the office of the Agency is located.

SCHEDULE 2

STATEMENT OF WORK

Project Description

This project will help the Recipient to provide working capital assistance to mitigate economic hardships resulting from COVID-19, improve chances of business sector survival, and better prepare for recovery.

Project Location

DARTMOUTH, NOVA SCOTIA

Project Financing

Project & Eligible Costs	Assistance Rate 100.000%	$	Financing	$
Other (operating)		$390,000.00	ACOA Repayable Funding	$390,000.00
Total Project & Eligible Costs		**$390,000.00**	**Total Project Financing**	**$390,000.00**

Details on Project Activities and Costs

Operating costs – other operating costs includes but is not limited to the following:

- rent (only eligible if the commercialrent program is not accessed)
- rent or lease of equipment and machinery
- salaries and benefits (only eligible for employees not covered by CEWS during the period in question)
- property taxes
- utilities
- additional safety measures
- interest portion of loan payment
- office supplies
- vehicle operating expenses
- professional fees
- insurances
- other fixed overhead costs and one-time stabilization expenditures

Expected Results from the Project

The federal government requires that results from projects receiving federal funding be identified. The Agency will thus follow-up on the following expected results identified from your project.

Expected Project Results

The RRRF will focus on the following, two objectives:

– The capacity to respond to recovery challenges; and;

– The survival of the business

STATEMENT OF WORK

Means of Verification
Annual Financial Statements
Annual Client Information Update
Annual Site Visits
Progress Reports

SCHEDULE 3

CLAIMS AND COSTS PRINCIPLES

1.0 Claims

1.1 The Agency will pay the Contribution to the Recipient, in respect of Costs Incurred, on the basis of claims that:

(a) are submitted on claim forms provided by the Agency and include the details of all Costs Incurred being claimed;

(b) are completed and certified by an authorized signing officer of the Recipient; and

(c) if applicable, include a declaration of any overdue amounts owed to Her Majesty the Queen in Right of Canada pursuant to any obligation other than this Agreement and provide details of any such amounts.

l.2 The total amount of the Contribution paid to the Recipient in respect to Costs Incurred but not yet paid to suppliers shall not exceed fifty per cent (50%) of the total authorized Contribution.

1.3 Unless specified in the Articles of Agreement – Payments, supporting documents do not need to be included when submitting a claim. However, purchase orders, cancelled cheques, invoices, receipts and all other supporting documentation must be retained and readily available for examination by the Agency during or after any payment in accordance with Schedule 1 – General Conditions, Monitoring, Rights to Audit and Physical Access.

1.4 With the submission of the final claim, the Recipient shall submit a confirmation of all confirmed and potential sources of government assistance received in support of the Project and a final payment certificate, on the form provided by the Agency for that purpose, attesting that the Costs Incurred for the entire Project have been paid to the suppliers. The term "paid" herein and in the certification means paid by monetary payment This certificate must be certified by an authorized signing officer of the Recipient.

1.5 Payments to the Recipient may be withheld by the Agency if the Recipient has any outstanding obligations hereunder, including any outstanding reports required in Schedule 4 – Reporting Requirements.

2.0 Project Costs Principles

2.1 Total Eligible Costs of the Project
The total Eligible Costs of the Project, as listed in Schedule 2- Statement of Work, will be the sum of the applicable direct costs that are or will reasonably and properly be incurred in the performance of the Project, less any applicable credits.

2.2 Incremental Costs
Eligible Costs, as identified in Schedule 2 – Statement of Work, include only incremental costs deemed essential for the implementation of the Project. Incremental costs are those that are new or additional, or costs that would not have otherwise been incurred if not for the implementation of the Project.

2.3 Reasonable Costs
Eligible Costs, as identified in Schedule 2- Statement of Work, include only those costs that are reasonable. A cost is reasonable if, in nature and amount, it does not exceed what would be incurred by an ordinary, prudent person in the conduct of competitive business. In determining the reasonableness of a particular cost, consideration must be given to:

(a) whether the cost is at fair market value;

CLAIMS AND COSTS PRINCIPLES

(b) the restraints and requirements of factors such as generally accepted sound business practices, arm's-length bargaining, federal, provincial and local laws and regulations, and agreement terms;

(c) the action that prudent business persons would take in the circumstances, considering their responsibilities to the owners of the business, their employees, customers, stakeholders, the Government and the public at large;

(d) significant deviations from the established practices of the Recipient that may unjustifiably increase Eligible Costs; and

(e) the specifications, delivery schedule and qua! ity requirements of the particular Project that may affect costs.

2.4 Travel Costs

Eligible travel costs include transportation, accommodations and meals (but not incidentals) that are directly attributable to the Project and included in Schedule 2-Statement of Work. In regards to kilometers and meals, the Agency will reimburse the Recipient using the rates set out in the National Joint Council Directive (the Directive) (www.njc-cnm.gc.ca), as may be amended from time to time. More specifically, meal costs incurred by the Recipient during eligible travel will be reimbursed by way of meal allowances at the same per diem rates as set forth in Appendix C or D of the Directive, as applicable, and kilometers travelled for eligible travel will be reimbursed based on the same kilometric rates set forth in Appendix B of the Directive. Notwithstanding the foregoing, no travel costs, including meal allowances or kilometers, will be paid or allocated for transportation, accommodations or meals that are either non-eligible or that were at no costs to the Recipient or included as part of other costs incurred (i.e. conference, inclusive-type accommodations, group transportation, etc.).

2.5 General Administrative Costs

General administrative costs include expenditures for office supplies, courier charges, utilities/telecommunications (e.g. telephone, fax, internet, electricity), and other office expenses identified as being directly attributable to the Project and included in Schedule 2 – Statement of Work. Incremental costs are only acceptable when they can be substantiated by the Recipient.

2.6 Salary and Wages Costs

Salary costs must be incremental and essential for the Project. Such wages or salaries must be for employees on the Recipient's payroll and included in Schedule 2 – Statement of Work. The acceptable payroll rate shall be the regular pay rate for the period, excluding premiums paid for overtime or shift work.

Salary and wages costs must be claimed on the same basis as they are incurred and paid to employees (i.e. weekly, bi-weekly, monthly), as supported by payroll records.

In certain cases, a salaried employee may not work exclusively on the Project. In those instances, only the proportion of their salary based on the actual time spent on the Project, as supported by timesheets or other satisfactory form oftime recording may be considered as an Eligible Cost of the Project. In order to determine the proportion of the employee salary for the time spent on the Project (a daily or hourly pay rate), the total amount of work days during a salary year can be reduced by the number of vacation days and statutory holidays to which the employee is entitled during that year, as applicable. No other deduction or mechanisms for increasing the proportion of the time spent on the Project will be allowed without the prior consent of the Agency.

When it has been expressly included in Schedule 2- Statement of Work, salary costs for the performance of an authorized and incremental role of qualified management personnel may be claimed in accordance with this Schedule.

CLAIMS AND COSTS PRINCIPLES

2.7 Payroll Burden

Payroll burden associated with eligible wages and salaries included in Schedule 2 -Statement of Work, which includes items such as group insurance, pension plans and the employer's share of federal deductions, is also eligible for personnel directly associated with the Project. The Recipient can claim a rate of fifteen per cent (15%) of salaries and wages for the payroll burden.

2.8 Non-Eligible Costs

The Agency considers certain categories of costs as non-eligible. These may include, but are not necessarily restricted to, items such as:

(a) the cost of land acquisition and any cost related to goodwill;

(b) cost allocation for the use of existing space owned by the Recipient;

(c) entertainment expenses (does not include networking receptions) and first-class airfare;

(d) dues and other membership fees;

(e) severance pay, cash-out of unused vacation, bonuses, overtime premium for salaried employees and commissions;

(f) refinancing of existing debt; and

(g) any costs for the purchase of assets that exceed fair market value of the said assets and any costs that would not necessitate an expenditure of cash by the Recipient. such as amortization and in-kind.

2.9 Credits

Credits are defined as the applicable portion of any income, rebate, allowance or other credit relating to any incurred cost received by or accruing to the Recipient. This includes the input tax credit and the reimbursement of sales taxes paid by the Recipient for goods and services. These credits must be taken into consideration in calculating Eligible Costs.

SCHEDULE 4

REPORTING REQUIREMENTS

1.0 General

1.1 Progress Report with Each Claim
The Recipient shall submit a progress report with each claim for payment, on the form provided by the Agency for that purpose, detailing the progress and results of the Project. Each progress report shall contain the following information in relation to the Project:

(a) a description of the progress made in the fulfillment of Schedule 2- Statement of Work during the reporting period;

(b) an assessment of any significant delay in completing the Project or in attaining any expected result identified in Schedule 2-Statement of Work, the reasons for such delay, and mitigation measures being taken; and

(c) the Recipient's revised projection of Project cash flows for the current fiscal year, if any significant change is expected,

1.2 Annual Financial Statements

(a) The Recipient shall provide the Agency with a copy of its annual audited financial statements within one hundred and eighty (180) days after the end of each fiscal year,

(b) The Recipient shall provide the above financial information annually until the end of the Control Period,

1.3 Internal Financial Statements
The Recipient shall provide a copy of its semiannual internally prepared financial statements, for monitoring purposes, within sixty (60) days following the respective six month period, The Agency also reserves the right to change the interval of monitoring and receipt of internally prepared financial statements, when deemed necessary by the Agency, and the Recipient shall provide them, upon written requests,

1.4 Report on Project Results
After the final payment of the Contribution by the Agency and until the end of the Control Period, the Recipient shall submit, upon request by the Agency, a report detailing the actual results of the Project as compared to the expected results in Schedule 2-Statement of Work, using the means of verification identified therein. All deviations must be explained. The report must be satisfactory to the Agency, at its sole discretion. The Agency may request independent third-party verification of this report or of the Project results, and the Recipient shall provide such independent verification upon written request and at its own expense.

2.0 Other Reports

2.1 Prior to any payment exceeding ninety percent (90%) of the total Contribution, the Recipient shall provide a statement of the total funding from all sources for the Project, including total Canadian government funding received.

2.2 The Recipient shall submit to the Agency a completed and signed copy of the Client Information Update form annually with its financial statements.

SCHEDULE 5

FACT SHEET FOR NEWS RELEASE

Program:
The Agency's REGI – Business Scale-up and Productivity (RRRF)

Project No:
217574

Name and Address of Recipient:
Metamaterial Technologies Inc.
l Research Drive, Suite 215
Dartmouth, Nova Scotia
B2Y 4M9

Recipient Contact:
Name: Dr. George Palikaras
Title: Founder & CEO
Telephone: (902) 482-5729
Fax:

Project Location:
DARTMOUTH, NOVA SCOTIA

Project Type:
REGI – Business Scale-up and Productivity

Agreement Type:
Contribution

Project Description:

Provide working capital assistance to mitigate economic hardships resulting from COVID-19

Total Project Costs:
$390,000.00

Eligible Costs:
$390,000.00

Authorized Assistance:
$390,000.00

Total Government Funding:
$390,000.00

Estimated Project Commencement Date: December 1, 2020

Estimated Project Completion Date: March 3l, 202l

Repayment Schedule Schedule 6

Client: Metamaterial Technologies Inc. **Start Date:** 2023/04/01
Account Number: 217574 **End Date:** 2026/03/01
Number of Repayments: 36
Total Repayable: $390,000.00

Payment#	Due Date	P/1/C	Amount Due	Amount Paid to Date	Amount Outstanding
					$390,000.00
				$0.00	**$390,000.00**
1	2023/04/01	Principal	$11,000.00		$379,000.00
2	2023/05/01	Principal	$11,000.00		$368,000.00
3	2023/06/01	Principal	$11,000.00		$357,000.00
4	2023/07/01	Principal	$11,000.00		$346,000.00
5	2023/08/01	Principal	$11,000.00		$335,000.00
6	2023/09/01	Principal	$11,000.00		$324,000.00
7	2023/10/01	Principal	$11,000.00		$313,000.00
8	2023/11/01	Principal	$11,000.00		$302,000.00
9	2023/12/01	Principal	$11,000.00		$291,000.00
10	2024/01/01	Principal	$11,000.00		$280,000.00
11	2024/02/01	Principal	$11,000.00		$269,000.00
12	2024/03/01	Principal	$11,000.00		$258,000.00
13	2024/04/01	Principal	$11,000.00		$247,000.00
14	2024/05/01	Principal	$11,000.00		$236,000.00
15	2024/06/01	Principal	$11,000.00		$225,000.00
16	2024/07/01	Principal	$11,000.00		$214,000.00
17	2024/08/01	Principal	$11,000.00		$203,000.00
18	2024/09/01	Principal	$11,000.00		$192,000.00
19	2024/10/01	Principal	$11,000.00		$181,000.00
20	2024/11/01	Principal	$11,000.00		$170,000.00
21	2024/12/01	Principal	$11,000.00		$159,000.00
22	2025/01/01	Principal	$11,000.00		$148,000.00
23	2025/02/01	Principal	$11.000.00		$137,000.00
24	2025/03/01	Principal	$11,000.00		$126,000.00
25	2025/04/01	Principal	$11,000.00		$115,000.00
26	2025/05/01	Principal	$11,000.00		$104,000.00
27	2025/06/01	Principal	$11,000.00		$93,000.00
28	2025/07/01	Principal	$11,000.00		$82,000.00
29	2025/08/01	Principal	$11,000.00		$71,000.00
30	2025/09/01	Principal	$11,000.00		$60,000.00
31	2025/10/01	Principal	$11,000.00		$49,000.00
32	2025/11/01	Principal	$11,000.00		$38,000.00
33	2025/12/01	Principal	$11,000.00		$27,000.00
34	2026/01/01	Principal	$11,000.00		$16,000.00
35	2026/02/01	Principal	$11,000.00		$5,000.00
36	2026/03/01	Principal	$5,000.00		$0.00

Exhibit 10.2.0

THIS AGREEMENT is dated 01 July 2021

BETWEEN:

Metamaterial Technologies Canada Inc. ("Meta Canada") with a principal place of business at 1 Research Drive, Dartmouth, Nova Scotia, Canada B2Y 4M9, a wholly owned subsidiary of Meta Materials Inc. ("Meta" or the "Parent Company")

Of the First Part

and

Georgios Palikaras (the "Executive"), currently of 17 Julies Walk, Halifax, Nova Scotia

Of the Second Part

WHEREAS:

Meta Canada is engaged in the business of research, development, and manufacture of smart materials;

The Executive has agreed to an offer of employment from Meta Canada; and

The parties hereto wish to enter into an agreement as to the terms and conditions governing their duties, responsibilities, obligations, and conduct for the duration of their employment relationship;

THEREFORE:

1. Duties and Scope of Employment

(a) **Position**: The Employer agrees to employ the Executive in the position of **CEO of Meta Materials Inc**. The Executive will report to the Board of Directors ("Supervisor") and will be working out of Meta Canada's facilities in Dartmouth, Nova Scotia and at any other such place as Meta Canada may reasonably require.

(b) **Commencement Date**: 01 July 2021.

(c) **Duties and Responsibilities**: The Executive will perform the duties and have the responsibilities and authority customarily performed and held by an employee in this position, or as otherwise may be assigned or delegated. As the role and responsibilities will vary based on business priorities, the Executive agrees to perform any other tasks that may be required, and that have been deemed reasonable for an employee of this title. The Employer may, from time to time, require the Executive to perform duties normally undertaken by others or different or additional duties; however, the Executive will not be assigned duties that they cannot reasonably perform.

The Executive's duties with Meta Canada may include performing work for or on behalf of Meta Canada's Parent Company and affiliates (collectively, the "Group"), without further compensation by them. Because of this possibility, any reference to Meta Canada includes a reference to such other Group member to the extent that it would not require them to be parties to this Agreement; but at all times the Executive's employment is solely with Meta Canada and not with such other members of the Group, who are instead intended to be third party beneficiaries to this Agreement.

From time to time, Meta Canada may modify and amend the Executive's duties or make changes to the Executive's reporting structure, in each case at Meta Canada's sole discretion.

(d) **Location of Work:** The Executive agrees to perform their work and services for Meta Canada at the principal offices of Meta Canada in Dartmouth, Nova Scotia. Occasion may arise when Meta Canada may contemplate the need for the Executive to work at any place, within or outside Canada, whether on a temporary or permanent basis, for the performance of their duties. The parties hereto will discuss any such situations and/or conditions as they arise, and any agreed upon changes will then be confirmed in writing.

(e) **Time and Attention**: The Executive will devote the focus of their full business efforts, time, attention, knowledge, and skills solely to the business and interests of Meta Canada or members of the Group should the Executive be required to perform work for such Group members from time to time.

For greater certainty, the Executive will not render services in any capacity (whether or not for gain, profit, or other monetary advantage) to any other person or entity and will not act as a sole proprietor or partner of any other person or entity, nor own more than ten percent of the stock of any other corporation without the prior written consent of Meta Canada.

The Executive will not, for the duration of the term specified within this Agreement, maintain any interests directly or indirectly, as a partner, officer, director, shareholder, advisor, employee, or act in any other capacity, for any organization that conducts business that may be perceived as similar to, or competitive with Meta Canada's business.

Notwithstanding the foregoing, the Executive may serve on corporate, civic, or charitable boards or committees, deliver lectures, fulfil speaking engagements, teach at educational institutions, or manage personal investments without such advance written consent, provided that such activities do not individually or in the aggregate interfere with the performance of the Executive's duties under this Agreement.

Nothing contained within this Agreement will be deemed to prevent, discourage, or limit the rights of the Executive to invest any of their funds or capital in any publicly-owned corporation or corporation that is regularly traded on a public exchange, nor will anything contained herein be deemed to prevent or discourage the Executive from investing, or limiting the right to invest their funds or capital in real estate.

(f) **Group Policies**: The Executive will abide by all corporate practices, policies, guidelines, and handbooks that are currently in effect, and as they may change from time to time during the course of their employment.

(g) **Protection of Corporate Interests**: Meta Canada and the Group are engaged in research, development, manufacture, distribution, marketing and sale of security and anti-counterfeiting products, with a focus on developing nanotechnology and optical thin film for use in banknote anti-counterfeiting and commercial product authentication markets (collectively, together with other aspects of the Group's business as conducted from time to time, the "Business").

As part of the Executive's duties, the Executive may identify, develop, have access to, or enhance the Group's confidential information and other intellectual property in connection with the Business, the protection of which is a key element of the Business. Accordingly, the Executive agrees at all times to be bound by the Protection of Corporate Interests Agreement (attached as Appendix B, the "POCI"), which the Executive acknowledges to be a key term of the Executive's employment.

Without in any way restricting anything else set out in this Agreement or in the POCI, the Executive will have access to and use of the Group's "Electronic Systems", being any electronic systems as well as electronic content created or stored by them. The Executive will comply with all of the Group's policies as disclosed from time to time in connection with Electronic Systems use. As set out in the POCI, all electronic content stored on Electronic Systems is the property of the Group or its licensors, and Meta Canada may give the Executive specific instructions regarding whether certain electronic content may be stored, must be deleted or must not be deleted, and the Executive will comply with those instructions.

The Executive agrees, as a condition of their employment, to enter into and to abide by the terms of the Non-competition and Non-solicitation Agreement attached hereto as Appendix C.

(h) **Best Efforts of Employee:** The Executive will maintain high professional standards and act in accordance with best practices. The Executive will, at all times, perform their job duties in a faithful, industrious manner, to the best of their abilities, and perform all required job duties pursuant to the express and implicit terms hereof, and to the reasonable satisfaction of Meta Canada.

(i) **No Conflicting Obligations**: The Executive represents and warrants to Meta Canada that they are under no obligations or commitments, whether contractual or otherwise, that are inconsistent with their obligations under this Agreement.

(j) **Hours of Work:** Core working hours will be defined by the Executive's reporting manager and the Executive will perform their duties within those times.

The Executive's duties may sometimes require the Executive to work additional hours and at various times that are outside of the Meta Canada's normal business hours. If the nature of the Executive's position is such that they are excluded from the provisions of applicable employment standards legislation relating to overtime wages, statutory holidays, or hours of work (the "Overtime Regulations") then, to the extent permitted by applicable employment standards law: (a) the compensation described in this Agreement includes all additional hours and extra days, and (b) Meta Canada will not be required to compensate the Executive, either in money or time off, for overtime or statutory holidays worked.

If the Executive's duties are not excluded from the Overtime Regulations, Meta Canada will pay overtime or statutory holiday pay strictly in accordance with its minimum obligations under those Overtime Regulations. However, the Executive must comply with Meta Canada's overtime policies that may be disclosed from time to time, including but not limited to obtaining approval in advance to work any hours of overtime (whether on regular days, weekends or statutory holidays) and reporting all overtime hours promptly after they are worked.

2. Compensation

(a) **Salary:** The Executive's annual base salary will be $553,500 CAD (the "Base Salary").

The Base Salary will be paid by way of direct deposit on a semi-monthly basis. The Executive's Base Salary will be reviewed at least annually in accordance with Meta Canada's policies. Effective as of the date of any change to the Base Salary, said change will be considered the new Base Salary for all purposes of this Agreement.

From this Base Salary, Meta Canada will deduct all requisite taxes and premiums, and remit all payable deductions as required by law, including but not limited those related to employment insurance, income tax, and Canada Pension Plan.

(b) **Vacation and Executive Benefits:** The Executive will receive 25 days of paid vacation, annually (pro-rated for partial calendar year, if appropriate). The vacation year commences on January 1st and ends on December 31st of each year.

The Executive will enrol in Meta Canada's current health benefits plan on their 1st day of employment. This plan presently provides medical, dental, AD&D, LTD and life insurance, in each case subject to the terms of such plan(s) as may be applicable thereto and as amended from time to time. Eligibility for benefits pursuant to any plan is dependent on the criteria set by the plan provider - Meta Canada does not determine nor guarantee the Executive's eligibility to participate or to receive benefits. Meta Canada may, at its sole discretion, terminate or modify its group benefits at any time – any such modification does not, in and by itself, constitute constructive dismissal or frustration of this Agreement.

The Executive will receive a wellness allowance of $250 per (pro-rated for partial calendar year, if appropriate), available to be used towards fitness or sports memberships or equipment, or nutritional consultation.

The Company reserves the right to modify, supplement and/or change the benefits plan from time to time.

(c) **Stock Options:** Upon approval by the Board of Directors of the Parent Company (the "Board") will grant the Executive share options of stock in Meta Canada's Parent Company (the "Option"), as part of Meta's Employee Stock Option Plan (the "ESOP") up to a value of $800,000 USD. The specific number of options will be determined on the grant date based on the fair market value of Met's stock on the date of grant.

The exercise price per share will be equal to the fair market value (as adjusted to reflect Material Non-public Information of the Parent Company that could affect the fair market value) on the date the Option was granted, as determined by the Board in good faith compliance with applicable guidance. The Option shall vest in accordance with the ESOP.

(d) **RSU Program:** After completion of the Probationary Period, Employee will be eligible to participate in the Restricted Share Unit Plan (the "**RSU Plan**") under the 2021 Equity Incentive Plan. The Executive will receive up to $800,000 USD in RSUs (prorated for partial years of employment). The specific number of RSUs will be determined on the grant date based on the fair market value of Meta's stock on the date of grant.

Meta Canada retains sole discretion to determine whether Restricted Share Units ("**RSUs**") will be awarded, the amount of any RSUs to be awarded and the timing of any such awards. The receipt of RSUs of any particular amount, or at all, is not guaranteed and the award of RSUs in any one year does not guarantee the award of RSUs in any future year. Meta Canada reserves the right to introduce, administer, replace, amend and/or delete the RSU Plan in its sole discretion, and the Executive agrees that such changes will not constitute a breach of the terms of employment contract, a dismissal or a constructive dismissal.

All awards of RSUs are subject to approval by the Compensation Committee of the Board and will be subject to the terms of a separate RSU award form and the 2021 Equity Incentive Plan. Participation in the RSU Plan is subject to the terms of such plan as may be applicable thereto and as amended from time to time at Meta's sole discretion and such changes will not constitute a breach of the terms of employment or constructive dismissal.

Neither the period of notice nor any payment in lieu thereof will be considered as extending the period of the Executive's employment with respect to the granting, vesting or exercise of any RSUs, except to the minimum extent required by applicable employment standards legislation, if any.

(e) **RRSP Contribution:** After completion of the Probationary Period, the Executive will be eligible to participate in Meta Canada's optional group RRSP plan, including a company matching element, in accordance with the terms and conditions of the RRSP plan, as amended from time to time (the "RRSP Plan").

If the Executive elects to contribute, the Executive will be eligible to receive a 100% matching contribution to the RRSP Plan from Meta Canada, up to a maximum annual amount of 6% of the Base Salary to a maximum of $6,000 per employee.

Meta Canada reserves the right to introduce, administer, amend and/or delete the RRSP Plan in its sole discretion, and such changes will not constitute a breach of the terms of employment or constructive dismissal.

The Executive must be Actively Employed by Meta Canada in order to participate in the RRSP Plan, and to receive any matching contributions to the RRSP Plan from Meta Canada. If the Executive resigns, or is dismissed, with or without cause, prior to an RRSP matching contribution being payable by Meta Canada, then the Executive will not be eligible to receive the matching contribution, pro-rated or otherwise, except to the minimum extent required by applicable employment standards legislation, if any.

3. Business Expenses

Meta Canada will reimburse the Executive for all prior-approved, necessary and reasonable business expenses incurred in connection with the Executive's duties, upon presentation of an itemized account and appropriate supporting documentation, in accordance with Meta Canada's generally applicable policies.

4. Data Protection

The Executive agrees to Meta Canada holding and processing, both electronically and manually, personal information about them, including sensitive personal information, reasonably necessary to Meta Canada's operations, management, security, or administration, and for the purpose of complying with applicable law, regulations, and procedures and fulfilling the terms of the employment contract.

5. Termination

(a) **Notice**: After the Probationary Period, in such event, Meta Canada will pay the Executive the Base Salary, continue any benefits and provide any other severance amounts as are required by applicable employment standards legislation through the end of the notice period and after which all obligations of Meta Canada to the Executive hereunder will cease.

The Executive agrees that such notice or payment fully satisfies any and all claims, causes of action, and/or complaints that you might have against the Employer with respect to termination notice, pay in lieu thereof or damages for wrongful dismissal. Without limiting the generality of the foregoing, the Executive agrees that upon the termination of their employment pursuant to this clause, they are not entitled to reasonable notice of termination in accordance with the common law. In no event shall the Executive be paid less than their statutory entitlements under the applicable employment standards legislation, including any entitlements to termination pay, severance pay, continued benefits or any other entitlements required by employment standards legislation.

In the event of any breach of contract by the Executive of any of the terms of this Agreement, including, without limitation, any breach of the Executive's obligations under the POCI, or in the event of any act or acts of gross misconduct by the Executive, Meta Canada may terminate their employment without notice, and with compensation to the Executive only to the date that notice of said termination is given, subject to any further entitlements arising under applicable employment standards legislation.

The Executive acknowledges that any failure on their part to abide by the terms of the said POCI may create an adverse reaction to Meta Canada's business and will constitute a breach of this Agreement and that, as a result of any breach of contract wherein confidential information is disseminated, Meta Canada is entitled to seek damages through legal means.

The Executive may terminate their employment at any time by providing Meta Canada at least four (4) for manager weeks' notice. Meta Canada may waive or abridge any such resignation notice in its sole discretion, by providing pay in lieu of notice as required by applicable employment standards legislation.

(b) **Business Equipment and Property**: Upon termination of employment, whatever the cause, the Executive will return to Meta Canada all Meta Canada property (including, but not limited to Meta Canada identification and building access cards, keys, portable office equipment, files, lists, etc.).

6. Pre-Employment Conditions

Employment is contingent upon:

(a) **Right to Work**: For purposes of federal immigration law, the Executive will be required to provide Meta Canada with documentary evidence of their identity and eligibility for employment in Canada - such documentation to be provided to Meta Canada within three (3) business days of the Commencement Date.

7. Miscellaneous Provisions

(a) **Whole Agreement:** In construing this Agreement, words in the singular shall include the plural and vice versa; words importing the neuter shall include the masculine and the feminine and vice versa; and words importing persons or individuals shall include corporations and vice versa. Words such as "hereunder", "hereto, "hereof", "herein", and other words commencing with "here" shall, unless the context clearly indicates to the contrary, refer to the whole of this Agreement and not to any particular section or part thereof.

No other agreements, representations or understandings (whether oral or written and whether express or implied) that are not expressly set forth in this Agreement have been made or entered into by either party with respect to the subject matter hereof. This Agreement contains the entire understanding of the parties with respect to the subject matter hereof – there are no collective agreements relevant to this employment relationship.

Each party agrees that they have entered into this Agreement in and of their own volition, without duress, that they have been afforded an opportunity to consult with legal counsel, and that they are of sound mind and body.

(b) **Notice**: Notices and all other communications contemplated by this Agreement will be in writing and will be deemed to have been duly given when personally delivered or when mailed by Canadian registered or certified mail, return receipt requested and postage prepaid. In the case of the Executive, mailed notices will be addressed to them at the residential address that they most recently communicated to Meta Canada in writing. In the case of Meta Canada, mailed notices will be addressed to its corporate headquarters, and all notices will be directed to the attention of Human Resources.

(c) **Modifications and Waivers**: No provision of this Agreement may be modified, waived or discharged, nor will any additional obligation assumed by either the Executive or Meta Canada in connection with this Agreement be binding unless supported by written documents signed by each party or their authorized representative. No waiver by either party of any breach of, or of compliance with, any condition or provision of this Agreement by the other party will be considered a waiver of any other condition or provision or of the same condition or provision at another time.

(d) **Effect of Partial Invalidity:** The invalidity of any portion of this Agreement will not affect the validity of any other provision. In the event that any provision of this Agreement is held to be invalid, Meta Canada and the Executive mutually agree that all remaining provisions will be deemed to be held in full force and effect as if they had been executed by both parties subsequent to the deletion of the invalid provision.

(e) **Choice of Law and Severability**: This Agreement will be interpreted in accordance with the laws of the province of Nova Scotia, Canada, without giving effect to provisions governing the choice of law. If any provision of this Agreement becomes or is deemed invalid, illegal or unenforceable in any applicable jurisdiction by reason of the scope, extent or duration of its coverage, then such provision will be deemed amended to the minimum extent necessary to conform to applicable law so as to be valid and enforceable; or, if such provision cannot be so amended without materially altering the intention of the parties, then such provision will be stricken and the remainder of this Agreement will continue in full force and effect. If any provision of this Agreement is rendered illegal by any present or future statute, law, ordinance or regulation (collectively, the "Law") then that provision will be curtailed or limited only to the minimum extent necessary to bring the provision into compliance with the Law. All the other terms and provisions of this Agreement will continue in full force and effect without impairment or limitation.

(f) **Assignment**: This Agreement and all of the Executive's rights and obligations hereunder are personal to them and may not be transferred or assigned by the Executive at any time. The Employer may assign its rights under this Agreement to any entity that assumes Meta Canada's obligations hereunder in connection with any sale or transfer of all or a substantial portion of Meta Canada's assets to such entity or to another member of the Group in connection with a reorganization.

(g) **Counterparts**: This Agreement may be executed in two or more counterparts, each of which is deemed an original, but all of which together will constitute one and the same instrument.

IN WITNESS WHEREOF, the parties hereto state that they have read and accept all the terms and conditions stipulated in this Agreement, have executed the same as of the date first above written.

Metamaterial Technologies Canada Inc.

_____

Georgios Palikaras

Per: _____

Ram Ramkumar

Board of Directors

Exhibit 10.1.1

LSE – 20200827 – META FINAL

LEASE

BETWEEN:

RANK INCORPORATED
"Landlord"

-and-

METAMATERIAL INC.
"Tenant"

LOCATION
60 Highfield Park Drive, Suite 102, Dartmouth, Nova Scotia

Commencement Date:
January 1, 2021

TABLE OF CONTENTS

LEASE

THIS LEASE dated August 28, 2020:

BETWEEN:

RANK INCORPORATED
("Landlord")

OF THE FIRST PART

AND:

METAMATERIAL INC.
("Tenant")

OF THE SECOND PART

IN CONSIDERATION of the mutual covenants herein contained, the parties hereto agree as follows:

In addition to any other terms defined elsewhere herein, the following are certain basic terms and provisions which are part of, may be referred to and are more fully specified in this Lease. If there is a discrepancy between the terms and provisions of this Article 1.1 and any other Article of the Lease, the provisions of this Article 1.1 of the Lease shall prevail.

ARTICLE 1. SUMMARY OF BASIC PROVISIONS, DEFINITIONS AND SCHEDULES

1.1 BASIC PROVISIONS

(a) **Address of Landlord:** c/o Page Property Management
7071 Bayers Road, Suite 4007
Halifax, Nova Scotia, B3L 2C2

(b) **Address of Tenant:** 60 Highfield Park Drive, Suite 102, Dartmouth, Nova Scotia

(c) **Tenant's business or Trade Name:** N/A

(d) **Building:**

60 Highfield Park Drive, Dartmouth, Nova Scotia, and situate upon the lands described in **Schedule "A"** hereof.

"Normal Building Hours" for the Building means Monday to Friday 8:00 AM to 6:00 PM, saving and excepting statutory holidays.

(e) **Premises:**

Approximately **Fifty-Three Thousand (53,000)** square feet of Rentable Area, identified as **Suite #102** (the "Premises") in the Building and indicated as per **Schedule "B"** attached hereto.

In accordance with Article 2.8, Landlord may have its surveyor or other professional prepare a final measurement of the area of the Premises and/or the Building in accordance with the then current standard for floor measurement as established by the Building Owners and Managers Association (BOMA) and used by Landlord in respect of premises located in the Building (the "**BOMA Standard**"), and, in such case, Basic Rent and Additional Rent will be adjusted accordingly, if required.

(f) **Term:**

The term of the Lease shall be for **ten (10) years and eight (8) months**, commencing on **January 1, 2021** (the "**Commencement Date**") and shall expire on **August 31, 2031** (the "**Term**") unless terminated sooner in accordance with the terms and conditions hereof.

(g) **Basic Rent:**

Subject to any provisions herein with respect to free rent, and subject always to adjustment as provided for in Article 2.8, the Tenant shall pay to the Landlord, as annual Basic Rent, plus all applicable taxes, and without any abatement, set-off or deduction whatsoever, as follows:

Year 1:	$6.50 per square foot calculated on 25,000 square feet of Rentable Area;
Year 2:	$6.50 per square foot calculated on 30,000 square feet of Rentable Area;
Year 3:	$6.50 per square foot calculated on 40,000 square feet of Rentable Area;
Year 4:	$6.50 per square foot calculated on 50,000 square feet of Rentable Area;
Year 5:	$6.50 per square foot calculated on the full Rentable Area of the Premises;
Years 6-7:	$8.00 per square foot calculated on the full Rentable Area of the Premises;
Years 8-end of Term:	$10.00 per square foot calculated on the full Rentable Area of the Premises;

All payments of Basic Rent shall be payable in advance, in equal monthly instalments on the first day of each and every month of the Term.

