UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 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 000-52008

LUNA INNOVATIONS INCORPORATED

(Exact name of Registrant as Specified in its Charter)

Delaware	**54-1560050**
(State or Other Jurisdiction of Incorporation or Organization)	***(I.R.S. Employer Identification Number)***

301 1st St SW, Suite 200
Roanoke, VA 24011
(Address of Principal Executive Offices)
(540) 769-8400
(Registrant's Telephone Number, Including Area Code)

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

Title of each class	Trading Symbol	Name of each exchange on which registered
Common Stock, $0.001 par value per share	LUNA	The Nasdaq Stock Market LLC

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 x

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes ☐ No x

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 x

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 during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes x No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a 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. o

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 x

The aggregate market value of the voting and non-voting common equity held by non-affiliates of the registrant on June 30, 2021 based upon the closing price of Common Stock on such date as reported by the Nasdaq Capital Market, was approximately $337.5 million.

Indicate the number of shares outstanding of each of the issuer's classes of common stock, as of the latest practicable date: As of March 11, 2022 there were 32,298,014 shares of the registrant's common stock outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Specified portions of the registrant's Proxy Statement with respect to its 2022 Annual Meeting of stockholders, anticipated to be filed within 120 days after the end of its fiscal year ended December 31, 2021, are incorporated by reference into Part III of this annual report on Form 10-K.

LUNA INNOVATIONS INCORPORATED
ANNUAL REPORT ON FORM 10-K
FOR THE YEAR ENDED DECEMBER 31, 2021

TABLE OF CONTENTS

CAUTIONARY NOTE REGARDING FORWARD LOOKING STATEMENTS

This Annual Report on Form 10-K, including the "Management's Discussion and Analysis of Financial Condition and Results of Operation" section in Item 7 of this report, and other materials accompanying this Annual Report on Form 10-K contain forward-looking statements within the meaning of Section 21E of the Securities Exchange Act of 1934, as amended, and Section 27A of the Securities Act of 1933, as amended. All statements other than statements of historical facts are "forward-looking statements" for purposes of these provisions, including those relating to future events or our future financial performance. In some cases, you can identify these forward- looking statements by words such as "intends," "will," "plans," "anticipates," "expects," "may," "might," "estimates," "believes," "should," "projects," "predicts," "potential" or "continue," or the negative of those words and other comparable words, and other words or terms of similar meaning in connection with any discussion of future operating or financial performance. Similarly, statements that describe our business strategy, goals, prospects, opportunities, outlook, objectives, plans or intentions are also forward-looking statements. These statements are only predictions and may relate to, but are not limited to, expectations of future operating results or financial performance, capital expenditures, introduction of new products, regulatory compliance, plans for growth and future operations, the potential impacts of the COVID-19 pandemic on our business, operations and financial results, the potential benefits of our recent acquisitions and dispositions, as well as assumptions relating to the foregoing.

These statements are based on current expectations and assumptions regarding future events and business performance and involve known and unknown risks, uncertainties and other factors that may cause actual events or results to be materially different from any future events or results expressed or implied by these statements. These factors include those set forth in the following discussion and within Item 1A "Risk Factors" of this Annual Report on Form 10-K and elsewhere within this report.

You should not place undue reliance on these forward-looking statements, which apply only as of the filing date of this Annual Report on Form 10-K. You should carefully review the risk factors described in other documents that we file from time to time with the U.S. Securities and Exchange Commission ("SEC"). Except as required by applicable law, including the rules and regulations of the SEC, we do not plan to publicly update or revise any forward-looking statements, whether as a result of any new information, future events or otherwise, other than through the filing of periodic reports in accordance with the Securities Exchange Act of 1934, as amended.

We have proprietary rights to a number of trademarks used in this Annual Report which are important to our business. Solely for convenience, the trademarks and trade names in this prospectus are referred to without the ® and TM symbols, but such references should not be construed as any indicator that their respective owners will not assert, to the fullest extent under applicable law, their rights thereto. All other trademarks, trade names and service marks appearing in this Annual Report are the property of their respective owners.

RISK FACTORS SUMMARY

Our business is subject to a number of risks and uncertainties, including those risks discussed at-length below. These risks include, among others, the following:

- Risks Relating to our Business
  - Our technology is subject to a license from Intuitive Surgical, Inc., which is revocable in certain circumstances. Without this license, we cannot continue to market, manufacture or sell our fiber-optic products.
  - We depend on third-party vendors for specialized components in our manufacturing operations, making us vulnerable to supply shortages and price fluctuations that could harm our business.
  - As a provider of contract research to the U.S. government, we are subject to federal rules, regulations, audits and investigations, the violation or failure of which could adversely affect our business.
  - Our products must meet exacting specifications, and defects and failures may occur, which may cause customers to return or stop buying our products.
  - The markets for many of our products are characterized by changing technology which could cause obsolescence of our products, and we may incur substantial costs in delivering new products.
- Risks Relating to our Operations and Business Strategy
  - If we fail to properly evaluate and execute our strategic initiatives, it could have an adverse effect on our future results and the market price of our common stock.
  - Health epidemics, including the COVID-19 pandemic, have had, and could in the future have, an adverse impact on our business, operations, and the markets and communities in which we and our customers and suppliers operate.
- Risks Relating to our Regulatory Environment

- Our operations are subject to domestic and foreign laws, regulations and restrictions, and noncompliance with these laws, regulations and restrictions could expose us to fines, penalties, suspension or debarment, which could have a material adverse effect on our profitability and overall financial position.
- We are or may become subject to a variety of privacy and data security laws, and our failure to comply with them could harm our business.

- Risks Relating to our Intellectual Property
  - Our proprietary rights may not adequately protect our technologies.
  - Third parties may claim that we infringe their intellectual property, and we could suffer significant litigation or licensing expense as a result.
- Risks Relating to our Common Stock
  - Our common stock price has been volatile and we expect that the price of our common stock will fluctuate substantially in the future, which could cause you to lose all or a substantial part of your investment.
  - Anti-takeover provisions in our amended and restated certificate of incorporation and bylaws and Delaware law could discourage or prevent a change in control, even if an acquisition would be beneficial to our stockholders, which could affect our stock price adversely and prevent attempts by our stockholders to replace or remove our current management.

PART I

ITEM 1. BUSINESS

Company Overview and Business Model

Luna Innovations Incorporated ("we" or the "Company") is a leader in advanced optical technology, providing high performance fiber optic test, measurement and control products for the telecommunications and photonics industries; and distributed fiber optic sensing solutions that measure and monitor materials and structures for applications in aerospace, automotive, energy, oil and gas, security and infrastructure. We have a broad range of products for the applications based on proprietary technology covered by a portfolio of over 700 patents either owned or exclusively in-licensed.

Our communications test and control products help customers test their fiber optic networks and assemblies with speed and precision in both lab and production environments. Our test and measurement products accelerate the development of high speed fiber optic components like photonic integrated circuits ("PICs"), coherent receivers and short-run fiber networks.

Our distributed fiber optic sensing products help designers and manufacturers more efficiently develop new and innovative products by measuring stress, strain, and temperature at a high resolution for new designs or manufacturing processes. In addition, our distributed fiber optic sensing products ensure the safety and structural integrity or operational health of critical assets in the field, by monitoring stress, strain, and vibration in large civil and industrial infrastructure such as bridges, roads, pipelines and borders. We manufacture and sell “terahertz” (THz) products for layer thickness measurements for materials like plastics, rubber, and paint. Our THz products are used in the aerospace and automotive/EV sectors. We also provide applied research services, typically under research programs funded by the U.S. government, in areas of sensing and instrumentation, advanced materials, optical technologies and health sciences.

Prior to September 30, 2021, we were organized into two main reporting segments, our Lightwave segment and our Luna Labs segment. We now have one reportable segment, Lightwave, following the determination that our Luna Labs segment met held-for-sale and discontinued operations accounting criteria at the end of the third quarter of 2021. Our Lightwave segment consists of our fiber optics testing, measurement and sensing solutions. On March 8, 2022, we completed the sale of substantially all of our equity interests in Luna Labs. Prior to the sale, our Luna Labs segment performed applied research principally in the areas of sensing and instrumentation, advanced materials, optical technologies and health sciences.

Dispositions and Acquisitions

Luna Labs

On March 8, 2022, we completed the sale of substantially all of our equity interests in our Luna Labs business to certain members of Luna Labs’ senior management team and a group of outside investors for an initial purchase price of $20.4 million before working capital and escrow adjustments and transaction fees. Total consideration included $13.0 million of cash received at closing, $2.5 million in the form of a convertible note and $1.7 million in the form of 60-day promissory notes. We can earn up to $1.0 million in future payments from Luna Labs upon the achievement by Luna Labs of certain financial goals.

LIOS Sensing

On March 10, 2022, we acquired NKT Photonics GmbH and LIOS Technology Inc. (collectively, “LIOS Sensing”) for €20.0 million, or $22.1 million. LIOS Sensing, based in Cologne, Germany and formerly owned by NKT Photonics A/S, provides temperature and strain sensing products which are highly complementary to our existing portfolio of fiber optic offerings.

OptaSense

On December 3, 2020, we acquired OptaSense Holdings Limited ("OptaSense") for $38.9 million, or £29.0 million, in cash. OptaSense, based in Farnborough, United Kingdom ("UK") and formerly owned by QinetiQ Holdings Limited, is a market leader in fiber optic distributed monitoring solutions for pipelines, oilfield services, security, highways and railways, and in power and utilities monitoring systems. The acquisition of OptaSense provided us with important distributed acoustic sensing ("DAS") intellectual property and products. OptaSense's technology and products and geographic footprint are highly complementary to our Lightwave segment which we believe will accelerate our technology roadmap and overall growth.

Lightwave

Our Lightwave segment develops, manufactures and markets distributed fiber optic sensing products and fiber optic communications test and control products. We develop and commercialize our fiber optic technology for sensing applications for aerospace, automotive, energy and infrastructure as well as for test and measurement applications in the telecommunications and data communications industries. Our Lightwave segment also performs applied research principally in the areas of optical and THz technologies.

Our key initiative for long term growth is to become a leading provider of fiber optic test, measurement, control and sensing equipment. The acquisition of OptaSense added distributed acoustic sensing technology to our existing suite of sensing products and provided for expansion into high-growth markets such as security and perimeter detection, smart infrastructure monitoring and oil and gas. Our products have historically been strong in long-range, discrete sensing and short range, fully distributed sensing which are best when specific, known locations need to be monitored. OptaSense's product offering has helped us fill a gap for long range, fully distributed measurement, which is best for applications where signals can occur anywhere along the length of the sensor.

Our primary product lines in our Lightwave segment are described in more detail below.

Communications Test and Photonic Controls Products

Test and Measurement Equipment for Fiber Optic Components and Sub-Assemblies

Our product lines in the optical test and measurement domain include our Optical Vector Analyzer, our Optical Backscatter Reflectometer, and our Phoenix family of tunable lasers.

Our optical test and measurement products primarily serve the telecommunications industry, as well as provide valuable applications in other fields. Our test and measurement products test and monitor the integrity of fiber optic network components and sub-assemblies. These products are designed for manufacturers and suppliers of optical components and sub-assemblies allowing them to reduce development, test and production costs and improve the quality of their products. Our products are particularly useful for characterizing and testing photonic integrated circuits, such as silicon photonics components, which are a critical technology enabling the growing worldwide demand for internet connectivity. Most manufacturers and suppliers of optical components and modules currently use a combination of different types of optical test equipment to measure performance and identify failures in optical networks, such as bad splices, bends, crimps and other reflective and non-reflective events that can cause defects and negatively impact product performance. Our optical test equipment products eliminate the need to employ multiple test products by addressing all stages of the end user’s product development lifecycle, including design verification, component qualification, assembly process verification and failure analysis.

Polarization Control

Our polarization control products include components, modules and instruments to measure, manage and control polarization and group delay in fiber optic networks. Our proprietary fiber optic squeezing technology enables a high-performance polarization control and measurement system for the accurate measurement of polarization properties of light sources and optical materials. We also manufacture and sell fiber optic coils for use in gyroscopes.

Tunable Lasers

Our swept tunable lasers are integrated into current and new products to help customers build faster, more flexible and cost-effective test and measurement products. Our laser has desirable properties in the quality of the laser light produced, the speed at which it can operate, the small size of the package, and the environmental conditions in which it can operate, making it possible to bring these capabilities out of the laboratory, and into more demanding environments such as aircraft structural health monitoring, automotive manufacturing, green energy and industrial applications.

Single Frequency Lasers

Through the acquisition of OptaSense, we acquired laser manufacturing capabilities for a range of highly coherent, integrated, very narrow line-width lasers for use in long range sensing applications. These lasers are manufactured under our “RIO” trade name and are used as the primary light source for our long range, DAS sensing products. We also sell these lasers as OEM components to other sensing and Light Detection and Ranging ("LiDAR") system manufacturers.

Sensing and Non-Destructive Test Products

ODiSI Sensing Solution

Our ODiSI products provide fully distributed strain and temperature measurements delivering an extraordinary amount of data by using an optical fiber as a continuous sensor to produce measurements every millimeter for a sensor up to 50 meters in length. Compared to traditional sensing methods, such as electrical strain gages, this technology provides greater insight into the performance, tolerances and failure mechanisms of composite structures and vehicles and can be integrated into locations and environments not accessible with traditional sensors. We believe our ODiSI products provide exceptional value to the aerospace and automotive industries as they continue to adopt electrification and move to lighter weight systems made of composite structures.

ODiSI incorporates multiple channels of fiber optic sensors whose inputs are integrated through an advanced measurement system and software using fiber optic sensing technology with our innovative monitoring system that allows several thousand sensors to be networked along a single optical fiber.

Hyperion Sensing Solution

Our Hyperion sensing products expand our capabilities in fiber optic sensing by providing distributed sensing using hundreds of Fiber-Bragg Grating ("FBG") or Extrinsic Fabry-Perot ("FP") sensors integrated into long-rage sensors of up to 40km in length, measured at sampling rates up to 5KHz. Hyperion enables rapid full-spectrum data acquisition and flexible peak detect algorithms of FBGs, Long Period FBGs and FP sensors with low-latency access to data for closed-loop feedback applications. Our Hyperion products target fiber optic sensing applications that require more dynamic measurement capabilities or longer distances than provided by our ODiSI platform, like monitoring of large, civil and industrial infrastructure.

Terahertz Sensing Systems

Our Terametrix THz gauging and imaging product line uses pulsed THz waves to provide precise single- and multi-layer thickness, density, basis weight and caliper thickness measurements to serve the industrial, non-destructive testing, and research markets. Similar to x-ray images, THz wavelengths penetrate through most non-conductive materials and can easily reveal imperfections such as voids, cracks, and density variations. THz offers a significant advantage over x-rays because the radiation is non-ionizing and thus is completely safe. THz technology, unlike other traditional methods, is non-contact, works with both opaque and translucent materials, and works well for multilayer structures. The ability to accurately measure layer thickness is critical for ensuring consistent quality, minimizing defects and reducing material usage for products such as tubing, tires, plastic bottles, adhesives and coatings. Handheld THz sensors can measure and scan specialty coatings and multilayer structures to check thickness consistency and locate subsurface defects. THz systems can be used to inspect the high-performance coatings used on military aircraft, verifying thickness of applied coatings with submicron accuracy.

Distributed Acoustic Sensing Products

OptaSense

Our line of advanced DAS interrogator units delivers superior measurements for a wide range of applications from advanced industrial monitoring through high performance geophysical measurements. Applications of these units include real-time pipeline monitoring preventing disruption flow, advance monitoring and evaluation of reservoir and wellbore to reduce risk and optimize recovery, real-time information detection on highways and railways for traffic management and ensuring safety, cost-effective surveillance of borders and national assets and the precise detection of faults in power and utility infrastructure. Our DAS operations include a market leading laser technology company that supports and vertically integrates the most critical element of the DAS system, its internal laser.

Sales and Marketing

We primarily market our fiber optic test, measurement and control products to telecommunications companies, defense agencies, government system integrators, researchers, original equipment manufacturers, distributors, testing labs and strategic partners worldwide. We have a regional sales force that markets and sells our products directly as well as through manufacturer representative organizations to customers in North America and through partner and distribution channels for sales outside of North America, including the EMEA, LATAM and APAC regions. We have a dedicated sales force for direct marketing of our distributed sensing products, with an initial focus on customers in the automotive, aerospace, and energy industries.

We sell and market our THz instruments primarily to original equipment manufacturers through a mix of technical sales engineers, value added resellers and independent sales representatives. We market these products and capabilities through industry specific channels, including the internet, industry trade shows and through trade journals.

We believe that we provide a high level of support in developing and maintaining our long-term relationships with our customers. Customer service and support are provided through our offices and those of our partners that are located throughout the world.

Luna Labs

On March 8, 2022, we completed the sale of substantially all of our equity interests in Luna Labs. Our Luna Labs business provided applied research for customers in our primary areas of focus, including sensing and materials such as coatings, adhesives, composites and bio-engineered materials. Our Luna Labs business also developed a wide variety of materials, including a range of coatings, including both hydrophobic and superoleophobic coatings, and bioengineered materials for homeostatic agents and wound healing. Luna Labs also performed a significant amount of applied research towards developing new sensors. This included sensors for the purpose of corrosion, temperature, strain, pressure, structural health and chemical detection. Much of the work is directed to harsh environments and uses optics.

Intellectual Property

We seek patent protection on inventions that we consider important to the operations of our business. We rely on a combination of patent, trademark, copyright and trade secret laws in the United States and other jurisdictions, as well as confidentiality procedures and contractual provisions to protect our proprietary technology and our brand. We control access to our proprietary technology and enter into confidentiality and invention assignment agreements with our employees and consultants and confidentiality agreements with other third parties.

Our success depends in part on our ability to develop patentable products and obtain, maintain and enforce patent and trade secret protection for our products, including successfully defending our patents against third-party challenges both in the United States and in other countries. We will only be able to protect our technologies from unauthorized use by third parties to the extent that we own or have licensed valid and enforceable patents or trade secrets that cover them. Furthermore, the degree of future protection of our proprietary rights is uncertain because we may not be able to obtain patent protection on some or all of our technology and because legal means afford only limited protection and may not adequately protect our rights or permit us to gain or keep our competitive advantage.

Currently, we own or license approximately 655 U.S. and international patents and approximately 65 U.S. and international patent applications. Our issued patents generally have terms that are scheduled to expire between 2022 and 2039. The patents scheduled to expire in 2022 are not expected to have a significant impact on our revenues or results of operations. Patents may not be issued for any pending or future pending patent applications owned by or licensed to us. Claims allowed under any issued patent or future issued patent owned or licensed by us may not be valid or sufficiently broad to protect our technologies. Any issued patents owned by or licensed to us now or in the future may be challenged, invalidated or circumvented, and, in addition, the rights under such patents may not provide us with competitive advantages. In addition, competitors may design around our technology or develop competing technologies. To the extent we elect to pursue, intellectual property rights may also be unavailable or limited in some foreign countries, which could make it easier for competitors to capture or increase their market share with respect to related technologies.

A discussion of our material in-licensed patents is set forth below.

Shape Sensing Patents

As a part of our sale of assets associated with our fiber optic shape sensing technology in the medical field to Intuitive Surgical, Inc. ("Intuitive") in 2014, we transferred our related patents to Intuitive. Also, as a part of this transaction, we entered into a license agreement with Intuitive pursuant to which we have the right to use all of our transferred technology outside the field of medicine and in respect of our existing non-shape sensing products in certain non-robotic medical fields. The license is revocable with ability to remedy, but only in the case that Luna were to enter competitively into the medical robotics space. Two U.S. patents that we now license back from Intuitive cover the use of optical frequency domain reflectometry and multiple, closely spaced Bragg gratings for shape sensing, and the use of the inherent scatter as a strain sensor for shape sensing. These two patents expire in July 2025. We also license back from Intuitive patents and patent applications that cover certain refinements to the measurements covered in the foregoing two patents and related technologies, which are necessary in order to achieve the necessary accuracies for medical and other applications. These patent applications were filed in the United States, the European Patent Office, China, India, Russia, Brazil, Japan, Indonesia and elsewhere. These patents and patent applications can support other nonmedical applications of our fiber optic shape sensing technology.