(h) **Additional Rent:**

The Tenant shall pay to the Landlord its Proportionate Share of Operating Costs and Property Taxes (together with an Administrative Charge on each such amount) on the Commencement Date. On or before the Commencement Date and the commencement of any fiscal period in which the Term falls, the Landlord shall estimate Operating Costs and Property Taxes and the Tenant's Proportionate Share thereof. The Tenant shall pay to the Landlord in equal monthly instalments in advance on the first day of each month a sum on account of its Proportionate Share of Operating Costs and Property Taxes based on the Landlord's estimates. For the current fiscal year, the estimated charges for various components of Additional Rent, including the Administrative Charge, are as follows:

(a)	Operating Costs:	$2.07 per square foot of rentable area plus HST
(b)	Property Taxes:	$2.63 per square foot of rentable area plus HST
(c)	**Total:**	**$4.70 per square foot of rentable area plus HST**

The Tenant acknowledges that such estimated charges are based upon information of which the Landlord is currently aware and that the actual charges may vary from the estimated charges as the Landlord becomes aware of more accurate information.

The Tenant will be responsible for the cost of interior cleaning and maintenance, and all utilities respecting the Premises, whether or not separately metered, as well as all other Additional Rent, pursuant to the Lease. The Tenant will make arrangements to have all separately metered utilities accounts for the Premises transferred to its name no later than the Possession Date.

Notwithstanding that Basic Rent is calculated and payable on a graduating level of Rentable Area, subject to any periods of free rent, throughout the Term the Tenant's Proportionate Share of Operating Costs and Property Taxes shall be calculated and payable on the entire Rentable Area of the Premises.

All items comprised in Additional Rent are subject to the Administrative Charge and to all applicable HST.

(i) **Possession Date:**

See paragraph A of Schedule "D". For clarity, the commencement of the Tenant's occupancy of the Premises will be the Possession Date unless the parties mutually designate a different date in writing.

(j) **Commencement Date:** **January 1, 2021**

(k) **Use:**

The Premises shall be used solely for the purpose of general offices, R&D and light manufacturing and other related uses for a Nanotechnology/Advanced Manufacturing company, or for such other use first approved in writing by the Landlord in its discretion, acting reasonably (the **"Permitted Use"**).

Tenant is solely responsible to satisfy itself that the Permitted Use is in compliance with all Applicable Laws, and that during the Term, Tenant will at all times fully comply with all such Applicable Laws, governing the conduct of its business on the Premises and in the Building.

(l) **Security Deposit:** **NOT APPLICABLE**

(m) **Property Manager:**

The Property Manager for the Building and the Premises will be Page Property Management unless designated to the contrary in writing by the Landlord (the "**Property Manager**").

(n) **Special Provisions:**

SPECIAL PROVISIONS APPLICABLE TO THIS LEASE ARE CONTAINED ON SCHEDULE "E" HERETO

1.2 DEFINITIONS

The terms defined in this Article 1.2 shall, for all purposes hereof and any other instruments supplemental hereto, have the meanings herein specified:

a) **"Administrative Charge"** means **fifteen percent (15%)** of the amount to which the Administrative Charge applies.

b) **"Additional Rent"** means the aggregate of all amounts other than Basic Rent that are payable by the Tenant under this Lease or are the responsibility of the Tenant under this Lease, including, as applicable but without limitation, (i) the Tenant's Proportionate Share of Operating Costs, (ii) the Tenant's Proportionate Share of Property Taxes, and (iii) the cost of all Additional Services.

c) **"Additional Services"** means the aggregate of (i) services that are not the responsibility of the Landlord under this Lease that the Tenant has requested the Landlord to perform, (ii) services performed by the Landlord on behalf of the Tenant of any of the Tenant's obligations set out in this Lease which the Tenant fails to perform (including, without limitations, any or all of the obligations of the Tenant pursuant to Article 5.1 hereof), provided that nothing herein shall obligate the Landlord to perform any such obligations, and (iii) Utilities Charges.

d) **"Affiliate"** an affiliate within the meaning of the Canada Business Corporations Act, R.S.C. 1985, c. C-44 as it exists on the date hereof.

e) **"Applicable Laws"** statutes, regulations, orders, rules, notices, policies, guidelines, codes, certificates of authorization, permits or directives and other requirements of a governmental or quasi-governmental authority with jurisdiction over the Premises or the Building, including, without limiting the generality of the foregoing, all federal, provincial, municipal or other hazardous materials or environmental legislation and all regulations, guidelines, procedures and requirements pursuant thereto or required thereby.

d) **"Basic Rent"** as of any particular time shall mean the net basic annual Rent payable in accordance with the terms hereof.

e) **"Building"** means the buildings, structures, and improvements from time to time during the Term erected on the Lands together with all fixtures, sprinklers, elevators, escalators, heating, ventilating, air-conditioning and mechanical and electrical equipment and machinery and water, gas, sewage, telephone and other communication facilities and electrical power services and Utilities comprised therein, belonging thereto, connected therewith or used in the operation thereof, and now or hereafter constructed, erected and installed therein and thereon, and all alterations, additions, and replacements thereto, and includes the Common Areas but excludes all Leasehold Improvements made, constructed, erected or installed therein by or on behalf of any tenant of premises therein. The municipal address of the Building is as set out in Subarticle l.l(d) hereof.

f) **"Commencement Date"** shall have the meaning given to it in Subarticle l.l(j) hereof and further defined in Article 2.2, herein.

g) **"Common Area"** shall mean all common areas and facilities, from time to time furnished or designated by Landlord as such, in connection with the Building, for the use, in common, in such manner as Landlord may permit, acting reasonably, of the occupants of premises in the Building and all others entitled thereto and now or hereafter developed by Landlord, including, without limiting the generality of the foregoing, parking lots and areas, sidewalks, pedestrian walks, driveways, loading areas, garden and grassed areas, landscaped areas and common pylon signs.

h) **"Premises"** means those premises in the Building which are described and identified in Subarticle l.l(e) hereof and as more specifically shown in **Schedule "B"** hereto.

i) **"Eligible Corporation"** shall mean a corporation which controls, is controlled by or is under common control with Tenant, control meaning the direct or indirect beneficial ownership of more than **fifty percent (50%)** of the voting shares of a corporation which may be voted at any meeting held for the purpose of the election of directors of that corporation.

j) **"Force Majeure"** means a strike, labour trouble, inability to get materials or services, power failure, restrictive governmental laws or regulations, riots, insurrection, sabotage, rebellion, war, act of God or any other similar reason, that is not the fault of the party asserting it. Force Majeure does not include inability to obtain funds.

k) **"Hazardous Material"** means any substance or material whose discharge, release, use, storage, handling or disposal is regulated, prohibited or controlled, either generally or specifically, by any governmental authority or quasi-governmental authority pursuant to or under any Applicable Laws, including, but not limited to, any contaminant, pollutant, deleterious substance, or material which may impair the environment, petroleum and other hydrocarbons and their derivatives and by-products, dangerous substances or goods, asbestos, gaseous, solid and liquid waste, special waste, toxic substance, hazardous or toxic chemical, hazardous waste, hazardous material or hazardous substance, either in fact or as defined in or pursuant to any Applicable Laws.

l) **"Improvements"** shall mean the Building and any other buildings, structures and/or fixed improvements existing on or under the Land at the Commencement Date or thereafter existing on or under the Land, together with all alterations, additions and thereto.

m) **"Land"** or **"Lands"** shall mean the land legally described on **Schedule "A"** attached hereto.

n) **"Landlord"** shall have the meaning given to it in Subarticle l.l(a) hereof and as further defined in Article 15.4 herein.

o) **"Landlord's Advisor"** shall mean the architect, engineer, surveyor, accountant, solicitor or any other person or representative qualified in his or her field, selected or appointed by Landlord, from time to time, for the purposes of making determinations under this Lease.

p) **"Landlord's Fiscal Year"** means the fiscal year of the Landlord from time to time;

q) **"Landlord's Work"** shall have the meaning given to it in Article 2.5 and **Schedule "C"** attached hereto.

r) **"Lease"** or **"the Lease"** or **"this Lease"** shall mean this instrument together with all schedules annexed or attached hereto as originally executed or delivered or if amended or supplemented or renewed, as so amended or supplemented or renewed.

s) **"Leasehold Improvements"** means all items generally considered to be leasehold improvements, including, without limitation, all fixtures, equipment, improvements, installations, alterations and additions from time to time made, erected or installed by or on behalf of Tenant, or any previous occupant of the Premises, including, without limitation, any stairways for the exclusive use of Tenant, all fixed partitions, light fixtures, plumbing fixtures, however affixed and whether or not movable, and all wall-to-wall carpeting other than carpeting laid over finished floors and affixed so as to be readily removable without damage, and all water, electrical, gas and sewage facilities, all heating, ventilating and air-conditioning equipment and facilities exclusively serving the Premises, all telephone and other communication wiring and cabling leading from the base building distribution panel to facilities located in the Premises, all cabinets, cupboards, shelving and all other items which cannot be removed without damage to the Premises; but excluding Trade Fixtures, furniture, unattached or free-standing partitions and equipment not in the nature of fixtures.

t) **"Lease Year"** means, in the case of the first Lease Year, the fiscal period beginning on the Commencement Date and ending on the last day of the Landlord's Fiscal Year in the year in which the Commencement Date occurs, and; (ii) in the case of each subsequent Lease Year, consecutive 12-month calendar years corresponding to the Landlord's Fiscal Year, except for the final Lease Year which shall end upon expiry of the Term

u) **"Mortgage"** shall mean any mortgage, charge or security instrument (including a deed of trust and mortgage securing bonds) and all instruments supplemental thereto which may now or hereafter affect the Building.

v) **"Mortgagee"** shall mean mortgagee, chargee or secured party, as the case may be, named in a Mortgage.

w) **"Net Lease"** shall have the general connotation of imposing upon Tenant the absolute obligation of paying the Additional Rent and the absolute obligation of paying for each and every other charge, cost and expense whatsoever rendered by Landlord to Tenant in connection with the Premises and Tenant's business, except where expressly excluded or modified.

x) **"Operating Costs"** shall mean, without duplication, the aggregate of all costs, expenses, fees, rentals and disbursements of every kind and nature, direct or indirect, incurred, accrued or attributed by or on behalf of Landlord to discharge its obligations under this lease with respect to the operation, supervision, maintenance, repair, replacement, administration and management of the Building and Common Areas, and without limitation, shall include the cost of:

(i) all insurance maintained by Landlord in respect of the Building and the cost of any deductible amounts paid by Landlord in respect of any insured risk or claim;

(ii) cleaning, snow removal, gardening, landscaping, garbage collection and disposal;

(iii) all remuneration including salaries, wages and fringe benefits of all personnel, including supervisory personnel, employed directly by Landlord or any agent or third party property manager engaged by Landlord to manage the Building (or indirectly and therefore on a pro-rata basis, as determined by Landlord, acting reasonably) in the operation, maintenance, repair, replacement, administration or management of the Building;

(iv) management fees paid to any agent engaged by Landlord to manage the Building;

(v) reasonable fees and expenses incurred for legal, accounting and other consulting or professional services relating to the Building;

(vi) policing, supervision and providing security and traffic control for the Building;

(vii) such share of the capital cost of the heating, ventilating and air-conditioning equipment serving the Premises, as is determined by Landlord, acting reasonably, having regard, amongst other things, to the expected normal operating life of such equipment, together with interest thereon;

(viii) communication, safety, sound, visual, lighting and other systems;

(ix) the costs of all utilities supplied to the Building including hot and cold water, natural gas, electricity, sanitary sewer facilities and any other utilities or forms of energy;

(x) office expenses including telephone, stationery and supplies and the fair market rental value as determined by Landlord from time to time, of space in the Building which would otherwise be rentable but which Landlord uses in leasing, operating, managing or maintaining the Building and finishing and fixtures for such space;

(xi) amounts paid to independent contractors for any services in connection with the Building and amounts payable for the rental of any equipment, installations or signs;

(xii) all expenditures incurred by or on behalf of Landlord in connection with the operation, maintenance, repair and replacements to the Building, its appurtenances, systems, equipment and facilities, including redecoration, structural maintenance, repairs and replacements and expenditures undertaken primarily to maintain the Building as an up to date Building having regard to the size, age, location and character of the Building, conserve energy, or reduce Operating Costs unless Landlord elects to depreciate or amortize such expenditures and thus includes them in the costs referred to in the next paragraph;

(xiii) depreciation on or amortization of all expenditures for any of the matters set out in this definition of Operating Costs or for which Landlord was unable to recover from a specific tenant, over Landlord's reasonable estimate of the economic life thereof, unless charged fully in the Lease Year in which such repairs and replacements were made;

(xiv) depreciation or amortization of the costs referred to in Section 1.2(xiii) above as determined in accordance with sound accounting principles or practices as applied by the Landlord, if such costs have not been charged fully in the Lease Year in which they are incurred, and interest on the undepreciated or unamortized balance of such costs, calculated monthly, at an annual rate of interest determined by the Landlord acting reasonably having regard to prevailing commercial interest rates in the Lease Year in which such costs were initially incurred and the Landlord's reasonable estimate of the economic life thereof;

(xv) Property Taxes to the extent not charged to Tenant pursuant to Article 4.2 and to other tenants of the Building pursuant to lease provisions similar to such Article;

(xvi) all business taxes and other taxes, if any, and from time to time payable in respect of the Common Areas;

(xvii) all costs:

(A) incurred by Landlord in consequence of its interest in the Building such as maintaining, cleaning and clearing of ice and snow from municipal sidewalks, adjacent property and the like;

(B) paid or incurred as determined by Landlord acting reasonably and *bona fide* but in Landlord's sole discretion and whose determination shall be final and binding, in respect of all shared structures, improvements, facilities, equipment, amenities, services (including retail and commercial) and common areas, including, without limitation, loading areas and docks, parking ramps, driveways and exterior areas which are or will be shared by users of the Building and the users of any other property, and all costs to the extent Landlord is required to contribute to the same in respect of the Building, or Landlord's ownership of them, whether or not such costs are incurred directly in respect of the Building; and

(C) an Administrative Charge in respect of all costs and expenses incurred in operating, supervising, administering, maintaining and repairing the Building or the Common Areas,

but shall exclude:

(D) the costs of repair or replacement resulting from inferior or deficient workmanship, materials or equipment with respect to the Building to the extent that such costs are: (i) recovered by Landlord pursuant to any warranty; (ii) reimbursed by insurers; or (iii) recovered by Landlord exercising the contractor's warranty;

(E) all taxes on corporate income, profits or excess profits, goods and services taxes paid by Landlord on taxable supplies and services assessed against Landlord;

and there shall be deducted from Operating Costs:

(F) net proceeds received by Landlord from its insurance policies to the extent that such proceeds relate to costs and expenses included in the Operating Costs; and

(G) net recoveries by Landlord from other tenants (other than recoveries from such tenants under clauses in their respective leases and recoveries on account of items not otherwise included in Operating Costs) which reduce the expenses incurred by Landlord in operating and maintaining the Building.

y) **"Possession Date"** shall have the meaning given to it in Subarticle l.l(i) hereof.

z) **"Project" or "Property'** shall mean the Lands, the Building and all other buildings, structures and appurtenances located upon the Lands.

aa) **"Property Taxes"** means all real estate, municipal or property taxes (including local improvement rates), levies, rates, duties, and assessments whatsoever imposed upon or in respect of any real property from time to time by any Authority, which may be levied or assessed against the Lands and Building, or Landlord, or the owners of the Lands and Building, and any and all taxes which may, in the future, be levied on the Lands, the Building or Landlord due to its ownership thereof in lieu of Property Taxes or in addition thereto and the cost to Landlord or the owners of appealing such levies, rates, duties and assessments. Should the Lands and Building not be fully occupied or assessed as a commercial property for determination of Property Taxes in any calendar year, then Landlord shall adjust the Property Taxes to an amount that would have been determined if the Building and Lands were fully occupied and assessed as a commercial property.

bb) **"Rent"** or **"Rentals"** shall mean the aggregate of all Basic Rent, Additional Rent, Value Added Taxes and any other rent, charges, costs, expenses or payments payable under this Lease, whether in the nature of rent or not.

cc) **"Rentable Area"** means, in respect of any rentable premises in the Building, the area of such premises expressed in square feet and computed by the methodology set out in the BOMA Standard.

dd) **"Structural Repairs"** shall mean repairs to, or arising from structural defects to, the structural elements of the bearing structure, outside structural perimeter walls (excluding glass, windows, partitions and doors) supporting beams, footings, joists, columns and foundations of the Premises.

ee) **"Taxes"** shall include Property Taxes, rates, duties, levies and assessments whatsoever, whether municipal, provincial, federal or otherwise, levied, imposed or assessed against real property, buildings, structures and improvements, from time to time levied, or against Landlord as a result of its ownership thereof, imposed or assessed in lieu thereof, including those levied, imposed or assessed for education, schools and local improvements and including all costs and expenses (including legal and other professional fees and interest and penalties on deferred payments) incurred by Landlord acting reasonably and in good faith in contesting, resisting or appealing any taxes, rates, duties, levies or assessments, but excluding taxes and license fees in respect of any business carried on by tenants and occupants of the Building and any income or profit taxes upon the income of Landlord, or corporate taxes upon the assets of Landlord, to the extent such taxes are not levied in lieu of taxes, rates, duties, levies and assessments and shall also include any and all taxes which may in the future be levied in lieu of taxes as hereinbefore defined; and in addition all parking lot taxes, if any, from time to time payable by Landlord in respect of the Common Area or any portion or facility thereof from time to time, less all income derived from the parking lot.

ff) **"Tenant"** includes the tenant named in this Lease and its respective heirs, executors, administrators, successors and assigns, as the case may be and as further defined in Article 15.6, herein.

gg) **"Tenant's Proportionate Share"** shall be determined by dividing the Property Taxes and the Operating Costs by the Total Rentable Area of the Building and multiplying the quotient by the Rentable Area of the Premises. If Landlord determines that any component of Operating Costs is attributable to only part of the Building, then those costs may be divided only by the Rentable Area to which those costs are so determined to be attributable. Should Landlord determine that any component of Operating Costs is not attributable to the Premises, Tenant shall remain responsible for payment of its Proportionate Share of that component of Operating Costs, as it relates to Common Areas.

hh) **''Tenant's Trade Fixtures"** shall mean the trade fixtures, furniture, machinery and equipment not in the nature of fixtures, installed or placed upon the Premises by Tenant. For greater certainty, **''Tenant's Trade Fixtures"** shall not include any:

(i) floor covering affixed to the floor;

(ii) drapes;

(iii) light fixtures;

(iv) washroom fixtures; or

(v) heating, ventilating or air conditioning systems, facilities and/or equipment, whether or not any of the foregoing are supplied by Landlord.

Each of the items described in paragraphs (i), (ii), (iii), (iv) and (v) above shall be deemed to be a part of Leasehold Improvements.

ii) **"Tenant's Work"** shall have the meaning given to it in Subarticle 2.6(a) herein and **Schedule "C"** attached hereto.

jj) **"Term"** shall have the meaning given to it in Subarticle 1.1(f) hereof and as further defined in Article 2.2 herein.

kk) **"Utilities"** means the cost of water, fuel, power and any other utilities used in the Building allocated to the Premises by Landlord and Landlord's costs of determining the Utilities Charge including professional, engineering and consulting fees.

ll) **"Utilities Charges"** means the total, without duplication, of: (a) the Utilities, (b) Landlord's costs of procuring any Utility Supply contract, including but not limited to, the amount of any security deposits, interest thereon, cost of providing letters of credit and any other similar costs; and (c) Landlord's costs of determining the Utilities Charge including professional, engineering and consulting fees, together with the Administrative Charge.

mm) **"Value Added Taxes"** shall have the meaning given to it in Article 3.2.

1.3 SCHEDULES

The following are the Schedules attached to and incorporated into this Lease by reference and deemed to be a part hereof:

Schedule	**Details of Schedule**
"A"	Description of Lands
"B"	Site Plan – Building and Premises
"C"	Tenant's and Landlord's Work
"D"	Rules and Regulations

ARTICLE 2. PREMISES, TERM, ADJUSTMENT OF COMMENCEMENT DATE

2.1 PREMISES

In consideration of the Rent and the covenants and agreements herein reserved and contained on the part of Tenant to be paid, observed and performed, Landlord, subject to the encumbrances, liens and interests as are notified by memorandum on the certificate of title to the Lands, does demise and lease unto Tenant the Premises for use and occupation by Tenant.

2.2 TERM

This Lease shall be for the Term set out in Subarticle 1.1(f) hereof unless earlier terminated as provided in this Lease.

2.3 NOTICE OF POSSESSION DATE – INTENTIONALLY DELETED

2.4 ADJUSTMENT OF COMMENCEMENT DATE

If the Commencement Date is other than the first day of a month, then the Commencement Date shall be the first day of the month next succeeding the earlier of such dates. In that event, however, Tenant shall pay Rent for the fractional month, on a per diem basis, calculated on the basis of **three hundred sixty five (365)** days per calendar year, until the Commencement Date and all appropriate provisions hereof shall be applicable during such period and, thereafter, the Basic Rent shall be paid in equal monthly instalments on the first day of each and every month, in advance. Neither the period given to Tenant to deliver to Landlord the Tenant's Plans and Specifications nor any delays to such period shall alter or extend the Fixturing Period or delay the Commencement Date as described in this Lease, nor shall any other provision hereof or any schedule attached to this Lease serve to alter or extend the Fixturing Period or delay the Commencement Date hereof.

2.5 LANDLORD'S WORK

The term **"Landlord's Work",** as used herein, shall mean those items relating to the construction of improvements to the Premises as are specified in the schedule entitled "Tenant's and Landlord's Work" attached hereto as **Schedule "C"**. Landlord shall complete Landlord's Work in a good and workmanlike manner with all due diligence and in full compliance with all Applicable Laws and with the requirements of all applicable policies of insurance in force with respect to the Premises.

2.6 TENANT'S WORK

a) The term **"Tenant's Work"**, as used herein, shall mean those items relating to the construction of Leasehold Improvements as are specified in the schedule entitled "Landlord's Work and Tenant's Work" attached hereto as **Schedule "C"** and all other items of work as are necessary to properly complete the Premises for use and occupancy by Tenant and the conduct of Tenant's business therein, thereon or therefrom, save and except for Landlord's Work, all of which construction and items of work shall be subject to the prior written approval of Landlord, such approval not to be unreasonably withheld. Landlord shall have **ten (10)** days from the date of receipt to approve, it being understood and agreed that any delays necessitated due to late delivery from Tenant to Landlord shall not result in a corresponding extension of any fixturing periods, any early possession periods, and periods of free or reduced rent, or the Commencement Date.

b) Tenant shall complete Tenant's Work in a good and workmanlike manner. Landlord shall, at all times, have access for the purpose of inspecting Tenant's Work.

c) From and including the Possession Date, Tenant shall actively commence and thereafter diligently conduct and complete Tenant's Work. Tenant shall use its best efforts to complete all Tenant's Work on or before the Commencement Date and, by such date, have all work at the Premises fully completed (including completion of the leasehold Improvements), and have the Premises fixtured and open for business. Any defects or deficiencies in Tenant's Work shall be immediately rectified whenever they occur and, in any event, when Tenant is required to do so by landlord, acting reasonably.

d) In connection with the making, constructing, erection, installation or alteration of the Premises and the leasehold Improvements and Tenant's Trade Fixtures and all other work or installations made by, for or on behalf of, at the direction or with the approval of Tenant in respect thereof, Tenant shall use its best efforts to comply with all the provisions of the applicable provincial legislation in respect of mechanics'/builders' liens and workmen's/workers' compensation and other statutes from time to time applicable thereto (including any provision requiring or enabling the retention of portions of any sums payable by way of holdbacks) and, except as to any such holdback, shall promptly pay all accounts relating thereto. Tenant will use its best efforts not to create or cause to be created or permit to be created any lien, mortgage, conditional sale agreement or other encumbrance in respect of the lands, the Building, the Premises or the leasehold Improvements or permit any such lien, mortgage, conditional sale agreement or other encumbrance to attach to the Premises, the Building or any part thereof. If and whenever any mechanics'/builders' or other lien for work, labour, services or materials supplied to or for Tenant or for the cost of which Tenant may be in any way liable or claims therefor shall arise or be filed or any such mortgage, conditional sale agreement or other encumbrance shall attach, Tenant shall, within **twenty (20)** days after receipt of notice thereof, procure the discharge thereof, including any certificate of action registered in respect of any lien, by payment or giving security or in such other manner as may be required or permitted by law, and, failing which, landlord may, in addition to all other remedies hereunder, avail itself of its remedy under Subarticle 13.1(a) and may make any payments required, into court only, to procure the discharge of any such liens or encumbrances, and landlord shall be reimbursed by Tenant as provided for in Subarticle 13.2(a), and its right to reimbursement shall not be affected or impaired if Tenant shall then or subsequently establish or claim that any lien or encumbrance so discharged was without merit or excessive or subject to any abatement, set-off or defence.

2.7 LANDLORD'S OBLIGATIONS REGARDING THE PREMISES

Tenant agrees that there is no promise, representation or undertaking by or binding upon landlord with respect to any construction, alterations, remodelling or decorating of the Premises, or installation of equipment or fixtures or leasehold Improvements in the Premises, other than landlord's Work.

2.8 ADJUSTMENT OF RENTABLE AREA

Landlord shall cause the Rentable Area of the Premises to be measured by landlord's Advisor and Rent that is calculated on the Rentable Area shall be adjusted accordingly, subject to Article 15.12 herein.

ARTICLE 3. RENT, HST, ADVANCE RENT

3.1 RENT

a) Tenant shall pay Basic Rent in the amount set out in Subarticle 1.1(g), which shall be payable without demand in advance in equal consecutive monthly instalments on the first of each month commencing on the Commencement Date. Rent is subject to adjustment upon certification of the Rentable Area of the Premises.

b) If the Rentable Area or any portion of it is revised in accordance with Article 2.8, the Basic Rent for each Lease Year will be recalculated automatically by multiplying the revised Rentable Area or portion of it by the applicable amounts per square foot designated in Subarticle 1.1(e) for the respective Lease Year, and the amount of the equal monthly instalments for such Lease Year will be deemed to have been amended accordingly. Upon any such revision of Rentable Area, Landlord will promptly calculate the amount of the difference between the original Basic Rent and the revised Basic Rent for the period prior to the date of such revision. If such amount represents an increase in Basic Rent, Tenant will immediately within **twenty-one (21)** days after being notified in writing by Landlord pay the amount to Landlord, or if such amount represents a decrease in Basic Rent, Landlord will within **twenty-one (21)** days after the calculation by Landlord repay the amount to Tenant failing which Tenant will have the right to offset such amount as against Rent and Additional Rent hereunder. A comparable adjustment in respect of any earlier payment of Tenant's Proportionate Share of Additional Rent will also be made.

c) If for any reason it will become necessary to calculate Rent for irregular periods of less than one year or one month, an appropriate pro rata adjustment will be made on a daily basis in order to compute the rent for such irregular period.

d) Except as otherwise provided herein, all payments by Tenant to Landlord under this lease will be:

(i) paid to Landlord by Tenant in lawful currency of Canada;

(ii) made when due hereunder, without prior demand therefor, at the address of Landlord set out on page one or such other place as Landlord may designate from time to time to Tenant;

(iii) applied towards amounts then outstanding hereunder, in such manner as Landlord directs.

3.2 HST AND OTHER VALUE ADDED TAXES

In addition to payment of Basic Rent and Additional Rent, Tenant shall pay to Landlord an amount equal to any and all goods and services taxes, sales taxes, value added taxes or any other similar taxes imposed by any competent authority with respect to the Basic Rent and/or the Additional Rent or any other moneys payable by Tenant to Landlord under this Lease, whether characterized as a harmonized sales tax, a goods and services tax, sales tax, capital tax, value added tax or otherwise (the "**Value Added Taxes**"). The amount of any Value Added Taxes so payable by Tenant shall be calculated by Landlord in accordance with all applicable legislation and shall be paid to Landlord by Tenant at the same time as the amounts to which such Value Added Taxes apply are payable to Landlord under the terms hereof or upon demand at such other time(s) as Landlord may from time to time determine, acting reasonably. Despite any other Article or provision hereof, the amount payable by Tenant under this Article 3.2 shall be deemed not to be Rent, but Landlord shall have all of the same remedies for and rights of recovery of such amounts as it has for recovery of Rent under this Lease.

ARTICLE 4. PAYMENT OF RENT, ADDITIONAL RENT, UTILITIES, JANITORIAL

4.1 PAYMENT OF RENT

Tenant shall pay Rent as provided in this Lease, without any prior demand therefor, to Landlord, at such place as may be designated by Landlord from time to time, or to any assignee of Landlord, upon notice in writing, to the place stipulated in such notice, at the time and in the manner set out in this Lease. This Lease shall be deemed and construed to be a Net Lease and the Rent payable under this Lease shall be paid to Landlord absolutely net, without deductions, defalcation, abatement or set off of any nature whatsoever.

4.2 PAYMENT OF ADDITIONAL RENT

a) Tenant will pay to Landlord Additional Rent as and when due. Prior to the Commencement Date (or within a reasonable period of time after the Commencement Date) and at the beginning of each subsequent Lease Year, Landlord will compute and deliver to Tenant an estimate of Property Taxes and Operating Costs for the upcoming Lease Year. Upon request, Landlord will deliver to Tenant with all estimates or charges for Additional Rent financial information, if any, explaining the estimates or charges.

b) Tenant will pay to Landlord, in monthly installments, one-twelfth of Tenant's Proportionate Share of Operating Costs and Property Taxes based upon Landlord's estimate of same for each Lease Year, at the same time as Tenant pays its monthly instalment of Basic Rent.

c) Landlord may from time to time re-estimate the amount of projected Operating Costs for the then current Lease Year and re-estimate Tenant's Proportionate Share of Operating Costs for the remainder of the Lease Year. Tenant will change its monthly instalments to conform to the revised estimate.

d) Unless delayed by causes beyond Landlord's control, Landlord will deliver to Tenant within **one hundred (180)** days after the end of each Lease Year a statement (the "**Operating Costs Statement**") setting out in reasonable detail the amount of Operating Costs for the preceding Lease Year and certified by Landlord's accountant. If the aggregate of the monthly installments of Operating Costs actually paid by Tenant during the preceding Lease Year differs from the Operating Costs payable for that Lease Year, Tenant will pay or Landlord will refund the difference without interest within **fifteen (15)** days after the delivery of the Operating Costs Statement or apply the

difference against the Additional Rent next falling due. The obligation to readjust Operating Costs will survive the expiry or sooner termination of the Term.

e) In the event that Landlord determines that any one or more of the matters (or any portion thereof) relating to Operating Costs relates to the whole or any portion of any one or more areas of the Property, Landlord may, acting reasonably, charge, apportion or allocate any one or more of such matters (or any portion thereof) relating to Operating Costs to or between the whole or any portion of any one or more of the different areas of the Property, to the exclusion of the whole or any portion of any one or more of the remaining areas of the Property, and Landlord shall have the right to charge the costs relating thereto solely to the tenants of the Property, or any one or more of them, to which such matter of Operating Costs is determined to relate.

f) If Tenant has special requirement(s) respecting some of the items making up Operating Costs, or uses a disproportionate amount of some of the items making up Operating Costs, Tenant shall pay an increased allocation of Operating Costs commensurate therewith as allocated by Landlord, acting reasonably.

g) Landlord shall have the right to allocate some or all items making up Operating Costs, acting reasonably, having regard, without limitation, to the various intended uses of the Premises within the Building and the relationship of the location and the area of the Premises in the Building to other premises in the Building, and Tenant shall pay an increased allocation of Operating Costs commensurate with Landlord's allocation.

h) In the event a disagreement may arise between Landlord and Tenant in regard to any matter or calculation or amount payable in respect of any Additional Rent, Tenant shall nevertheless make payment in accordance with any notice given by Landlord, but the difference shall immediately be referred by Landlord for decision by Landlord's Advisor, who shall act impartially and reasonably in making such decision. Any adjustments required to any previous payment made by Tenant by reason of any such decision shall be made within thirty days thereof.

i) Tenant shall not be entitled to claim a re-adjustment in respect of any Additional Rent whether paid or payable in instalments or otherwise, if based upon any error of estimate, allocation, calculation or computation thereof, unless claimed in writing prior to the expiration of one year from the conclusion of the twelve month period in respect of which the charge accrued.

j) In the event that the Term shall expire or terminate by the effluxion of time on any other day than December 31st, the amount payable by Tenant for Additional Rent shall be adjusted by apportioning the amount payable for such year in the ratio that the number of days of the Term in such year bears to the number of days in that year.

4.3 TAXES ATTRIBUTABLE TO THE PREMISES

In addition to those taxes forming a part of Additional Rent, Tenant shall pay for each Lease Year during the Term:

a) to Landlord, HST (at the rate established by parliament from time to time) on all Rent payable hereunder;

b) to the lawful authority the amount of any assessment of business taxes, or replacement thereof in respect of the Premises which are directly billed to Tenant by such lawful taxing authority, or to Landlord on account of its ownership thereof or interest therein.

4.4 PAYMENT OF UTILITIES

a) Tenant shall be responsible for the cost of all utilities and equipment provided for Tenant's exclusive use or consumption in connection with the Premises including, without restricting the generality of the foregoing, gas, water, electricity, telephone and communication service charges and rates and garbage removal costs incurred by Tenant or relating to the Premises and any other charges and/or rates relating to services and/or utilities provided for the exclusive use of Tenant in respect of Tenant's occupation of the Premises and the operation of Tenant's business carried on thereon or therefrom.

b) In the event that there is not installed in the Premises a separate meter or meters whereby the exact rate or charge for any one or more of the items comprising Utilities can be determined, then Tenant shall pay its Proportionate Share of the rates or charges for such item or items comprising Utilities as are determined by a master or central meter or meters; provided that Landlord may, from time to time, determine Tenant's consumption of any item comprising Utilities, upon whatever reasonable basis may be selected by it, including by estimating the consumption thereof and, in the event Landlord determines that such consumption is disproportionate to the consumption of other tenants of the Building, Landlord may require Tenant to install, at Tenant's expense, a domestic meter or other means for measuring or checking such consumption and Tenant shall, in addition to payment by Tenant of its Proportionate Share as aforesaid, pay to Landlord, or at the request of Landlord, directly to the supplier of such item comprising Utilities, as and when due, from time to time, any and all charges or rates for such consumption which is disproportionate, as aforesaid, as measured (in the case of the installation of the metering or checking device) or determined by Landlord, as aforesaid.

4.5 POST-DATED CHEQUES/PAY BY DIRECTION

a) Tenant shall provide to Landlord a pre-authorized electronic direct funds transfer form to permit automatic debiting of Tenant's account with its banker for the monthly instalment of Basic Rent and the estimated monthly instalment of Tenant's Proportionate Share of Operating Costs Property Taxes as aforesaid, and, if applicable, generally any amount payable provisionally pursuant to the provisions hereof on an estimated basis. Tenant agrees to provide replacement authorizations from time to time during the Term as Tenant changes its bank account details or as the monthly instalment of Basic Rent or the monthly instalment of Tenant's Proportionate Share of Operating Costs and Property Taxes change forthwith upon notice of such change being given to Tenant by Landlord. Tenant shall advise Landlord and Tenant's bank immediately if any withdrawal is made from its bank account other than in accordance with this Subarticle 4.5 (a) and Landlord shall not be liable to account for any such withdrawal, except to the extent that Landlord received funds to which it is not entitled.

b) In the alternative, if requested by Landlord, Tenant shall prior to the commencement of each and every Lease Year forward **twelve (12)** post-dated cheques in the amounts equal to the sum of the monthly instalment of Basic Rent and the estimated monthly instalment of Tenant's Proportionate Share of Operating Costs and Property Taxes for each of the **twelve (12)** months of the next Lease Year.

c) Tenant agrees to make all other Basic Rent and Additional Rent payments to Landlord by cheque, or at the option of Landlord, by direct deposit, at the times contemplated by the terms hereof.