Coherent

In December 2006, we entered into an asset transfer and license agreement with Coherent, Inc. Under the agreement, we acquired the rights to manufacture Coherent's "Iolon" brand of swept tunable lasers as well as certain manufacturing equipment and inventory previously used by Coherent to manufacture the lasers. We continue to enhance, produce and market these lasers under our "Phoenix" brand. Under this agreement, Coherent granted non-exclusive licenses to us for certain U.S. patents and other intellectual property rights owned or controlled by Coherent for making, having made, using, importing, selling and offering for sale the lasers. This agreement expired in 2016. However, the patent licenses became fully paid and perpetual, as we fulfilled our royalty obligations during the 10-year period and the license to the other intellectual property rights is perpetual. These U.S. patents will expire by the end 2022. As consideration, we paid Coherent a total of $1.3 million in addition to paying royalties on net sales of products sold by us that incorporate the lasers or that are manufactured using the intellectual property covered by the licenses.

The Phoenix laser is a miniaturized, external-cavity laser offering high performance in a compact footprint and is applicable to a range of fiber optic test and measurement, instrumentation, and sensing applications. These products employ frequency-tuned lasers to measure various aspects of the transmission properties of telecommunications fiber optic components and systems. Lasers are also used in fiber optic sensing applications such as distributed strain and temperature mapping, and distributed measurement of shape. We currently use these lasers within our ODiSI platform of products, our fiber optic shape sensing products and certain of our backscatter reflectometer products, and we also sell variations of the Phoenix laser as standalone products. Under our agreements related to our sale of assets to Intuitive, we have certain obligations to supply Intuitive with these lasers.

Corporate History

We were incorporated in the Commonwealth of Virginia in 1990 and reincorporated in the State of Delaware in April 2003. We completed our initial public offering in June 2006. Our executive offices are located at 301 1st St SW, Suite 200, Roanoke, Virginia 24011 and our main telephone number is (540) 769-8400.

Competition

We compete with a variety of companies in several different product markets. The products that we have developed or are currently developing will compete with other technologically innovative products, as well as products incorporating conventional materials and technologies. We expect that we will compete with companies that manufacture test and measurement equipment for a wide range of industries, including aerospace, defense, healthcare, telecommunications, energy (including oil and gas and green energy), industrial measurement, and security applications. Although there can be no assurance that we will continue to do so, we believe that we compete favorably in these areas because our products leverage advanced technologies to offer superior performance. If we are unable to effectively compete in these areas in the future, we could lose business to our competitors, which could harm our operating results.

We also compete, or will compete, for government, university and corporate research contracts relating to a broad range of technologies. Competition for contract research is intense and the industry has few barriers to entry. We compete against a number of in-house research and development departments of major corporations, as well as a number of small, limited-service contract research providers and companies backed by large venture capital firms. The contract research industry continues to experience consolidation, which has resulted in greater competition for clients. Increased competition might lead to price and other forms of competition that could harm our operating results. We compete for contract research on the basis of a number of factors, including reliability, past performance, expertise and experience in specific areas, scope of service offerings, technological capabilities and price.

Government Regulation

Environmental, Health and Safety Regulation

Our facilities and current and proposed activities involve the use of a broad range of materials that are considered hazardous under applicable laws and regulations. Accordingly, we are subject to a number of domestic and foreign laws and regulations and other requirements relating to employee health and safety, protection of the environment, product labeling and product take back. Regulated activities include the storage, use, transportation and disposal of, and exposure to, hazardous or potentially hazardous materials and wastes. Our current and proposed activities also include potential exposure to physical hazards associated with work environment and equipment. We could incur costs, fines, civil and criminal penalties, personal injury and third-party property damage claims, or we could be required to incur substantial investigation or remediation costs, if

we were to violate or become liable under environmental, health and safety laws and regulations or requirements. Liability under environmental, health and safety laws can be joint and several and without regard to fault. There can be no assurance that violations of environmental, health and safety laws will not occur in the future as a result of the inability to obtain permits in a timely manner, human error, equipment failure or other causes. Environmental, health and safety laws could also become more stringent over time, imposing greater compliance costs and increasing risks and penalties associated with violations, which could harm our business. Further, violations of present and future environmental, health and safety laws could restrict our ability to expand facilities and pursue certain technologies, as well as require us to acquire costly equipment or to incur potentially significant costs to comply with environmental, health and safety regulations and other requirements.

We have made, and will continue to make, expenditures to comply with current and future environmental, health and safety laws. We anticipate that we could incur additional capital and operating costs in the future to comply with existing environmental, health and safety laws and new requirements arising from new or amended statutes and regulations. In addition, because the applicable regulatory agencies have not yet promulgated final standards for some existing environmental, health and safety programs, we cannot at this time reasonably estimate the cost for compliance with these additional requirements. The amount of any such compliance costs could be material. We cannot predict the impact that future regulations will impose upon our business.

Human Capital Management

We seek to fulfill our mission by attracting talented people, fostering innovation and managing aspects of our business in an ethical manner that benefits our stakeholders, including the communities in which we operate. We promote and empower a diverse workforce who are dedicated to helping solve our customers' toughest challenges. As of December 31, 2021, we had 385 full-time employees and 7 part-time employees, including approximately 30% employed in research, development and engineering positions, approximately 35% employed in operations, approximately 20% employed in sales and marketing, and approximately employed 15% in administrative positions. None of our employees are covered by a collective bargaining agreement, and we consider our relationship with our employees to be good. As of March 11, 2022, we had approximately 375 total employees following the disposition of Luna Labs and acquisition of LIOS.

Backlog

Our backlog of purchase orders received for which the related goods have not been shipped or recognized as revenue, for our Lightwave segment, was $38.4 million and $28.2 million at December 31, 2021 and 2020, respectively. We define backlog as the dollar amount of obligations payable to us under negotiated contracts upon completion of a specified portion of work that has not yet been completed, exclusive of revenues previously recognized for work already performed under these contracts, if any. Total backlog includes funded backlog, which is the amount for which money has been directly authorized by the U.S. government or for which a purchase order has been received from a commercial customer, and unfunded backlog, which represents firm orders for which funding has not yet been appropriated. Indefinite delivery and quantity contracts and unexercised options are not reported in total backlog. Our backlog is subject to delays or program cancellations that may be beyond our control.

Website Access to Reports

Our website address is www.lunainc.com. We make available, free of charge under "SEC Filings" on the Investor Relations portion of our website, access to our annual report on Form 10-K, our quarterly reports on Form 10-Q and our current reports on Form 8-K, as well as amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended, as soon as reasonably practicable after such material is electronically filed with or furnished to the SEC. Information appearing on our website is not incorporated by reference in and is not a part of this annual report. The SEC maintains an internet site that contains reports, proxy and information statements, and other information regarding our filings at www.sec.gov.

ITEM 1A. RISK FACTORS

You should carefully consider the risks described below before deciding whether to invest in our common stock. The risks described below are not the only ones we face. Additional risks not presently known to us or that we currently believe are immaterial may also impair our business operations and financial results. If any of the following risks actually occurs, our business, financial condition or results of operations could be adversely affected. In such case, the trading price of our common stock could decline and you could lose all or part of your investment. Our filings with the Securities and Exchange Commission also contain forward-looking statements that involve risks or uncertainties. Our actual results could differ materially from

those anticipated or contemplated by these forward-looking statements as a result of a number of factors, including the risks we face described below, as well as other variables that could affect our operating results. Past financial performance should not be considered to be a reliable indicator of future performance, and investors should not use historical trends to anticipate results or trends in future periods.

RISKS RELATING TO OUR BUSINESS

Our technology is subject to a license from Intuitive Surgical, Inc., which is revocable in certain circumstances. Without this license, we cannot continue to market, manufacture or sell our fiber-optic products.

As a part of the sale of certain assets to Intuitive Surgical, Inc. ("Intuitive") in 2014, we entered into a license agreement with Intuitive pursuant to which we received rights to use all of our transferred technology outside the field of medicine and in respect of our existing non-shape sensing products in certain non-robotic medical fields. This license back to us is revocable if after notice and certain time periods, we were to (i) challenge the validity or enforceability of the transferred patents and patent applications, (ii) commercialize our fiber optical shape sensing and localization technology in the field of medicine (except to perform on a development and supply project for Hansen Medical, Inc.), (iii) violate our obligations related to our ability to sublicense in the field of medicine or (iv) violate our confidentiality obligations in a manner that advantages a competitor in the field of medicine and not cure such violation. Maintaining this license is necessary for us to conduct our fiber-optic products business, both for our telecom products and our ODiSI sensing products. If this license were to be revoked by Intuitive, we would no longer be able to market, manufacture or sell these products which could have a material adverse effect on our operations.

We depend on third-party vendors for specialized components in our manufacturing operations, making us vulnerable to supply shortages and price fluctuations that could harm our business.

We primarily rely on third-party vendors for the manufacture of the specialized components used in our products. The highly specialized nature of our supply requirements poses risks that we may not be able to locate additional sources of the specialized components required in our business. For example, there are few manufacturers who produce the special lasers used in our optical test equipment. Our reliance on these vendors subjects us to a number of risks that could negatively affect our ability to manufacture our products and harm our business, including interruption of supply, including as a result of the COVID-19 pandemic. Although we are now manufacturing tunable lasers in low-rate initial production, we expect our overall reliance on third-party vendors to continue. Any significant delay or interruption in the supply of components, or our inability to obtain substitute components or materials from alternate sources at acceptable prices and in a timely manner could impair our ability to meet the demand of our customers and could harm our business.

We depend upon outside contract manufacturers for a portion of the manufacturing process for some of our products. Our operations and revenue related to these products could be adversely affected if we encounter problems with these contract manufacturers.