4.6 LATE PAYMENT CHARGE

Tenant hereby acknowledges that late payment by Tenant to Landlord of the monthly instalment of Basic Rent or Tenant's Proportionate Share of Operating Costs Property Taxes or Additional Rent due hereunder will cause Landlord to incur costs not contemplated by this Lease, the exact amount of which will be extremely difficult or impracticable to ascertain. Such costs include, but are not limited to, processing and accounting charges and late charges which may be imposed on Landlord by the terms of any mortgage. Accordingly, if any monthly instalment of Basic Rent or Tenant's Proportionate Share of Operating Costs and Property Taxes or Additional Rent is not received by Landlord when such amount is due, Tenant shall pay to Landlord a late charge of **One Hundred Dollars ($100.00)** per occurrence. Acceptance of such late charge by Landlord shall in no event constitute a waiver of Tenant's default with respect to such overdue amount nor prevent Landlord from exercising any of the other rights and remedies granted hereunder. The foregoing shall be without prejudice to any other right or remedy available to Landlord under or pursuant to this Lease by reason of a monetary default by Tenant.

4.7 JANITORIAL AND CLEANING

Tenant, at its sole cost and expense, shall be responsible for the cleaning of the Premises.

ARTICLE 5. MAINTAINING PREMISES, ET AL.

5.1 MAINTAINING PREMISES

a) Subject to reasonable wear and tear and to Subarticle 5.1(d), Tenant will, at all times during the continuance hereof, at its own cost and expense, keep and maintain the interior and the exterior of the Premises, including, without limitation, all Leasehold Improvements and Tenant's Trade Fixtures, mouldings, doors, hardware, partitions, walls, fixtures, lighting and plumbing fixtures, wiring, piping, ceilings, floors and all glass therein or connected therewith (inclusive of outside windows and doors) in good and tenantable repair and condition to the end that the same shall, at all times, be kept in tenantable and first-class condition, reasonable wear and tear excepted, and at the expiration or determination hereof, peaceably surrender and yield up unto Landlord the Premises, including, without limitation, all Leasehold Improvements and all glass therein or connected therewith (inclusive of outside windows and doors) in good and tenantable repair and first-class condition, as aforesaid, save for reasonable wear and tear, and Tenant will, subject to the foregoing, at its sole expense, with or without notice from Landlord and so often as it shall be necessary to maintain, repair, replace, recondition or renew (save for reasonable wear and tear), in whole or in part, the Premises, carry out the same, or at Landlord's option, pay Landlord for the costs of any such maintenance, repair, replacement, reconditioning or renewal.

b) Tenant shall be responsible for and shall keep whole and in good order all glass and/or plate glass installed in or upon or used in connection with the Premises (inclusive of outside windows and doors on the perimeter) and shall be responsible for the replacement of all such glass and/or plate glass damaged or destroyed by any cause whatsoever.

c) Tenant will also pay, when due, all costs of waste removal and related sanitary control measures from and on the Premises and Tenant agrees to adopt standards therefor equal to or better than that provided to the rest of the Building.

d) Landlord will, at all times during the continuance hereof keep and maintain the Common Areas in reasonably good and tenantable repair and condition and will make, in whole or in part, all necessary Structural Repairs.

5.2 ALTERATIONS TO PREMISES

Tenant may, at any time and from time to time, at its sole expense, make such changes, alterations or improvements to, and may paint and decorate the interior of the Premises, in such manner as shall, in the judgment of Tenant, better adapt the same for the purpose of Tenant's business, provided that:

a) no changes, alterations, additions or improvements shall be made without written notice to Landlord which shall be in the form of scaled drawings certified by an accredited architect or engineer detailing the nature and scope of the work to be done and without the prior written consent of Landlord therefor, such consent not to be unreasonably withheld;

b) Tenant shall observe all of the provisions hereof, including, without limitation, all of those provisions relating to fire regulations and insurance policies; and

c) Tenant will not be entitled to make any changes, alterations, additions or improvements whatsoever to the structure of the Premises, including the electrical, mechanical (including heating and air conditioning), plumbing or telephone facilities, equipment, machinery, connections, wiring, pipes, ducts or other paraphernalia which form part thereof without the prior written consent of Landlord therefor, such consent not to be unreasonably withheld, save as may be required pursuant to the provisions of Subarticle 5.2(a) hereof; provided that any changes, alterations or improvements required pursuant to Subarticle 5.2(a) hereof shall only be made upon not less than fifteen (15) days written notice thereof to Landlord.

5.3 NOTICE OF DAMAGE

Tenant shall give to Landlord prompt written notice of any accident or damage to or defect in the plumbing, water pipes, heating and/or air conditioning apparatus, electrical equipment, conduits or wiring or of any other damage or injury to the Premises, or any part thereof, howsoever caused; provided that nothing herein shall be construed so as to require repairs to be made by Landlord, except as expressly provide in this Lease.

5.4 NON-INTERFERENCE WITH HEATING, ETC.

Tenant shall not move, remove or otherwise interfere with the heating or air conditioning apparatuses, if any, in the Premises except for the regulation of the degree of heat or air conditioning or as otherwise required by the terms hereof.

5.5 RIGHT OF LANDLORD TO PERFORM TENANT'S OBLIGATIONS

Notwithstanding any other provision hereof, including, without limitation, Article 5.2 above, all repairs, replacements, renewals, reconditioning and maintenance, which are the responsibility of Tenant under the terms hereof and which, in the opinion of Landlord:

a) affect any electrical, plumbing, heating, ventilating or air conditioning equipment, fixtures, systems or apparatus serving the Premises, whether or not located within the Premises (including, without limitation, any rooftop heating, ventilating and/or air conditioning equipment and connections thereof); or

b) affect or may affect the structure of the Premises, or any part thereof;

shall, at the option of Landlord, acting reasonably, be performed only by Landlord, at Tenant's sole cost and expense, and, upon completion thereof, Tenant shall pay to Landlord, on demand, as Additional Rent, Landlord's costs and expenses in connection with the work, including, without limitation, the reasonable costs and fees of Landlord's Advisor, together with the Administrative Charge in respect thereof.

5.6 INSPECTION

Landlord may, by itself or by its agents, with or without workmen or others, upon reasonable notice and at any reasonable time and from time to time during the Term, enter upon the Premises, or any part thereof, for the purpose, among others, of viewing the state and condition thereof.

5.7 TELECOMMUNICATIONS SYSTEMS

Tenant may utilize a telecommunication service provider of its choice with Landlord's prior written consent, which terms shall include without limitation, the following:

a) Tenant shall cause the service provider to execute and deliver to Landlord Landlord's standard form of license agreement which shall include a provision for Landlord to receive compensation for the use of the space for the service provider's equipment and materials;

b) Landlord shall incur no expense or liability whatsoever with respect to any aspect of the provision of telecommunication services, including without limitation, the cost of installation, service, materials, repairs, maintenance, interruption or loss of telecommunication service;

c) Tenant shall indemnify and hold harmless Landlord for all losses, claims, demands, expenses and judgments against Landlord caused by or arising out of, either directly or indirectly, any acts or omissions by the service provider or Tenant or those for whom they are at law responsible; and

d) Tenant shall incorporate in its agreement with its service provider a provision granting Tenant the right to terminate the service provider agreement if required to do so by Landlord and Landlord shall have the right at any

time during the Term to require Tenant, at Tenant's expense, to exercise the termination right and to contract for telecommunication service with a different service provider.

5.8 HVAC

a) Landlord shall provide heat to the Premises and the interior Common Areas sufficient to maintain reasonable temperatures during Normal Business Hours. It is understood and accepted by Tenant that Landlord may reduce the degree of heating provided after Normal Business Hours in a manner comparable to other comparable office buildings of a similar age and in a similar location. Landlord may enter the Premises at any time in order to inspect, control or regulate the operation of any heating, ventilating and air-conditioning facilities and equipment.

b) Landlord shall provide ventilation and air-conditioning to the Premises during Normal Business Hours. The systems furnished and operated by Landlord for air conditioning and ventilation to the Premises are designed for a reasonable density of persons and for general office purposes based on window shading being fully closed where windows are exposed to direct sunlight. Arrangement of partitions, equipment or special purpose areas, or the installation of equipment with high levels of heat production by Tenant may require alteration of the portion of the air-conditioning and ventilation systems located within the Premises. Any alterations that can be accommodated by Landlord's equipment shall be made at Tenant's expense and in accordance with Article 5.2 hereof. Tenant acknowledges that the heating, air-conditioning and ventilation system serving the Premises or the Building may require initial balancing or that alterations made from time to time whether inside the Premises or in other areas of the Building, may temporarily cause imbalance of the heating, air-conditioning and ventilation system, and Tenant shall allow a reasonable amount of time for such readjustment and rebalancing.

c) Should Landlord fail to provide sufficient heat or air-conditioning or chilled water at any time it shall not be liable for direct, indirect, or consequential damages, or for personal discomfort or illness.

ARTICLE 6. LANDLORD'S RIGHT TO REPAIR OR MAKE ALTERATIONS

6.1 RESTORATION OF PREMISES

Tenant shall, upon the termination or earlier determination hereof, restore the Premises, or any part thereof, as requested by Landlord, at Tenant's own expense, to the base building condition thereof existing at the Commencement Date, save for reasonable wear and tear, provided, however, that the Premises and all Leasehold Improvements shall, upon completion or installation thereof, become the property of Landlord and shall be surrendered by Tenant to Landlord on the termination or earlier determination hereof. Except to the extent herein or otherwise expressly agreed by Landlord in writing, Tenant's Trade Fixtures shall not be removed by Tenant from the Premises, either during or at the expiration or sooner termination hereof, except that Tenant, if not in default under this Lease, may, concurrently with the expiration of the Term by the effluxion of time, remove Tenant's Trade Fixtures, provided, however, that if Tenant fails to remove Tenant's Trade Fixtures concurrently with the expiration of the Term as aforesaid, Tenant's Trade Fixtures not so removed, shall, at the sole option of Landlord, become the property of Landlord. If Tenant, in removing Tenant's Trade Fixtures and Leasehold Improvements, or any portion thereof, as Landlord may require to be removed, damages the Premises, Tenant shall, at its own cost and expense, repair such damage, or, at the option of Landlord, pay Landlord for the cost of such damage.

6.2 SURRENDER OF KEYS

At the expiration or earlier termination of the Term, Tenant shall surrender all keys for the Premises to Landlord, at the place then fixed for the payment of Rent, and shall inform Landlord of all combinations of locks, safes and vaults, if any, within the Premises and which are not required or permitted to be removed therefrom.

6.3 LANDLORD'S RIGHT TO REPAIR OR MAKE ALTERATIONS

a) Landlord shall be permitted upon reasonable notice, at any reasonable time and from time to time, to enter and to have its authorized agents, employees and contractors enter the Premises for the purpose of inspecting and/or viewing the condition thereof and undertaking any work of any kind deemed necessary or expedient by Landlord acting reasonably, and Tenant shall provide free and unhampered access for such purposes and shall not be

entitled to compensation for any inconvenience, nuisance and/or discomfort or loss caused thereby, provided that Landlord, in exercising its rights hereunder, shall proceed, to the extent reasonably possible, so as to minimize interference with Tenant's use and enjoyment of the Premises, provided that nothing herein shall be construed so as to require repairs, replacements and/or renewals, in whole or in part, to be made by Landlord, except as expressly provided for in this Lease.

b) Landlord shall, in addition and notwithstanding anything to the contrary in this Lease contained, have the right to make any changes, expansions, reductions, enclosures, additions, renewals, replacements, repairs, improvements or alterations, in whole or in part, as Landlord, from time to time, may decide in respect of the Building, or any portion thereof, including the Premises, and Tenant shall not be entitled to compensation for any inconvenience, nuisance and/or discomfort or loss caused thereby. Landlord, in exercising its rights hereunder, shall proceed, to the extent reasonably possible, so as to minimize interference with Tenant's use and enjoyment of the Premises, provided that nothing herein shall be construed so as to require any of the aforesaid items to be done by Landlord except as expressly provided for in this Lease.

6.4 CONTROL OF BUILDING BY LANDLORD

a) Landlord will control the management and operation of the Building. In doing so, Landlord will have, among its other rights, the right to:

(i) temporarily close parts of the Common Areas to prevent their dedication or the accrual to anyone of rights in them; grant, modify and terminate easements and other agreements pertaining to the use and operation of the Building or any part of it; and temporarily obstruct or close off parts of the Building for maintenance, repair or construction;

(ii) employ personnel for the operation, maintenance and control of the Building, which may be managed by Landlord or by anyone else designated by Landlord;

(iii) use parts of the Common Areas for merchandising, display, decorations, entertainment and structures designed for retail selling or special features or promotional activities;

(iv) reasonably regulate all aspects of loading and unloading, delivery and shipping of fixtures, equipment and merchandise, and all aspects of garbage collection and disposal;

(v) designate areas where Tenant and its employees may park in the Building;

(vi) construct and alter multiple deck, elevated or underground parking facilities, and impose or permit to be imposed reasonable charges for the use of parking facilities by anyone, including tenants and customers;

(vii) construct other buildings or improvements in or near the Building and make changes to all or any part of the Building; and

(viii) at any time, upon **sixty (60) days**' written notice to Tenant, to relocate Tenant in whole or in part to other premises in the Property provided that the new premises shall contain the same area and be in a similar location and provided that Landlord shall pay the actual and reasonable expenses incurred by Tenant in physically moving its trade fixtures to the relocation premises.

b) Landlord is not liable for and Tenant will not be entitled to any compensation or Rent reduction as a result of any change in the Common Areas caused by Landlord's exercise of its rights under this Lease.

c) Provided Tenant is not in default hereunder, Tenant shall have the non-exclusive right during Normal Building Hours, in common with all others entitled thereto and in accordance with the Rules and Regulations in respect thereof, to use the parts of the Common Areas appropriate and intended for common use, for their proper and intended purposes.

ARTICLE 7. INSURANCE, INDEMNITY AND RELEASE

7.1 LANDLORD'S INSURANCE

Landlord shall take out and maintain with respect to the Building:

a) Commercial general liability insurance against personal and bodily injury, including death, and property damage.

b) Insurance with coverage against the perils of fire and standard extended coverage endorsement perils, against water damage however caused and against loss by such other insurable hazards as a prudent owner would insure.

c) Boiler and machinery insurance.

d) Loss of rental income insurance, including loss of all rentals receivable from tenants of leasable premises in the Building, including Basic Rent and all other amounts payable thereunder.

Landlord, acting reasonably, shall determine all policy terms including deductibles and may take out and maintain other insurance as it considers advisable, but Landlord shall not be required to take out or maintain any insurance with respect to any loss, injury or damage required to be insured against by Tenant or with respect to Tenant Property and/or liability. All proceeds of Landlord's insurance shall belong to Landlord although some portions are to be applied to reduce operating costs as provided in this Lease. Notwithstanding Tenant contributions to Landlord insurance premiums, no insurable interest is conferred upon Tenant under policies carried by Landlord. Tenant acknowledges that it is not, by such contribution or otherwise, relieved of any legal liability or liability arising from its wilful acts or negligence.

7.2 TENANT'S INSURANCE

Prior to taking possession of the Premises, Tenant shall provide to Landlord a CSIO Certificate of Insurance. Throughout the term of the Lease, Tenant shall take out and keep in force in its name the following:

(a) Broad form (all risk/all perils) property insurance (including coverage for sewer back-up and water damage, flood and earthquake perils) on property of every description owned by Tenant, or for which Tenant is responsible or legally liable, including Leasehold Improvements, in an amount equal to **100%** of the full replacement cost, without depreciation, of same (including equipment breakdown insurance, if applicable);

(b) Comprehensive commercial general liability insurance with a limit of not less than **Five Million Dollars ($5,000,000)** per occurrence or such greater amount as Landlord may from time to time reasonably require;

(c) Business interruption insurance from all perils for a minimum of **twelve (12) months** on either an ALS (actual loss sustained) or Profits policy form;

(d) Tenant's legal liability (all risks form) insurance in an amount not less than **one hundred percent (100%)** of the full replacement cost of the Premises, including loss of use;

(e) Plate glass insurance, if applicable;

(f) Automobile insurance and non-owned automobile insurance of not less than **Five Million Dollars ($5,000,000)** inclusive limits, if applicable; and

(g) any other such additional insurance as Landlord or the Mortgagee, acting reasonably, may from time to time require.

Each applicable policy shall contain a breach of conditions endorsement in favour of Landlord and shall name Landlord and Property Manager as Additional Insureds. All such insurance shall be primary insurance and shall not call into contribution any insurance carried by Landlord. The portion of the proceeds of insurance referred to herein payable for the Leasehold Improvements are hereby assigned to and shall be made payable jointly to Tenant and Landlord. Each applicable policy shall contain a waiver of any subrogation rights which Tenant's insurers may have against Landlord, a cross-liability clause, and

severability of interest provisions as applicable, and shall not be subject to cancellation without at least **thirty (30)** days prior written notice to Landlord. Prior to commencement of the Lease, Tenant will deliver evidence of the above required insurance coverages to the Property Manager. In the event that Tenant's occupancy of the Premises causes an increase in the insurance carried by Landlord, Tenant shall pay such increase in premiums immediately upon demand by Landlord.

For clarification, Tenant acknowledges that it shall be solely responsible for security of all of its property and merchandise at all times during the tenancy both during and after Normal Business Hours and Landlord shall have no liability whatever for loss or damage to any of Tenant's property or merchandise from any cause, however caused, including but not limited to loss or damage caused through the negligence of Landlord, its agents or those for whom Landlord is in law responsible.

7.3 GENERAL PROVISIONS OF TENANT'S INSURANCE AND TENANT'S PREMIUMS

a) Tenant's insurance policies shall be in a form satisfactory to Landlord and shall be placed with insurers licensed to do business in Canada and shall exclude the exercise of any claim of the insurer or insurers, whether by subrogation or otherwise, against Landlord and against those for whom Landlord is in law responsible. All policies of commercial general liability insurance shall contain a severability of interest clause and a cross -liability clause as between Landlord and Tenant.

b) Each applicable policy shall name Landlord as an additional insured as its interest may appear and shall contain a waiver in favour of Landlord and any Mortgagee, of any breach or violation of any warranties, representations, declarations or conditions contained in such policies. All such insurance shall be primary insurance, shall firstly respond to any loss or damage suffered or incurred by Tenant and shall not call into contribution any insurance carried by Landlord or any Mortgagee.

c) The portion of the proceeds of insurance referred to herein payable for the Leasehold Improvements are hereby assigned to and shall be made payable to Landlord in priority to all others. If this Lease is not terminated such proceeds received by Landlord shall be released to Tenant upon receipt by Landlord of a certificate of the Architect stating that repairs to the Leasehold Improvements to the extent of such proceeds have been satisfactorily completed by Tenant, free of liens. If the Lease is terminated pursuant to any provision in Article 8, Tenant shall and does hereby assign and agree to pay to Landlord, the proceeds of its policies of insurance relating to the Leasehold Improvements, in each case, in an amount equal to the full replacement cost thereof without any deduction for depreciation.

d) All policies of insurance shall contain a provision requiring that at least thirty (30) days written notice be given to Landlord by the insurer in the event of a material reduction and/or change in policy coverage and prior to cancellation and Tenant shall obtain undertakings from all insurers to that effect.

e) Tenant shall, **ten (10)** days prior to the Commencement Date and **thirty (30)** days prior to the expiry of any insurance required to be carried by Tenant, deliver certificates of insurance to Landlord in a form acceptable to Landlord, or if requested by Landlord, Tenant shall provide certified copies of its insurance policy(ies) to Landlord. Receipt by Landlord of certificates of insurance from Tenant shall in no way act as confirmation by Landlord that Tenant's insurance complies with the terms hereof and shall not be construed as a waiver with regard to Tenant's obligations to insure:

f) If Tenant fails to perform its obligations pursuant to Article 7.2 or Article 7.3, Landlord shall have the right, but not the obligation, to perform such obligations and to pay the costs or premium therefore and in such event Tenant shall repay to Landlord, as Additional Rent, forthwith on demand, the amount paid by Landlord, together with the Administrative Charge in respect thereof.

g) The acquisition and maintenance by Tenant of the insurance policies as required pursuant to Article 7.2 shall not limit or restrict the liability of Tenant under this Lease.

h) Notwithstanding any other provisions hereof, Tenant hereby releases Landlord, and any Party for whom Landlord is legally responsible, from any liability for loss to the extent of all insurance proceeds paid under the policies of insurance maintained by Tenant or which would have been paid if Tenant had maintained the insurance it is required to maintain under this Lease and had diligently processed any claims thereunder.

7.4 CANCELLATION OF OR INCREASE IN LANDLORD'S INSURANCE PREMIUMS

a) Tenant will not, at any time during the Term, use, suffer or allow the Premises, or any part thereof, to be used for any trade, business, occupation or calling or refrain or cease to carry on business upon the Premises or vacate the same, nor permit anything to be done or not to be done, or bring any flammable material, machinery or equipment upon the Premises, whereby the insurance rates upon the Premises and/or the Improvements, or any one or more of them, may be increased, or the policy or policies of insurance thereon, insuring against, inter alia, damage by fire, for the time being subsisting, may become void or voidable or cancelled.

b) If Tenant, by any means whatsoever: (1) causes any increase in Landlord's insurance premiums, Tenant shall pay to Landlord, on demand, the amount of such increase. Tenant shall comply promptly with all reasonable requirements of any underwriter association or of any insurer of Landlord or Tenant; or (2) causes a cancellation or coverage reduction or threatened cancellation or coverage reduction or material change of any insurance policy on the Building, then Landlord, upon notice, if practicable, may enter as provided and remedy the condition giving rise to the threatened or actual cancellation or coverage reduction in which case Tenant shall pay to Landlord on demand the cost of such remedy plus the Administrative Charge in respect thereof.

7.5 RELEASE

Tenant expressly releases Landlord and waives all claims against Landlord and those for whom Landlord is, in law, responsible, including those for death, injury, bodily harm, damage to or loss of property or income, nuisance, inconvenience, discomfort, breach of or frustration of Lease, or abatement of rent arising from:

a) any entry of, activities and work upon, or removal of items from the Premises by Landlord or its designates, as required or permitted by this Lease;

b) any change, alteration or modification to the Building or the performance of work in connection therewith;

c) any interruption or cessation in the supply of utilities, services or systems serving the Premises, the Building;

d) any occurrence, cause or peril required by this lease to be insured against by Tenant;

e) any other occurrence, cause or peril whatsoever,

except and to the extent arising by the willful acts or omissions of Landlord or those for whom it is in law responsible.

7.6 INDEMNIFICATION OF LANDLORD

Tenant covenants and agrees that:

a) unless caused by the wilful act or omission of Landlord and/or its agents, Landlord shall not be liable nor responsible, in any way, notwithstanding the cause thereof for any:

(i) injury to or death of any person, or loss or damage to any property belonging to Tenant or its employees, invitees or licensees or any other person for whom Tenant is in law responsible, or any person in or about the Building for the purpose of attending at the Premises or in respect of any damage to property belonging to or entrusted to any one or more of them, or for any consequential injury, loss or damage arising from or sustained by any one or more of the aforesaid, unless resulting from (and in such case limited to the extent of) the actual fault or negligence of Landlord, its employees, invitees or licensees, or any other person for whom Landlord is in law responsible;

(ii) injury or damage, of any nature whatsoever, to any person or property, caused by the failure or by reason of any unavoidable breakdown or other cause, to supply adequate drainage, snow or ice removal, or by reason of the reasonable interruption of any public utility or other service, or in the event of gas, steam, water, rain, snow, ice or other substances leaking into, issuing or flowing from the water, steam, sprinkler or drainage pipes or plumbing of the Building or from any other place or quarter, into any part of the Premises, or for any loss or damage caused by

or attributable to the condition or arrangement of any electric or other wiring or for any damage caused by anything done or omitted to be done by any other tenant of the Building, provided in each and every case that Landlord, or the other tenant of the Building, as the case may be, has acted in a reasonable and prudent manner;

(iii) act or omission (including theft, malfeasance or negligence) on the part of any agent, contractor or person, from time to time employed by Landlord to perform security services, maintenance, supervision, cleaning or any other work or service in or about the Premises or the Building;

(iv) loss or damage, however caused, to money, securities, negotiable instruments, papers or other valuables of Tenant; or

(v) loss or damage to any automobiles, or their contents, or for the unauthorized use by other tenants or strangers of any parking space allotted to Tenant;

and Tenant covenants to indemnify and save harmless Landlord from and against any and all claims, causes of action, liability, costs and/or expenses, (including Landlord's own solicitor's fees and disbursements) whatsoever and howsoever arising in respect of any one or more of the foregoing, unless resulting from (and in such case limited to the extent of) the actual fault or negligence of Landlord, with the exception, however, of any consequential injury, loss or damage;

b) Landlord shall have no responsibility or liability for the failure to supply, if required to do so under the terms hereof, interior climate control, when prevented from doing so by strikes, the necessity of repairs, any order or regulation of any body having jurisdiction, the failure of the supply of any utility required for the operation thereof or any other cause beyond Landlord's reasonable control.

c) Landlord shall be under no obligation to repair or maintain Leasehold Improvements or to repair or maintain or insure Tenant's Trade Fixtures or other property;

d) Landlord shall be under no obligation to remedy any default of Tenant and shall not incur any liability to Tenant for any act or omission in the course of its curing or attempting to cure any such default or in the event of its entering upon the Premises to undertake any examination thereof or any work therein or in the case of any emergency;

e) Tenant agrees to defend, indemnify and save harmless Landlord in respect of all claims for bodily injury or death, property damage or other loss or damage arising howsoever out of the use or occupation of the Premises, or from the conduct of any work by or any act or omission of Tenant or any assignee, subtenant, agent, employee, contractor, invitee or licensee of Tenant, or anyone else for whom Tenant may be responsible, and in respect of all costs, expenses and liabilities incurred by Landlord in connection with or arising out of all such claims, including the expenses of any action or proceeding pertaining thereto, and in respect of any loss, cost, expense or damage suffered or incurred by Landlord (including Landlord's own reasonable solicitor's fees and disbursements) arising from any breach or non-performance by Tenant of any of its covenants or obligations under this Lease. Tenant's obligations to observe or perform this covenant shall survive the expiration or other termination of the Term.

ARTICLE 8. DESTRUCTION OF PREMISES OR IMPROVEMENTS

8.1 TOTAL DESTRUCTION

In the event of the Total Destruction (as herein defined) of the Premises by fire, the elements or other cause or casualty, then, in such event, this Lease shall terminate with effect from the date when such destruction occurs. Thereupon, Tenant shall immediately surrender the Premises and all its interest therein to Landlord, and Tenant shall pay Rent only to the time of such destruction, and Landlord may re-enter and repossess the Premises discharged hereof. Upon such termination, Tenant shall remain liable to Landlord for all sums accrued due to Landlord pursuant to the terms hereof to the date of such destruction. **"Total Destruction"** shall mean such damage to the Premises as renders the same unfit for use by Tenant for Tenant's business, which cannot reasonably be repaired within **One Hundred Eighty (180)** days of the date of the destruction to the state where Tenant could use substantially all of the Premises for Tenant's business. The certificate of Landlord's Advisor certifying that Total Destruction has or has not occurred shall be binding and conclusive upon both Landlord and Tenant for the purposes hereof.

8.2 PARTIAL DESTRUCTION

In the event of Partial Destruction (as herein defined) of the Premises by fire, the elements or other cause or casualty, then, in such event, if the destruction is such, in the opinion of Landlord's Advisor, that the Premises cannot be used for Tenant's business until repaired, the Rent and all Additional Rent, shall abate until the repair has been made. If the destruction is such that, in the opinion of Landlord's Advisor, the Premises may be partially used for Tenant's business while the repairs are being made, then the Basic Rent shall abate in the proportion that the part of the Premises rendered unusable bears to the whole of the Premises. **"Partial Destruction"** shall mean any damage to the Premises less than Total Destruction but which renders all or part of the Premises temporarily unfit for the use by Tenant for Tenant's business. The certificate of Landlord's Advisor, as to whether the whole or a part of the Premises is rendered usable and certifying to the extent of the part rendered usable, shall be binding and conclusive upon both Landlord and Tenant for the purposes hereof. Notwithstanding anything in this paragraph contained, if, in fact, the Partial Destruction is repaired within fourteen days of the date of destruction, there shall be no abatement of Rent.

8.3 REPAIR OF PARTIAL DESTRUCTION

In the event of Partial Destruction, subject to Article 8.6 below and with all due diligence, Landlord shall repair and restore the Premises (including the Leasehold Improvements) according to the nature of the damage, excepting Tenant's Trade Fixtures, which Tenant shall repair and restore to substantially the condition of same immediately prior to such Partial Destruction. Should Tenant wish the repair and restoration to differ from the original plans and specifications for the Premises, then Landlord shall agree to abide by Tenant's wish if the cost of such different repair or restoration is not materially more than the replacement cost of the damage and if Tenant agrees to pay all costs in excess of the replacement cost.

8.4 DESTRUCTION OF IMPROVEMENTS

Notwithstanding the foregoing provisions concerning Total Destruction or Partial Destruction of the Premises, in the event of any damage to or destruction of the Improvements, or any part thereof (and whether or not the Premises are destroyed), to such a material extent or of such a nature that, in the opinion of Landlord's Advisor, the Improvements, or any part thereof, must be or should be totally or partially demolished, whether to be reconstructed, in whole or in part, or not, then either party may, at its option (to be exercised within **sixty (60)** days from the date of destruction) give notice to the other that this Lease is terminated with effect from the date stated in the notice. If Tenant is unable to effectively use the Premises after the destruction, the date given in the notice shall be the date of destruction. Upon such termination, Tenant shall immediately surrender the Premises and all its interest therein to Landlord and Tenant shall remain liable to Landlord for all sums accrued due pursuant to the terms hereof to the date of termination. Landlord's Advisor shall determine whether the Premises can or cannot be effectively used by Tenant and Landlord's Advisor's certificate thereon shall be binding and conclusive upon both Landlord and Tenant for the purposes hereof.

8.5 LIMITATION

Unless caused by the negligence or wilful act or omission of Landlord and/or its agents, in none of the cases aforesaid shall Tenant have any claim upon Landlord for any damages sustained by it. No damage, compensation or claim whatsoever shall be payable by Landlord for inconvenience, loss of business or annoyance or other loss or damage whatsoever arising from the occurrence of any such damage or destruction of the Premises, or any part thereof.

8.6 INSURANCE

If any of the cases aforesaid are not covered under insurance as required to be maintained by Landlord pursuant to the terms hereof then Landlord shall not have any obligation to repair whether Total Destruction or Partial Destruction, and in each such case this Lease shall, at the option of Landlord, terminate, upon Landlord giving **thirty (30)** days' notice to Tenant, not later than sixty days from the date of any such destruction and, failing such notice, as aforesaid, the terms of this Article 8.6 shall govern.

ARTICLE 9. ASSIGNMENT AND SUBLETTING, CHANGE OF CONTROL OF TENANT'S BUSINESS

9.1 CONSENT REQUIRED

a) Except to an Eligible Corporation, Tenant shall not assign this Lease in whole or in part, nor sublet all or part of the Premises, nor mortgage or encumber this Lease or the Premises or part thereof, nor suffer or permit the occupation or use of all or part of the Premises by others (collectively "Transfer"), without the prior written consent of Landlord, which

consent may not be unreasonably withheld. Landlord's failure to so consent shall be deemed reasonably withheld if: (a) Tenant is in arrears of Rent at the time of request for consent; (b) such Transfer will result in a change in use of the Premises; or (c) if the proposed sub-tenant assignee, concessionaire, licensee or occupier (individually as applicable, the "Transferee") does not meet Landlord's requirements with respect to: (i) experience and capability in the business to be conducted upon the Premises; and, (ii) business history, financial status and background.

b) Any such consent shall not constitute a waiver of Landlord's consent to any subsequent Transfer, and shall be conditional upon: (a) payment of any outstanding rental arrears; (b) payment to Landlord of its administrative/legal costs of considering such request and preparing and/or reviewing the transfer documentation in the amount of **Twelve Hundred Fifty Dollars ($1, 250.00)** and; (c) execution of an instrument in writing whereby the Transferee covenants directly with Landlord to be bound by and comply with all of the terms hereof as if it were Tenant originally executing this Lease and specifically in the case of a sub-lease, covenanting to guarantee the obligations of Tenant and acknowledge that in the enforcement hereof, Landlord may distrain against the assets of the sub-tenant.

c) No Transfer shall release Tenant from the performance of any of the terms, covenants and conditions hereof.

d) No Transfer shall have any effect unless in writing and signed by Landlord.

e) Landlord will, within **thirty (30)** days after having received notice and all necessary information, notify Tenant in writing either that it consents or does not consent to the Transfer.

9.2 LANDLORD OPTION TO TERMINATE

a) If Tenant wishes to Transfer this Lease, in whole or in part, Tenant shall give prior notice to Landlord stipulating the proposed Transferee and if the proposed Transferee is not an Eligible Corporation such notice shall include details to be considered by Landlord pursuant to 9.1(a) and the use to be made of the Premises; and be accompanied by a copy of the applicable offer to purchase or sublet and if such Transferee is not an Eligible Corporation, and if Landlord withholds its consent to such Transfer and Tenant proceeds with the Transfer in the absence of Landlord's consent, Landlord may terminate this Lease upon **fifteen (15)** days' notice to Tenant given within **forty-five (45)** days next following the giving of the notice by Tenant unless Tenant by notice to Landlord given within the **fifteen (15)** day period withdraws the request to transfer.

b) If this Lease is transferred in whole or in part without the consent of Landlord when required, Landlord may nevertheless collect rent from the Transferee but such acceptance of rent and any failure by Landlord to object shall not be considered a waiver of this covenant or an acceptance of the Transferee as Tenant.

9.3 CORPORATE OWNERSHIP

Any share transfer, whether by sale, assignment, bequest, inheritance operation of law or other disposition which will result in a change in the effective voting or other control of Tenant as "Control" is defined in the Canada Business Corporations Act shall, unless such shares are listed on a recognised stock exchange in Canada or the United States, be deemed to be a Transfer to which Articles 9.1 and 9.2 apply, the person or entity in whom such control will vest being considered the Transferee.

9.4 TRANSFER BY THE LANDLORD

Landlord, at any time and from time to time, may sell, transfer, lease, assign or otherwise dispose of the whole or any part of its interest in the Building, or in the Premises and, at any time and from time to time, may enter into any Mortgage of the whole or any part of its interest in the Building or in the Premises. If the party acquiring such interest agrees to assume, and so long as it holds such interest, to perform the covenants of Landlord under this lease, Landlord shall thereupon be released from all of its covenants under this lease.

9.5 EXCESS RENTAL

Notwithstanding anything herein to the contrary, Tenant shall not assign, sublet, license or part with or share possession of the Premises, or any part thereof, if the Rental or other consideration to be received by Tenant exceeds the greater of that stipulated in this Lease as being payable by Tenant to Landlord hereunder, unless and until Tenant undertakes to pay such excess to Landlord.