Many of our products are manufactured internally. However, we also rely upon contract manufacturers to produce the finished portion of certain lasers. Our reliance on contract manufacturers for these products makes us vulnerable to possible capacity constraints and reduced control over delivery schedules, manufacturing yields, manufacturing quality control and costs. If the contract manufacturer for our products were unable or unwilling to manufacture our products in required volumes and at high quality levels or to continue our existing supply arrangement, we would have to identify, qualify and select an acceptable alternative contract manufacturer or move these manufacturing operations to internal manufacturing facilities. An alternative contract manufacturer may not be available to us when needed or may not be in a position to satisfy our quality or production requirements on commercially reasonable terms, including price. Any significant interruption in manufacturing our products, including as a result of the COVID-19 pandemic, would require us to reduce the supply of products to our customers, which in turn would reduce our revenue, harm our relationships with the customers of these products and cause us to forego potential revenue opportunities.

As a provider of contract research to the U.S. government, we are subject to federal rules, regulations, audits and investigations, the violation or failure of which could adversely affect our business.

We must comply with and are affected by laws and regulations relating to the award, administration and performance of U.S. government contracts. Government contract laws and regulations affect how we do business with our government customers and, in some instances, impose added costs on our business. A violation of a specific law or regulation could result in the imposition of fines and penalties, termination of our contracts or debarment from bidding on contracts. In some instances,

these laws and regulations impose terms or rights that are more favorable to the government than those typically available to commercial parties in negotiated transactions. For example, the U.S. government may terminate any of our government contracts and, in general, subcontracts, at their convenience, as well as for default based on performance.

In addition, U.S. government agencies, including the Defense Contract Audit Agency and the Department of Labor, routinely audit and investigate government contractors. These agencies review a contractor's performance under its contracts, cost structure and compliance with applicable laws, regulations and standards. The U.S. government also may review the adequacy of, and a contractor's compliance with, its internal control systems and policies, including the contractor's purchasing, property, estimating, compensation and management information systems. Any costs found to be improperly allocated to a specific contract will not be reimbursed, while such costs already reimbursed must be refunded. If an audit uncovers the inclusion of certain claimed costs deemed to be expressly unallowable, or improper or illegal activities, we may be subject to civil and criminal penalties and administrative sanctions, including termination of contracts, forfeiture of profits, suspension of payments, fines and suspension or prohibition from doing business with the U.S. government. In addition, our reputation could suffer serious harm if allegations of impropriety were made against us.

In addition to the risk of government audits and investigations, U.S. government contracts and grants impose requirements on contractors and grantees relating to ethics and business practices, which carry civil and criminal penalties including monetary fines, assessments, loss of the ability to do business with the U.S. government and certain other criminal penalties.

We may also be prohibited from commercially selling certain products that we develop if the U.S. government determines that the commercial availability of those products could pose a risk to national security. For example, certain of our wireless technologies have been classified as secret by the U.S. government and as a result we cannot sell them commercially. Any of these determinations would limit our ability to generate product sales and license revenues.

Our failure to attract, train and retain skilled employees or members of our senior management and to obtain necessary security clearances for such persons or maintain a facility security clearance would adversely affect our business and operating results.

The availability of highly trained and skilled technical and professional personnel is critical to our future growth and profitability. Competition for scientists, engineers, technicians and professional personnel is intense and our competitors aggressively recruit key employees. In the past, we have experienced difficulties in recruiting and hiring these personnel as a result of the tight labor market in certain fields. Any difficulty in hiring or retaining qualified employees, combined with our growth strategy and future needs for additional experienced personnel, particularly in highly specialized areas such as nanomaterial manufacturing and fiber optic sensing technologies, may make it more difficult to meet all of our needs for these employees in a timely manner. Although we intend to continue to devote significant resources to recruit, train and retain qualified employees, we may not be able to attract and retain these employees, especially in technical fields in which the supply of experienced qualified candidates is limited, or at the senior management level. Any failure to do so would have an adverse effect on our business. Any loss of key personnel could have a material adverse effect on our ability to meet key operational objectives, such as timely and effective project milestones and product introductions, which in turn could adversely affect our business, results of operations and financial condition.

We provide certain services to the U.S. government that require us to maintain a facility security clearance and for certain of our employees and our board chairman to hold security clearances. In general, the failure for necessary persons to obtain or retain sufficient security clearances, any loss by us of a facility security clearance or any public reprimand related to security matters could result in a U.S. government customer terminating an existing contract or choosing not to renew a contract or prevent us from bidding on or winning certain new government contracts.

In addition, our future success depends in a large part upon the continued service of key members of our senior management team. We do not maintain any key-person life insurance policies on our officers. The loss of any members of our management team or other key personnel could seriously harm our business.

Our business is subject to the cyclical nature of the markets in which we compete and any future downturn may reduce demand for our products and revenue.

Many factors beyond our control affect our business, including consumer confidence in the economy, interest rates, fuel prices, health crises, such as the COVID-19 pandemic, international conflicts, such as the current hostilities between Russia and Ukraine, and the general availability of credit. The overall economic climate and changes in Gross National Product growth have a direct impact on some of our customers and the demand for our products. We cannot be sure that our business will not be adversely affected as a result of an industry or general economic downturn.

Our customers may reduce capital expenditures and have difficulty satisfying liquidity needs because of continued turbulence in the U.S. and global economies, resulting in reduced sales of our products and harm to our financial condition and results of operations.

In particular, our historical results of operations have been subject to substantial fluctuations, and we may experience substantial period-to-period fluctuations in future results of operations. Any future downturn in the markets in which we compete could significantly reduce the demand for our products and therefore may result in a significant reduction in revenue or increase the volatility of the price of our common stock. Our revenue and results of operations may be adversely affected in the future due to changes in demand from customers or cyclical changes in the markets utilizing our products.

In addition, the telecommunications industry has, from time to time, experienced, and may again experience, a pronounced downturn. To respond to a downturn, many service providers may slow their capital expenditures, cancel or delay new developments, reduce their workforces and inventories and take a cautious approach to acquiring new equipment and technologies from original equipment manufacturers, which would have a negative impact on our business. Weakness in the global economy or a future downturn in the telecommunications industry may cause our results of operations to fluctuate from quarter-to-quarter and year-to-year, harm our business, and may increase the volatility of the price of our common stock.

Customer acceptance of our products is dependent on our ability to meet changing requirements, and any decrease in acceptance could adversely affect our revenue.

Customer acceptance of our products is significantly dependent on our ability to offer products that meet the changing requirements of our customers, including telecommunication, military, medical and industrial corporations, as well as government agencies. Any decrease in the level of customer acceptance of our products could harm our business.

Our products must meet exacting specifications, and defects and failures may occur, which may cause customers to return or stop buying our products.

Our customers generally establish demanding specifications for quality, performance and reliability that our products must meet. However, our products are highly complex and may contain defects and failures when they are first introduced or as new versions are released. Our products are also subject to rough environments as they are integrated into our customer products for use by the end customers. If defects and failures occur in our products, we could experience lost revenue, increased costs, including warranty expense and costs associated with customer support, delays in or cancellations or rescheduling of orders or shipments, product returns or discounts, diversion of management resources or damage to our reputation and brand equity, and in some cases consequential damages, any of which would harm our operating results. In addition, delays in our ability to fill product orders as a result of quality control issues may negatively impact our relationship with our customers. We cannot assure you that we will have sufficient resources, including any available insurance, to satisfy any asserted claims.

The markets for many of our products are characterized by changing technology which could cause obsolescence of our products, and we may incur substantial costs in delivering new products.

The markets for many of our products are characterized by changing technology, new product introductions and product enhancements, and evolving industry standards. The introduction or enhancement of products embodying new technology or the emergence of new industry standards could render existing products obsolete, and result in a write down to the value of our inventory, or result in shortened product life cycles. Accordingly, our ability to compete is in part dependent on our ability to continually offer enhanced and improved products.

The success of our new product offerings will depend upon several factors, including our ability to:

- accurately anticipate customer needs;
- innovate and develop new technologies and applications;
- successfully commercialize new technologies in a timely manner;
- price products competitively and manufacture and deliver products in sufficient volumes and on time; and
- differentiate our product offerings from those of our competitors.

Our inability to find new customers or retain existing customers could harm our business.

Our business is reliant on our ability to find new customers and retain existing customers. In particular, customers normally purchase certain of our products and incorporate them into products that they, in turn, sell in their own markets on an ongoing basis. As a result, the historical sales of these products have been dependent upon the success of our customers’

products and our future performance is dependent upon our success in finding new customers and receiving new orders from existing customers.

In several markets, the quality and reliability of our products are a major concern for our customers, not only upon the initial manufacture of the product, but for the life of the product. Many of our products are used in remote locations for higher value assembly, making servicing of our products unfeasible. Any failure of the quality or reliability of our products could harm our business.

Customer demand for our products is difficult to accurately forecast and, as a result, we may be unable to optimally match production with customer demand, which could adversely affect our business and financial results.

We make planning and spending decisions, including determining the levels of business that we will seek and accept, production schedules, inventory levels, component procurement commitments, personnel needs and other resource requirements, based on our estimates of customer requirements. The short-term nature of commitments by many of our customers and the possibility of unexpected changes in demand for their products reduce our ability to accurately estimate future customer requirements. On occasion, customers may require rapid increases in production, which can strain our resources, cause our manufacturing to be negatively impacted by materials shortages, necessitate higher or more restrictive procurement commitments, increase our manufacturing yield loss and scrapping of excess materials, and reduce our gross margin. We may not have sufficient capacity at any given time to meet the volume demands of our customers, or one or more of our suppliers may not have sufficient capacity at any given time to meet our volume demands. Conversely, a downturn in the markets in which our customers compete can cause, and in the past have caused, our customers to significantly reduce or delay the amount of products ordered or to cancel existing orders, leading to lower utilization of our facilities. Because many of our costs and operating expenses are relatively fixed, reduction in customer demand due to market downturns or other reasons would have a negative effect on our gross margin, operating income and cash flow.