ARTICLE 10. COMPLIANCE WITH LAWS AND REGULATIONS, GENERAL COVENANTS

10.1 COMPLIANCE WITH LAWS AND REGULATIONS

a) Tenant will, at all times and in all respects, in regard to the Premises, strictly conform to all laws and Tenant agrees to indemnify and save harmless Landlord from any costs, charges or damages to which Landlord may be put or suffer by reason of the breach by Tenant or by any of those for whom Tenant is responsible in law of any such laws and, in addition, Tenant shall observe the Rules and Regulations annexed hereto as **Schedule "D"**, or such other reasonable rules and regulations as Landlord may make, from time to time, acting reasonably, for the comfort and/or convenience of Landlord's tenants in the Building and/or the operation and/or the preservation of good order therein.

b) Tenant shall further comply with any orders, rules and regulations of the Canadian Fire Underwriters Association or any other body now or hereafter constituted exercising similar functions and with the requirements of all policies of public liability, fire and other kinds of insurance at any time in force with respect to the Premises, or any part thereof as those orders, rules, regulations and requirements relate to Tenant's Work and/or Tenant's use and occupation of the Premises.

10.2 LANDLORD'S GENERAL COVENANTS

Landlord covenants with Tenant:

a) that subject to the payment of Rent hereby reserved by Tenant and upon Tenant observing and performing the covenants to be observed and performed by Tenant, to allow Tenant to possess and enjoy the Premises for the Term, without any interruption or disturbance from Landlord or any other Person lawfully claiming by, from or under it; and

b) to observe and perform all the covenants and obligations of Landlord herein.

10.3 TENANT'S GENERAL COVENANTS

Tenant covenants with Landlord:

a) to pay the Rent; and

b) to observe and perform all the covenants and obligations of Tenant herein.

ARTICLE 11. USE OF PREMISES

11.1 USE OF PREMISES

Tenant will operate its business in the Premises only for the Permitted Use for no other purpose. Tenant shall satisfy itself that such use is permissible pursuant to all applicable zoning and other municipal laws and regulations. Tenant shall also be solely responsible for obtaining its own occupancy permit. Tenant shall at all times fully comply with all Applicable Laws.

11.2 CONDUCT OF BUSINESS

a) The operation and maintenance of Tenant's business shall be of the highest quality and to a standard compatible with the Building.

b) Tenant shall operate and carry on Tenant's business continuously in the Premises during the continuance hereof and, without restricting the generality of the foregoing, Tenant shall not vacate or leave the Premises during the continuance hereof. Tenant acknowledges that it is an important tenant of the Building and that the continuous carrying on of Tenant's business in the Premises is essential to the economic viability of the Building.

c) Tenant shall not paint, display, inscribe, place or affix any sign, symbol, notice or lettering of any kind anywhere outside the Premises (whether on the outside or inside of the Premises) so as to be visible from the outside of the Premises, with the exception only of any identification sign and such other signs as Landlord may permit (such permission not to be unreasonably withheld), in each case containing only the name of Tenant and such other names as Landlord may permit, and to be subject to the approval of Landlord as to design, size, location and content, acting reasonably.

d) Tenant acknowledges that its covenants and obligations set forth in Subarticle 11.2(a), (b) and (c) are covenants and obligations designed for the mutual benefit and protection of all tenants of premises in the Building and to render the Building as a whole of maximum attractiveness to the public, and to achieve the maximum volume of business therein. In the event that Tenant is in breach of any of such covenants or obligations or fails to observe or perform any of them, then without prejudice to any other right or remedy which Landlord may have under this Lease or otherwise at law or equity, Landlord shall have the right to bring action in any court of competent jurisdiction against Tenant for an injunction, judgement or order directing Tenant to remedy such breach and to observe and perform such covenant or obligation.

11.3 NUISANCE

a) Tenant will not use, exercise or carry on, or permit or suffer to be used, exercised or carried on, in or upon the Premises, or any part thereof, any noxious, noisome or offensive art, trade, business, occupation or calling, and no act, thing or matter whatsoever shall, at any time during the continuance hereof, be done or not be done (including, without limitation, smells or odours within or emanating or escaping from the Premises, vacating the Premises or ceasing to carry on business therein) upon the Premises, or any part thereof, which shall or may be or grow to the annoyance, nuisance, grievance or cause damage to the occupiers or owners of the adjoining lands or properties of Landlord or tenants of other portions of the Building.

b) Tenant shall not use any advertising media that Landlord shall deem objectionable to it or other tenants of the Building, including, without limitation, loudspeakers, phonographs, broadcasts, or telecasts, in a manner to be heard or seen outside the Premises.

c) Tenant shall not place a load upon any portion of any floor of the Premises which exceeds the floor load which the area of such floor being loaded was designed to carry, having regard to the loading of adjacent areas and that which is allowed by law. Landlord reserves the right to prescribe the weight and position of all safes and heavy installations which Tenant wishes to place in the Premises, so as to distribute properly the weight thereof and Tenant shall pay for all reasonable costs incurred by Landlord and Landlord's Advisor in making such assessment.

11.4 HAZARDOUS MATERIAL

Tenant shall not cause or permit any Hazardous Material to be placed, held, located, carried on or disposed of, on, under or in any part of the Premises and Tenant covenants to permit Landlord to conduct inspections and appraisals of all or any of Tenant's records, business and assets upon reasonable notice, at any reasonable time and from time to time, which might reasonably relate to Hazardous Material, to ensure compliance by Tenant of not causing or permitting any Hazardous Material to be placed, held, located, carried on or disposed of on, under or in any part of the Premises.

11.5 SIGNS

a) Tenant's Signs: Tenant shall not at any time cause or permit any sign, picture, advertisement, notice, lettering, flag, decoration or direction (herein collectively called **"Signs"**) to be painted, displayed, inscribed, placed, affixed or maintained within the Premises and visible outside the Premises or in or on any windows or the exterior of the Premises (including glass demising walls facing onto Common Areas), nor anywhere else on or in the Building, without the prior and continuous consent of Landlord which consent may, with respect to proposed signage on the main floor of the Building, or which can be seen from outside the Premises, be arbitrarily

withheld, but otherwise shall not be unreasonably withheld, provided that the copy and style of any Signs shall be consistent with the first-class nature ofthe Building and in accordance with Landlord's sign criteria. No hand-written signs will be permitted. Landlord may at any time prescribe a uniform pattern of identification signs for tenants to be placed on the outside of the Premises and other premises. Any breach by Tenant of this provision may be immediately rectified by Landlord at Tenant's expense and in this connection, Landlord shall be entitled to enter the Premises and remove any Signs contravening this provision and charge Tenant the costs thereof, and same shall not constitute a re-entry under this Lease and Landlord shall not be liable for any damages caused thereby, whether or not arising from its own negligence. At the expiration or earlier termination hereof, Tenant will remove any such sign from the Premises at its expense and will promptly repair all damage caused by its installation or removal.

b) Directory Board: Landlord may erect and maintain (as an Operating Cost) a directory board in the main lobby of the Building which shall indicate the name of Tenant and the location of the Premises within the Building. Tenant shall pay Landlord's cost of changes thereto, and any other signage with respect to the Premises. Should sufficient space exist on the directory board, Landlord may provide to Tenant, at Tenant's expense, additional entries as requested. The directory board shall be for identification only and not for advertising. Landlord's acceptance of any name for listing on the directory board will not be deemed, nor will it substitute for, Landlord's consent, as required by this Lease, to any sublease, assignment or other occupancy of the Premises.

c) Landlord's Signs: In addition to Landlord's right to install general information and direction signs in an about the Building as would be customary for a comparable office building of similar age and similar location, Landlord shall have the right at any time to place upon the Building a notice of reasonable dimensions, reasonably placed so as not to interfere with Tenant's business, stating that the Building is for sale, or that areas of the Building are for lease, as the case may be, and at any time during the last six (6) months of the Term, that the Premises are for rent and Tenant shall not remove such notices or signs.

(d) Upon expiration or termination hereof, Tenant shall remove all such signs or advertising where directed to by Landlord and shall repair any damage caused by such removal.

11.6 HOLDING OVER

If Tenant remains in possession of the Premises after the Term or extensions thereof with the consent of Landlord but without executing a new lease, there is no tacit renewal hereof despite any statutory provision or legal presumption to the contrary. Tenant will occupy the Premises as a Tenant from month to month (with either party having the right to terminate such month to month tenancy at any time on **one (1)** calendar months' notice, whether or not the date of termination is at the end of a rental period) at a monthly Minimum Rent payable in advance on the first day of each month equal to two times the Minimum Rent payable during the last month of the Term, and Tenant will comply with the same terms, covenants and conditions as are in this Lease as far as they apply to a monthly tenancy including, for greater certainty, the payment of Additional Rent.

ARTICLE 12. QUIET ENJOYMENT, PARKING, PAYMENT OF TAXES, ETC., FORCE MAJEURE

12.1 QUIET ENJOYMENT

a) If Tenant duly and punctually pays the Rent and complies with its obligations, except as provided herein, Tenant will be entitled to peaceably possess and enjoy the Premises during the Term without interruption by Landlord or those lawfully claiming through Landlord.

b) Any expansion or enlargement of the Building shall not adversely affect Tenant's use and enjoyment of the Premises or the business carried on therefrom in any material manner.

12.2 PARKING

a) Landlord agrees to provide adequate parking facilities and lighting therefor, in the Common Area of the Building. Landlord agrees that in no event shall the number of parking spaces in the Common Area of the Building be fewer than the number of parking spaces required to satisfy all governmental and quasi-governmental requirements.

b) Landlord reserves the right to require Tenant and Tenant's employees, servants, agents and contractors, or anyone else over whom Tenant has control, to park in areas of the Building designated by Landlord as employee parking area(s) and

to restrict Tenant and Tenant's employees, servants, agents or contractors, or anyone else over whom Tenant has control, from parking in any other area(s) whatsoever. Tenant shall, upon request, promptly furnish to Landlord the license numbers of all motor vehicles operated by Tenant and by Tenant's employees, servants, agents or contractors, or anyone else over whom Tenant has control. In the event that Tenant, Tenant's employees, servants, agents or contractors, or anyone else over whom Tenant has control, park vehicles in areas of the Building, other than those area(s) that may be designated by Landlord, then Landlord shall have the right, in addition to Landlord's rights set out in **Schedule "D"** herein and in addition to any other remedy Landlord may have, to charge Tenant **Fifty ($50.00) Dollars** per vehicle per day or part of a day that such vehicle is parked in any undesignated area. Such charges shall be deemed to be Additional Rent under this Lease and collectible as such.

ARTICLE 13. LANDLORD'S REMEDIES, LANDLORD'S RIGHTS

13.1 LANDLORD'S REMEDIES

a) It is hereby expressly agreed that:

(i) if default is made in the payment of Rent as the same falls due; or,

(ii) in case Tenant defaults or is in breach of the fulfilment or observance or performance or fails to perform, observe or fulfil any other term, covenant or condition, whether expressed or implied, in this Lease on the part of Tenant to be observed or performed (other than the payment of Rent as the same falls due), which default continues for **ten (10)** days after delivery of written notice of such default, or if the default is not capable of being cured within **ten (10)** days, if Tenant fails to begin to cure the default within **ten (10)** days and to continue with all due diligence until the default is cured (time to be considered strictly of the essence of this provision); or,

(iii) if the Term or any of Tenant's Trade Fixtures and/or the goods or chattels in or on the Premises shall be at any time seized or attached or taken in execution or attachment or under extra-judicial process by any creditor or creditors of Tenant, or shall be seized or distrained for business or income taxes or under a security interest, including, without limitation, a bill of sale or chattel mortgage or conditional sales contract, or under any other type of security; or,

(iv) in case Tenant shall without Landlord's consent, such consent not to be unreasonably withheld, attempt to or shall remove, mortgage, charge or encumber Tenant's Trade Fixtures, or attempt to or shall remove, mortgage, charge or encumber its goods and chattels, except in the ordinary course of its business, or if Tenant shall make any assignment for the benefit of creditors or, becoming bankrupt or insolvent, shall take the benefit of any Act that may be in force for bankrupt or insolvent debtors, or if any proceedings shall be taken or order shall be made for the winding up of Tenant; or,

(v) in case Tenant shall abandon or attempt to abandon the Premises or in case the Premises shall become vacant or unoccupied for a period of five (5) consecutive days or be used for any other purpose than as permitted under the terms hereof, or be used by any other person than such as are entitled to use them, as provided for under the terms hereof, or in case Tenant ceases to carry on business on the Premises; or,

(vi) in case a judgment of any court of competent jurisdiction is obtained against Tenant and remains unsatisfied for a period of **ten (10)** days after its entry; or

(vii) Tenant, or an indemnifier or guarantor hereof, or any party occupying the Premises, becomes bankrupt or insolvent or takes the benefit of any act now or hereafter in force for bankrupt or insolvent debtors or files any proposal or makes any assignment for the benefit of creditors or any arrangement or compromise; or

(viii) a receiver or receiver and manager is appointed for all or a portion of Tenant's property or such indemnifier's, guarantor's or occupant's property; or

(ix) any step is taken or any action or proceeding is instituted by Tenant or by any other party including, without limitation, any court or governmental body of competent jurisdiction for the dissolution, winding-up or liquidation of Tenant or its assets; or

(x) Tenant defaults under any loan agreement made between Landlord and Tenant and it has not cured such default as provided for therein,

then, and in every such case, Landlord shall have the right to re-enter the Premises and forfeit this Lease, if Landlord so desires, or Landlord shall have the option of terminating this Lease, and, upon either a forfeiture hereof or the exercise by Landlord of its option to terminate this Lease, this Lease shall terminate, cease and be void and the Term hereby granted expire and be at an end, all without prejudice, however, to any other remedy Landlord may have, including, and without restricting the generality of the foregoing, maintaining an action for full damages for the unexpired portion of the Term, without any requirement in law or in equity imposed upon Landlord to notify Tenant, prior to, concurrently with, or at any time following re-entry and forfeiture or the exercise of the option by Landlord to terminate this Lease, and seek damages from Tenant for the unexpired portion of the Term, which said requirement is hereby waived and dispensed with by Tenant, anything herein contained to the contrary notwithstanding (it being understood and agreed that any default, seizure, distraint, attachment, assignment, bankruptcy, or insolvency, winding-up, non-observance, non-performance, breach, abandonment, vacating, failing to occupy, or any other matter referred to herein shall be deemed to be a fundamental breach going to the root hereof and amounting to a repudiation by Tenant hereof) and notwithstanding that Landlord has distrained and seized or may distrain or seize upon Tenant's Trade Fixtures, goods and/or chattels for any amount which may be owing or deemed to be owing by Tenant pursuant to the terms hereof, it being agreed and understood that any such distress and/or seizure shall in no event be deemed to be a recognition by Landlord (except at its option) of the continuing existence of the within Lease and tenancy and any payment of Rent shall not give Tenant the right to continued occupancy of the Premises, and Landlord may in exercising any of its rights hereunder, without notice or any form of legal process, forthwith re-enter, take or obtain possession of the Premises, or any part thereof in the name of the whole, as though Tenant or its servants or any occupant of the Premises, or any part thereof, were holding over after the expiration of the Term and Landlord may thereafter have repossession of and enjoy the same as of its former estate, and shall be entitled to remove Tenant's effects therefrom, into the custody of a bailee or other person at the sole cost of Tenant, including any and all storage charges resulting therefrom.

b) Upon the happening of any one or more of the matters referred to in paragraphs 13.l(a)(i) to (vi) above, Landlord shall, in addition to all of the other remedies and rights herein granted to it, be entitled to:

(i) re-let the Premises, or any part thereof, either in the name of Landlord or otherwise, for a term or terms which may, if Landlord chooses, be less or greater than the balance of the then existing Term hereof and Landlord may grant reasonable concessions in connection therewith;

(ii) receive from Tenant, on demand, repayment of the unamortized portion of Tenant Allowance (amortized over the initial Term) as well as such reasonable expenses as Landlord may incur in re-letting the Premises, including, without limitation, legal costs, solicitor's fees and real estate commissions or brokerage;

(iii) receive from Tenant, on demand, the expenses of keeping the Premises in good order and condition and/or preparing the Premises for re-letting;

(iv) make any alterations, repairs, replacements, renewals or decorations, in whole or in part, in or to the Premises, which Landlord may consider advisable and necessary for the purpose of re-letting them, and any such alterations, repairs, replacements, renewals or decorations, in whole or in part, shall not operate or be construed to relieve Tenant of its obligations or liabilities hereunder.

c) Upon the happening of any one or more of the matters referred to in paragraphs 13.1(a)(vi) to (ix), the next **three (3)** months' Rent shall immediately become due and payable as accelerated rent, and Landlord may re-enter and take possession of the Premises as though Tenant, or any other occupant of the Premises were holding over after the expiration of the Term, and this Lease, at the option of Landlord, will become forfeited and determined. The accelerated rent will be recoverable by Landlord in the same manner as the Rent hereby reserved and as if the Rent were in arrears.

13.2 LANDLORD'S RIGHTS

a) In addition to all rights and remedies of Landlord available to it in the event of any default hereunder by Tenant, either by virtue of any other provision hereof or by statute or the general law, Landlord:

(i) shall have the right (but shall not be obligated to), at all times, upon reasonable notice to Tenant, to remedy or attempt to remedy any default of Tenant, and in so doing, may make any payments due by Tenant to third parties and may enter upon the Premises to do any work or other things therein, and, in such event, all reasonable expenses of Landlord in remedying or attempting to remedy such default shall be payable by Tenant to Landlord forthwith upon demand;

(ii) if Landlord re-enters the Premises pursuant to the provisions of either this Lease or any applicable law, it may either terminate this Lease or it may from time to time, without terminating Tenant's obligations under this Lease, make any alterations and repairs considered by Landlord necessary to facilitate a re-letting, and re-let the Premises or any part thereof as agent of Tenant for such term or terms and at such rental or rentals and upon such other terms and conditions as Landlord in its reasonable discretion considers advisable. Upon each re-letting all Rent and other moneys received by Landlord from the re-letting will be applied to the payment of (a) indebtedness other than Rent due hereunder from Tenant to Landlord (b) costs and expenses of there-letting including brokerage fees, legal fees and costs of the alterations and repairs and (c) Rent due and unpaid hereunder. The residue, if any, will be held by Landlord and applied in payment of future Rent as it becomes due and payable. lf the rent received from the re-letting during a month is less than the Rent to be paid during that month by Tenant, Tenant shall pay the deficiency to Landlord. The deficiency will be calculated and paid monthly. No re-entry by Landlord will be construed as an election on its part to terminate this Lease unless a written notice of that intention is given to Tenant. Despite a re-letting without termination, Landlord may subsequently elect at any time to terminate this Lease for a breach which is then continuing.

(iii) may recover, as Additional Rent, all reasonable sums paid or expenses incurred hereunder by Landlord which ought to have been paid or incurred by Tenant or for which Landlord hereunder is entitled to reimbursement from Tenant and any interest owing to Landlord hereunder, by any and all remedies available to it for the recovery of Rent in arrears;

(iv) shall have the right to obtain injunctive relief in the event Tenant threatens to cease to carry on Tenant's business or ceases to carry on Tenant's business from the Premises.

b) Tenant hereby waives and renounces the benefit of any present or future Act of the legislature of the Province of Nova Scotia, taking away or limiting Landlord's rights of distress and agrees with Landlord that, notwithstanding any such Act, Landlord may seize upon and sell, by private sale or otherwise, to any person, including Landlord, all Tenant's goods and chattels for payment of Rent (including, without limitation, any accelerated Rent), costs or any other moneys which may be due to Landlord pursuant to the terms hereof.

c) If Tenant shall remain in possession of the Premises after the expiration of the Term and Landlord shall accept Rent, the acceptance of the Rent by Landlord shall not be deemed to renew the Term or tenancy created by this Lease and, in the absence of any agreement in writing between Landlord and Tenant, Tenant shall be deemed to be a tenant-at-will only, but such tenancy-at-will shall be subject, as far as applicable to a tenancy-at-will, to the covenants, provisions and conditions hereof and Rent shall be two times the Rent payable during the month immediately preceding the expiration or termination hereof.

d) Should Tenant be in default in the payment of any Rent as provided for in this Lease or any other terms, covenants or conditions of the within Lease and should Landlord re-enter and take possession of the Premises as hereinbefore provided, then any Advance Rental paid under this Lease shall belong absolutely to Landlord, without prejudice, however, to Landlord's right to claim full damages against Tenant for the unexpired portion of the Term.

e) No waiver on behalf of Landlord of any breach of any of the covenants, provisions, conditions, restrictions or stipulations contained in this Lease, whether negative or positive in form, shall take effect or be binding upon Landlord, unless the same is expressed in writing under the authority of Landlord or its agent, and any waiver so expressed shall extend only

to the particular breach so waived and shall not limit or affect Landlord's rights with respect to any other or future breach.

f) Landlord may distrain for Rent, including accelerated Rent, if any, or for any money hereby made recoverable by distress upon the goods and chattels of Tenant wheresoever situated and upon any other premises to which the same may have been removed and wherever the same may be found within the Province or Territory, as the case may be, in which the Premises are situate. Tenant hereby further agrees that Landlord may, at its option, sell such goods and chattels as are seized by levy of distress by way of public sale or by private sale to itself or any other party.

g) Unless otherwise expressly provided for in this Lease, any Rent in arrears and all moneys due under this Lease and all sums paid for expenses incurred by Landlord, which ought to have been paid or incurred by Tenant, shall bear interest at the prime lending rate per annum from time to time charged or which would be charged to Landlord by its bank or lending institution, plus **six percent (6%)** per annum, calculated monthly ("**Interest**"), from the date the same became due or were spent or incurred, as the case may be, until the date of payment or repayment, and any judgment obtained against Tenant relating to this Lease shall provide for Interest thereon, which Interest shall run and be included and payable on any such judgment, until such judgment shall be fully satisfied.

h) Notwithstanding anything contained in this Lease to the contrary or not contained in this Lease, payment of Rent and each and every other payment or sum of money required to be paid by Tenant to Landlord pursuant to any provision hereof, whether by way of indemnity or otherwise, shall be payable without any prior demand therefor, and shall, from and after the past due date of payment thereof, be deemed to be and construed as Rent, and all rights and remedies available to Landlord for the collection of Rent and all rights and remedies available to Landlord for the collection of Rent in arrears may be resorted to by Landlord for the collection thereof, with Interest and costs as provided for in this Lease.

i) In the event that Landlord shall be entitled, under the terms hereof or by law, to enter the Premises, then Landlord shall be at liberty to effect such re-entry forcibly, and, for such purpose, Landlord, or its servants or agents, may break open locks, doors, windows otherwise, as may be deemed necessary for such purposes, without in any way incurring any liability or becoming responsible for damages or otherwise to Tenant.

j) Landlord shall have the right to apply the whole or any part of any Advance Rent paid in accordance with the terms hereof on account of the Rent or any other Rent or other moneys outstanding or accruing due under this Lease.

k) If Tenant, at any time during any period Tenant is allowed possession of the Premises or throughout the Term or at the expiration or early termination of the Term, is in default under any covenant or obligation contained in this Lease, Landlord shall have a lien on all Tenant's stock-in-trade, inventory, equipment and facilities, and Tenant's Trade Fixtures, as security against loss or damage resulting from any such default by Tenant, inclusive of non-payment of Rent, and none of the foregoing items shall be removed by Tenant, or anyone acting for or on Tenant's behalf, unless and until such default is remedied.

l) Landlord shall, in respect of the Building, maintain insurance against any form or forms of loss necessary to enable it to perform its obligations under this Lease and as a prudent Landlord would reasonably deem necessary, from time to time, and the cost thereof shall be deemed to be included as part of the Additional Rent.

m) During the last **twelve (12)** months of the Term, Landlord shall have the right to erect signage upon the Premises and Common Areas showing the Premises as available for lease and Landlord shall have the right during Normal Business Hours, but upon reasonable notice to Tenant, to show the Premises to prospective tenants, provided Tenant's business is not adversely affected.

n) Landlord may, from time to time, resort to any or all of the rights and remedies available to it in the event of any default under this Lease by Tenant, either by any provision hereof or by statute or the general law, all of which rights and remedies are intended to be cumulative and not alternative, and the express provisions under this Lease as to certain rights and remedies are not to be interpreted as excluding any other or additional rights and remedies available to Landlord by statute or the general law.

o) Tenant shall pay to Landlord all expenses incurred by Landlord, including but not limited to legal fees and disbursements on a solicitor and his own client basis, in connection with any steps or legal action taken by Landlord in consequence of any breach hereof by Tenant.

ARTICLE 14. SUBORDINATION, NON-DISTURBANCE, CERTIFICATE, NON-REGISTRATION OF LEASE

14.1 SUBORDINATION, NON-DISTURBANCE

a) Tenant hereby subordinates its rights hereunder to the lien or charge of any mortgage or mortgages, or the lien or charge resulting from any other method of financing or refinancing, declaration of trust, debenture issue or any other such method of financing or refinancing, now or hereafter in force or placed upon or against the Building, or any part thereof, and of all advances made or hereafter to be made on the security thereof. The validity hereof shall be recognized by the holder of such lien or charge, notwithstanding the default of landlord under any such mortgage, declaration of trust, debenture, issue or other method of financing or re-financing or any foreclosure thereof, and Tenant's possession and right to use in and to the Premises and the Common Area will not be disturbed in consequence thereof, so long as Tenant is not in default under the terms hereof.

b) If any Mortgagee from any financing or refinancing, declaration of trust, debenture issue or any such other method of financing or refinancing, now or hereafter in force or placed upon or against the Building, or any part thereof, shall at any time require any change, not of a substantial nature, in any of the terms, covenants or provisions hereof, Tenant will consider, acting reasonably, the modification hereof to comply with the requirement of such Mortgagee.

c) It is further agreed that Landlord may assign this Lease and/or the Rent, or any portion thereof, in the event of any financing or refinancing, and notice to that effect signed by Landlord shall be a sufficient authority for Tenant to pay the Rent, or such portion thereof as is assigned, and the receipt of such assignee of Landlord shall be a full and adequate discharge to Tenant for such payment

d) In the event of any Mortgagee, receiver, receiver-manager or trustee under any mortgage, trust deed, debenture or other charge duly going into possession of the Building, or any part thereof, Tenant shall attorn to and become the tenant of such Mortgagee or trustee.

e) If at any time during the currency of a Mortgage of the interest of Landlord in the Premises or the Building, notice of which has been given to Tenant, Landlord shall be in default under this lease and such default would otherwise allow Tenant to terminate this lease, Tenant, before becoming entitled as against the Mortgagee to exercise any right to terminate this lease, shall give to Mortgagee notice in writing of such default. Such Mortgagee shall have **sixty (60)** days after the giving of such notice, or such longer period as may be reasonable in the circumstances, within which to remedy such default, and if such default is remedied within such time Tenant shall not, by reason thereof, terminate this lease. The rights and privileges granted to any such Mortgagee by virtue of this Article shall not be deemed to alter, affect or prejudice any of the rights and remedies available to Tenant as against Landlord. Any notice to be given to such Mortgagee shall be deemed to have been properly given if mailed by registered mail to its most recent address.

14.2 ESTOPPEL CERTIFICATES

Each party at any time and from time to time within **ten (10)** days after notice from the other shall execute and deliver to the other a statement in writing certifying that this lease is unmodified and in full force and effect (or, if modified, stating the modifications and that the same is in full force and effect as modified), the amount of the Rent then being paid under this lease, the dates to which the same have been paid, the Commencement Date and duration of the Term and stating whether or not there is any existing default of which it has notice, and the particulars and amount of insurance policies on the Premises. Any statement delivered pursuant to the provisions of this Article shall be conclusive of the matters therein referred to, it being intended that any such statement delivered pursuant to this paragraph may be relied upon by any prospective purchaser of the Building, or any part thereof, or any Mortgagee or holder of any charge thereof, or any assignee of any Mortgage or charge upon the Building or any part thereof.

14.3 NON-REGISTRATION

a) Subject to the written approval of Landlord as to the form and content, Tenant shall have the right to register a notice of lease respecting this Lease in the appropriate Land Titles Office, but shall not be entitled to register this Lease, or attach this Lease to such notice and shall not, in any event, register such notice prior to the Commencement Date. Such notice shall, however, only recite the parties to this Lease, the date hereof, the legal description of the Lands and the Term.

b) Should Landlord, in its judgment, consider it necessary, advisable or expedient to further vary the boundaries of the Lands as they are constituted from time to time, by addition to or subtraction from the Lands, Tenant agrees to partially discharge any notice previously registered against the Lands, all at Landlord's cost, so that such notice will only relate to the Lands as they exist, from time to time, after any such variation of boundaries (provided such discharge does not substantially adversely affect the use or enjoyment of the Premises by Tenant or Tenant's business). Landlord or its solicitors may, at Landlord's cost, deliver a partial discharge of notice to Tenant to be executed and returned **within ten (10)** days.

ARTICLE 15. INTERPRETATION

15.1 APPLICABLE LAW

The provisions hereof shall be construed and interpreted in accordance with, and the rights of the parties hereto be governed by, the laws of the Province of Nova Scotia. Each of the parties hereto hereby irrevocably attorns to the jurisdiction of the Courts of the Province of Nova Scotia.

15.2 ENTIRE AGREEMENT

This Lease, together with all schedules annexed or attached hereto, contains all the representations, warranties, covenants, agreements, conditions and understandings between Landlord and Tenant concerning the Premises and the Building and is intended by Landlord and Tenant to be a final expression of their agreement and as a complete and exhaustive statement of the terms thereof, all negotiations, representations, warranties, covenants, agreements, conditions and understanding, including without limitation the terms of all offers to lease made between Landlord and Tenant with respect to the Premises, having been incorporated herein, and it is so admitted by Tenant so that Tenant shall be forever estopped from asserting to the contrary. Without limitation, this Lease, together with all schedules annexed or attached hereto, shall supersede the terms of all offers to lease made between Landlord and Tenant with respect to the Premises, and all such offers to lease shall be deemed to be null and void and of no further force or effect upon the execution hereof.

15.3 FORCE MAJEURE

Whenever and to the extent that either party shall be unable to fulfill or shall be delayed or restricted in the fulfilment of any obligation imposed upon the other party under the terms hereof in respect of construction, the supply or provision of any service or utility, or the doing of any work or the making of any repairs, replacements and/or renewals, in whole or in part, by reason of being unable to obtain the materials, goods, equipment, service, utility or labour required to enable that party to fulfill any such obligation, or by reason of any statute, law or order-in-council or any regulation or order passed or made pursuant thereto, or by reason of the order or direction of any administration, controller or board, or any governmental department or office or other authority required, or by reason of any other cause beyond its control, whether of the foregoing character or not, including, but without limiting the foregoing, acts of God, fire, strikes or unfavourable weather, the party shall be relieved from the fulfillment of such obligation during the period of such delay, and the other party shall not be entitled to compensation for such inconvenience, nuisance or discomfort thereby occasioned or to treat that part as being in default under this Lease.

15.4 LANDLORD

It is expressly understood and agreed that the term **"Landlord"**, as used in this Lease, shall mean the owner only for the time being of the Building, and, in the event of the sale, assignment or transfer by such owner of its or their interest in the Building (and the assumption of Landlord's obligations under this Lease by the new owner), such owner shall thereupon be released and discharged from all of the covenants and obligations of Landlord thereafter accruing under this Lease and Tenant shall look to Landlord's

successor(s) or assign(s), as the case may be, for the enforcement of such covenants and obligations. All rights of Tenant shall be enforceable against the Lands only, and not in personam against Landlord or any of Landlord's other assets.

15.5 HEADINGS

Any captions, paragraph or Article numbers or marginal notes appearing in this Lease are inserted only as a matter of convenience and in no way define, limit or describe the scope or intent hereof, nor any part thereof.

15.6 TENANT

The word **"Tenant"** shall be deemed and taken to mean each and every person or party mentioned as a Tenant in this Lease and, if there is more than one Tenant, covenants of Tenant contained in this Lease shall be held and construed as both joint and several; and, if there shall be one or more person or party to this Lease, any notice required or permitted by the terms hereof may be given by or to any one thereof, and shall have the same force and effect as if given by or to all thereof. The use of the neuter, or singular pronoun to refer to Landlord or Tenant shall be deemed a proper reference even though Landlord or Tenant may be an individual, partnership, corporation or a group of two or more individuals or corporations. The necessary grammatical changes required to make the provisions hereof apply in the plural sense, where there is more than one Landlord or Tenant, and to either corporations, associations, partnerships, entitles (legal or otherwise) or individuals, males or females, shall, in all instances, be assumed as though in each case fully expressed, and the term "person" or "persons", when used in this Lease, shall, where the context permits, include natural persons, corporations, partnerships, associations, regulatory bodies and entitles, legal or otherwise.

15.7 SUCCESSORS AND ASSIGNS

Unless the context otherwise requires or unless expressly provided otherwise, the word **"Landlord"** and the word **"Tenant",** whenever used in this Lease, shall be construed to include and shall mean the successors and assigns of Landlord, and the successors and approved assigns of Tenant, and the heirs, executors and administrators of any individual Tenant, and Tenant's agents, servants, licensees, contractors, or any person whatsoever permitted by Tenant to be upon the Building or the Premises.

15.8 SEVERABILITY

If any covenant, obligation, agreement, term or condition hereof, which is not a fundamental term going to the root hereof, or the application thereof to any person or circumstance, shall, to any extent, be invalid or unenforceable, the remainder hereof or the application of such covenant, obligation, agreement, term or condition to persons or circumstances, other than those in respect of which it is held invalid or unenforceable, shall not be affected thereby and each covenant, obligation, agreement, term and condition hereof shall be separately valid and enforceable to the fullest extent permitted by law.

15.9 OBLIGATIONS

Nothing contained in this Lease shall be construed as imposing upon Landlord the obligation of performing or carrying out or incurring any costs, charges or expenses relating to any one or more items, or any part thereof, of Operating Costs, if, in the opinion of Landlord, it is unnecessary, unreasonable or impractical to do so. Landlord shall, in no event be liable to Tenant or to invitees or licensees including clients or customers of Tenant for direct, indirect or consequential damage or damages to Tenant or any of the foregoing persons nor shall Tenant or such persons previously described be entitled to any compensation or to any repayment or reduction in Rent by reason of any interruption, inconvenience, nuisance or discomfort arising from the repair, renovation, alteration, rebuilding or expansion of any portion of the Building (including the Common Areas and the systems of the Building) or any construction or other work on the Lands provided Landlord uses its reasonable efforts to minimize such interruption, inconvenience, nuisance or discomfort.

15.10 INCLUDED MEANINGS

Whenever any term defined in this Lease is used in this Lease, such term, if required by Landlord, shall be deemed to include, where not specifically stated, the words **"any part or parts thereof"** and as used in this Lease, unless the context otherwise requires, the expressions **"this Lease", "hereof", hereby", "hereto", "hereunder", "thereof"** and similar expressions refer to this Lease and all schedules annexed or attached to this Lease as a whole and not to any particular Article, Subarticle, paragraph, subparagraphs or

other portion thereof, and the use of the term **"law"** or **"laws"** shall include all federal, provincial and municipal laws, ordinances, codes, by-laws, rules, regulations and any other legal requirements whatsoever. **"Term"** shall include any and all renewal(s) thereof.

15.11 LANDLORD'S ADVISOR

Landlord's Advisor, in making any determination pursuant to the terms hereof, shall act impartially and reasonably and in good faith, shall be deemed to be acting as an expert and not an arbitrator, and the determination of Landlord's Advisor shall be final and binding on both Landlord and Tenant and the *Arbitration Act* of Nova Scotia, or any similar legislation in force in the Province of Nova Scotia from time to time, shall not apply.

15.12 MEASUREMENT OF THE PREMISES

The Rentable Area of the Premises shall be verified by Landlord's Advisor in accordance with BOMA measurement methods and a signed certificate stating the actual measurement of the Premises shall be issued to Tenant. Rent shall be adjusted accordingly.

15.13 PARTNERSHIP OR AGENCY

By entering into this Lease, Landlord does not in any way or for any purpose become a partner of Tenant nor is the relationship of principal and agent created.

15.14 BROKERAGE COMMISSION

Since Landlord has not employed or retained a broker for this Lease or anything related to it, Tenant will indemnify and hold Landlord harmless from claims for commission with respect to this Lease or any matter related to it.

15.15 TIME OF THE ESSENCE

Time is of the essence of this Lease and every part thereof.

ARTICLE 16. NOTICES

16.1 NOTICES

Any notice required or contemplated by any provision hereof shall be given in writing and shall be signed by the party giving the notice, addressed, in the case of Landlord:

c/o Page Property Management
7071 Bayers Road, Suite 4007
Halifax, Nova Scotia B3L 2C2

in the case of notice to Tenant:

at the Premises

delivered or sent by facsimile, registered mail or electronic mail, postage prepaid, return receipt requested. The time of giving of such notice if mailed shall be conclusively deemed to be the fifth (5th) business day after the day of such mailing unless regular mail service is interrupted by strikes or other irregularities. Such notice, if delivered or sent by facsimile or electronic mail, shall be conclusively deemed to have been given and received at the time of such delivery or the time of such sending by facsimile or electronic email unless received after 5:00 p.m. in which event such notice shall be deemed to have been given and received on the next business day. If in this Lease two or more persons are named as Tenant, such notice shall be delivered personally to any one of such persons. Provided that either party may, by notice to the other, from time to time designate another address in Canada to which notices mailed more than ten (10) days thereafter shall be addressed.

ARTICLE 17. ADDITIONS, SUBDIVISION AND ASSIGNMENT

17.1 ADDITIONS AND DISPOSITION

Tenant acknowledges and agrees the general layout of the Building and the adjoining lands and buildings and shall not be deemed to be a representation or agreement of Landlord that the Building and the adjoining lands and buildings will be exactly as indicated, and that nothing in this Lease shall be construed so as to prevent Landlord from adding additional lands to the Building or disposing of any portion of the Building. Without limitation, Tenant expressly acknowledges and agrees that Landlord may from time to time, in Landlord's sole and unilateral discretion, add additional lands to the Building or dispose of any portion of the Building, including without limitation a disposition by way of dedication for road widening, corner cutting, turning bays or other public purposes, whether by sale, agreement for sale, mortgage, hypothecation, quit claim or otherwise, and when and so often as Landlord shall add additional lands to the Building or dispose of any portion of the Building, then the defined terms "Building" and "Lands" herein shall automatically be amended to include all additional lands added to the Building and shall automatically be amended to exclude all portions of the Building disposed of by Landlord as aforesaid, and Landlord shall revise Tenant's Proportionate Share in accordance with Article 4.2. Tenant hereby waives its right to any claim against Landlord related directly or indirectly to the addition of lands or disposal of lands from the Building.

17.2 SUBDIVISION

In the event Landlord decides to register a plan of subdivision (the **"Plan"**) of the Lands, or any part thereof, Tenant hereby consents to the registration of the Plan, and covenants with Landlord to provide any consents and perform any acts required of Tenant relating to or incidental to the registration of the Plan, and, upon registration of the Plan, the Lands shall be deemed amended to reflect the result of the registration of the Plan, and Tenant shall forthwith discharge or cause to be discharged any notice or other instrument relating to this Lease, remaining registered against that portion of the Lands resulting from the registration of the Plan, to which this Lease no longer applies, and Landlord shall revise Tenant's Proportionate Share in accordance with Article 4.2.

17.3 SALE OR ASSIGNMENT

The rights of Landlord under this Lease may be sold, mortgaged, charged, transferred or assigned at any time and from time to time to a purchaser, Mortgagee, trustee for bond holders or otherwise, and in the event of a sale or an assignment or default by Landlord under any Mortgage, trust deed or trust indenture and the purchaser, assignee, Mortgagee or trustee, as the case may be, duly entering into possession of the Land, the Building or the Premises, Tenant will, and does hereby, attorn to and agree to become the tenant of such purchaser, assignee, Mortgagee or trustee under the terms hereof. Tenant shall, at the request of Landlord, provide a written acknowledgement of receipt of a notice of assignment by Landlord.

ARTICLE 18. ACCEPTANCE

18.1 ACCEPTANCE

Tenant does hereby acknowledge that Landlord is not required to do any work or provide any improvements to the Premises, except as expressly otherwise provided for in this Lease, and Tenant hereby accepts the Premises in their condition existing at the Commencement Date, and does hereby accept this Lease of the Premises subject to the conditions, restrictions, provisos, obligations and covenants above set forth.

18.2 EXECUTION

The parties hereto agree that this Lease may be transmitted by facsimile device or such other electronic and digital transmission and that the reproduction of signatures by way of facsimile device or electronic and digital transmission will be treated as though such reproductions were executed originals and communication by such means shall be legal and binding.

THE REMAINDER OF THIS PAGE IS BLANK, AND THE SIGNATURE PAGE FOLLOWS

ARTICLE 19. EXECUTION

IN WITNESS WHEREOF the parties hereto have executed this Lease.

RANK INCORPORATED

Per: _____
Joseph Ramia
Director
I have the authority to bind the Corporation.

COMPANY NAME

Witness _____
Print Name: **MARK DAVID**

METAMATERIAL INC.

Per: _____
George Palikaras
President and CEO
I have the authority to bind the Corporation.

Witness _____
Print Name: **Nadine Geddes**

SCHEDULE "A": DESCRIPTION OF LANDS

Parcel Description – PID 40430191

Registration County: HALIFAX COUNTY
Street/Place Name: HIGHFIELD PARK DRIVE /DARTMOUTH
Title of Plan: PLAN OF SURVEY OF PARCEL B A S/D & CONSOLIDATION OF BLOCKS MM-1 & MM-18A LANDS REGISTERED TO RANK INCORPORATED
Designation of Parcel on Plan: BLOCK MM-18AB
Registration Number of Plan: 103412202
Registration Date of Plan: 2013-07-15 10:00:17

Together with a right of way over Lot HP-8 as more particularly described in Document 40762 recorded July 2 1987.

Subject to Service Easement ME-6 as more particularly described in Document 37140 recorded June 18 1987.

Subject to a Service Easement ME-7 as more particularly described in Document 47209 recorded July 28 1987 and Document 40761 recorded July 2 1987.

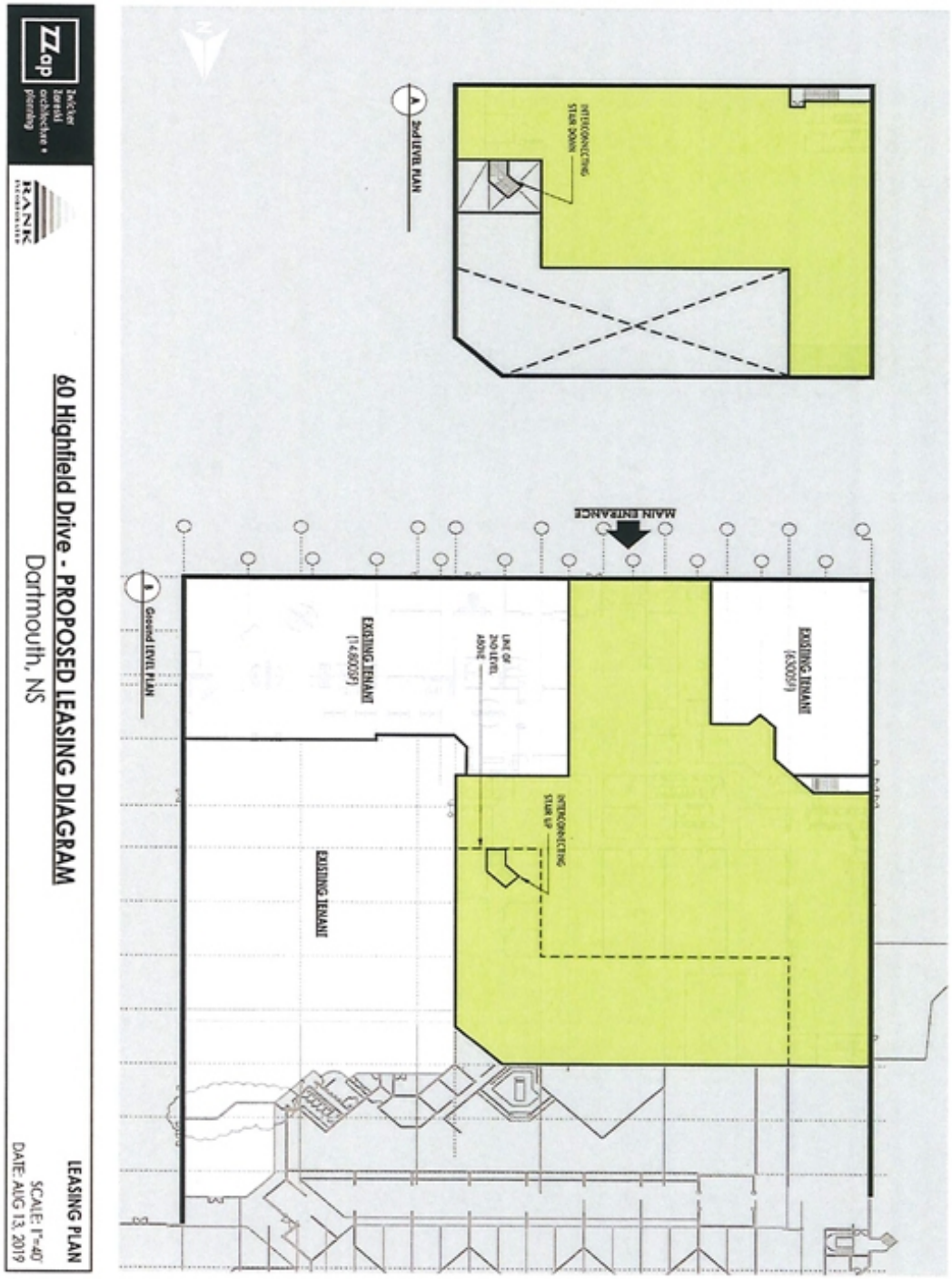
Subject to an Easement in favour of Heritage Gas Limited as more particularly described in an Easement Agreement found recorded as Document 102155877.

*** Municipal Government Act, Part IX Compliance ***

Compliance:

The parcel is created by a subdivision (details below) that has been filed under the Registry Act or registered under the Land Registration Act
Registration District: HALIFAX COUNTY
Registration Year: 2013
Plan or Document Number: 103412202

SCHEDULE "B": PREMISES



SCHEDULE "C": LANDLORD'S WORK AND TENANT'S WORK

A. Landlord's Work

There is no Landlord's Work - the Tenant will accept the Premises on an "as is, where is" basis.

B. Tenant's Work

All or other work required to fully fixture and equip the Premises to ready them for the conduct of the Tenant's business therein (including all construction work according to the Tenant's Plans and Specification approved by the Landlord) shall be completed by the Tenant, at the Tenant's cost, subject to prior written approval of the Landlord, in accordance with the provisions of the Lease.

SCHEDULE "D": RULES AND REGULATIONS

1. SECURITY - Landlord may from time to time adopt appropriate systems and procedures for the security or safety of the Property, including the Common Area in the Premises, any person occupying, using or entering the same, or any equipment, finishings or contents thereof.

2. RETURN OF KEYS - At the end of the Term, Tenant shall promptly return to Landlord all keys for the Property and Premises which are in possession of Tenant.

3. WINDOWS - Tenant shall observe Landlord's rules with respect to maintaining window coverings at all windows in the Premises so that the Property represents a uniform exterior appearance, and no any window shades, screens, drapes, covers or other materials on or at any window in the Premises shall be installed without Landlord's prior written consent. All window coverings on external windows shall be maintained so as to maintain a uniform exterior appearance.

4. REPAIRS, MAINTENANCE, ALTERATIONS AND IMPROVEMENTS - No repairs, maintenance, alterations or improvements to the Premises shall be carried out by Tenant except during the times agreed to in advance by Landlord and in a manner which will not interfere with the rights of other tenants in the Property.

5. WATER FIXTURES - Water fixtures shall only be used for the purposes for which they were intended. Any cost or damage resulting from such misuse by Tenant shall be paid for by Tenant.

6. PERSONAL USE OF PREMISES - The Premises shall not be used or permitted to be used for residential, lodging or sleeping purposes or for the storage of personal effects or property not required for business purposes.

7. HEAVY ARTICLES – No safe or other heavy article, which in Landlord's reasonable opinion may damage the Premises, shall be placed in or moved about the Premises without Landlord's prior written consent.

8. BICYCLES, ANIMALS – Subject to the Permitted Use, no animals or birds shall be brought onto the Property. No bicycles or other vehicles or self or motorized propulsion shall be used within the property and shall only be used or brought within the Property or the Premises and such shall only be parked except in areas designated from time to time by Landlord for such purposes.

9. FURNITURE AND EQUIPMENT – No furniture or equipment shall be moved into or out of the Premises through entrances, elevators or corridors or at time or by movers or moving companies except with the prior written approval of Landlord.

10. SOLICITATIONS - No canvassing, soliciting or peddling shall be conducted on the Property.

11. REFUSE – All refuse shall be placed in proper receptacles within the Premises or in receptacles provided by Landlord for the Property. Should Landlord determine that Tenant's use of the refuse bins provided at the Property are excessive, Landlord may require Tenant, at Tenant's expense, to provide its own refuse bin.

12. OBSTRUCTIONS - Tenant shall not obstruct or place anything in or on the sidewalks or driveways outside the Property or in the lobbies, corridors, stairwells or other common areas of the Property, or use such locations for any purpose except access to and exit from the Premises without Landlord's prior written consent. Tenant shall not obstruct access to the main heater ducts, janitors, and electrical closets and other Building systems. Landlord may remove at Tenant's expense any such obstruction or thing (unauthorized by Landlord) without notice or obligation to Tenant.

13. PROPER CONDUCT - Tenant shall not conduct itself in any manner which is inconsistent with the character of the Property as a quality building or which will impair the comfort and convenience of other tenants in the Property.

14. PARKING & SMOKING – Tenant is responsible for the enforcement of Landlord's parking and smoking policy with its employees, contractors, sub-contractors, agents, and those for whom it is law responsible.

15. USE OF PREMISES – Tenant shall not use or permit the use of the Premises in such manner as to create any noise or odours objectionable or offensive to Landlord or any other tenant of the Property or any other nuisance or hazard or the breach of any

applicable law or any requirement of the insurers of the Property. No musical instruments or sound producing equipment or amplifiers that may be heard outside the Premises, shall be played or operated on the Premises.

16. EMPLOYEES, AGENTS AND INVITEES - In these Rules and Regulations, Tenant includes the employees, agents, invitees and licensees of Tenant and others permitted by Tenant to use or occupy the Premises.

17. EMERGENCY – If any emergency situation arises Tenant shall cause all occupants of the Premises to vacate the Property if directed to do so by Landlord or any public authority, in the manner prescribed by such public authority.

18. NON-COMPLIANCE BY OTHER TENANTS – Landlord shall not be responsible to Tenant for any non- observance or violation of these Rules and Regulations by any other tenant and the failure by Landlord to enforce the Rules and Regulations with respect to any other tenant shall not constitute a waiver of the Rules and Regulations with respect to Tenant.

19. GENERAL – These rules and regulations, together with all amendments, deletions and additions, are not necessarily intended for uniform application, but may be waived in whole or in part in respect of other premises without waiving them as to future application to the Premises. The imposition of such rules and regulations shall not create any liability of Landlord of any such lack of enforcements. Landlord may vary, waive, replace, or add to the Rules and Regulations at any time and upon doing so shall deliver a copy thereof to Tenant.

SCHEDULE "E": SPECIAL PROVISIONS

A. EARLY POSSESSION

Provided the Tenant has executed and delivered the Lease, a CSIO certificate of insurance evidencing compliance with all insurance requirements set out herein, the Tenant shall be granted non-exclusive occupancy of the Premises on September 1, 2020 (the **"Early Possession Date"**). The Tenant shall be entitled to install its trade fixtures in the Premises and undertake construction within the Premises as and from the Early Possession Date. The plans and specifications for all construction to be undertaken by the Tenant in the Premises (the **"Tenant's Plans and Specifications"**) is subject to the prior written consent of the Landlord in its discretion, acting reasonably.

From the Early Possession Date until the Commencement Date (the **"Fixturing Period"**), the Tenant shall be subject to all terms and conditions of the Lease, save and except the Tenant shall not be required to pay Basic Rent or its Proportionate Share of Operating Costs and Property Taxes comprised in Additional Rent. The Tenant shall, however, be fully responsible for all charges for cleaning, maintenance and utilities consumed in the Premises during the Fixturing Period.

B. FREE RENT

Provided it is otherwise in good standing under the Lease, for the first **eight (8)** months of the Term, the Tenant shall not be required to pay Basic Rent or its Proportionate Share of Operating Costs and Property Taxes comprised in Additional Rent. Notwithstanding the foregoing, during any periods of free or reduced Rent provided for in the Lease, the Tenant will be required to comply with all other terms and conditions in the Lease, and, without limiting the foregoing, the Tenant will be responsible for the cost of cleaning, maintenance, pest control, and all utilities (whether or not separately metered) respecting the Premises, as well as all other Additional Rent as defined in the Lease.

C. OPTION TO RENEW

Provided the Tenant is itself in physical occupation of the Premises, is operating its business in the whole of the Premises and is not in default under the Lease or curing any such default, the Tenant shall have a one-time option to renew the Lease for a further **five (5)** year term on the same terms and conditions as provided for therein (save and except for any free Rent, any graduated Rent, any right to renew or extend, any right to terminate, and any allowance, concession or inducement of any nature, any fixturing period, or any Landlord's Work provided for hereunder or in the Lease, if any, will not apply to any renewal or extension of the original Term of the Lease), based on then current market rents, the same to be negotiated between Landlord and Tenant acting reasonably but which shall not be less than the Basic Rent payable in the last year of the Term. The Tenant must provide Landlord **nine (9) months'** prior written notice of its intent to exercise such Option to Renew (the **"Renewal Notice"**). In the event Landlord and Tenant are unable to agree on current market rents within **three (3)** months of receipt by Landlord of the Renewal Notice, such determination shall be referred to arbitration by a single arbitrator, in accordance with the provisions of the *Arbitration Act* of Nova Scotia.

D. SIGNAGE

Landlord shall provide Tenant with a location for signage on the side and front of the Building, as well as on the pylon sign for the Building, to be used in conjunction with other tenants. Design and size of signage is subject to Landlord's prior written consent, such consent not to be unreasonably withheld or delayed. The Tenant is solely responsible for the design, installation, maintenance, and removal of all approved signage.

E. TRAILER PARKING

For a **two (2)** year period starting on the Commencement Date, the Landlord will permit the Tenant to park a trailer in the parking lot adjacent to the Building in a designated parking space that does not affect parking for other tenants (and/or their guests and/or invitees) or affect the circulation of traffic in the parking lot. The designated parking space shall be mutually agreed upon in writing by the Landlord and the Tenant. The Tenant shall be required to insure the trailer at its sole cost and provide proof of such insurance to the Landlord upon request. At the conclusion of the **two (2)** year period, the Tenant shall remove the trailer from the parking lot.

F. RESTORATION

Tenant will turn the Premises over to the Landlord at the expiration of its tenancy in good repair and broom-swept clean condition, with no obligation to demolish any of the leasehold improvements, or to restore any part of the Building altered or demolished with the Landlord's consent, or to repair normal wear and tear, repairs caused by insurable hazards, latent defects, acts of God or repairs

for which the Landlord is responsible, save and except for the removal of signage and specialty fixtures, and repairs related to such removals.

G. **CLARIFICATION OF BASIC RENT**

For clarity, the following is a summary with respect to the payment of Basic Rent payable by the Tenant to the Landlord during the Term. The summary is for illustrative purposes only, and in the event of any discrepancy between the contents of this paragraph and Article 1.1(g) or any other provisions of this Lease, Article 1.1(g) shall govern.

Year 1: Free Rent Period: January 1, 2021 to August 31, 2021 = Gross Rent Free for 8 months
September 1, 2021 to December 31, 2021 = $6.50 x 25,000 sq. ft. (4 months);
Year 2: January 1, 2022 to December 31, 2022 = $6.50 x 30,000 sq. ft.;
Year 3: January 1, 2022 to December 31, 2023 = $6.50 x 40,000 sq. ft.;
Year 4: January 1, 2023 to December 31, 2024 = $6.50 x 50,000 sq. ft.;
Year 5: January 1, 2024 to December 31, 2025 = $6.50 x 53,000 sq. ft.;
Year 6: January 1, 2025 to December 31, 2026 = $8.00 x 53,000 sq. ft.;
Year 7: January 1, 2026 to December 31, 2027 = $8.00 x 53,000 sq. ft.;
Year 8: January 1, 2027 to December 31, 2028 = $10.00 x 53,000 sq. ft.;
Year 9: January 1, 2028 to December 31, 2029 = $10.00 x 53,000 sq. ft.; and

To end of Term: January 1, 2029 to August 31, 2031 = $10.00 x 53,000 sq. ft.

*4 month Fixturing Period is not included in the term noted above (September 1, 2020 to December 31, 2020)

H. **OPTION TO TERMINATE FOR EXPANSION**

Provided the Tenant is itself in physical occupation of the Premises, is operating its business in the whole of the Premises and is not in default under the Lease or curing any such default, on and from **September 1, 2026** (being the first day after the **fifth (5th)** anniversary of the expiration of the Gross Rent Free Period), if the Tenant wishes to expand its business operations into (i) additional space in the Building or (ii) additional space located in the buildings owned by the Landlord located at 40 or 50 Highfield Park, Dartmouth, Nova Scotia (collectively, the **"Expansion Premises"**), then it shall provide written notice of same (the **"Expansion Notice"**) to the Landlord specifying the amount of space and any other requirements necessary to accommodate such expansion (the **"Expansion Requirements"**). The Expansion Requirements shall not permit the Tenant to reduce the size of the Premises.

The Landlord shall have **sixty (60)** days from its receipt of the Expansion Notice to advise the Tenant in writing whether it is able to accommodate the Expansion Requirements in any or all of the locations comprised in the Expansion Premises. If the Landlord is able to accommodate the Expansion Requirements, the Landlord and Tenant shall forthwith negotiate the terms and conditions applicable to such space, both parties acting reasonably and in good faith. If the Landlord is unable to accommodate the Expansion Requirements, then the Tenant shall have a one-time right to terminate the Lease in the manner provided for herein.

If the Tenant elects to terminate the Lease as provided for in this paragraph I of this Schedule E, then it shall give written notice of termination to the Landlord **("Notice of Termination for Expansion"),** and the Lease shall terminate on the last day of the **ninth (9th)** full calendar month following the date of such Notice **("Termination Date for Expansion").** Contemporaneously with the delivery of the Notice of Termination for Expansion, the Tenant shall pay the Landlord the aggregate of the unamortized balance of (i) all amounts expended by the Landlord on behalf of the Tenant and (ii) all real estate or brokerage commission, based on an annual interest rate of **5%**, calculated as of the Termination Date for Expansion, and the Tenant shall deliver vacant possession of the Premises to the Landlord as provided for in the Lease. In addition to the foregoing, all principal and interest due and owing on the

Notice of Termination for Expansion pursuant to any loan agreement made by the Landlord to the Tenant, whether or not otherwise then due, shall become forthwith due and payable.

I. CONTINUOUS OPERATION

Provided the Tenant is not in default under the Lease or curing any such default, the Tenant shall not be obligated to continuously operate its business in the Premises. The Tenant will not be in default if it vacates the Premises prior to the expiration of the Term or any renewal *provided* the Tenant continues to perform, as and when due, all of its covenants and agreements in the Lease, including, without limiting the generality of the foregoing, the Tenant's obligation to pay all Rent as and when due and the Tenant's obligation to maintain in full force and effect all policies of insurance under the Lease as provided for in Article 7 and Article 11.4.

J. **ARTICLE 5.7 – TELECOMMUNICATIONS SYSTEMS -** Articles 5.7(a) and (d) are deleted.

K. **ARTICLE 5.8 – HVAC – Article 5.8 (a) and Article 5.8(b) -** In each of Article 5.8(a) and Article 5.8(b), the word "office" is deleted.

L. **ARTICLE 5.8 – HVAC – Article 5.8 (HVAC)** is subject to **Article 18.1 (Acceptance),** and in the event of any conflict between Article 5.8 and Article 18.1, the provisions of Article 18.1 shall take precedence.

M. **ARTICLE 6.3(B) - LANDLORD'S RIGHT TO REPAIR OR MAKE ALTERATIONS –** The first sentence of Article 6.3(b) is delated and replaced with the following:

"Landlord shall, in addition and notwithstanding anything to the contrary in this Lease contained, have the right to make any changes, expansions, reductions, enclosures, additions, renewals, replacements, repairs, improvements or alterations, in whole or in part, as Landlord, from time to time, may decide in respect of the Building, or any portion thereof, including the Premises, and Tenant shall not be entitled to compensation for any inconvenience, nuisance and/or discomfort or loss caused thereby unless such changes, expansions, reductions, enclosures, additions, renewals, replacements, repairs, improvements or alterations regularly and continually interfere in a material manner with the Tenant's access to and use of the Premises.

N. **ARTICLE 6.4 (viii) - RELOCATION** is deleted.

O. **ARTICLE 9.1(e) – CONSENT REQUIRED –** the reference in Article 9.1(e) to **thirty (30)** days is deleted and replaced by a reference to **twenty (20)** days.

P. **ARTICLE 9.3 (CORPORATE OWNERSHIP)**

Article 9.3 **(Corporate Ownership)** is amended by adding the following text immediately after the existing Article:

"Notwithstanding the foregoing, no consent of the Landlord shall be required with respect to any of the following transfers, or any combination thereof, namely: (a) a transfer to the parent of the Tenant, or to a subsidiary, associated or affiliated corporation of the Tenant, including without limitation, to a corporation which is a subsidiary of a wholly-owned subsidiary of the Tenant; or (b) a transfer to a corporation which is formed by the Tenant and another corporation or corporations as the result of an amalgamation or merger, such transfers as being collectively referred to herein as **"Internal Reorganizations".** The Tenant must provide the Landlord with at least **thirty (30)** days' prior written notice of any Internal Reorganization providing reasonable detail about the nature and extent of the Internal Reorganization and its impact on the Landlord. Without limiting the foregoing, Article 9.1(c) will continue to apply to any Transfer, including any Internal Reorganization.

Q. **ARTICLE 11.2(B) (CONTINUOUS OPERATION)** is deleted.

R. **ARTICLE 11.4 (HAZARDOUS MATERIAL)**

The text of Article 11.4 is deleted and replaced by the following:

"The Tenant covenants and agrees that at all times the Tenant (and all persons under its direction and control and any parties with whom it contracts or for whom it is responsible at law) will fully comply with all Applicable Laws, including, without limitation, those with respect to any and all Hazardous Material brought upon, kept, generated, used, stored, transported upon, treated, disposed of, or otherwise managed in or about the Premises (collectively, the **"Hazardous Material Laws").**

The Tenant shall be fully liable for all damages of any manner arising from any failure to fully comply with the Hazardous Material Laws by Tenant (and all persons under its direction and control and any parties with whom it contracts for whom it is responsible at law), such liability to survive the termination of the Lease for any reason until satisfied in full.

Not less than **thirty (30)** days prior to the date that any Hazardous Material will first be brought onto the Premises, the Tenant will provide Landlord proof of insurance satisfactory to the Landlord, acting reasonably, with respect to the Hazardous Material Laws. Any such policy of insurance shall comply with any applicable provisions of Article 7.

Tenant covenants to permit Landlord to conduct inspections and appraisals of all or any of Tenant's records, business and assets upon reasonable notice, at any reasonable time and from time to time, which might reasonably relate to compliance by Tenant (and all persons under its direction and control and any parties with whom it contracts for whom it is responsible at law) with the Hazardous Material Laws."

S. **ARTICLE 13.1(A)(V) (CONTINUOUS OPERATION)** is deleted and replaced with the following:

"(v) except as provided for in paragraph J of Schedule "E" (Continuous Operation), in case the Tenant shall abandon or attempt to abandon the Premises or in case the Premises shall become vacant or unoccupied for a period of **five (5)** consecutive days or be used for any other purpose than as permitted under the terms of this Lease, or be used by any other person than such as are entitled to use them, as provided for under the terms of this Lease, or in case the Tenant ceases to carry on business on the Premises, or,"

T. **ARTICLE 13.1(A)(VI) (UNSATISFIED JUDGEMENT)** is deleted and replaced with the following:

"(vi) a final judgment or decree for the payment of money in excess of **Fifty Thousand Dollars ($50,000.00)** is rendered against the Tenant by a court having jurisdiction and such judgment or decree shall not within a period of **thirty (30)** days thereafter have been and remain vacated or discharged or stayed pending appeal within the applicable appeal period, or"

U. **ARTICLE 13.2(A)(IV) (CONTINUOUS OPERATION)** is deleted and replaced with the following:

"(iv) shall have the right to obtain injunctive relief in the event Tenant threatens to cease to carry on the Tenant's business or ceases to carry on the Tenant's business from the Premises (except as provided for in paragraph J of Schedule "E" (Continuous Operation)."

V. **ARTICLE 15.14 – BROKERAGE COMMISSION**

The text of Article 15.14 (Brokerage Commission) is deleted and replaced with the following:

"15.14 Geof Ralph of Partners Global Corporate Real Estate Inc. has worked with the Landlord and the Tenant to help negotiate this Lease, that the Landlord will be pay the brokerage fee payable to Partners Global Corporate Real Estate Inc. arising therefrom. The Landlord is not responsible for any other brokerage or consulting fees in respect of this Lease, and the Tenant will indemnify and save harmless the Landlord in respect of claims for any such fees."

Metamaterial Inc.
1 Research Drive
Dartmouth / Nova Scotia
B2Y 4M9 / Canada

metamaterial.com

Re: **EXECUTIVE EMPLOYMENT AGREEMENT**

Dear Kenneth,

We are all delighted to be able to extend you this offer and look forward to working with you. To indicate your acceptance of the Company's offer, please sign and date this letter in the space provided below and return it to me, along with a signed and dated original copy of the Confidentiality Agreement, on or before **Dec 14, 2020**.

The Company requests that you begin work in this new position on or after **Dec 14, 2020**. Please indicate the date (either on or before the aforementioned date) on which you expect to begin work in the space provided below. In all cases your start date with us will be the date reflected in the accompanying Executive Employment Contract.

Very truly yours,

George Palikaras
President & CEO
Metamaterial Inc.

ACCEPTED AND AGREED BY:

[EMPLOYEE NAME]

Kenneth Rice
(Signature)
Date 12.11.2020
Anticipated Start Date: 12.14.2020

Schedule A: Job Description and Terms of Reference
Schedule B: Bonus Terms of Reference
Attachment 1: At-Will Employment, Confidential Information, Invention Assignment, and Arbitration Agreement
Attachment 2: Employment policies and handbook

This offer of employment is open for acceptance until 6:00 pm. on 13th December 2020

THIS EXECUTIVE EMPLOYMENT CONTRACT as of the 14th day of December, 2020.

BETWEEN:

METAMATERIAL INC., a corporation incorporated pursuant to the laws of the Province of Ontario and having its registered office at 1 Research Drive, Halifax, Nova Scotia, B2Y 4M9 ("Corporation");

- and

Kenneth Rice, a resident of the United States, ("Executive") (together with the Corporation, the "Parties" or each individually, a "Party")

WHEREAS:

A. The Corporation is engaged in the business of development and manufacture of smart materials (the "Business");

B. The Executive and the Corporation wish to confirm the terms and conditions of the Executive's employment with the Corporation;

C. The Corporation is in the process of completing a reverse take-over of Torchlight Energy Inc. (the "RTO").

NOW THEREFORE IN CONSIDERATION of the mutual terms, covenants and agreements hereinafter contained, the receipt and sufficiency of which are hereby acknowledged, the parties hereto agree as follows:

1. POSITION

The Executive shall be employed in the position of Chief Finance Officer and Executive Vice President of the Corporation on the terms and conditions set out in this Agreement effective **December 14, 2020** ("Effective Date"). The Executive shall report directly to the CEO of Metamaterial Inc. (the "CEO").

2. DUTIES AND RESPONSIBILITIES

(a) The duties and responsibilities of the Executive as CFO & EVP of the Corporation shall include those duties and responsibilities as are customary in such position. The Executive will also have such duties and responsibilities as are commensurate with his status of CFO & EVP as may from time to time be assigned by the CEO. The Executive will perform such duties and responsibilities including but not limited to those set out in Schedule A, and will observe all reasonable instructions given to the Executive by the CEO to the best of Executive's ability and in accordance with reasonable business standards and subject to a balanced scorecard that will be agreed upon by the Executive and the CEO within a reasonable time following the Effective Date, at the Company's discretion.

(b) The Executive acknowledges that, as CFO & EVP, he owes fiduciary duties to the Corporation and that beginning as of March 1, 2021 he will devote his full time and attention to the position CFO & EVP and shall not engage in any other business, occupation or activity or accept any other employment or remuneration, appointment to an agency, board or organization external to the Corporation without prior written approval of the CEO.

(c) The Executive will at all working times conduct himself with a standard of professionalism and integrity expected of someone in his position. The Parties agree that the performance of his duties and responsibilities requires both the highest level of integrity and the Corporation's complete confidence in the Executive's relationship with employees as well as persons outside the Corporation with whom the Executive may deal in the course of his employment.

(d) The Executive will truly and faithfully account for and deliver to the Corporation and its subsidiaries, affiliates or associated corporations (collectively, "META Entities") all money, securities and things of value belonging to the applicable META Entities that the Executive may from time to time receive for, from or on account of the applicable META Entities; and

(e) The Executive will abide and be bound by the rules and policies of the Corporation, including its Code of Business Conduct and Ethics and Employee Handbook, as amended from time to time and provided to the Executive.

(f) The Executive represents and warrants that he is free to act in the position of CFO & EVP of the Corporation, and is not bound by any restrictive covenants or non-competition arrangements that would prevent him from carrying out his duties under this Agreement.

3. EMPLOYMENT

(a) The Executive's employment under this Agreement shall commence on the Effective Date and shall be at-will, meaning that either Executive or the Corporation may terminate Executive's employment at any time and for any reason, with or without cause, and with or without notice, subject to the terms of Article 7 below. Any contrary representations that may have been made to Executive are superseded by this Agreement.

4. REMUNERATION

(a) Base Salary: The Corporation shall pay the Executive an initial salary at the rate of **$156,000 USD** (the "Base Salary") per year. The Base Salary will be paid in bi-weekly instalments, less all deductions required by law, or in any other manner as may be agreed between the Corporation and the Executive. The Base Salary shall be increased to **$216,000 USD** on March 1st 2021.

(b) Quarterly Bonuses: During each calendar quarter of Executive's employment, except for any quarter that begins or ends during the Notice Period (as defined below), Executive will be eligible to receive a quarterly bonus up to a target of **$27,000 USD** (the "Quarterly Bonus"). The amount of the Quarterly Bonus (if any) will be determined by the Corporation or its Board of Directors (the "Board"), in their sole discretion, based on Executive's achievement of the balanced scorecard referenced in Section 2(a) above. The Quarterly Bonus, if any, will be paid to the Executive within thirty (30) calendar days following the approval of the quarter-end financial statements of the Corporation for each quarter. Notwithstanding the foregoing, in the first two years of following the Effective Date, **25% of the any Quarterly Bonus** shall be issued in an amount of fully vested options of the Corporation (rounded up) determined by dividing $6,750 by the value of the closing market price of the Corporation's common shares as of the date prior to the date issued to Executive.