Rapidly changing standards and regulations could make our products obsolete, which would cause our revenue and results of operations to suffer.

We design products to conform to our customers' requirements and our customers' systems may be subject to regulations established by governments or industry standards bodies worldwide. Because some of our products are designed to conform to current specific industry standards, if competing or new standards emerge that are preferred by our customers, we would have to make significant expenditures to develop new products. If our customers adopt new or competing industry standards with which our products are not compatible, or the industry groups adopt standards or governments issue regulations with which our products are not compatible, our existing products would become less desirable to our customers and our revenue and results of operations would suffer.

The results of our operations could be adversely affected by economic and political conditions and the effects of these conditions on our customers' businesses and levels of business activity.

Global economic and political conditions affect our customers' businesses and the markets they serve. A severe or prolonged economic downturn, including during and following the COVID-19 pandemic, or a negative or uncertain political climate could adversely affect our customers' financial conditions and the timing or levels of business activity of our customers and the industries we serve. This may reduce the demand for our products or depress pricing for our products and have a material adverse effect on our results of operations. Changes in global economic conditions could also shift demand to products or services for which we do not have competitive advantages, and this could negatively affect the amount of business we are able to obtain. In addition, if we are unable to successfully anticipate changing economic and political conditions, we may be unable to effectively plan for and respond to those changes, and our business could be negatively affected as a result.

We have experienced net losses in the past, and because our strategy for expansion may be costly to implement, we may experience losses and may not maintain profitability or positive cash flow.

We have experienced net losses in the past. We expect to continue to incur significant expenses as we pursue our strategic initiatives, including increased expenses for research and development, sales and marketing and manufacturing. We may also grow our business in part through acquisitions of additional companies and complementary technologies which could cause us to incur greater than anticipated transaction expenses, amortization or write-offs of intangible assets and other acquisition-related expenses. As a result, we may incur net losses in the future, and these losses could be substantial. At a certain level, continued net losses could impair our ability to comply with Nasdaq continued listing standards, as described further below.

Our ability to generate additional revenues and remain profitable will depend on our ability to execute our key growth initiative regarding the development, marketing and sale of sensing products, develop and commercialize innovative technologies, expand our contract research capabilities and sell the products that result from those development initiatives. We may not be able to sustain or increase our profitability on a quarterly or annual basis.

We have obtained capital by borrowing money under a term loan and revolving line of credit and we might require additional capital to support and expand our business; our term loan and revolving line of credit have various covenants with which we must comply.

We intend to continue to make investments to support our business growth, including developing new products, enhancing our existing products, obtaining important regulatory approvals, enhancing our operating infrastructure, completing our development activities and building our commercial scale manufacturing facilities. To the extent that we are unable to remain profitable and to finance our activities from continuing operations, we may require additional funds to support these initiatives and to grow our business.

If we are successful in raising additional funds through issuances of equity or convertible debt securities, our existing stockholders could suffer significant dilution, including as the result of the issuance of warrants in connection with the financing, and any new equity securities we issue could have rights, preferences and privileges superior to those of our existing common stock. If we raise additional funds through debt financings, these financings may involve significant cash payment obligations and covenants that restrict our ability to operate our business and make distributions to our stockholders.

We have a term loan and borrowings under a revolving line of credit with PNC Bank, National Association ("PNC"), which require us to comply with a number of affirmative and restrictive covenants including, among others, financial covenants regarding minimum net leverage and fixed charge coverage, affirmative covenants regarding delivery of financial statements, payment of taxes, and maintenance of government compliance, and restrictive covenants regarding dispositions of property, acquisitions, incurrence of additional indebtedness or liens, investments and transactions with affiliates. We are also restricted from paying dividends or making other distributions or payments on our capital stock, subject to limited exceptions. Upon the occurrence of certain events, including our failure to satisfy its payment obligations, failure to adhere to the financial covenants, the breach of certain of our other covenants, cross defaults to other indebtedness or material agreements, judgment defaults and defaults related to failure to maintain governmental approvals, PNC will have the right, among other remedies, to declare all principal and interest immediately due and payable, and to exercise secured party remedies.

If we are unable to obtain adequate financing or financing terms satisfactory to us when we require it, our ability to continue to support our business growth and to respond to business challenges could be significantly limited.

We face and will face substantial competition in several different markets that may adversely affect our results of operations.

We face and will face substantial competition from a variety of companies in several different markets. As we focus on developing marketing and selling fiber optic sensing products, we may also face substantial and entrenched competition in that market.

Many of our competitors have longer operating histories, greater name recognition, larger customer bases and significantly greater financial, sales and marketing, manufacturing, distribution, technical and other resources than we do. These competitors may be able to adapt more quickly to new or emerging technologies and changes in customer requirements. In addition, current and potential competitors have established or may establish financial or strategic relationships among themselves or with existing or potential customers or other third parties. Accordingly, new competitors or alliances among competitors could emerge and rapidly acquire significant market share. We cannot assure you that we will be able to compete successfully against current or new competitors, in which case our revenues may fail to increase or may decline.

Intense competition in our markets could result in aggressive business tactics by our competitors, including aggressively pricing their products or selling older inventory at a discount. If our current or future competitors utilize aggressive business tactics, including those described above, demand for our products could decline, we could experience delays or cancellations of customer orders, or we could be required to reduce our sales prices.

Shifts in product mix may result in declines in gross profit.

Our gross profit margins vary among our product platforms and are generally highest on our test and measurement instruments. Our overall gross profit may fluctuate from period to period as a result of a variety of factors including shifts in product mix, the introduction of new products, and decreases in average selling prices for older products. If our customers decide to buy more of our products with low gross profit margins or fewer of our products with high gross profit margins, our total gross profits could be harmed.

RISKS RELATING TO OUR OPERATIONS AND BUSINESS STRATEGY

If we fail to properly evaluate and execute our strategic initiatives, including the integration of acquired businesses, it could have an adverse effect on our future results and the market price of our common stock.

We evaluate strategic opportunities related to products, technology and business transactions, including acquisitions and divestitures. In the past, we have acquired businesses to support our growth strategy, including the acquisition of LIOS Sensing in March 2022 and OptaSense in December 2020. If we choose to enter into such transactions in the future, we face certain risks including:

- the failure of the acquired business to meet our performance and financial expectations;
- difficulty integrating an acquired business's operations, personnel and financial and reporting systems into our current business
- potential unknown liabilities associated with the acquisition;
- lost sales and customers as a result of customers deciding not to do business with us;
- complexities associated with managing the larger combined company with distant business locations;
- integrating personnel while maintaining focus on providing consistent, high quality products;
- loss of key employees; and
- performance shortfalls as a result of the division of management's attention caused by completing the acquisition and integrating operations.

If any of these events were to occur, our ability to maintain relationships with the customers, suppliers and employees or our ability to achieve the anticipated benefits of the acquisition could be adversely affected, or could reduce our future earnings or otherwise adversely affect our business and financial results and, as a result, adversely affect the market price of our common stock.

If we cannot successfully transition our revenue mix from contract research revenues to product sales and license revenues, we may not be able to fully execute our business model or grow our business.

Our business model and future growth depend on our ability to transition to a revenue mix that contains significantly larger product sales and revenues from the provision of services or from licensing, particularly following our sale of Luna Labs in March 2022. Product sales and these revenues potentially offer greater scalability than contract research revenues. Our current plan is to increase our sales of commercial products, our licensing revenues and our provision of non-research services to customers so as to represent a larger percentage of our total revenues. If we are unable to develop and grow our product sales and revenues from the provision of services or from licensing to augment our contract research revenues, however, our ability to execute our business model or grow our business could suffer. There can be no assurance that we will be able to achieve increased revenues in this manner.

Failure to develop, introduce and sell new products or failure to develop and implement new technologies, could adversely impact our financial results.

Our success will depend on our ability to develop and introduce new products that customers choose to buy. The new products the market requires tend to be increasingly complex, incorporating more functions and operating at faster speeds than old products. If we fail to introduce new product designs or technologies in a timely manner or if customers do not successfully introduce new systems or products incorporating our products, our business, financial condition and results of operations could be materially harmed.

If we are unable to manage growth effectively, our revenues and net loss could be adversely affected.

We may need to expand our personnel resources to grow our business effectively. We believe that sustained growth at a higher rate will place a strain on our management as well as on our other human resources. To manage this growth, we must continue to attract and retain qualified management, professional, scientific and technical and operating personnel. If we are unable to recruit a sufficient number of qualified personnel, we may be unable to staff and manage projects adequately, which in turn may slow the rate of growth of our contract research revenues or our product development efforts.

We may not be successful in identifying market needs for new technologies or in developing new products.

Part of our business model depends on our ability to correctly identify market needs for new technologies. We intend to identify new market needs, but we may not always have success in doing so in part because our contract research largely centers on identification and development of unproven technologies, often for new or emerging markets. Furthermore, we must identify the most promising technologies from a sizable pool of projects. If our commercialization strategy process fails to identify projects with commercial potential or if management does not ensure that such projects advance to the commercialization stage, we may not successfully commercialize new products and grow our revenues.

Our growth strategy requires that we also develop successful commercial products to address market needs. We face several challenges in developing successful new products. Many of our existing products and those currently under development are technologically innovative and require significant and lengthy product development efforts. These efforts include planning, designing, developing and testing at the technological, product and manufacturing-process levels. These activities require us to make significant investments. Although there are many potential applications for our technologies, our resource constraints require us to focus on specific products and to forgo other opportunities. We expect that one or more of the potential products we choose to develop will not be technologically feasible or will not achieve commercial acceptance, and we cannot predict which, if any, of our products we will successfully develop or commercialize. The technologies we research and develop are new and steadily changing and advancing. The products that are derived from these technologies may not be applicable or compatible with the state of technology or demands in existing markets. Our existing products and technologies may become uncompetitive or obsolete if our competitors adapt more quickly than we do to new technologies and changes in customers' requirements. Furthermore, we may not be able to identify if and when new markets will open for our products given that future applications of any given product may not be readily determinable, and we cannot reasonably estimate the size of any markets that may develop. If we are not able to successfully develop new products, we may be unable to increase our product revenues.