(c) Employee Stock Option Plan: The Corporation shall recommend to its human resources and compensation committee of the Board (the "HRCC") the granting to the Executive of an option to acquire **300,000 common shares** of META (the "Stock Option") at the closing market price of the Corporation's common shares on the day prior to the first day after the expiry of the Blackout Period as defined in the Corporation's Amended and Restated Employee Stock Option Plan (the "ESOP") applicable on the date of this agreement.. The Stock Option, shall be granted (i) in accordance with the then current ESOP and at all times shall be subject to the terms and conditions (including vesting provisions) of the ESOP and (ii) only upon such granting of options being recommended by the HRCC and approved by the Board.

(d) Benefit Plan: The Executive will be entitled to participate in the group benefit plans now or hereinafter established by the Corporation and on the same cost sharing basis as is currently in effect for other executives. The terms of the benefit plans (including provider) are subject to change. The Corporation reserves the right to amend, modify, or discontinue benefits plans at any time in accordance with applicable laws.

(e) Vacation: The Executive shall be entitled to twenty-five (25) working days' paid vacation per calendar year in accordance with the Corporation's vacation policy set out in the Employee Handbook, such vacation to be taken at a time or times mutually convenient to the Executive and the Board of the Corporation. Any accrued but otherwise unused vacation entitlements will be governed by the vacation policies of the Corporation as amended.

(f) Reimbursement of Expenses: The Corporation shall reimburse the Executive for necessary and reasonable business expenses including, without limitation, travel, entertainment, and other expenses actually and properly incurred by the Executive in the course of performing his duties and responsibilities hereunder, subject to the Executive furnishing to the Corporation for review on a quarterly basis a report detailing the expenses of the Executive and having available supporting receipts and particulars.

(g) Policies: Any payments and entitlements set forth in this Article 4 shall be made in accordance with the Corporation's policies and applicable law a copy can be found in Attachment 3.

5. LOCATION AND HOURS OF WORK

(a) The Executive shall work remotely at Executive's home office in Boston, Massachusetts. The Executive acknowledges that the Corporation has its registered office in Halifax and has operations in London and California and may be required from time to time to travel on behalf of the Corporation throughout the world.

(b) The Executive agrees that, as a senior executive and as a salaried employee, he will be required to work beyond regular office hours for which no overtime payment will be made, and that the schedule of work will be determined by duties and responsibilities as assigned.

6. DIRECTORSAND OFFICERS INSURANCE

The Corporation agrees to maintain directors and officers liability Insurance for the benefit of the Executive having coverage and policy limits having the same terms and conditions as the one maintained for the directors and officers of the Corporation.

7. TERMINATION

(a) Resignation Without Good Reason. Executive may resign Executive's employment without Good Reason at any time upon providing the Corporation six (6) months' advance written notice (the "Notice Period"), including, where possible, to provide overlap with incoming replacement for training purposes. During the Notice Period, Executive will continue to receive Executive's then-current Base Salary and benefits, however, Executive will not be entitled to any Quarterly Bonuses for any calendar quarter that ends or begins during the Notice Period. Executive acknowledges that the Corporation shall still have the right to terminate Executive's employment for Cause during the Notice Period and may waive all or part of the Notice Period upon Executive's request, at the Corporation's sole discretion. In the event that the Company terminates Executive's employment for Cause, or agrees to waive any or all of the Notice Period, Executive's employment with the Corporation shall cease immediately as of such termination for Cause or date agreed on by the Parties and Executive shall have no further entitlement to Base Salary, benefits, Quarterly Bonuses, or any other benefits under this Agreement.

(b) Termination without Cause; Resignation for Good Reason. Subject to Executive signing and not revoking a separation agreement and release of known and unknown claims in the form provided by the Company (including nondisparagement and no cooperation provisions) (the "Release") and provided that such Release becomes effective and irrevocable no later than sixty (60) days following the termination date or such earlier date required by the release (the "Release Deadline"), if the Executive's employment is terminated without Cause by the Corporation (except in the case of death or Disability), or Executive resigns his employment for Good Reason, the Executive shall be entitled to the following:

(i) continued payment of Executive's Base Salary for a period equal to six (6) months following the termination date

(ii) payment of two Quarterly Bonus payments to be made quarterly following the termination date;

(iii) The Corporation will also continue the benefits under Section 4(d), except disability benefits coverage, for the Severance Period, if such benefits are available subject to the terms of the plans, or pay to the Executive an amount equal to the Corporation's contribution for these benefits. Disability benefits will cease immediately on the date of termination;

(iv) any earned unpaid bonus for the fiscal year prior to the termination, payable at the same time other employees of the Corporation are paid such bonus;

(v) a prorated amount of the Quarterly Bonus for the calendar quarter in which the termination occurs based on the date of termination, payable at the same time other employees of the Corporation are paid such bonus;

(vi) (a) any earned but unpaid Base Salary through the termination date, (b) accrued but unpaid vacation pay, and (c) reimbursement of expenses incurred through the termination date in accordance with Section 4(f) hereof; the whole, owing as at the termination date, payable in accordance with the laws of the state in which Executive works as of the termination date (the "Basic Payments"); and

(vii) six (6) months' accelerated vesting of the Stock Option, subject at all times to the terms of the ESOP.

The Executive agrees that the foregoing payments in Section 7(b) represents the Executive's complete entitlement to severance or other benefits in the event of the termination of Executive's employment. Executive further acknowledges that if the Release does not become effective by the Release Deadline, Executive will forfeit any rights to severance or benefits under this Section 7(b) or elsewhere in this Agreement

For the purposes of this Agreement,

"Cause" means

(i) theft, fraud or embezzlement by the Executive from the Corporation;

(ii) conviction of the Executive of a criminal act or other offence relating to the Executive's employment; or

(iii) any breach of this Agreement by the Executive not cured within thirty (30) days after written notice by the Corporation to the Executive thereof.

"Good Reason" means any one of the following events which occurs without the Executive's express or implied agreement (but does not include any of these events where there is termination of the Executive's employment for just cause or disability):

(i) a change of the Executive's title within the Corporation; or

(ii) a change in Executive reporting structure such that Executive no longer reports to the CEO of the Corporation.; or

(iii) any other reason in law that would constitute a constructive discharge under the laws of the state in which Executive works.

In order for Good Reason to be invoked under this Agreement, the Executive must provide the Corporation with thirty (30) days' prior written notice of the first occurrence of the event giving rise to Good Reason setting forth the basis for Executive's resignation and allow the Corporation thirty (30) days following such notice to cure such occurrence. If the Corporation does not remedy the situation to eliminate the Good Reason within thirty (30) days of receipt of the Executive's written notice pursuant to this provision, the Executive may then terminate his employment for Good Reason but Executive must resign from all positions Executive then holds with the Company to be effective not later than thirty (30) days after the expiration of the cure period.

(c) Termination with Cause. The Corporation may terminate Executive's employment with Cause at any time, immediately and without notice. In the event of the termination of Executive's employment for Cause, Executive will be entitled only to the Basic Payments.

(d) Death. For greater certainty, Executive's employment will terminate immediately upon the death of the Executive and no payments will be required to be made to the Executive's estate pursuant to this Agreement except for the Basic Payments.

(e) The Parties acknowledge and agree that the payment(s) provided to the Executive under this Article 7 includes, fulfils and discharges of all of the obligations of the Corporation and the META Entities to the Executive and is inclusive of and in full satisfaction of any claim or entitlement by the Executive to reasonable notice, pay in lieu of notice, and any compensation under applicable employment standards legislation or equivalent legislation and common or civil law, provided however, under no circumstances will the entitlements with which the Executive is provided fall below the minimum requirements under applicable employment standards legislation, as amended from time to time. Resignation of Positions on Termination of this Agreement. Upon termination of the Executive's employment for any reason, the Executive shall immediately on his date of termination resign all offices and directorships he holds in the Corporation or the META Entities, if any.

8. DISABILITY

(a) Incapacity to Perform Duties. The Executive acknowledges and agrees that the ability to provide his full time and attention as provided in Section 2(b) is a *bona fide* occupational requirement of his position as CFO & EVP. For purposes of this Agreement, Disability means that the Executive is unable to perform the essential duties and responsibilities of the Executive's then- assigned position with or without reasonable accommodation for a continued period of 180 days in any consecutive 12-month period.

9. CONFLICT OF INTEREST

For the purpose of identifying and avoiding actual and potential conflicts of interest, the Executive personally shall have a continuing obligation to disclose to the Corporation any personal assets, investments and commercial involvements, and those of their spouse, if known, that may raise concerns about the actual and potential conflicts of interest and shall, at least annually, provide a formal report to the Corporation.

10. CONFIDENTIAL INFORMATION AND INTELLECTUAL PROPERTY

Executive agrees to execute the Company's At-Will Employment, Confidential Information, Invention Assignment, and Arbitration Agreement (the "Confidentiality Agreement") on the Effective Date.

11. AMENDMENTS

This Agreement may not be amended without the mutual written consent of the Executive and the Corporation. It is agreed that this Agreement may be amended by mutual consent of the Executive and the Corporation without causing termination of this Agreement.

12. MISCELLANEOUS

(a) Any notice required or permitted to be given to the Executive shall be sufficiently given if delivered to the Executive personally, by email or if mailed by registered mail to the Executive's address last known to the Corporation.

(b) Any notice required or permitted to be given to the Corporation shall be sufficiently given if sent by registered mail, email or faxed to the CEO.

(c) Any notice sent by registered mail shall be deemed to be received on the 4th day after it has been posted for delivery.

(d) This Agreement, together with the Confidentiality Agreement, the ESOP, and any stock option agreement between Executive and the Company, constitutes the entire Agreement between the Parties with respect to the employment and appointment of the Executive, and replaces and supersedes any other agreements, understandings, or promises between the Executive and the Corporation. Any modifications to this Agreement must be made in accordance with Article 11 hereof otherwise such modification shall have no force and effect and shall be void.

(e) The Corporation shall be authorized and entitled to deduct from payments under this Agreement, and all compensation and payments (in whatever form) that the Corporation provides to the Executive, any deductions required by law or otherwise agreed to by the Executive and the amounts owing by the Executive to the META Entities.

(f) The headings in this Agreement are for convenience only and are not to be construed in any way as additions to or limitations of the covenants and agreements contained in it.

(g) The failure or delay by either party in exercising any rights under this Agreement shall not operate as a waiver of such rights and any single or partial exercise by either party of any right shall not preclude any further exercise of such rights or any other rights.

(h) The various sections and subsections, phrases and sentences in this Agreement are severable and if any section or subsection or any identifiable part is held to be invalid, void or unenforceable by any court, tribunal or other body or person of competent jurisdiction, this shall not affect the validity or enforceability of the remaining provisions or identifiable parts.

(i) Unless the context requires otherwise words importing one gender include all other genders and words importing the singular include the plural and vice versa.

(j) This Agreement shall be governed by and interpreted and construed in accordance with the laws of the Commonwealth of Massachusetts and the laws of the United States of America applicable therein. Any dispute relating to or arising out of this Agreement shall be subject to binding arbitration pursuant to the arbitration provisions of the Confidentiality Agreement.

(k) This Agreement may be signed in one or more counterparts, which, taken together shall constitute one Agreement.

13. BENEFIT OF AGREEMENT

This Agreement shall inure to the benefit of and be binding upon the Parties hereto and their respective heirs, executors, legal personal representatives, successors and permitted assigns. This Agreement and all of the rights and obligations of the Executive hereunder may not be transferred or assigned by the Executive at any time.

14. FORCE MAJEURE

No party hereto shall be held responsible or liable or be deemed to be in default or in breach of this Agreement for its delay, failure or inability to meet any of its obligations under this Agreement caused by or arising from any cause which is unavoidable or beyond the reasonable control of such party, including war, warlike operations, riot, insurrection, pandemic, orders of government, strikes, lockouts, disturbances or any act of God or other cause which frustrates the performance of this Agreement. Notwithstanding the foregoing, the Corporation shall not, in any event, be discharged from its payment obligations to the Executive under this Agreement.

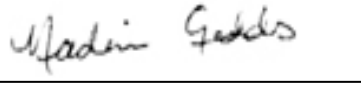
15. INDEPENDENT LEGAL ADVICE

The Executive acknowledges that the Corporation has advised the Executive to obtain independent legal advice with respect to the entry into this Agreement and confirms that he have either done so or has knowingly waived their right to do so. The Executive further acknowledges that this Agreement has been entered into by him freely and voluntarily and not the result of any threat, promise or undue influence made or exercised by the Corporation or any other party.

IN WITNESS WHEREOF the parties hereto have set their hand and affixed their seals as of the day and year first above written.

SIGNED, SEALED AND DELIVERED

in the presence of: **METAMATERIAL INC.**



Witness Per: 

Witness George Palikaras

Witness **Kenneth Rice**

SCHEDULE 'A'

Chief Financial Officer and EVP
Job Description and Terms of Reference

- **Job Title** Chief Financial Officer and Executive Vice President (EVP), Metamaterial Inc. ("META"), CSE:MMAT to be up-listed on NASDAQ
- **Accountable to:** President & CEO
- **Reports to:** President & CEO
- **Remuneration:** As set forth in Article 4 of the Agreement.

Job Purpose: The Chief Financial Officer (CFO) position is accountable for the administrative, financial, and risk management operations of the company, to lead the Finance Team within the Company, to include the development of a financial and operational strategy, metrics tied to that strategy, and the ongoing development and monitoring of control systems designed to preserve company assets and report accurate financial results. In addition, the position is responsible for development and implementation of the strategy and plans for the medical assets of the Company including but not limited to:

a. Establishing META Medical Imaging initially including i. Five year business plan
   ii. First round financing
   iii. MRI development and registration (US and CA)
   iv. MRI Go to Market plan
   v. Mammowise development plan
   vi. Stroke Imaging development plan

b. Business development support for Glucowise

Principal accountabilities are:

Planning & Strategic

1. To help the company make strategic decisions by taking an active role in financial analysis and management.
2. Assist in formulating the company's future direction and supporting tactical initiatives
3. Monitor and direct the implementation of strategic business plans
4. Develop financial and tax strategies
5. Manage the capital request and budgeting processes
6. Develop performance measures that support the company's strategic direction
7. Assist CEO in the strategic business plan development
8. Analysis and planning for achieving business growth

Operational Excellence

1. Participate in key decisions as a member of the executive management team
2. Maintain in-depth relations with all members of the management team
3. Manage the accounting, human resources, investor relations, legal, tax, and treasury departments
4. Oversee the financial operations of subsidiary companies and foreign operations
5. Manage any third parties to which functions have been outsourced
6. Oversee the company's transaction processing systems

7. Implement operational best practices
8. Oversee employee benefit plans, with particular emphasis on maximizing a cost- effective benefits package
9. Supervise acquisition due diligence and negotiate acquisitions
10. Implement effective operational & business processes;
11. Engage employees and other stakeholders toward common goals;
12. Assess and adjust the organization's direction in response to changing environment;
13. Understand key drivers of revenues and expenses;
14. Identify the most important key Performance Indicators (KPIs) to measure and evaluate Corporate performance.

Financial Information

1. Oversee the on-time issuance of financial information
2. Personally review and approve all filings with the CSE Securities and any future Exchange Commission, if needed or applicable
3. Report financial results to the Board of Directors
4. Develop annual, quarterly and monthly required MD&A, filings and reports.

Risk Management

1. Understand and mitigate key elements of the company's risk profile to meet Regulatory compliance targets
2. Monitor all open legal issues involving the company, and legal issues affecting the industry
3. Construct and monitor reliable control systems
4. Maintain appropriate insurance coverage
5. Ensure that the company complies with all legal and regulatory requirements
6. Ensure that record keeping meets the requirements of auditors and government agencies
7. Report risk issues to the audit committee of the board of directors
8. Maintain relations with external auditors and investigate their findings and recommendations

Corporate Development, Funding & Third Parties

1. Monitor cash balances and cash forecasts
2. Analyze new strategic initiatives (this encompasses investment rounds, mergers & acquisitions, long term partnerships, divestitures and strategic alliances);
3. Propose market entry and/or expansion;
4. Develop strategic initiatives related to clients and services and well as potential organizational transformation initiatives
5. Negotiate contracts with potential strategic partners;
6. Participate in meetings, financial conferences, shareholder meetings, Investor Days, in order to communicate the Corporate strategy to shareholders and other potential partners.
7. Arrange for debt and equity financing
8. Financing and execution of corporate mergers and acquisitions
9. Support business development
10. Participate in conference calls with the investment community and support IR team.
11. Maintain banking relationships
12. Represent the company with investment bankers and investors

Exhibit 10.2.2

Metamaterial Inc.
1 Research Drive
Dartmouth / Nova Scotia
B2Y 4M9 / Canada

metamaterial.com

Re: **EXECUTIVE EMPLOYMENT AGREEMENT**

Dear Jonathan,

We are all delighted to be able to extend you this offer and look forward to working with you. To indicate your acceptance of the Company's offer, please sign and date this letter in the space provided below and return it to me, along with a signed and dated original copy of the Confidentiality Agreement, on or before **Dec 16, 2020**.

The Company requests that you begin work in this new position on or after **Dec 16, 2020**. Please indicate the date (either on or before the aforementioned date) on which you expect to begin work in the space provided below. In all cases your start date with us will be the date reflected in the accompanying Executive Employment Contract.

Very truly yours,

George Palikaras
President & CEO/Founder
Metamaterial Inc.

ACCEPTED AND AGREED BY:
Jonathan Waldern

(Signature)
Date December 16th 2020

Schedule A: Job Description and Terms of Reference
Schedule B: Bonus Terms of Reference
Attachment 2: At-Will Employment, Confidential Information, and Invention Assignment Agreement
Attachment 3: Employment policies and handbook

This offer of employment is open for acceptance until 11:59 pm EST on 16th December 2020

THIS EXECUTIVE EMPLOYMENT CONTRACT as of the 16 day of December, 2020.

BETWEEN:

METAMATERIAL INC., a corporation incorporated pursuant to the laws of the Province of Ontario and having its registered office at 1 Research Drive, Halifax, Nova Scotia, B2Y 4M9 ("Corporation")

- and -

DR JONATHAN WALDERN, a resident of the United States, ("Executive") (together with the Corporation, the "Parties" or each individually, a "Party")

WHEREAS:

A. The Corporation is engaged in the business of development and manufacture of smart materials (the "Business");
B. The Executive and the Corporation wish to confirm the terms and conditions of the Executive's employment with the Corporation;
C. The Corporation is in the process of completing a reverse take-over of Torchlight Energy Inc. (the "RTO").

NOW THEREFORE IN CONSIDERATION of the mutual terms, covenants and agreements hereinafter contained, the receipt and sufficiency of which are hereby acknowledged, the parties hereto agree as follows:

1. POSITION

The Executive shall be employed in the position of Chief Technology Officer of the META Entities (as defined below) on the terms and conditions set out in this Agreement effective **December 16, 2020** ("Effective Date"). The Executive shall report directly to the CEO of Metamaterial Inc. (the "CEO").

2. DUTIES AND RESPONSIBILITIES

(a) The duties and responsibilities of the Executive as CTO of the META Entities shall include those duties and responsibilities as are customary in such position. The Executive will also have such duties and responsibilities as are commensurate with his status of CTO as may from time to time be assigned by the CEO. The Executive will perform such duties and responsibilities including but not limited to those set out in Schedule A, and will observe all reasonable instructions given to the Executive by the CEO to the best of Executive's ability and in accordance with reasonable business standards and subject to a balanced scorecard that will be agreed upon by the Executive and the CEO within a reasonable time following the Effective Date, at the Corporation's discretion.

(b) The Executive acknowledges that, as CTO, he owes fiduciary duties to the Corporation and that he will devote full-time to the position CTO and shall not engage in any other business, occupation or activity or accept any other employment or remuneration, appointment to an agency, board or organization external to the Corporation without prior written approval of the CEO, except that the Corporation acknowledges and agrees that Executive may continue to perform duties in his existing role with OptDx, Inc., and his advisory agreement with DigiLens, Inc.

(c) The Executive will at all working times conduct himself with a standard of professionalism and integrity expected of someone in his position. The Parties agree that the performance of his duties and responsibilities requires both the highest level of integrity and the Corporation's complete confidence in the Executive's relationship with employees as well as persons outside the Corporation with whom the Executive may deal in the course of his employment.

(d) The Executive will truly and faithfully account for and deliver to the Corporation and its subsidiaries, affiliates or associated corporations (collectively, "META Entities") all money, securities and things of value belonging to the applicable META Entities that the Executive may from time to time receive for, from or on account of the applicable META Entities; and

(e) The Executive will abide and be bound by the rules and policies of the Corporation, including its Code of Business Conduct and Ethics and Employee Handbook, as amended from time to time and provided to the Executive.

(f) The Executive represents and warrants that he is free to act in the position of CTO of the Corporation, and is not bound by any restrictive covenants or non-competition arrangements that would prevent him from carrying out his duties under this Agreement.

3. EMPLOYMENT

The Executive's employment under this Agreement shall commence on the Effective Date and shall be at-will, meaning that either Executive or the Corporation may terminate Executive's employment at any time and for any reason, with or without Cause, subject to the terms of Article 7 below. Any contrary representations that may have been made to Executive are superseded by this Agreement.

4. REMUNERATION

(a) Salary: The Corporation shall pay the Executive an initial salary at the rate of **$150,000 USD** (the "Initial Salary") per year. Upon the Corporation achieving a public offering of shares of its securities or the securities of Torchlight Energy Inc. in connection with the announce RTO and the up-listing process on the Nasdaq Exchange, (the "Funding Milestone"), which is expected to complete in Q1 2021, the Corporation shall increase the Executive's salary to the rate of **$250,000 USD** (the "Base Salary") per year. The Initial Salary and Base Salary will be paid in bi-weekly instalments, less all deductions required by law, or in any other manner as may be agreed between the Corporation and the Executive.

(b) Quarterly Bonus: During each calendar quarter of Executive's employment, except for any quarter that begins or ends during the Notice Period (as defined below), the Executive will be eligible to receive a quarterly bonus up to a target of $50,000 in cash and up to an additional 0.25% of fully vested options, over eight consecutive quarters (the "Quarterly Bonus"). The number of options will be calculated over the total issued and outstanding shares of the Corporation at the time of granting of such options in accordance to the Board approved ESOP plan (the "Quarterly Bonus"). It is anticipated that once the Corporation up-lists on the Nasdaq the ESOP plan will offer the Executive the choice of i) a Non-Qualified Stock Option ("NSO") plan or ii) an Incentive Stock Option ("ISO") plan and iii) a Restricted Stock Unit ("RSU") plan. The amount of the Quarterly Bonus (if any) will be determined by the Corporation or its Board of Directors (the "Board") in their sole discretion, based on their assessment of Executive's achievement of the initial criteria and objectives set forth in Schedule B. The Quarterly Bonus, if any, will be paid and options will be granted to the Executive within thirty (30) days following the approval of the Corporation's quarter-end financial statements. Beyond the initial eight quarters, the Quarterly Bonus will continue as a cash-only incentive.

(c) Employee Stock Option Plan: The Corporation shall recommend to its human resources and compensation committee of the Board (the "HRCC") the granting to the Executive of an option to acquire **1,115,000 common shares** of META (the "Stock Option") at the closing market price of the Corporation's common shares on the day prior to the first day after the expiry of the Blackout Period as defined in the Corporation's Amended and Restated Employee Stock Option Plan (the "ESOP") applicable on the date of this agreement. The Stock Option, shall be granted (i) in accordance with the then current ESOP of the Corporation and the stock option agreement between the Parties, and at all times shall be subject to the terms and conditions (including vesting provisions) of the ESOP and (ii) only upon such granting of options being recommended by the HRCC and approved by the Board. Notwithstanding any vesting provisions to the contrary in the ESOP, Executive's Stock Option will commence vesting as of the first day of Executive's employment.

(d) Benefit Plan: The Executive will be entitled to participate in the group benefit plans now or hereinafter established by the Corporation and on the same cost sharing basis as is currently in effect for other executives. The terms of the benefit plans (including provider) are subject to change. The Corporation reserves the right to amend, modify, or discontinue benefits plans at any time in accordance with applicable laws.

(e) Vacation: The Executive shall be entitled to twenty-five (25) working days' paid vacation per calendar year in accordance with the Corporation's vacation policy set out in the Employee Handbook, such vacation to be taken at a time or times mutually convenient to the Executive and the Board of the Corporation. Any accrued but otherwise unused vacation entitlements will be governed by the vacation policies of the Corporation as amended.

(f) Reimbursement of Expenses: The Corporation shall reimburse the Executive for necessary and reasonable business expenses including, without limitation, travel, entertainment, and other expenses actually and properly incurred by the Executive in the course of performing his duties and responsibilities hereunder, subject to the Executive furnishing to the Corporation for review on a quarterly basis a report detailing the expenses of the Executive and having available supporting receipts and particulars.

(g) Policies: Any payments and entitlements set forth in this Article 4 shall be made in accordance with the Corporation's policies and applicable law. A copy of the Corporation's current Employee Handbook is attached as Attachment 3.

5. LOCATION AND HOURS OF WORK

(a) The Executive shall be employed by the Corporation at its offices located in Pleasanton, California. The Executive acknowledges that the Corporation has its registered office in Halifax and has operations in London and may be required from time to time to travel on behalf of the Corporation throughout the world.

(b) The Executive agrees that, as a senior executive and as a salaried employee, he will be required to work beyond regular office hours for which no overtime payment will be made, and that the schedule of work will be determined by duties and responsibilities as assigned.

6. DIRECTORS AND OFFICERS INSURANCE

The Corporation agrees to maintain directors and officers liability Insurance for the benefit of the Executive having coverage and policy limits having the same terms and conditions as the one maintained for the directors and officers of the Corporation.

7. TERMINATION

The parties covenant and agree that this Agreement and the Executive's employment may be terminated at any time in the following manner in the following circumstances:

(a) Resignation Without Good Reason. Executive may resign Executive's employment without Good Reason at any time upon providing the Corporation six (6) months' advance written notice (the "Notice Period"), including, where possible, to provide overlap with incoming replacement for training purposes. During the Notice Period, Executive will continue to receive Executive's then-current Base Salary and benefits, however, Executive will not be entitled to any Quarterly Bonuses for any calendar quarter that ends or begins during the Notice Period. Executive acknowledges that the Corporation shall still have the right to terminate Executive's employment for Cause during the Notice Period and may waive all or part of the Notice Period upon Executive's request, at the Corporation's sole discretion. In the event that the Company terminates Executive's employment for Cause, or agrees to waive any or all of the Notice Period, Executive's employment with the Corporation shall cease immediately as of such termination for Cause or date agreed on by the Parties and Executive shall have no further entitlement to Base Salary, benefits, Quarterly Bonuses, or any other benefits under this Agreement.

(b) Termination without Cause; Resignation for Good Reason. Subject to Executive signing and not revoking a separation agreement and release of known and unknown claims in the form provided by the Company (including nondisparagement and no cooperation provisions) (the "Release") and provided that such Release becomes effective and irrevocable no later than sixty (60) days following the termination date or such earlier date required by the release (the "Release Deadline"), if the Executive's employment is terminated without Cause by the Corporation (except in the case of death or Disability) or Executive resigns his employment for Good Reason, the Executive shall be entitled to the following:

(i) continued payment of Executive's Base Salary for a period equal to six (6) months following the termination date;

(ii) payment of two (2) Quarterly Bonus payments to be made quarterly following the termination date;

(iii) The Corporation will also continue the benefits under section 4(d), except disability benefits coverage, for a period equal to twelve (12) months, if such benefits are available subject to the terms of the plans, or pay to the Executive an amount equal to the Corporation's contribution for these benefits. Disability benefits will cease immediately on the date of termination;

(iv) (a) any earned but unpaid Base Salary through the termination date, (b) accrued but unpaid vacation pay, (c) any earned but unpaid Quarterly Bonus for the quarter(s) prior to the termination date, payable at the same time other employees of the Corporation are paid such bonuses, and (d) reimbursement of expenses incurred through the termination date in accordance with Section 4(f) hereof; the whole, owing as at the termination date, payable in accordance with the law applicable in the state in which Executive works as of the termination date (the "Basic Payments"); and

(v) six (6) months' accelerated vesting of the Stock Option, subject at all times to the terms of the ESOP.

The Executive agrees that the foregoing payments reflected in Section 7(b) represents the Executive's complete entitlement to severance or other benefits in the event of the termination of Executive's employment. Executive further acknowledges that if the Release does not become effective by the Release Deadline, Executive will forfeit any rights to severance or benefits under this Section 7(b) or elsewhere in this Agreement.

For the purposes of this Agreement,

"Cause" means

(vi) theft, fraud or embezzlement by the Executive from the Corporation;

(vii) conviction of the Executive of a criminal act or other offence relating to the Executive's employment; or

(viii) any breach of this Agreement by the Executive not cured within thirty (30) days after written notice by the Corporation to the Executive thereof.

"Good Reason" means any one of the following events which occurs without the Executive's express or implied agreement (but does not include any of these events where there is termination of the Executive's employment for just cause or disability):

(i) a change of the Executive's title or status within the Corporation;

(ii) a change in the person or body to whom the Executive reports; or

(iii) any other action(s) that would constitute a constructive discharge under the laws of the state in which Executive works for the Corporation.

In order for Good Reason to be invoked under this Agreement, the Executive must provide the Corporation with thirty (30) days' prior written notice of the first occurrence of the event giving rise to Good Reason setting forth the basis for Executive's resignation and allow the Corporation thirty (30) days following such notice to cure such occurrence. If the Corporation does not remedy the situation to eliminate the Good Reason within thirty (30) days of receipt of the Executive's written notice pursuant to this provision, the Executive may then terminate his employment for Good Reason but Executive must resign from all positions Executive then holds with the Company to be effective not later than thirty (30) days after the expiration of the cure period.

(c) Termination for Cause. The Corporation at may terminate Executive's employment with Cause at any time, immediately and without notice. In the event of the termination of Executive's employment for Cause, Executive will be entitled only to the Basic Payments.

(d) Death. For greater certainty, Executive's employment will terminate immediately upon the death of the Executive and no payments will be required to be made to the Executive's estate pursuant to this Agreement except for the Basic Payments.

(e) The Parties acknowledge and agree that the payment(s) provided to the Executive under this Article 7 includes, fulfils and discharges of all of the obligations of the Corporation and the META Entities to the Executive and is inclusive of and in full satisfaction of any claim or entitlement by the Executive to reasonable notice, pay in lieu of notice, and any compensation under applicable employment standards legislation or equivalent legislation and common or civil law, provided however, under no circumstances will the entitlements with which the Executive is provided fall below the minimum requirements under applicable employment standards legislation, as amended from time to time.

(f) Resignation of Positions on Termination of this Agreement. Upon termination of the Executive's employment for any reason, the Executive shall immediately on his date of termination resign all offices and directorships he holds in the Corporation or the META Entities, if any.

8. DISABILITY

(a) Incapacity to Perform Duties. The Executive acknowledges and agrees that the ability to provide his full time and attention as provided in Section 2(c) is a *bona fide* occupational requirement of his position as CTO. For purposes of this Agreement, Disability means that the Executive is unable to perform the essential duties and responsibilities of the Executive then assigned position with or without reasonable accommodation for a continued period of 180 days in any consecutive 12-month period.

9. CONFLICT OF INTEREST

For the purpose of identifying and avoiding actual and potential conflicts of interest, the Executive personally shall have a continuing obligation to disclose to the Corporation any personal assets, investments and commercial involvements, and those of their spouse, if known, that may raise concerns about the actual and potential conflicts of interest and shall, at least annually, provide a formal report to the Corporation.

10. CONFIDENTIAL INFORMATION AND INTELLECTUAL PROPERTY

As a condition of this Agreement, Executive agrees to execute the At-Will Employment, Confidential Information, and Invention Assignment Agreement (the "Confidentiality Agreement"), attached hereto as Attachment 2. In the event of any conflict between the Confidentiality Agreement and this Agreement, the terms of the Confidentiality Agreement shall control. For the avoidance of doubt, any intellectual property that constitutes an Invention under the Confidentiality Agreement shall remain the property of the Company and assigned thereto in accordance with the terms of the Confidentiality Agreement, regardless of whether it was conceived, authored, invented, developed, or reduced to practice in Executive's role with OptDx, Inc., unless such Invention qualifies fully under the provisions of Section 2870 of the California Labor Code as set forth in Section 3.G. of the Confidentiality Agreement, or the Invention

was conceived, authored, invented, developed, or reduced to practice in Executive's role with OptDx, Inc., (and outside of his role at the Company) in the period ending on March 31, 2021.

11. AMENDMENTS

This Agreement may not be amended without the mutual written consent of the Executive and the Corporation. It is agreed that this Agreement may be amended by mutual consent of the Executive and the Corporation without causing termination of this Agreement.

12. MISCELLANEOUS

(a) Any notice required or permitted to be given to the Executive shall be sufficiently given if delivered to the Executive personally, by email or if mailed by registered mail to the Executive's address last known to the Corporation.

(b) Any notice required or permitted to be given to the Corporation shall be sufficiently given if sent by registered mail, email or faxed to the CEO.

(c) Any notice sent by registered mail shall be deemed to be received on the 4th day after it has been posted for delivery.

(d) This Agreement, together with the Confidentiality Agreement, the ESOP, and any stock option agreement between Executive and the Corporation, constitutes the entire Agreement between the Parties with respect to the employment and appointment of the Executive replaces and supersedes any other agreements, understandings, or promises between the Executive and the Corporation. Any modifications to this Agreement must be made in accordance with Article 11hereof otherwise such modification shall have no force and effect and shall be void.

(e) The Corporation shall be authorized and entitled to deduct from payments under this Agreement, and all compensation and payments (in whatever form) that the Corporation provides to the Executive, any deductions required by law or otherwise agreed to by the Executive.

(f) The headings in this Agreement are for convenience only and are not to be construed in any way as additions to or limitations of the covenants and agreements contained in it.

(g) The failure or delay by either party in exercising any rights under this Agreement shall not operate as a waiver of such rights and any single or partial exercise by either party of any right shall not preclude any further exercise of such rights or any other rights.

(h) The various sections and subsections, phrases and sentences in this Agreement are severable and if any section or subsection or any identifiable part is held to be invalid, void or unenforceable by any court, tribunal or other body or person of competent jurisdiction, this shall not affect the validity or enforceability of the remaining provisions or identifiable parts.

(i) Unless the context requires otherwise words importing one gender include all other genders and words importing the singular include the plural and vice versa.

(j) This Agreement shall be governed by and interpreted and construed in accordance with the laws of the State of California and the laws of the United States of America applicable therein. Any relating to or arising out of this Agreement shall be brought exclusively in the State of California and, by execution and delivery of this Agreement, the Executive and the Company irrevocably consent to the jurisdiction of those courts.

(k) All references to dollars herein shall be deemed to be references to the lawful currency of the United States.

(l) This Agreement may be signed in one or more counterparts, which, taken together shall constitute one Agreement.

13. BENEFIT OF AGREEMENT

This Agreement shall inure to the benefit of and be binding upon the parties hereto and their respective heirs, executors, legal personal representatives, successors and permitted assigns. This Agreement and all of the rights and obligations of the Executive hereunder may not be transferred or assigned by the Executive at any time.

14. FORCE MAJEURE

No party hereto shall be held responsible or liable or be deemed to be in default or in breach of this Agreement for its delay, failure or inability to meet any of its obligations under this Agreement caused by or arising from any cause which is unavoidable or beyond the reasonable control of such party, including war, warlike operations, riot, insurrection, pandemic, orders of government, strikes, lockouts, disturbances or any act of God or other cause which frustrates the performance of this Agreement. Notwithstanding the foregoing, the Corporation shall not, in any event, be discharged from its payment obligations to the Executive under this Agreement.

15. INDEPENDENT LEGAL ADVICE

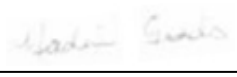
The Executive acknowledges that the Corporation has advised the Executive to obtain independent legal advice with respect to the entry into this Agreement and confirms that he have either done so or has knowingly waived their right to do so. The Executive further acknowledges that this Agreement has been entered into by him freely and voluntarily and not the result of any threat, promise or undue Influence made or exercised by the Corporation or any other party.

IN WITNESS WHEREOF the parties hereto have set their hand and affixed their seals as of the day and year first above written.

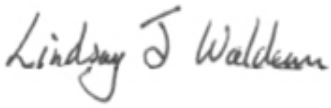
SIGNED, SEALED AND DELIVERED

in the presence of: **METAMATERIAL INC.**

Per:



Witness GEORGE PALIKARAS



Witness **JONATHAN WALDERN**

SCHEDULE 'A'

Chief Technology Officer
Job Description and Terms of Reference

- **Job Title:** CTO, Metamaterial, Inc. (META)
- **Accountable to:** George Palikaras President & CEO
- **Reports to:** George Palikaras President & CEO
- **Location:** 5880 West Las Positas Boulevard, Suite 51, Pleasanton, CA 94588 USA

Job Purpose: The Chief Technology Officer (CTO) will report directly to the CEO. He/she should combine a broad knowledge of the potential value in emerging technologies, and a keen understanding of how these technologies can affect the Company's business and business processes. This person also needs strong communication and interpersonal skills to influence senior executives. The CTO's function is to help them evaluate different paths to achieving the business goals, advance corporate culture in addition to being a spokesperson for the organization. As META is pushing the boundaries of innovation in optics, the successful candidate CTO will be contributing in major corporate and organizational decisions.

The CTO will focus his/her efforts on using and establishing tools to provide better processes, business management systems and services to improve operations, to enable the Corporation to reach its financial and marketing goals using an innovative technology approach. At the same time, the CTO is the public face of the technology department. He represents the Corporation at conferences, trade and other events that strengthen the corporate brand image.

Key Responsibilities and Accountabilities:

Your leadership role will encompass:

Strategic:

i. Plan and Integrate R&D into the process of commercial product development
ii. Link the work of engineering/R&D teams to the organization's strategy
iii. Support the Business Development and Sales function to win new business
iv. Nurture and win new revenue-producing relationships with strategic OEM.
v. Clarify responsibilities among related teams
vi. Coordinate the scientific R&D work and be a bridge from engineering to production and commercialization efforts.
vii. Measure team performance, including process, people and customer metrics
viii. Facilitate the resolution of conflicts between teams
ix. Ensure that teams have access to the right people at the right time
x. Treat the organization's customers and investors as important stakeholders
xi. Partner/Communicate with multiple team leaders

Functional:

a. Inform CEO when there is a significant change in CTO's budget or schedule
b. Monitor new technologies assessing commercial potential
c. Manage multiple programs to compensate for changes
d. Build and maintain core technical competences
e. Contribute to the strategic direction of the company
f. Develop IP and collaborative partnerships
g. Develop branding concepts for newly forming offerings
h. CTO is a member of a five-person operating committee that makes all important program decisions
i. Provide reliable technical assessments of potential mergers & acquisitions

Beyond Functional:

1. Work in partnership with the CEO to create a rolling 12-month strategic plan and implement new processes and approaches to achieve it.
2. Implement program and project management -
   a. Create detailed project plans for all META's current and new product lines to include timescales, resource commitments, milestones, budgets and risk registers.
   b. Project manage against each plan to ensure on time delivery, to provide status updates, accurate financial forecasting and re-scoping when required.

c. Instigate regular project review meetings and formal reporting.

3. Implement regular business review meetings to assess activities against plan, spend against budget, address critical issues and provide focus on forthcoming activities. This would be in addition to project reviews, providing the opportunity to assess business performance as a whole and would take place weekly/bi-weekly to provide operational review and also monthly to assess performance in more detail.
4. Create clear reporting and communication channels to support the needs of staff and of the Board. This will involve the implementation of a standard reporting cycle covering business performance within technology development, projects, finance, people etc. to provide insight and direction. The cycle will likely include -
   a. Annual General Meeting Board meeting and pack;
   b. Quarterly review and report for the Board;
   c. Monthly business performance review (for the Board and staff);
   d. Weekly/bi-weekly progress updates for staff.
   e. Additional/exceptional meetings/reports as required.

   Content of reports will be developed to utilize standard reporting templates and the use of balanced scorecard metrics to determine performance.
5. Contribute to Compliance and Governance related activities within project and operational management as required.
6. Contribute to or lead domestic and overseas business development, investment attraction and sales activities as required.
7. Build teams and undertake people management of staff to include the setting of annual performance objectives and quarterly performance reviews.
8. Oversee the day-to-day operations, keeping the CEO informed of significant events.

Professional Standards and Performance Review: As an experienced professional, you will maintain high professional standards and act in accordance with best practice. You will support the development of the professional standards of the team and take a continuous approach to improvement and your own personal development. As a senior representative of the Company, you act in line with the Company Code of Conduct. You will also participate in the performance review process.

Desired Qualifications:
PhD in related field, senior management executive experience (8+ years) Proven experience in business management systems, project management, OPEX/CAPEX planning.
Proven experience in corporate governance and quality control systems. Experience in VC and Capital Markets fundraising Business Development, Fundraising and Sales.

Additional Expertise:
ITAR management experience.
Business Ethics implementation.

Delegated Authority: TBD with CEO.

I agree that the above Terms of Reference accurately describes the above post and has been jointly developed.

Employee's name and signature

JONATHAN WALDERN

Date December 16th 2020.

Manager's name and signature

Date December 16, 2020.

SCHEDULE 'B'

Bonus Terms of Reference

Bonus allocated over four quarters. Five performance categories to be tracked on a quarterly with prior Board and CEO approval using a balanced scorecard:

1. Top Line Revenue. The annual $ target to be agreed with CEO. This will account for 40% of the overall bonus.
2. OEM industry partnerships that are revenue producing or strategic suppliers. This will be be 20% of the overall bonus structure.
3. Introduction of new Products & submission of new patents (to be 20% of the overall bonus)
4. Financing through non-dilutive and strategic OEM capital investments (to be 10% of the overall bonus)
5. Individual performance (to be 10% of the overall bonus).

LEASE AMENDING AGREEMENT

THIS LEASE AMENDING AGREEMENT made as of June 1, 2021 (the "**Effective Date**").

BY AND BETWEEN:

RANK INCORPORATED

(the "**Landlord**")

- and -

METAMATERIAL INC.

(the "**Tenant**")

WHEREAS

A. By lease dated August 28, 2020 (the "**Lease**"), the Landlord leased certain lands known as Suite 102, 60 Highfield Park Drive, Dartmouth, Nova Scotia, as more particularly described in the Lease as the "Premises", to the Tenant;

B. The Landlord and Tenant have agreed to amend the Lease as hereinafter set out.

NOW THEREFORE, in consideration of the Lands and of the sum of One Dollar ($1.00) now paid by each of the parties hereto to the other, and other good and valuable consideration, the receipt whereof is hereby acknowledged, the parties hereby agree as follows:

1. Capitalized terms not otherwise defined herein shall have the meanings attributed to them in the Lease.

2. As of the Effective Date, the Lease is amended as follows:

   (a) The body of Section 1.1(e) is hereby deleted and replaced with the following:

   "Approximately Sixty Eight Thousand (68,000) square feet of Rentable Area, identified as Suite #102 containing approximately Fifty Three Thousand (53,000) square feet of Rentable Area (the "**Existing Premises**") and a portion of Suite _____, containing approximately Fifteen Thousand (15,000) square feet of Rentable Area (the "**New Premises**" and together with the Existing Premises, (the "**Premises**") in the Building and indicated as per Schedule "B" attached hereto.

   In accordance with Article 2.8, Landlord shall have its surveyor or other professional prepare a final measurement of the area of the Premises and the Building no later than July 15, 2021 in accordance with the then current standard for floor measurement as established by the Building Owners and Managers Association (BOMA) and used by Landlord in respect of premises located in the Building (the "**BOMA Standard**"), and, in such case, Basic Rent and Additional Rent will be adjusted accordingly, if required."

   (b) The body of Section 1.1(g) is hereby deleted and replaced with the following:

   "Subject to the provisions herein with respect to free rent, and subject always to adjustment as provided for in Article 2.8, the Tenant shall pay to the Landlord, as annual Basic Rent, plus all applicable taxes, and without any abatement, set-off or deduction whatsoever, as follows:

   Year 1: $1.19 per square foot calculated on the full Rentable Area of the Premises;

   Year 2: $2.80 per square foot calculated on the full Rentable Area of the Premises;

   Year 3: $3.28 per square foot calculated on the full Rentable Area of the Premises;

   Year 4: $3.76 per square foot calculated on the full Rentable Area of the Premises;

   Year 5: $3.90 per square foot calculated on the full Rentable Area of the Premises;

   Years 6-7: $4.49 per square foot calculated on the full Rentable Area of the Premises;

   Years 8 – end of Term: $5.26 per square foot calculated on the full Rentable Area of the Premises;

   All payments of Basic Rent shall be payable in advance, in equal monthly instalments on the first day of each and every month of the Term."

(c) The body of Section 2.8 is hereby deleted and replaced with the following:

"Landlord shall cause the Rentable Area of the Premises to be measured by Landlord's Advisor on or before July 15, 2021 and Rent that is calculated on the Rentable Area shall be adjusted accordingly, subject to Article 15.12 herein."

(d) The body of Section 15.12 is hereby deleted and replaced with the following:

"The Rentable Area of the Premises shall be verified by Landlord's Advisor by July 15, 2021 in accordance with BOMA measurement methods and a signed certificate stating the actual measurement of the Premises shall be issued to Tenant. Rent shall be adjusted accordingly."

(e) Schedule "B" is completely deleted and replaced with Schedule "B" hereto.

(f) The body of Section B of Schedule "E" is deleted and replaced with the following:

"Provided it is otherwise in good standing under the Lease, for the first **eight (8) months** of the Term, the Tenant shall not be required to pay Basic Rent or its Proportionate Share of Operating Costs and Property Taxes comprised in Additional Rent for the Existing Premises.

Provided it is otherwise in good standing under the Lease, for the first **twelve (12) months** of the Term (the "**Free Rent Period**"), and further provided that the Landlord delivers vacant possession of the New Premises to the Tenant by July 15, 2021, the Tenant shall not be required to pay Basic Rent in respect of the New Premises. In the event that the Landlord does not deliver vacant possession of the New Premises to the Tenant by July 15, 2021, the Free Rent Period shall be extended one (1) day for each day after July 15, 2021 that the Landlord is unable to deliver vacant possession of the New Premises to the Tenant.

Notwithstanding the foregoing, during any periods of free or reduced Rent provided for in the Lease, the Tenant will be required to comply with all other terms and conditions in the Lease, and, without limiting the foregoing, the Tenant will be responsible for the cost of cleaning, maintenance, pest control, and all utilities (whether or not separately metered) respecting the Premises, as well as all other Additional Rent as defined in the Lease."

(g) The body of Section D of Schedule "E" is completely deleted and replaced by the following:

Landlord shall provide Tenant with a location for signage on the side and front of the Building, as well as on the pylon sign for the Building, to be used in conjunction with other tenants. Landlord will also permit Tenant the use of the former Convergis Technologies pylon sign on an as-is, where-is basis. Design and size of all signage is subject to Landlord's prior written consent, such consent not to be unreasonably withheld. The Tenant is solely responsible for the design, installation, maintenance, and removal of all approved signage.

(h) The body of Section G of Schedule "E" is deleted and replaced with the following:

"For clarity, the following is a summary with respect to the payment of Basic Rent payable by the Tenant to the Landlord during the Term. The summary is for illustrative purposes only, and in the event of any discrepancy between the contents of this paragraph and Article 1.1(g) or any other provisions of this Lease, Article 1.1(g) shall govern.

Year 1: Free Rent Period Existing Premises:

January 1, 2021 to August 31, 2021 = Gross Rent Free for 8 months;

September 1, 2021 to December 31, 2021 = $1.19 x 53,000 sq. ft. (4 months);

Year 1: Free Rent Period New Premises: Calendar year 2021 is Basic Rent Free;

Year 2: $2.80 per square foot calculated on the full Rentable Area of the Premises;

Year 3: $3.28 per square foot calculated on the full Rentable Area of the Premises;

Year 4: $3.76 per square foot calculated on the full Rentable Area of the Premises;

Year 5: $3.90 per square foot calculated on the full Rentable Area of the Premises;

Years 6-7: $4.49 per square foot calculated on the full Rentable Area of the Premises; and

Years 8 – end of Term: $5.26 per square foot calculated on the full Rentable Area of the Premises."

(i) The following is added to the end of Section H of Schedule "E":

"Provided the Tenant is itself in physical occupation of the Premises, is operating its business in the whole of the Premises and is not in default under the Lease or curing any such default, then the Tenant will have, during the Term of the Lease a right of first opportunity to lease any Expansion Premises on the terms set out below.

Right of First Opportunity

The Landlord will provide notice to the Tenant of the availability or pending availability of any Expansion Premises within five (5) days of the Landlord becoming aware of the availability of any Expansion Premises, and the Tenant will have twenty (20) days after receipt of the Landlord's notice to provide the Landlord with notice of its desire to lease the applicable Expansion Premises. Upon receipt of the Tenant's notice to lease the Expansion Premises the Landlord and Tenant will have Sixty (60) days to finalize the terms and conditions of the lease or amendment of the Lease for the Expansion Premises.

If the Tenant declines to lease the Expansion Premises or fails to respond within the twenty (20) day notice period, then the Landlord shall be entitled to lease the Expansion Premises to whomever and on whatever terms it determines are appropriate, without any further right of or obligation to the Tenant.

The Expansion Premises shall not include any portions of the Expansion Premises that are vacant on the Effective Date.

(j) The following is added to the end of Section P of Schedule "E":

"The Landlord acknowledges and agrees that the pending publically announced transaction between the Tenant and Torchlight Energy Resources, Inc., as may be modified, will not be deemed to be a Transfer to which Articles 9.1 and 9.2 apply."

3. The Landlord agrees to complete the following, at its sole cost and expense, on or before June 30, 2021:

   (a) Repair all cracks and other damage to the common walkways serving the Building; and

   (b) Paint the exterior façade of the Building in a colour palette to be mutually agreed with the Tenant.

4. The Tenant, at its sole cost and expense, shall be entitled to:

   (a) Install up to an initial 100kW solar panel array to service its operations taking into account the structural integrity and loading of the roof of the Building, provided that prior to the installation of same, the Tenant shall submit all related calculations, drawings, and plans and specifications to the Landlord for its prior written approval, the same not to be unreasonably withheld; and

   (b) Install up to two (2) flag poles near the entrance of the Building.

5. The Landlord agrees to refer Tenant to an architect to assist Tenant with the design and installation of the exterior façade of the Building adjacent to the Premises. The cost of the design and installation of the façade shall be mutually agreed upon in writing by the Landlord and the Tenant, each acting reasonably, and will be paid for by the Landlord and charged back to the Tenant as Additional Rent, amortized over the Term at an annual interest rate of five percent (5%), using generally accepted accounting principles.

6. The Landlord covenants and agrees to provide the Tenant vacant possession of the New Premises no later than Sixty (60) days after execution of this Agreement and the Landlord further agrees, that notwithstanding anything set out in the Lease, the Tenant may occupy the New Premises as soon as vacant possession is available.

7. Other than as expressly set out herein, all other provisions of the Lease remain in full force and effect, unamended.

8. This Amending Agreement shall be construed and governed by the laws of the Province of Nova Scotia and the federal laws of Canada applicable therein.

9. This Amending Agreement shall enure to the benefit of and be binding upon the parties hereto, their respective successors and assigns.

10. The Landlord and Tenant agree that this Amending Agreement may be executed in counterpart and transmitted by e-mail and that the reproduction of signatures in counterpart by way of e-mail will be treated as though such reproduction were executed originals.

The parties have executed this Amending Agreement as of the Effective Date

RANK INCORPORATED

Per:
Name: Joseph Ramia
Title: Secretary

Per: _____
Name:
Title:

METAMATERIAL INC.

Per: _____
Name: George Palikaras
Title: President & CEO

Per: _____
Name:
Title:

SCHEDULE “B”: PREMISES

(attached)

Exhibit 10.1.1.2

SUBSCRIPTION AGREEMENT

THIS SUBSCRIPTION AGREEMENT made as of the 8 day of JUNE, 2021;

B E T W E E N :

METAMATERIAL INC., an Ontario corporation (the **"Company")**

OF THE FIRST PART

- and -

RANK INCORPORATED

(the **"Subscriber")**

OF THE SECOND PART

WHEREAS the Subscriber wishes to subscribe for 993,490 common shares in the capital of the Company (the **"Purchased Shares"),** on and subject to the terms set out in this Subscription Agreement;

WHEREAS in consideration of its subscription for the Purchased Shares, the Subscriber has (a) amended the lease between the Subscriber and the Company relating to the Subscriber's Highfield Facility located in Dartmouth, Nova Scotia (the **"Lease")** to (i) expanded the space leased to the Company pursuant to the Lease by approximately 15,000 square feet to approximately 68,000 square feet, and (ii) reduced the annual rent payable under the Lease for the remainder of its term by an aggregate amount of $2,877,867 (the amendments to the Lease in (a)(i) and (a)(ii) collectively being the **"Lease Amendments"),** and (b) paid or will pay to the Company $500,000 for on-going tenant improvements (the **"Tenant Payment"** and together with the Lease Amendments, the **"Consideration");**

WHEREAS the parties have the determined that the Consideration has an aggregate fair value equal to the value of the Purchased Shares;

NOW THEREFORE THIS AGREEMENT WITNESSES that in consideration of the respective covenants and agreements of the parties contained herein, and other good and valuable consideration, the sufficiency and receipt of which are hereby acknowledged, the parties hereto agree as follows:

1. SUBSCRIPTION

1.1 ***Subscription.*** The Subscriber hereby irrevocably subscribes for and agrees to purchase from the Company, and the Company hereby sells and issues to the Subscriber, the Purchased Shares at a price per Purchased Share of $3.40 (the "**Subscription Price**").

1.2 ***Subscription Price.*** The obligation to pay the aggregate Subscription Price for the Purchased Shares shall be satisfied by the Consideration. The parties hereby acknowledge that the Consideration has an aggregate fair value equal to the value of the Purchased Shares. For greater certainty, the Company has determined that the Consideration has a fair value that is not less than the fair equivalent of the money that the Company would have received if the Purchased Shares had been issued for cash consideration.

2. SECURITIES LAWS

2.1 ***No Offering Memorandum.*** The Company acknowledges that is has not provided to the Subscriber any form of offering memorandum relating to the Company or the Purchased Shares. The Subscriber acknowledges that it has not received any form of offering memorandum relating to the Company or the Purchased Shares, and that the terms and conditions applicable to the sale and delivery of the Purchased Shares are contained in this Subscription Agreement.

3. CLOSING

3.1 ***Closing.*** Delivery of the Purchased Shares will be completed at the offices of the Company's solicitors **("Closing")** on June__, 2021 or on such other date as determined by the Company in its sole discretion.

3.2 ***Direction.*** The Subscriber hereby directs the Company to register the holder of the Purchased Shares subscribed for herein on the books of the Company in the name of the Subscriber.

4. REPRESENTATIONS AND WARRANTIES

4.1 ***Representations and Warranties of the Company.*** By accepting this Subscription Agreement, the Company will be deemed to have represented and warranted to the Subscriber as follows:

(a) the Company is now, and on Closing will be, a corporation incorporated, organized and subsisting under the laws of the Province of Ontario;

(b) on the issuance pursuant to the terms of this Subscription Agreement, the Purchased Shares shall be validly created and issued to the Subscriber as fully paid and nonassessable shares in the capital of the Company, free of liens and encumbrances imposed by the Company;

(c) the Company has all necessary corporate power, authority and capacity to enter into this Subscription Agreement and all other agreements and instruments to be executed by it as contemplated by this Subscription Agreement and to carry out its obligations under this Subscription Agreement and such other agreements and instruments; and

(d) this Subscription Agreement has been duly executed and delivered by the Company.

4.2 ***Representations and Warranties of the Subscriber.*** The Subscriber hereby acknowledges, represents, warrants and covenants to the Company as follows:

(a) the Subscriber has such knowledge and experience in financial and business affairs as to be capable of evaluating the merits and risks of the investment hereunder in the Purchased Shares and is able to bear the economic risk of total loss of such investment;

(b) the Subscriber is eligible to purchase the Purchased Shares pursuant to an exemption from the prospectus and registration requirements under applicable securities laws in Canada **("Canadian Securities Laws")** and the Subscriber has properly completed, executed and delivered to the Company the applicable certificate(s) (dated as of the date hereof) set forth in Schedule A indicating that the Subscriber fits within one of the exemption categories under applicable Canadian Securities Laws, and the information contained therein is true and correct, and the representations, warranties and covenants contained in the applicable schedules attached hereto will be true and correct, both as of the date of execution of this Subscription Agreement and as at Closing.

(c) if the Subscriber is resident outside of Canada:

(i) the Subscriber is purchasing the Purchased Shares pursuant to exemptions from prospectus or equivalent requirements under applicable laws or, if such is not applicable, the Subscriber is permitted to purchase the Purchased Shares under the applicable laws of the securities regulators in the jurisdiction in which the Subscriber is resident (the **"International Jurisdiction")** without the need to rely on any exemptions and the Subscriber has properly completed, executed and delivered to the Company the applicable certificate(s) (dated as of the date hereof) set forth in Schedule B;

(ii) the applicable laws of the authorities in the International Jurisdiction do not require the Issuer to make any filings or seek any approvals of any kind whatsoever from any securities regulator of any kind whatsoever in the International Jurisdiction in connection with the offer, issue, sale or resale of any of the Purchased Shares;

(iii) the purchase of the Purchased Shares by the Subscriber does not trigger:

A. any obligation to prepare and file a prospectus or similar document, or any other report with respect to such purchase in the International Jurisdiction; or

B. any continuous disclosure reporting obligation of the Issuer in the International Jurisdiction;

(d) the Subscriber has obtained such professional legal, accounting and investment advice, and has made such independent investigation of the Company, the Purchased Shares and the investment contemplated by this Subscription Agreement as the Subscriber deems appropriate in reaching its decision to purchase Purchased Shares hereunder;

(e) the Subscriber acknowledges that it has had an opportunity to ask, and have answered to its satisfaction, questions with respect to the Company and its business and the Purchased Shares;

(f) the Subscriber confirms that there is no person acting or purporting to act on behalf of the Subscriber in connection with the transactions contemplated herein who is entitled to any brokerage or finder's fee

(g) the Subscriber acknowledges that no prospectus has been filed by the Company with any securities regulatory authority in connection with the issuance of the Purchased Shares, and that the issuance of the Purchased Shares is exempt from the prospectus and registration requirements of applicable securities legislation, rules and regulations;

(h) the Subscriber fully understands the restrictions on resale on the Purchased Shares and will not resell the Purchased Shares except in accordance with the provisions of applicable Canadian Securities Laws.

(i) The certificates representing the Purchased Shares (and any replacement certificate), or, if applicable, ownership statements issued under a direct registration system or other electronic book-based or book-entry system, in each case, if issued prior to the expiration of the applicable hold periods, will bear a legend in accordance with the Canadian Securities Laws, which will be in substantively the following form:

"Unless permitted under securities legislation, the holder of this security must not trade the security before October 10, 2021."

(j) the Subscriber, if a corporation, partnership or joint venture, was not created, nor is it being used primarily, to permit the purchase of securities (including the Purchased Shares) without a prospectus;

(k) the decision of the Subscriber to tender this Subscription Agreement and acquire the Purchased Shares has not been made as a result of any oral or written representation as to fact or otherwise made by or on behalf of the Company or any other person and is based entirely upon this Subscription Agreement. The Subscriber has relied only on the information contained in this Subscription Agreement in making the decision to subscribe for the Purchased Shares hereunder. No representation, (written or oral) has been made to the Subscriber by or on behalf of the Company with respect to the purchase of the Purchased Shares;

(l) this Subscription Agreement has been duly executed and delivered by the Subscriber; and

(m) this Agreement constitutes a valid and binding obligation of the Subscriber enforceable against the Subscriber in accordance with its terms subject, however, to the customary limitations with respect to bankruptcy, insolvency or other laws affecting creditors' rights generally and to the availability of equitable remedies.

4.3 ***Reliance on Representations and Warranties of the Subscriber.*** The Subscriber acknowledges that the representations, warranties and covenants contained in this Agreement, including the schedules attached hereto, are made by the Subscriber with the intent that they may be relied upon by the Company in determining, among other things, the Subscriber's eligibility to purchase the Purchased Shares.

5. GENERAL PROVISIONS

5.1 ***Survival.*** The parties agree that the provisions of this Subscription Agreement, including without limitation the representations, warranties and covenants contained herein, shall survive and continue in full force and effect and be binding upon the Subscriber and the Company, notwithstanding the completion of the purchase of the Purchased Shares by the Subscriber pursuant hereto and any subsequent disposition by the Subscriber of any of the Purchased Shares.

5.2 ***Assignment.*** Neither party may assign this Agreement without the prior written consent of the other party.

5.3 ***Notice.*** Any notice or other communication required or permitted to be given pursuant to this Agreement shall be in writing, shall be addressed to the relevant party at the address set out herein for such party, and shall be given by prepaid first-class mail or by hand-delivery as hereinafter provided. Any such notice or other communication, if mailed by prepaid first-class mail at any time other than during a general discontinuance of postal service due to strike, lockout or otherwise, shall be deemed to have been received on the fourth Business Day after the post-marked date thereof, or if delivered by hand shall be deemed to have been received at the time it is delivered to the applicable address set out herein for such party to an individual at such address having apparent authority to accept deliveries on behalf of the addressee. Notice of a change of address shall also be governed by this section. In the event of a general discontinuance of postal service due to strike, lock-out or otherwise, notices or other communications shall be delivered by hand and shall be deemed to have been received in accordance with this section.

5.4 ***Further Assurances.*** The Subscriber agrees that it will promptly do, make, execute or deliver, or cause to be done, made, executed or delivered, all such further acts, documents and things as the Company may reasonably require from time to time for the purpose of

giving effect to the provisions of this Subscription Agreement and the Subscriber agrees that it will use reasonable efforts and take all such steps as may be reasonably within its power to implement to their full extent the provisions of this Subscription Agreement.

5.5 ***Governing Law.*** This Subscription Agreement shall be governed by the laws of the Province of Ontario and by the laws of Canada applicable therein and each of the Subscriber and the Company hereby submits to the non-exclusive jurisdiction of the Province of Ontario in connection with this Subscription Agreement.

5.6 ***Enurement.*** This Agreement shall enure to the benefit of, and be binding upon, the parties hereto and their respective heirs, administrators, estate trustees, successors, affiliates and permitted assigns.

5.7 ***Gender and Number.*** In this Subscription Agreement, unless the context otherwise requires, words importing the singular include the plural and *vice versa* and words importing one gender include all genders.

5.8 ***Currency.*** In this Subscription Agreement, all amounts are stated and payable in Canadian currency.

5.9 ***Invalidity of Provisions.*** Each of the provisions contained in this Subscription Agreement is distinct and severable and a declaration of invalidity or unenforceability of any such provision by a court of competent jurisdiction shall not affect the validity or enforceability of any other provision of this Subscription Agreement.

5.10 ***Counterparts.*** This Subscription Agreement may be signed in counterparts and each of such counterparts shall constitute an original document and such counterparts, when taken together, shall constitute one and the same instrument.

5.11 ***Electronic Delivery.*** Each party shall be entitled to rely on delivery by facsimile, pdf or other electronic format of an executed copy of this Subscription Agreement, and acceptance by a party of such copy shall be legally effective to create a valid and binding agreement between the Subscriber and the Company in accordance with the terms of this Subscription Agreement.

[*Signature page to follow.*]

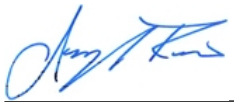
IN WITNESS WHEREOF the Subscriber and the Company have duly executed this Subscription Agreement as of the date above first written.

METAMATERIAL INC.

Per: _____

Name:
Title:

RANK INCORPORATED

Per: 

Name: Joseph Ramia
Title: Secretary

SCHEDULE A
ACCREDITED INVESTOR STATUS CERTIFICATE

The categories listed herein contain certain specifically defined terms. If you are unsure as to the meanings of those terms, or are unsure as to the applicability of any category below, please contact your broker and/or legal advisor before completing this certificate. Capitalized terms used but not defined herein have the meanings ascribed thereto in the Subscription Agreement to which this Schedule A is attached.

In connection with the purchase by the undersigned Subscriber of the Purchased Shares, the Subscriber, on its own behalf hereby represents, warrants, covenants and certifies to Metamaterial Inc. (the **"Company")** (and acknowledges that the Company and its counsel are relying thereon) that:

(a) the Subscriber is resident in or otherwise subject to the laws of the jurisdiction set out as the "Subscriber's Address" on page 3 the Subscription Agreement and is purchasing the Purchased Shares as principal for its own account and not for the benefit of any other person;

(b) the Subscriber is an "accredited investor" within the meaning of NI 45-106, or, in Ontario, the *Securities Act* (Ontario), on the basis that as at the Closing the undersigned fits within one or more categories of an "accredited investor" reproduced below, beside which the undersigned has indicated the undersigned belongs to such category; and

(c) upon execution of this Schedule A, including, if applicable, Exhibit I attached hereto, by the Subscriber, this Schedule A shall be incorporated into and form a part of the Subscription Agreement.

(PLEASE CHECK THE BOX OF THE APPLICABLE CATEGORY OF ACCREDITED INVESTOR)

****If you check box (i), (k) or (l), you must also complete attached Exhibit I - Risk Acknowledgement Form****

☐ (a) except in Ontario, a Canadian financial institution, or a Schedule III bank;

☐ (a.l) in Ontario, a financial institution that is (i) a bank listed in Schedule I, II or III of the *Bank Act* (Canada); (ii) an association to which the *Cooperative Credit Associations Act* (Canada) applies or a central cooperative credit society for which an order has been made under subsection 473(1) of that Act; or (iii) a loan corporation, trust company, trust corporation, insurance company, treasury branch, credit union, caisse populaire, financial services cooperative or credit union league or federation that is authorized by a statute of Canada or Ontario to carry on business in Canada or Ontario, as the case may be;

☐ (b) except in Ontario, the Business Development Bank of Canada incorporated under the *Business Development Bank of Canada Act* (Canada);

☐ (c) a subsidiary of any person or company referred to in paragraphs (a), (a.l) or (b), if the person or company owns all of the voting securities of the subsidiary, except the voting securities required by law to be owned by directors of that subsidiary;

☐ (d) a person or company registered under the securities legislation of a jurisdiction (province or territory) of Canada as an adviser or dealer;

☐ (e) an individual registered under the securities legislation of a jurisdiction of Canada as a representative of a person referred to in paragraph (d);

☐ (e.l) an individual formerly registered under the securities legislation of a jurisdiction of Canada, other than an individual formerly registered solely as a representative of a limited market dealer under one or both of the *Securities Act* (Ontario) or the *Securities Act* (Newfoundland and Labrador);

☐ (f) the Government of Canada or a jurisdiction (province or territory) of Canada, or any crown corporation, agency or wholly owned entity of the Government of Canada or a jurisdiction (province or territory) of Canada;

☐ (g) a municipality, public board or commission in Canada and a metropolitan community, school board, the Comite de gestion de la taxe scolaire de Pile de Montreal or an intermunicipal management board in Quebec;

☐ (h) any national, federal, state, provincial, territorial or municipal government of or in any foreign jurisdiction, or any agency of that government;

☐ (i) a pension fund that is regulated by either the Office of the Superintendent of Financial Institutions (Canada), a pension commission or similar regulatory authority of a jurisdiction (province or territory) of Canada;

☐ (j) an individual who, either alone or with a spouse, beneficially owns financial assets having an aggregate realizable value that, before taxes, but net of any related liabilities, exceeds $1,000,000; ***[PLEASE ALSO COMPLETE SECTIONS 2-4 OF EXHIBIT I]***

☐ (j.1) an individual who beneficially owns financial assets having an aggregate realizable value that, before taxes but net of any related liabilities, exceeds $5,000,000;

☐ (k) an individual whose net income before taxes exceeded $200,000 in each of the two most recent calendar years or whose net income before taxes combined with that of a spouse exceeded $300,000 in each of the two most recent calendar years and who, in either case, reasonably expects to exceed that net income level in the current calendar year; ***[PLEASE ALSO COMPLETE SECTIONS 2-4 OF EXHIBIT I]***

☐ (l) an individual who, either alone or with a spouse, has net assets of at least $5,000,000; ***[PLEASE ALSO COMPLETE SECTIONS 2-4 OF EXHIBIT I]***

☒ (m) a person, other than an individual or investment fund, that has net assets of at least $5,000,000 as shown on its most recently prepared financial statements;

☐ (n) an investment fund that distributes or has distributed its securities only to (i) a person that is or was an accredited investor at the tune of the distribution, (ii) a person that acquires or acquired securities in the circumstances referred to in sections 2.10 [*Minimum amount investment]* or 2.19 [*Additional investment in investment funds}* of NI 45-106, or (iii) a person described in sub- paragraph (i) or (ii) that acquires or acquired securities under section 2.18 *[Investment fund reinvestment}* of NI 45-106;

☐ (o) an investment fund that distributes or has distributed securities under a prospectus in a jurisdiction of Canada for which the regulator or, in Quebec, the securities regulatory authority, has issued a receipt;

☐ (p) a trust company or trust corporation registered or authorized to carry on business under the *Trust and Loan Companies Act* (Canada) or under comparable legislation in a jurisdiction of Canada or a foreign jurisdiction, acting on behalf of a fully managed account managed by the trust company or trust corporation, as the case may be;

☐ (q) a person acting on behalf of a fully managed account managed by that person, if that person is registered or authorized to carry on business as an adviser or the equivalent under the securities legislation of a jurisdiction of Canada or a foreign jurisdiction;

☐ (r) a registered charity under the *Income Tax Act* (Canada) that, in regard to the trade, has obtained advice from an eligibility adviser or an adviser registered under the securities legislation of the jurisdiction of the registered charity to give advice on the securities being traded;

☐ (s) an entity organized in a foreign jurisdiction that is analogous to any of the entities referred to in paragraphs (a) to (d) or paragraph (i) in form and function;

☐ (t) a person in respect of which all of the owners of interests, direct, indirect or beneficial, except the voting securities required by law to be owned by directors, are persons that are accredited investors;

☐ (u) an investment fund that is advised by a person registered as an adviser or a person that is exempt from registration as an adviser;

☐ (v) (i) a person that is recognized or designated by the securities regulatory authority or, except in Ontario and Québec, the regulator as an accredited investor; or (ii) in Ontario, a person that is recognized or designated by the Ontario Securities Commission as an accredited investor; or

☐ (w) a trust established by an accredited investor for the benefit of the accredited investor's family members of which a majority of the trustees are accredited investors and all of the beneficiaries are the accredited investor's spouse, a former spouse of the accredited investor or a parent, grandparent, brother, sister, child or grandchild of that accredited investor, of that accredited investor's spouse or of that accredited investor's former spouse.