We face risks associated with our international business.

We currently conduct business internationally and we might considerably expand our international activities in the future. Our international business operations are subject to a variety of risks associated with conducting business internationally, including:

- having to comply with U.S. export control regulations and policies that restrict our ability to communicate with non-U.S. employees and supply foreign affiliates and customers;
- changes in or interpretations of foreign regulations that may adversely affect our ability to sell our products, perform services or repatriate profits to the United States;
- the imposition of tariffs;
- hyperinflation or economic or political instability in foreign countries;
- imposition of limitations on, or increase of withholding and other taxes on remittances and other payments by foreign subsidiaries or joint ventures;
- conducting business in places where business practices and customs are unfamiliar and unknown;
- the imposition of restrictive trade policies;
- the imposition of inconsistent laws or regulations;
- the imposition or increase of investment and other restrictions or requirements by foreign governments;
- uncertainties relating to foreign laws and legal proceedings;
- potential changes in a specific country's or region's political or economic climate, including the current hostilities between Russia and Ukraine;
- having to comply with a variety of U.S. laws, including the Foreign Corrupt Practices Act ("FCPA"); and
- having to comply with licensing requirements.

We do not know the impact that these regulatory, geopolitical and other factors may have on our international business in the future. Further, the COVID-19 pandemic has prompted precautionary government-imposed closures of certain travel and business. It is unknown whether and how global supply chains, may be affected if such an epidemic persists for an extended period of time. We may incur expenses or delays relating to such events outside of our control or experience potential disruption of our ability to travel to customer sites and industry conferences important to the marketing and support of our products, any of which could have an adverse impact on our business, operating results and financial condition.

We may dispose of or discontinue existing product lines and technology developments, which may adversely impact our future results.

On an ongoing basis, we evaluate our various product offerings and technology developments in order to determine whether any should be discontinued or, to the extent possible, divested. In addition, if we are unable to generate the amount of cash needed to fund the future operations of our business, we may be forced to sell one or more of our product lines or technology developments.

We cannot guarantee that we have correctly forecasted, or that we will correctly forecast in the future, the right product lines and technology developments to dispose or discontinue or that our decision to dispose of or discontinue various investments, product lines and technology developments is prudent if market conditions change. In addition, there are no assurances that the discontinuance of various product lines will reduce operating expenses or will not cause us to incur material charges associated with such decision. Furthermore, the discontinuance of existing product lines entails various risks, including the risk that we will not be able to find a purchaser for a product line or the purchase price obtained will not be equal to at least the book value of the net assets for the product line. Other risks include managing the expectations of, and maintaining good relations with, our historical customers who previously purchased products from a disposed or discontinued product line, which could prevent us from selling other products to them in the future. We may also incur other significant liabilities and costs associated with disposal or discontinuance of product lines, including employee severance costs and excess facilities costs.

Health epidemics, including the COVID-19 pandemic, have had, and could in the future have, an adverse impact on our business, operations, and the markets and communities in which we and our customers and suppliers operate.

In December 2019, a disease referred to as COVID-19 was reported and has spread to many countries worldwide, including the United States.

The ongoing global COVID-19 pandemic has impacted, and will likely continue to impact, the way we conduct our business, including the way in which we interface with customers, suppliers and our employees. The COVID-19 pandemic has affected how we interact with our customers by reducing face-to-face meetings and increasing our on-line and virtual presence. While increasing our on-line and virtual presence has proven effective, we are unsure of the impact if these conditions continue for an extended period. During 2021, we experienced an increased level of disruption in our supply chain and from certain customers all of which have resulted in delayed revenue. While we believe these disruptions are temporary, there is no guarantee we will be able to manage through these disruptions. If the demand for our products, or our access to critical components were to be interrupted, it could have a material adverse impact on our results of operations.

In response to the COVID-19 pandemic, many state, local, and foreign governments have put in place, and others in the future may put in place, quarantines, executive orders, shelter-in-place orders, and similar government orders and restrictions in order to control the spread of the disease. Such orders or restrictions, or the perception that such orders or restrictions could occur, have resulted in business closures, work stoppages, slowdowns and delays, work-from-home policies, travel restrictions, and cancellation or postponement of events, among other effects that could negatively impact productivity and disrupt our operations and those of our customers and suppliers. We have implemented alternate work arrangements, including staggered schedules and shifts, distancing within our offices and working from home for most of our employees, and we may take further actions that alter our operations as may be required by federal, state, or local authorities, or which we determine are in our best interests. While most of our operations can be performed under these alternate work arrangements, there is no guarantee that we will be as effective while working under them because our team is dispersed, many employees may have additional personal needs to attend to (such as looking after children as a result of school closures or family who become sick), and employees may become sick themselves and be unable to work. Decreased effectiveness of our team could adversely affect our results due to our inability to meet in person with potential customers, longer time periods for supply, longer time periods for manufacturing and other decreases in productivity that could seriously harm our business.

In addition, while the potential impact and duration of the COVID-19 pandemic on the global economy and our business in particular may be difficult to assess or predict, the pandemic has resulted in, and may continue to result in, significant disruption of global financial markets, reducing our ability to access capital, which could negatively affect our liquidity in the future.

The global impact of COVID-19 continues to rapidly evolve, and we will continue to monitor the situation closely. The ultimate impact of the COVID-19 pandemic or a similar health epidemic is highly uncertain and subject to change. We do not yet know the full extent of potential delays or impacts on our business, operations, or the global economy as a whole. While the spread of COVID-19 may eventually be contained or mitigated, there is no guarantee that a future outbreak of this or any other widespread epidemics will not occur, or that the global economy will recover, either of which could seriously harm our business.

RISKS RELATING TO OUR REGULATORY ENVIRONMENT

Our operations are subject to domestic and foreign laws, regulations and restrictions, and noncompliance with these laws, regulations and restrictions could expose us to fines, penalties, suspension or debarment, which could have a material adverse effect on our profitability and overall financial position.

Our operations, particularly our international sales, subject us to numerous U.S. and foreign laws and regulations, including, without limitation, regulations relating to imports, exports (including the Export Administration Regulations and the International Traffic in Arms Regulations), technology transfer restrictions, anti-boycott provisions, economic sanctions and anti-corruption laws including the FCPA and the UK Bribery Act of 2010 in the United Kingdom. The number of our various emerging technologies, the development of many of which has been funded by the Department of Defense, presents us with many regulatory challenges. Failure by us or our sales representatives or consultants to comply with these laws and regulations could result in administrative, civil, or criminal liabilities and could result in suspension of our export privileges, which could have a material adverse effect on our business. Changes in regulation or political environment may affect our ability to conduct business in foreign markets including investment, procurement and repatriation of earnings.

Environmental regulations could increase operating costs and additional capital expenditures and delay or interrupt operations.

The photonics industry, as well as the semiconductor industry, are subject to governmental regulations for the protection of the environment, including those relating to air and water quality, solid and hazardous waste handling, and the promotion of occupational safety. Various federal, state and local laws and regulations require that we maintain certain environmental permits. While we believe that we have obtained all necessary environmental permits required to conduct our manufacturing processes, if we are found to be in violation of these laws, we could be subject to governmental fines and liability for damages resulting from such violations.

Changes in the aforementioned laws and regulations or the enactment of new laws, regulations or policies could require increases in operating costs and additional capital expenditures and could possibly entail delays or interruptions of our operations.

If our manufacturing facilities do not meet Federal, state or foreign country manufacturing standards, we may be required to temporarily cease all or part of our manufacturing operations, which would result in product delivery delays and negatively impact revenues.

Our manufacturing facilities are subject to periodic inspection by regulatory authorities and our operations will continue to be regulated by the FDA for compliance with Good Manufacturing Practice requirements contained in the quality systems regulations. We are also required to comply with International Organization for Standardization ("ISO"), quality system standards in order to produce certain of our products for sale in Europe. If we fail to continue to comply with Good Manufacturing Practice requirements or ISO standards, we may be required to cease all or part of our operations until we comply with these regulations. Obtaining and maintaining such compliance is difficult and costly. We cannot be certain that our facilities will be found to comply with Good Manufacturing Practice requirements or ISO standards in future inspections and audits by regulatory authorities. In addition, if we cannot maintain or establish manufacturing facilities or operations that comply with such standards or do not meet the expectations of our customers, we may not be able to realize certain economic opportunities in our current or future supply arrangements.

We are subject to additional significant foreign and domestic government regulations, including environmental and health and safety regulations, and failure to comply with these regulations could harm our business.

Our facilities and current and proposed activities involve the use of a broad range of materials that are considered hazardous under applicable laws and regulations. Accordingly, we are subject to a number of foreign, federal, state and local laws and regulations relating to health and safety, protection of the environment and the storage, use, disposal of, and exposure to, hazardous materials and wastes. We could incur costs, fines and civil and criminal penalties, personal injury and third-party property damage claims, or could be required to incur substantial investigation or remediation costs, if we were to violate or become liable under environmental, health and safety laws. Moreover, a failure to comply with environmental laws could result in fines and the revocation of environmental permits, which could prevent us from conducting our business. Liability under environmental laws can be joint and several and without regard to fault. There can be no assurance that violations of environmental and health and safety laws will not occur in the future as a result of the inability to obtain permits, human error, equipment failure or other causes. Environmental laws could become more stringent over time, imposing greater compliance costs and increasing risks and penalties associated with violations, which could harm our business. Accordingly, violations of

present and future environmental laws could restrict our ability to expand facilities, pursue certain technologies, and could require us to acquire costly equipment or incur potentially significant costs to comply with environmental regulations.

Compliance with foreign, federal, state and local environmental laws and regulations represents a small part of our present budget. If we fail to comply with any such laws or regulations, however, a government entity may levy a fine on us or require us to take costly measures to ensure compliance. Any such fine or expenditure may adversely affect our development. We cannot predict the extent to which future legislation and regulation could cause us to incur additional operating expenses, capital expenditures or restrictions and delays in the development of our products and properties.

We are or may become subject to a variety of privacy and data security laws, and our failure to comply with them could harm our business.

We maintain sensitive information, including confidential business and personal information in connection with our business customers and our employees, and may be subject to laws and regulations governing the privacy and security of such information. In the United States, there are numerous constantly evolving federal and state privacy and data security laws and regulations governing the collection, use, disclosure and protection of personal information. Each of these laws can be subject to varying interpretations.

Certain federal regulators have been focusing on cybersecurity as an area of concern for several years. For example, in guidance from the SEC since at least 2011, cybersecurity has been raised as an area where companies, which would include global investment firms, must disclose both threats to the company and material cyber events that have been experienced by that company. In at least three cases from the latter half of 2021, the SEC brought enforcement actions against registered companies that failed to report such cyber events. We expect increasing SEC enforcement activity related to cybersecurity matters, including by the SEC's Office of Compliance Inspections and Examinations (OCIE) in its examination programs, where cybersecurity has been prioritized with an emphasis on, among other things, proper configuration of network storage devices, information security governance, and policies and procedures related to retail trading information security. Further, the SEC has indicated in recent remarks that areas of focus for potential new policies and initiatives could include cyber hygiene and preparedness, cyber incident reporting to the government and, in certain circumstances disclosure to the public.

In addition, states are constantly adopting new laws or amending existing laws, requiring attention to frequently changing regulatory requirements. For example, the California Consumer Privacy Act, or the CCPA, which took effect on January 1, 2020, is an example of the trend toward increasingly comprehensive privacy legislation being introduced in the United States. The CCPA gives California residents expanded rights to access and delete their personal information, opt out of certain personal information sharing and receive detailed information about how their personal information is used by requiring covered companies to provide new disclosures to California consumers (as that term is broadly defined and can include any of our current or future employees who may be California residents) and provide such residents new ways to opt-out of certain sales of personal information. The CCPA provides for civil penalties for violations, as well as a private right of action for data breaches that is expected to increase data breach litigation. The CCPA may increase our compliance costs and potential liability. Some observers have noted that the CCPA could mark the beginning of a trend toward more stringent privacy legislation in the United States. Other states are beginning to pass similar laws.

Additionally, California voters approved a new privacy law, the California Privacy Rights Act, or CPRA, in the November 3, 2020 election. Effective starting on January 1, 2023, the CPRA will significantly modify the CCPA, including by expanding consumers' rights with respect to certain sensitive personal information. The CPRA also creates a new state agency that will be vested with authority to implement and enforce the CCPA and the CPRA.

New legislation proposed or enacted in Colorado, Illinois, Massachusetts, Nevada, New Jersey, New York, Rhode Island, Virginia, Washington and other states, and a proposed right to privacy amendment to the Vermont Constitution, imposes, or has the potential to impose, additional obligations on companies that collect, store, use, retain, disclose, transfer and otherwise process confidential, sensitive and personal information, and will continue to shape the data privacy environment nationally. State laws are changing rapidly and there is discussion in Congress of a new federal data protection and privacy law to which we would become subject if it is enacted. Further, certain state laws may be more stringent or broader in scope, or offer greater individual rights, with respect to confidential, sensitive and personal information than federal, international or other state laws, and such laws may differ from each other, which may complicate compliance efforts.

A similar situation exists in the EU, where the General Data Protection Regulation, the GDPR, took effect in 2018 in the European Economic Area, the EEA. The GDPR governs the collection, use, disclosure, transfer or other processing of personal data of European data subjects. Among other things, the GDPR imposes requirements regarding the security of personal data and notification of data processing obligations to the competent national data processing authorities, changes the lawful bases on which personal data can be processed, and expands the definition of personal data. In addition, the GDPR increases the

scrutiny of transfers of personal data from the EEA to the United States and other jurisdictions that the European Commission does not recognize as having "adequate" data protection laws, and imposes substantial fines for breaches and violations (up to the greater of €20 million or 4% of our consolidated annual worldwide gross revenue). The GDPR also confers a private right of action on data subjects and consumer associations to lodge complaints with supervisory authorities, seek judicial remedies and obtain compensation for damages resulting from violations of the GDPR.

Certain jurisdictions have enacted data localization laws and cross-border personal data transfer laws, which could make it more difficult to transfer information across jurisdictions (such as transferring or receiving personal data that originates in the EU). Existing mechanisms that may facilitate cross-border personal data transfers may change or be invalidated. For example, absent appropriate safeguards or other circumstances, the EU GDPR generally restricts the transfer of personal data to countries outside of the EEA, such as the United States, which the European Commission does not consider to provide an adequate level of data privacy and security. The European Commission released a set of "Standard Contractual Clauses" in June 2021 that are designed to be a valid mechanism by which entities can transfer personal data out of the EEA to jurisdictions that the European Commission has not found to provide an adequate level of protection. Currently, these Standard Contractual Clauses are a valid mechanism to transfer personal data outside of the EEA. The Standard Contractual Clauses, however, require parties that rely upon that legal mechanism to comply with additional obligations, such as conducting transfer impact assessments to determine whether additional security measures are necessary to protect the at-issue personal data. Moreover, due to potential legal challenges, there exists some uncertainty regarding whether the Standard Contractual Clauses will remain a valid mechanism for transfers of personal data out of the EEA. In addition, laws in Switzerland and the UK similarly restrict transfers of personal data outside of those jurisdictions to countries such as the United States that do not provide an adequate level of personal data protection.

Further, the vote in the United Kingdom in favor of exiting the European Union, referred to as Brexit, has complicated data protection regulation in the United Kingdom. In particular, as of January 1,2021, the GDPR has been converted into United Kingdom law and the United Kingdom is now a "third country" under the GDPR. On June 28, 2021, the European Commission announced a decision of "adequacy" concluding that the UK ensures an equivalent level of data protection to the GDPR, which provides some relief regarding the legality of continued personal data flows from the EEA to the UK. Some uncertainty remains, however, as this adequacy determination must be renewed after four years and may be modified or revoked in the interim. We cannot fully predict how the Data Protection Act, the UK GDPR, and other UK data protection laws or regulations may develop in the medium to longer term nor the effects of divergent laws and guidance regarding how data transfers to and from the UK will be regulated

All of these evolving compliance and operational requirements may impose significant costs that are likely to increase over time, and may require us to (a) modify our data processing practices and policies, (b) put in place additional mechanisms ensuring compliance with the new data protection rules, (c) divert resources from other initiatives and projects, and (d) restrict the way products and services involving data are offered, all of which could significantly harm our business, financial condition, results of operations and prospects. Further, compliance with these and any other applicable privacy and data security laws and regulations is a rigorous and time-intensive process. If we fail to comply with any such laws or regulations, we may face significant fines and penalties that could adversely affect our business, financial condition and results of operations. In addition to the foregoing, any breach of privacy laws or data security laws, particularly resulting in a significant security incident or breach involving the misappropriation, loss or other unauthorized use or disclosure of sensitive or confidential personal information, could have a material adverse effect on our business, reputation and financial condition. In any circumstances where we are a data controller, we will be accountable for any third-party service providers we engage to process personal data on our behalf. We attempt to mitigate the associated risks but there is no assurance that privacy and security-related safeguards will protect us from all risks associated with the third-party processing, storage and transmission of such information.

RISKS RELATING TO OUR INTELLECTUAL PROPERTY

Our proprietary rights may not adequately protect our technologies.

Our commercial success will depend in part on our obtaining and maintaining patent, trade secret, copyright and trademark protection of our technologies in the United States and other jurisdictions as well as successfully enforcing this intellectual property and defending it against third-party challenges. We will only be able to protect our technologies from unauthorized use by third parties to the extent that valid and enforceable intellectual property protections, such as patents or trade secrets, cover them. In particular, we place considerable emphasis on obtaining patent and trade secret protection for significant new technologies, products and processes. The degree of future protection of our proprietary rights is uncertain because legal means afford only limited protection and may not adequately protect our rights or permit us to gain or keep our competitive advantage. The degree of future protection of our proprietary rights is also uncertain for products that are currently

in the early stages of development because we cannot predict which of these products will ultimately reach the commercial market or whether the commercial versions of these products will incorporate proprietary technologies.

Our patent position is highly uncertain and involves complex legal and factual questions. Accordingly, we cannot predict the breadth of claims that may be allowed or enforced in our patents or in third-party patents. For example:

- we or our licensors might not have been the first to make the inventions covered by each of our pending patent applications and issued patents;
- we or our licensors might not have been the first to file patent applications for these inventions;
- others may independently develop similar or alternative technologies or duplicate any of our technologies;
- it is possible that none of our pending patent applications or the pending patent applications of our licensors will result in issued patents;
- patents may issue to third parties that cover how we might practice our technology;
- our issued patents and issued patents of our licensors may not provide a basis for commercially viable technologies, may not provide us with any competitive advantages, or may be challenged and invalidated by third parties; and
- we may not develop additional proprietary technologies that are patentable.

Patents may not be issued for any pending or future pending patent applications owned by or licensed to us, and claims allowed under any issued patent or future issued patent owned or licensed by us may not be valid or sufficiently broad to protect our technologies. Moreover, protection of certain of our intellectual property may be unavailable or limited in the United States or in foreign countries, and we have not sought to obtain foreign patent protection for certain of our products or technologies due to cost, concerns about enforceability or other reasons. Any issued patents owned by or licensed to us now or in the future may be challenged, invalidated, or circumvented, and the rights under such patents may not provide us with competitive advantages. In addition, competitors may design around our technology or develop competing technologies. Intellectual property rights may also be unavailable or limited in some foreign countries, and in the case of certain products no foreign patents were filed or can be filed. This could make it easier for competitors to capture or increase their market share with respect to related technologies. We could incur substantial costs to bring suits in which we may assert our patent rights against others or defend ourselves in suits brought against us. An unfavorable outcome of any litigation could have a material adverse effect on our business and results of operations.