For the purposes hereof, the following definitions are included for convenience:

(a) *"bank"* means a bank named in Schedule I or II of the *Bank Act* (Canada);

(b) *"Canadian financial institution"* means (i) an association governed by the *Cooperative Credit Associations Act* (Canada) or a central cooperative credit society for which an order has been made under section 473(1) of that Act, or (ii) a bank, loan corporation, trust company, trust corporation, insurance company, treasury branch, credit union, caisse populaire, financial services cooperative, or league that, in each case, is authorized by an enactment of Canada or a jurisdiction of Canada to carry on business in Canada or a jurisdiction of Canada;

(c) *"company"* means any corporation, incorporated association, incorporated syndicate or other incorporated organization;

(d) *"financial assets"* means (i) cash, (ii) securities, or (iii) a contract of insurance, a deposit or an evidence of a deposit that is not a security for the purposes of securities legislation;

(e) *"fully managed account"* means an account of a client for which a person makes the investment decisions if that person has full discretion to trade in securities for the account without requiring the client's express consent to a transaction;

(f) *"investment fund"* has the same meaning as in National Instrument 81-106 *Investment Fund Continuous Disclosure;*

(g) *"person"* includes

(i) an individual,

(ii) a corporation,

(iii) a partnership, trust, fund and an association, syndicate, organization or other organized group of persons whether incorporated or not, and

(iv) an individual or other person in that person's capacity as a trustee, executor, administrator or personal or other legal representative.

(h) *"related liabilities"* means (i) liabilities incurred or assumed for the purpose of financing the acquisition or ownership of financial assets, or (ii) liabilities that are secured by financial assets;

(i) *"Schedule III bank"* means an authorized foreign bank named in Schedule III of the *Bank Act* (Canada);

(j) *"spouse"* means, an individual who, (i) is married to another individual and is not living separate and apart within the meaning of the *Divorce Act* (Canada), from the other individual, (ii) is living with another individual in a marriage-like relationship, including a marriage-like relationship between individuals of the same gender, or (iii) in Alberta, is an individual referred to in paragraph (i) or (ii), or is an adult interdependent partner within the meaning of the *Adult Interdependent Relationships Act* (Alberta); and

(k) *"subsidiary"* means an issuer that is controlled directly or indirectly by another issuer and includes a subsidiary of that subsidiary.

In NI 45-106 a person or company is considered to be an affiliated entity of another person or company if one is a subsidiary entity of the other, or if both are subsidiary entities of the same person or company, or if each of them is controlled by the same person or company.

In NI 45-106 a person (first person) is considered to control another person (second person) if (a) the first person, directly or indirectly, beneficially owns or exercises control or direction over securities of the second person carrying votes which, if exercised, would entitle the first person to elect a majority of the directors of the second person, unless that first person holds the voting securities only to secure an obligation, (b) the second person is a partnership, other than a limited partnership, and the first person holds more than 50% of the interests of the partnership, or (c) the second person is a limited partnership and the general partner of the limited partnership is the first person.

In NI 45-106 a trust company or trust corporation described in paragraph (p) above of the definition of "accredited investor" (other than in respect of a trust company or trust corporation registered under the laws of Prince Edward Island that is not registered or authorized under the *Trust and Loan Companies Act* (Canada) or under comparable legislation in another jurisdiction of Canada) is deemed to be purchasing as principal.

In NI 45-106 a person described in paragraph (q) above of the definition of "accredited investor" is deemed to be purchasing as principal.

Important Information Regarding the Collection of Personal Information

The Company is required to file a report of trade with all applicable securities regulatory authorities containing personal information about the Subscriber. The Subscriber acknowledges that it has been notified by the Company:

(i) of such delivery of a report of trade containing the full legal name, residential address and telephone number and email address of each Subscriber, the number and type of securities purchased, the total purchase price paid for such securities, the date of the purchase and specific details of the prospectus exemption relied upon under applicable securities laws to complete such purchase, including how the Subscriber qualifies for such exemption;

(ii) that this information is collected indirectly by the applicable securities regulatory authority or regulator under the authority granted to it under, and for the purposes of the administration and enforcement of, the securities legislation; and

(iii) that the Subscriber may contact the applicable securities regulatory authority or regulator by way of the contact information provided in Appendix II to this certificate for more information regarding the indirect collection of such information.

By completing this certificate, the Subscriber authorizes the indirect collection of this information by each applicable securities regulatory authority or regulator and acknowledges that such information is made available to the public under applicable securities legislation.

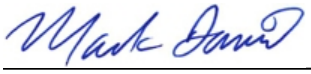
The foregoing representations contained in this certificate are true and accurate as of the date of this certificate and will be true and accurate as of the Closing. If any such representations shall not be true and accurate prior to the Closing, the undersigned shall give immediate written notice of such fact to the Company prior to the Closing.

Dated: As of JUNE 8 , 2021

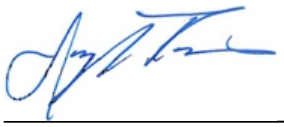
Signed: 

Witness (If Subscriber is an Individual)

RAWK INCORPORATED
Print the name of Subscriber



Print Name of Witness



If Subscriber not an Individual,
Print name and title of Authorized Signing Officer

Joseph Ramia
Secretary

EXHIBIT I TO SCHEDULE A
RISK ACKNOWLEDGEMENT FORM FOR INDIVIDUAL ACCREDITED INVESTORS

[Accredited investor categories - (j), (k) and (l) only]

WARNING TO INVESTORS

This investment is risky. Do not invest unless you can afford to lose all the money you pay for this investment.

SECTION 1 TO BE COMPLETED BY THE ISSUER	
1. About your investment	
Type of securities: Common Shares	Issuer: Metamaterial Inc.
Purchased from: Issuer	
SECTIONS 2 TO 4 TO BE COMPLETED BY THE SUBSCRIBER	
2. Risk acknowledgement	
This investment is risky. Initial that you understand that:	**Your Initials**
Risk of loss - You could lose your entire investment of $_____. *[Instruction: Insert the total dollar amount of the investment.]*	
Liquidity risk - You may not be able to sell your investment quickly - or at all.	
Lack of information - You may receive little or no information about your investment.	
Lack of advice - You will not receive advice from the salesperson about whether this investment is suitable for you unless the salesperson is registered. The salesperson is the person who meets with, or provides information to, you about making this investment. To check whether the salesperson is registered, go to www.arethevregistered.ca.	
3. Accredited investor status	
You must meet at least **one** of the following criteria to be able to make this investment. Initial the statement that applies to you. (You may initial more than one statement.) The person identified in section 6 is responsible for ensuring that you meet the definition of accredited investor. That person, or the salesperson identified in section 5, can help you if you have questions about whether you meet these criteria.	**Your initials**
• Your net income before taxes was more than $200,000 in each of the 2 most recent calendar years, and you expect it to be more than $200,000 in the current calendar year. (You can find your net income before taxes on your personal income tax return.)	
• Your net income before taxes combined with your spouse's was more than $300,000 in each of the 2 most recent calendar years, and you expect your combined net income before taxes to be more than $300,000 in the current calendar year.	
• Either alone or with your spouse, you own more than $1 million in cash and securities, after subtracting any debt related to the cash and securities.	
• Either alone or with your spouse, you have net assets worth more than $5 million. (Your net assets are your total assets (including real estate) minus your total debt.)	

4. Your name and signature	
By signing this form, you confirm that you have read this form and you understand the risks of making this investment as identified in this form.	
First and last name (please print):	
Signature:	Date: _____, 2021
SECTION 5 TO BE COMPLETED BY THE SALESPERSON	
5. Salesperson information	
[Instruction: The salesperson is the person who meets with, or provides information to, the subscriber with respect to making this investment. That could include a representative of the issuer, a registrant or a person who is exempt from the registration requirement.]	
First and last name of salesperson (please print):	
Telephone:	Email:
Name of firm (if registered):	
SECTION 6 TO BE COMPLETED BY THE ISSUER	
6. For more information about this investment	
Please contact: Metamaterial Inc. 1 Research Drive Dartmouth, Nova Scotia B2Y 4M9 Attention: George Palikaras Phone: 902 482-5729 E-Mail: george.palikaras@metamaterial.com Website: metamaterial.com **For more information about prospectus exemptions, contact your local securities regulator. You can find contact information at www.securities-administrators.ca.**	

EXHIBIT II TO SCHEDULE A
SECURITIES COMMISSION CONTACT INFORMATION

Alberta Securities Commission
Suite 600, 250 – 5th Street SW
Calgary, Alberta T2P 0R4
Telephone: (403) 297 6454
Toll free in Canada: 1-877-355-0585
Facsimile: (403) 297-2082

British Columbia Securities Commission
P.O. Box 10142, Pacific Centre
701 West Georgia Street
Vancouver, British Columbia V7Y 1L2
Inquiries: (604) 899-6854
Toll free in Canada: 1-800-373-6393
Facsimile: (604) 899-6581
Email: inquiries@bcsc.bc.ca

The Manitoba Securities Commission
500 – 400 St. Mary Avenue
Winnipeg, Manitoba R3C 4K5
Telephone: (204) 945-2548
Toll free in Manitoba 1-800-655-5244
Facsimile: (204) 945-0330

Financial and Consumer Services Commission (New Brunswick)
85 Charlotte Street, Suite 300
Saint John, New Brunswick E2L 2J2
Telephone: (506) 658-3060
Toll free in Canada: 1-866-933-2222
Facsimile: (506) 658-3059
Email: info@fcnb.ca

Government of Newfoundland and Labrador
Financial Services Regulation Division
P.O. Box 8700
Confederation Building
2nd Floor, West Block
Prince Philip Drive
St. John's, Newfoundland and Labrador A1B 4J6
Attention: Director of Securities
Telephone: (709) 729-4189
Facsimile: (709) 729-6187

Government of the Northwest Territories
Office of the Superintendent of Securities P.O. Box 1320
Yellowknife, Northwest Territories X1A 2L9
Attention: Deputy Superintendent, Legal & Enforcement
Telephone: (867) 920-8984
Facsimile: (867) 873-0243

Nova Scotia Securities Commission
Suite 400, 5251 Duke Street
Duke Tower
P.O. Box 458
Halifax, Nova Scotia B3J 2P8
Telephone: (902) 424-7768
Facsimile: (902) 424-4625

Government of Nunavut Department of Justice Legal
Registries Division P.O. Box 1000, Station 570
1st Floor, Brown Building
Iqaluit, Nunavut X0A 0H0
Telephone: (867) 975-6590
Facsimile: (867) 975-6594

Ontario Securities Commission
20 Queen Street West, 22nd Floor
Toronto, Ontario M5H 3S8
Telephone: (416) 593-8314
Toll free in Canada: 1-877-785-1555
Facsimile: (416) 593-8122
Email: exemptmarketfilings@osc.gov.on.ca
Public official contact regarding indirect collection of information: Inquiries Officer

Prince Edward Island Securities Office
95 Rochford Street, 4th Floor Shaw Building
P.O. Box 2000
Charlottetown, Prince Edward Island C1A 7N8
Telephone: (902) 368-4569
Facsimile: (902) 368-5283

Autorité des marchés financiers
800, Square Victoria, 22e étage C.P. 246, Tour de la Bourse
Montréal, Québec H4Z 1G3
Telephone: (514) 395-0337 or 1-877-525-0337
Facsimile: (514) 873-6155 (For filing purposes only)
Facsimile: (514) 864-6381 (For privacy requests only)
Email: fmancementdessocietes@lautorite.qc.ca (For corporate finance issuers);

Financial and Consumer Affairs Authority of Saskatchewan
Suite 601 - 1919 Saskatchewan Drive
Regina, Saskatchewan S4P 4H2
Telephone: (306) 787-5879
Facsimile: (306) 787-5899

Government of Yukon
Department of Community Services
Law Centre, 3rd Floor
2130 Second Avenue
Whitehorse, Yukon Y1A 5H6
Telephone: (867) 667-5314
Facsimile: (867)393-6251

SCHEDULE B
FOREIGN PURCHASER'S CERTIFICATE

(Residents of Jurisdictions other than Canada and the United States)

Capitalized terms not specifically defined in this Schedule B have the meanings ascribed to them in the Subscription Agreement to which this Schedule B is attached.

In connection with the purchase by the undersigned Purchaser of the Purchased Shares, the Purchaser hereby represents, warrants, covenants and certifies to the Company (and acknowledges that the Company and its counsel are relying thereon) that:

(a) The Subscriber is a resident of a country (an **"International Jurisdiction")** other than Canada or the United States and the decision to subscribe for the Purchased Shares was taken in such International Jurisdiction.

(b) The delivery of the Subscription Agreement, the acceptance of it by the Company and the issuance of the Purchased Shares to the Subscriber complies with all laws applicable to the Subscriber, including the laws of such Subscriber's jurisdiction of residence, and all other applicable laws, and will not cause the Company to become subject to, or require it to comply with, any disclosure, prospectus, filing or reporting requirements under any applicable laws of the International Jurisdiction.

(c) The Subscriber is knowledgeable of, or has been independently advised as to, the application or jurisdiction of the securities laws of the International Jurisdiction that would apply to the subscription (other than the securities laws of Canada and the United States).

(d) The Subscriber is purchasing the Purchased Shares pursuant to exemptions from the prospectus and registration requirements (or their equivalent) under the applicable securities laws of that International Jurisdiction or, if such is not applicable, each is permitted to purchase the Purchased Shares under the applicable securities laws of the International Jurisdiction without the need to rely on an exemption.

(e) The applicable securities laws do not require the Company to register the Purchased Shares file a prospectus or similar document, or make any filings or disclosures or seek any approvals of any kind whatsoever from any regulatory authority of any kind whatsoever in the International Jurisdiction.

(f) The Subscriber will, if requested by the Company, deliver to the Company a certificate or opinion of local counsel from the International Jurisdiction that will confirm the matters referred to in subparagraphs (b), (d) and (e) above to the satisfaction of the Company, acting reasonably.

(g) The Subscriber will not sell, transfer or dispose of the Purchased Shares except in accordance with all applicable laws, including applicable securities laws of Canada and the United States, and the Subscriber acknowledges that the Company shall have no obligation to register any such purported sale, transfer or disposition which violates applicable Canadian or United States or other securities laws.

(h) Upon execution of this Schedule B by the Subscriber, this Schedule B shall be incorporated into and form an integral part of the Subscription Agreement.

The foregoing representations, warranties, covenants and certifications contained in this certificate are true and accurate as of the date of this certificate and will be true and accurate as of Closing. If any such representations, warranties, covenants and certifications shall not be true and accurate prior to the Closing, the undersigned shall give immediate written notice of such fact to the Company prior to the Closing.

Dated:

Signed: _____

Name:

CODE OF BUSINESS CONDUCT AND ETHICS

INTRODUCTION

This Code of Business Conduct and Ethics ("Code") does not address all issues that may arise, but it is intended to document the principles of conduct and ethics to be followed by all employees, officers (including, without limitation, the Chief Executive Officer (CEO), Chief Financial Officer (CFO) and other high-ranking executive officers) and directors of Meta Materials Inc. (the "Company").

The purpose of this Code is to:

- Promote honest and ethical conduct, including the ethical handling of actual or apparent conflicts of interest between personal and professional relationships;
- Promote both the avoidance and appearance of conflicts of interest, including disclosure to an appropriate person of any material transaction or relationship that reasonably could be expected to give rise to such a conflict;
- Promote full, fair, accurate, timely and understandable disclosure in reports and documents that the Company files with, or submits to, the securities regulators and in other public communications made by the Company;
- Promote compliance with applicable governmental laws, rules and regulations;
- Promote the prompt internal reporting to an appropriate person of violations of this Code;
- Promote accountability for adherence to this Code;
- Provide guidance to employees, officers and directors to help them recognize and deal with ethical issues;
- Provide mechanisms to report unethical conduct; and
- Help foster the Company's longstanding culture of honesty and accountability.

The Company expects all its employees, officers and directors to fully comply and act in accordance, at all times, with the principles stated above and the more detailed provisions provided hereinafter. Violations of this Code by an employee, officer or director are grounds for disciplinary action up to and including immediate termination of employment or directorship.

POLICY

Workplace

1. A Non-discriminatory Environment

The Company (and its subsidiaries and affiliates) fosters a work environment in which all individuals are treated with respect and dignity. The Company is committed to being an equal opportunity employer that does not discriminate against employees, officers, directors or potential employees, officers or directors on the basis of race, colour, religion, sex, national origin, age, sexual orientation or disability or any other category protected by Canadian and US and regulations and, in addition, in accordance with the laws or regulations applicable in the jurisdiction where such employees, officers or directors are located. The Company will make reasonable accommodations for its employees, officers and directors in compliance with applicable laws and regulations. The Company is committed to actions and

policies to assure fair employment, including equal treatment in hiring, promotion, training, compensation, termination and corrective action, and will not tolerate discrimination by its employees, officers, directors and agents.

2. Harassment-Free Workplace

The Company will not tolerate harassment of its employees, officers, directors, customers or suppliers in any form. See the Harassment and Bullying Prevention and Complaint Processing Policy in the Employee Handbook.

3. Sexual Harassment

Sexual harassment is illegal, and all employees, officers and directors are prohibited from engaging in any form of sexually harassing behaviour. Sexual harassment means any unwelcome sexual conduct, either visual, verbal, or physical, and may include, but is not limited to, unwanted sexual advances, unwanted touching and suggestive touching, language of a sexual nature, telling sexual jokes, innuendoes, suggestions, suggestive looks and displaying sexually suggestive visual materials.

4. Substance Abuse

The Company is committed to maintaining a safe and healthy work environment free of substance abuse. Employees, officers, and directors are expected to perform their responsibilities in a professional manner and, to the degree that job performance or judgment may be hindered, be free from the effects of drugs and/or alcohol.

5. Workplace Violence

The workplace must be free from violent behavior. Threatening, intimidating or aggressive behavior, as well as bullying, subjecting to ridicule or other similar behavior toward fellow employees or others in the workplace will not be tolerated.

6. Employment of Family Members

Employment of more than one family member at a Company office or other premises is permissible, but the direct supervision of one family member by another is not permitted unless otherwise authorized in writing by the Chair of the Company's Audit Committee. Except for summer and co-op students, indirect supervision of a family member by another is also discouraged and requires the prior written approval of the Chair of the Company's Audit Committee. If allowed, any personnel actions affecting that employee must also be reviewed and expressly endorsed by the forenamed executive.

Environment, Health and Safety

1. Environment

The Company is committed to sound environmental management. The Company is committed to managing all phases of its business in a manner that minimizes any adverse effects of its operations on the environment.

7. Health and Safety

The Company is committed to providing a healthy and safe workplace in compliance with applicable laws, rules and regulations. Employees must be aware of the safety issues and policies that affect their job, other employees and the community in general. Managers, upon learning of any circumstance affecting or having a high likelihood of affecting the health and safety of the workplace or the community, must act immediately to address the situation. Employees must immediately advise their managers of any workplace injury or any circumstance presenting a dangerous situation to them, other co-workers or the community in general, so that timely corrective action can be taken.

Third Party Relationships

1. Conflict of Interest

Employees, officers, and directors of the Company are required to act with honesty and integrity and use good judgment to avoid any relationship or activity that might create, or appear to create, a conflict between their personal interests and the interests of the Company. Employees must disclose promptly in writing possible conflicts of interest to their manager, or if the manager is involved in the conflict of interest, to the Chair of the Company's Audit Committee. Officers and directors must disclose promptly in writing any perceived conflicts to the Chair of the Audit Committee.

Conflicts of interest arise where an individual's position or responsibilities with the Company present an opportunity for personal gain apart from the normal rewards of employment or directorship. They also arise where a director's, officer's or employee's personal interests, loyalties or actions interfere with, or conflict in any way (or even appear to interfere or conflict) with, the interests of the Company. Such conflicts of interest can cause a director, officer or employee to give preference to personal interests in situations where corporate responsibilities should come first. Directors, officers and employees shall perform the responsibilities of their positions on the basis of what is in the best interests of the Company, free from the influence of personal considerations and relationships, and should avoid both conflicts of interests and the appearance thereof.

8. Gifts and Entertainment

Employees, officers and directors or their immediate families shall not use their position with the Company to solicit any cash, gifts or free services from any Company customer, supplier, or contractor for their or their immediate family's or friend's personal benefit. Gifts or entertainment from others should not be accepted if they could be reasonably considered to be extravagant for the employee, officer or director who receives it, or otherwise improperly influence the Company's business relationship with or create an obligation to a customer, supplier or contractor. The following are non-exclusive guidelines regarding gifts and entertainment:

- Nominal gifts and entertainment, such as logo items, pens, calendars, caps, shirts and mugs are acceptable.
- Reasonable invitations to business-related meetings, conventions, conferences or product training seminars may be accepted.
- Invitations to social, cultural or sporting events may be accepted if the cost is reasonable and your attendance serves a customary business purpose such as networking (e.g. meals, holiday parties and tickets).
- Invitations to golfing, fishing, sports events or similar trips that are usual and customary for your position within the Company and the industry and promote good working relationships with customers and suppliers may be accepted provided, in the case of employees, they are approved in advance by your manager.

To prevent violations, planned gifts or entertainment should be reviewed with the Audit Committee in advance and all such expenses shall be accurately documented.

9. Competitive Practices

The Company firmly believes fair competition is fundamental to the continuation of the free enterprise system. The Company complies with and supports laws which prohibit restraints of trade, unfair practices, or abuse of economic power.

The Company shall not enter arrangements that unlawfully restrict its ability to compete with other businesses, or the ability of any other business organization to compete freely with the Company. The Company's employees, officers, and

directors shall also be prohibited from entering or discussing any unlawful arrangement or understanding that may result in unfair business practices or anticompetitive behaviour.

10. Supplier and Contractor Relationships

The Company shall select its suppliers and contractors in a non-discriminatory manner based on the quality, price, service, delivery and supply of goods and services. This decision must never be based on personal interests or the interests of family members or friends.

Employees must promptly inform their managers, and officers and directors must promptly inform the Chair of the Audit Committee, of any relationships that create or appear to create a conflict of interest.

11. Public Relations

The Company's CEO and the CFO are responsible for all public relations, including all contact with the media and the financial and investment communities. Unless you are specifically and expressly authorized to represent, or speak on behalf of, the Company, you may not provide or respond to inquiries or requests for information. This includes newspapers, magazines, trade publications, radio, and television as well as any other external sources requesting information about the Company. If you are contacted about any topic, you shall immediately refer the call to one of the above individuals.

Employees must be careful not to disclose confidential, personal, or business information through public or casual discussions to the media or others. See META-303 *Corporate Disclosure Policy* for additional information.

12. Government Relations

Employees, officers, and directors may participate in the political process as private citizens. It is important to separate personal political affiliation and activity and the Company's political activities, if any, to comply with the appropriate rules and regulations relating to lobbying or attempting to influence government officials. The Company's political activities, if any, are subject to the overall direction and discretion of the Board. The Company will not reimburse employees for money or personal time contributed to political campaigns. In addition, employees may not work on behalf of a candidate's campaign while at work or at any time use the Company's facilities for that purpose unless approved by the Chair of the Audit Committee.

No employee, officer or director may offer improper payments when acting on behalf of the Company.

Company funds shall not be used to make payment or provide anything of value, directly or indirectly (through agents or otherwise), in money, property, services or any other form to a government official, political party or candidate for political office in consideration for the recipient agreeing to:

- exert influence to assist the Company in obtaining or retaining business or secure any advantage; or
- commit any act in violation of a lawful duty or otherwise influence an official act.

If you are in doubt about the legitimacy of a payment that you have been requested to make, you shall promptly refer such situations to the Chair of the Audit Committee.

In addition, the Company, its employees, officers, and directors are strictly prohibited from attempting to influence any person's testimony in any manner whatsoever in courts of justice or any administrative tribunals or other government bodies.

13. Directorship

Employees of the Company shall not act as directors or officers of any other corporate entity or organization, public or private, without the prior written approval of the CEO. Directorships or officerships with such entities shall not be authorized if they are contrary to the interest of the Company, which shall be determined by the CEO in his or her sole discretion. The CEO may provide authorizations for directorships/officerships that are necessary for business purposes or for directorships/officerships with charitable organizations or non-profits.

14. Legal Compliance with Laws, Rules and Regulations (including Insider Trading Laws and Timely Disclosure)

All employees, officers, and directors of the Company are required to comply, in good faith and at all times, with both the spirit and the letter of all applicable laws, rules and regulations, and shall behave in an ethical manner. Whenever an applicable law, rule or regulation is unclear or seems to conflict with another law or any policy of the Company, including but not limited to this Code, you should seek clarification from your manager or the CEO.

Employees, officers, and directors of the Company are required to comply with the Company's Insider Trading Policy and all other policies and procedures applicable to them that are adopted by the Company from time to time.

Employees, officers, and directors of the Company must cooperate fully with those individuals (including the Chief Financial Officer and the Corporate Secretary) responsible for preparing reports filed with the securities regulatory authorities and all other materials that are made available to the investing public to ensure those persons are aware in a timely manner of all information that is required to be disclosed. Employees, officers, and directors of the Company should also cooperate fully with the Company's independent auditors in their audits and in assisting with the preparation of financial disclosures.

Senior officers of the Company must comply with the Company's Corporate Disclosure Policy and provide full, fair, accurate, understandable, and timely disclosure in reports and documents filed with, or submitted to, securities regulatory authorities and other materials that are made available to the investing public.

Information and Records

1. Confidential and Proprietary Information and Trade Secrets

Employees, officers, and directors of the Company may be exposed to certain information that is considered confidential by the Company or may be involved in the design or development of new procedures related to the business of the Company. All such information and procedures, whether or not they are the subject of copyright or patent protection, are the sole property of the Company. Employees, officers and directors shall not disclose confidential information to persons outside the Company, including family members, friends and third-party service providers, unless expressly permitted by the CFO or Chairman of the Board. Additionally, employees should only disclose such confidential information with other employees who have a "need to know" at determined in their manager's sole discretion.

Employees, officers, and directors of the Company are responsible and accountable for safeguarding the Company's documents and information to which they have direct or indirect access as a result of their employment or directorship with the Company.

15. Financial Reporting and Records

The Company seeks to maintain a high standard of accuracy and completeness in its financial records. These records serve as a basis for managing our business and are crucial for meeting obligations to employees, customers, investors, and others, as well as for compliance with regulatory, tax, financial reporting and other legal requirements. Employees, officers, and directors who make entries into business records or who issue regulatory or financial reports, are responsible for full, fair, accurate, timely and understandable disclosure, must fairly present all information in a truthful, accurate and timely manner, and must ensure that all information is properly recorded, classified and summarized. Such persons should also have an appropriate understanding of, and should seek in good faith to adhere to, relevant accounting and financial reporting principles, standards, laws, rules, regulations, and the Company's financial and accounting policies, controls and procedures. No employee, officer or director will exert any influence over, coerce, mislead or in any way manipulate or attempt to manipulate the independent auditors of the Company.

16. Record Retention

The Company maintains all records in accordance with laws and regulations regarding retention of business records. The term "business records" covers a broad range of files, reports, business plans, receipts, policies, and communications, including hard copy, electronic, audio recording, microfiche and microfilm files whether maintained at work or at home. The Company prohibits the unauthorized destruction of, or tampering with, any records, whether written or in electronic format, where the Company is required by law or government regulation to maintain such records or where it has reason to know of a threatened or pending government investigation or litigation relating to such records.

Company Assets

1. Use of Company Property

The use of Company property for individual profit or any unlawful or unauthorized personal or unethical purpose is strictly prohibited. The Company's assets, including information, technology, intellectual property, buildings, land, equipment, machines, software, and cash, shall only be used for business purposes, except as expressly provided by Company policy or approved in writing by your respective manager.

17. Destruction of Property and Theft

Employees, officers, and directors of the Company shall not intentionally damage or destroy the property of the Company and others or commit theft.

18. Intellectual Property of Others

Employees, officers, and directors of the Company shall not reproduce, distribute, or alter copyrighted materials without obtaining the written permission of the copyright owner or its authorized agents. Software used in connection with the Company's business must be properly licensed and used only in accordance with that license.

19. Information Technology

The Company's information technology systems, including computers, e-mail, intranet and internet access, telephones and voice mail are the property of the Company and are to be used primarily for business purposes. The Company information technology systems may be used for minor or incidental personal messages provided that such use is kept at a minimum and such use complies with Company policy.

Employees, officers, and directors of the Company shall not use the Company's information technology systems to:

- Allow others to gain access to the Company's information technology systems through the use of your password or other security codes;
- Send harassing, threatening or obscene messages;
- Send chain letters;
- Access the internet for inappropriate use;
- Send copyrighted documents that are not authorized for reproduction;
- Make personal or group solicitations unless authorized by a senior officer; or
- Conduct personal commercial business.

The Company will monitor the use of its information technology systems.

PROTOCOL

This Code forms part of the conditions of employment or engagement for all employees, officers and directors of the Company, and it is the responsibility of all employees, officers, and directors of the Company to understand and comply with this Code.

If you observe or become aware of an actual or potential violation of this Code or of any law or regulation, whether committed by the Company's employees, directors, officers or by other individuals or groups associated with the Company, it is your responsibility to report the circumstances as outlined herein and to cooperate fully with any investigation by the Company. This Code is designed to provide an atmosphere of open communication for compliance issues and to ensure that employees acting in good faith have the means to report actual or potential violations.

For assistance with compliance matters, employees should contact their manager or the CFO. If both your manager and the CFO are unable to resolve the issue, or if you are uncomfortable discussing the issue with either your manager or the CFO, you can report potential or actual infractions following the process outlined in META-302 *Whistleblower Policy*.

Officers and directors who become aware of any violation to this Code should promptly report them to the Chair of the Audit Committee openly or confidentially (in the manner described in the *Whistleblower Policy*).

Following the receipt of any complaints submitted hereunder, the Audit Committee shall promptly investigate each matter so reported and recommend that the Company take corrective disciplinary actions, if appropriate, up to and including termination of employment or directorship.

There will be no reprisals against employees, officers and directors for good faith reporting of compliance concerns or violations.

The Audit Committee shall confidentially retain any complaints received hereunder for a period of seven years.

PROCEDURE

All employees shall annually review this Code and complete a Certification of Policies form, indicating that this Code has been reviewed in its entirety, and sign and return the completed form to Human Resources.

This policy was adopted by the Board effective February 18, 2022.

Exhibit 21.1

List of subsidiaries

Name	Jurisdiction
2798331 Ontario Inc	Ontario, Canada
Metamaterial Exchangeco Inc	Ontario, Canada
Metamaterial Inc	Ontario, Canada
Medical Wireless Sensing Ltd	London, United Kingdom
Metamaterial Technologies USA Inc	California, United States
Metamaterial Technologies Canada Inc	Federal, Canada
Meta Material Single Member S.A.	Greece
Nanotech Security Corp.	British Columbia, Canada
1315115 BC Inc.	British Columbia, Canada
Torchlight Energy Inc.	Nevada, United States
Torchlight Hazel, LLC	Texas, United States
Hudspeth Oil Corp.	Texas, United States
Oilco Holdings Inc	Nevada, United States
Hudspeth Operating, LLC	Texas, United States

KPMG LLP
Vaughan Metropolitan Centre
100 New Park Place, Suite 1400
Vaughan ON L4J 0J3
Canada

Telephone (905) 265-5900
Fax (905) 265-6390
Internet www.kpmg.ca

Consent of Independent Registered Public Accounting Firm

The Board of Directors
Meta Materials Inc.

We consent to the use of:

- our report dated March 1, 2022, with respect to the consolidated financial statements of Meta Materials Inc. (the "Entity") which comprise the consolidated balance sheets as of December 31, 2021 and December 31, 2020, the related consolidated statements of operations and comprehensive loss, changes in stockholders' equity and cash flows for each of the years in the three-year period ended December 31, 2021, and the related notes (collectively, the "consolidated financial statements"), and

- our report dated March 1, 2022 on the effectiveness of the Entity's internal control over financial reporting as of December 31, 2021

each of which is included in this Annual Report on Form 10-K of the Entity for the fiscal year ended December 31, 2021.

We also consent to the incorporation by reference of such reports in the Registration Statements on Form S-3 (Nos. 333-233653, 333-248316, 333-249062, 333-256632 and 333-256636), and the Registration Statements on Form S-8 (Nos. 333-210812 and 333-259073).

We also consent to the reference to our firm under the heading "Experts" in the Registration Statements.

KPMG LLP

Chartered Professional Accountants, Licensed Public Accountants

March 1, 2022
Vaughan, Canada

Consent of Independent Registered Public Accounting Firm

The Board of Directors
Meta Materials Inc.

We consent to the use of:

- our report dated March 1, 2022, with respect to the consolidated financial statements of Meta Materials Inc. (the "Entity") which comprise the consolidated balance sheets as of December 31, 2021 and December 31, 2020, the related consolidated statements of operations and comprehensive loss, changes in stockholders' equity and cash flows for each of the years in the three-year period ended December 31, 2021, and the related notes (collectively, the "consolidated financial statements"), and

- our report dated March 1, 2022 on the effectiveness of the Entity's internal control over financial reporting as of December 31, 2021

each of which is included in this Annual Report on Form 10-K of the Entity for the fiscal year ended December 31, 2021.

We also consent to the incorporation by reference of such reports in the Registration Statements on Form S-3 (Nos. 333-233653, 333-248316, 333-249062, 333-256632 and 333-256636), and the Registration Statements on Form S-8 (Nos. 333-210812 and 333-259073).

We also consent to the reference to our firm under the heading "Experts" in the Registration Statements.

/s/ KPMG LLP

Chartered Professional Accountants, Licensed Public Accountants

March 1, 2022
Vaughan, Canada

Exhibit 31.1

CERTIFICATION PURSUANT TO
RULES 13a-14(a) AND 15d-14(a) UNDER THE SECURITIES EXCHANGE ACT OF 1934,
AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, George Palikaras, certify that:

1. I have reviewed this annual report on Form 10-K of Meta Materials Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 1, 2022

By: /s/ **George Palikaras**

George Palikaras
Chief Executive Officer

Exhibit 31.2

CERTIFICATION PURSUANT TO
RULES 13a-14(a) AND 15d-14(a) UNDER THE SECURITIES EXCHANGE ACT OF 1934,
AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Kenneth Rice, certify that:

1. I have reviewed this annaul report on Form 10-K of Meta Materials Inc;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 1, 2022

By: /s/ **Kenneth Rice**

Kenneth Rice
Chief Financial Officer

Exhibit 32.1

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350, AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report of Meta Materials Inc (the "Company") on Form 10-K for the year ended December 31, 2021 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I certify, pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002, that:

(1) The Report fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and result of operations of the Company.

Date: March 1, 2022

By: /s/ **George Palikaras**
George Palikaras
Chief Executive Officer

Exhibit 32.2

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350, AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report of Meta Materials Inc (the "Company") on Form 10-K for the year ended December 31, 2021 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I certify, pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002, that:

(1) The Report fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and result of operations of the Company.

Date: March 1, 2022

By: /s/ **Kenneth Rice**

Kenneth Rice
Chief Financial Officer