We also rely on trade secrets to protect our technology, especially where we believe patent protection is not appropriate or obtainable. However, trade secrets are difficult to protect. We regularly attempt to obtain confidentiality agreements and contractual provisions with our collaborators, employees and consultants to protect our trade secrets and proprietary know-how. These agreements may be breached or may not have adequate remedies for such breach. While we use reasonable efforts to protect our trade secrets, our employees, consultants, contractors or scientific and other advisors, or those of our strategic partners, may unintentionally or willfully disclose our information to competitors. If we were to enforce a claim that a third party had illegally obtained and was using our trade secrets, our enforcement efforts would be expensive and time consuming, and the outcome would be unpredictable. In addition, courts outside the United States are sometimes unwilling to protect trade secrets. Moreover, if our competitors independently develop equivalent knowledge, methods and know-how, it will be more difficult for us to enforce our rights and our business could be harmed.

If we are not able to defend the patent or trade secret protection position of our technologies, then we will not be able to exclude competitors from developing or marketing competing technologies and we may not generate enough revenues from product sales to justify the cost of developing our technologies and to achieve or maintain profitability.

We also rely on trademarks to establish a market identity for our company and our products. To maintain the value of our trademarks, we might have to file lawsuits against third parties to prevent them from using trademarks confusingly similar to or dilutive of our registered or unregistered trademarks. Also, we might not obtain registrations for our pending trademark applications, and we might have to defend our registered trademark and pending trademark applications from challenge by third parties. Enforcing or defending our registered and unregistered trademarks might result in significant litigation costs and damages, including the inability to continue using certain trademarks.

Third parties may claim that we infringe their intellectual property, and we could suffer significant litigation or licensing expense as a result.

Various U.S. and foreign issued patents and pending patent applications, which are owned by third parties, exist in our technology areas. Such third parties may claim that we infringe their patents. Because patent applications can take several years to result in a patent issuance, there may be currently pending applications, unknown to us, which may later result in issued patents that our technologies may infringe. For example, we are aware of competitors with patents in technology areas applicable to our optical test equipment products. Such competitors may allege that we infringe these patents. There could also be existing patents of which we are not aware that our technologies may inadvertently infringe. We have from time to time been, and may in the future be, contacted by third parties, including patent assertion entities or intellectual property advisors,

about licensing opportunities that also contain claims that we are infringing on third party patent rights. If third parties assert these claims against us, we could incur extremely substantial costs and diversion of management resources in defending these claims, and the defense of these claims could have a material adverse effect on our business, financial condition and results of operations. Even if we believe we have not infringed on a third party's patent rights, we may have to settle a claim on unfavorable terms because we cannot afford to litigate the claim. In addition, if third parties assert claims against us and we are unsuccessful in defending against these claims, these third parties may be awarded substantial damages as well as injunctive or other equitable relief against us, which could effectively block our ability to make, use, sell, distribute or market our products and services in the United States or abroad.

Commercial application of nanotechnologies in particular, or technologies involving nanomaterials, is new and the scope and breadth of patent protection is uncertain. Consequently, the patent positions of companies involved in nanotechnologies have not been tested, and there are complex legal and factual questions for which important legal principles will be developed or may remain unresolved. In addition, it is not clear whether such patents will be subject to interpretations or legal doctrines that differ from conventional patent law principles. Changes in either the patent laws or in interpretations of patent laws in the United States and other countries may diminish the value of our nanotechnology-related intellectual property. Accordingly, we cannot predict the breadth of claims that may be allowed or enforced in our nanotechnology-related patents or in third party patents. In the event that a claim relating to intellectual property is asserted against us, or third parties not affiliated with us hold pending or issued patents that relate to our products or technology, we may seek licenses to such intellectual property or challenge those patents. However, we may be unable to obtain these licenses on commercially reasonable terms, if at all, and our challenge of the patents may be unsuccessful. Our failure to obtain the necessary licenses or other rights could prevent the sale, manufacture or distribution of our products and, therefore, could have a material adverse effect on our business, financial condition and results of operations.

A substantial portion of our technology is subject to retained rights of our licensors, and we may not be able to prevent the loss of those rights or the grant of similar rights to third parties.

A substantial portion of our technology is licensed from academic institutions, corporations and government agencies. Under these licensing arrangements, a licensor may obtain rights over the technology, including the right to require us to grant a license to one or more third parties selected by the licensor or that we provide licensed technology or material to third parties for non-commercial research. The grant of a license for any of our core technologies to a third party could have a material and adverse effect on our business. In addition, some of our licensors retain certain rights under the licenses, including the right to grant additional licenses to a substantial portion of our core technology to third parties for non-commercial academic and research use. It is difficult to monitor and enforce such non-commercial academic and research uses, and we cannot predict whether the third-party licensees would comply with the use restrictions of such licenses. We have incurred and could incur substantial expenses to enforce our rights against them. We also may not fully control the ability to assert or defend those patents or other intellectual property which we have licensed from other entities, or which we have licensed to other entities.

In addition, some of our licenses with academic institutions give us the right to use certain technology previously developed by researchers at these institutions. In certain cases, we also have the right to practice improvements on the licensed technology to the extent they are encompassed by the licensed patents and are within our field of use. Our licensors may currently own and may in the future obtain additional patents and patent applications that are necessary for the development, manufacture and commercial sale of our anticipated products. We may be unable to agree with one or more academic institutions from which we have obtained licenses whether certain intellectual property developed by researchers at these academic institutions is covered by our existing licenses. In the event that the new intellectual property is not covered by our existing licenses, we would be required to negotiate a new license agreement. We may not be able to reach agreement with current or future licensors on commercially reasonable terms, if at all, or the terms may not permit us to sell our products at a profit after payment of royalties, which could harm our business.

Some of our patents may cover inventions that were conceived or first reduced to practice under, or in connection with, U.S. government contracts or other federal funding agreements. With respect to inventions conceived or first reduced to practice under a federal funding agreement, the U.S. government may retain a non-exclusive, non-transferable, irrevocable, paid-up license to practice or have practiced for or on behalf of the United States the invention throughout the world. We may not succeed in our efforts to retain title in patents, maintain ownership of intellectual property or in limiting the U.S. government's rights in our proprietary technologies and intellectual property when an issue exists as to whether such intellectual property was developed in the performance of a federal funding agreement or developed at private expense.

If we fail to obtain the right to use the intellectual property rights of others which are necessary to operate our business, and to protect their intellectual property, our business and results of operations will be adversely affected.

In the past, we have licensed certain technologies for use in our products. In the future, we may choose, or be required, to license technology or intellectual property from third parties in connection with the development of our products. We cannot assure you that third-party licenses will be available on commercially reasonable terms, if at all. Our competitors may be able to obtain licenses, or cross-license their technology, on better terms than we can, which could put us at a competitive disadvantage. Also, we often enter into confidentiality agreements with such third parties in which we agree to protect and maintain their proprietary and confidential information, including at times requiring our employees to enter into agreements protecting such information. There can be no assurance that the confidentiality agreements will not be breached by any of our employees or that such third parties will not make claims that their proprietary information has been disclosed.

RISKS RELATING TO OUR COMMON STOCK

Our common stock price has been volatile and we expect that the price of our common stock will fluctuate substantially in the future, which could cause you to lose all or a substantial part of your investment.

The public trading price for our common stock is volatile and may fluctuate significantly. Since January 1, 2009, our common stock has traded between a high of $12.85 per share and a low of $0.26 per share. Among the factors, many of which we cannot control, that could cause material fluctuations in the market price for our common stock are:

- sales of our common stock by our significant stockholders, or the perception that such sales may occur;
- changes in earnings estimates, investors' perceptions, recommendations by securities analysts or our failure to achieve analysts' earnings estimates;
- quarterly variations in our or our competitors' results of operations;
- challenges integrating our recent or future acquisitions, including the inability to realize any expected synergies;
- general market conditions and other factors unrelated to our operating performance or the operating performance of our competitors;
- announcements by us, or by our competitors, of acquisitions, new products, significant contracts, commercial relationships or capital commitments;
- pending or threatened litigation;
- any major change in our board of directors or management or any competing proxy solicitations for director nominees;
- changes in governmental regulations or in the status of our regulatory approvals;
- announcements related to patents issued to us or our competitors;
- a lack of, limited or negative industry or securities analyst coverage;
- health epidemics, including the COVID-19 pandemic;
- political, economic and social instability, including, for example, the military incursion of Russia into Ukraine, terrorist activities and any disruption these events may cause to the broader global industrial economy;
- discussions of our company or our stock price by the financial and scientific press and online investor communities; and
- general developments in our industry.

In addition, the stock prices of many technology companies have experienced wide fluctuations that have often been unrelated to the operating performance of those companies. These factors may materially and adversely affect the market price of our common stock.

If our estimates relating to our critical accounting policies are based on assumptions or judgments that change or prove to be incorrect, our operating results could fall below expectations of financial analysts and investors, resulting in a decline in our stock price.

The preparation of financial statements in conformity with U.S. GAAP requires our management to make estimates, assumptions and judgments that affect the amounts reported in the consolidated financial statements and accompanying notes. We base our estimates on historical experience and on various other assumptions that we believe to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets, liabilities, equity, revenue and expenses that are not readily apparent from other sources. Our operating results may be adversely affected if our assumptions change or if actual circumstances differ from those in our assumptions, which could cause our operating results to fall below the expectations of financial analysts and investors, resulting in a decline in our stock price. Significant assumptions and estimates used in preparing our consolidated financial statements include those related to revenue recognition, stock-based

compensation and income taxes. Moreover, the revenue recognition guidance, ASC Topic 606, *Revenue from Contracts with Customers*, requires more judgment than did the prior guidance.

Anti-takeover provisions in our amended and restated certificate of incorporation and bylaws and Delaware law could discourage or prevent a change in control, even if an acquisition would be beneficial to our stockholders, which could affect our stock price adversely and prevent attempts by our stockholders to replace or remove our current management.

Our amended and restated certificate of incorporation and bylaws and Delaware law contain provisions that might delay or prevent a change in control, discourage bids at a premium over the market price of our common stock and adversely affect the market price of our common stock and the voting and other rights of the holders of our common stock. These provisions include:

- a classified board of directors serving staggered terms;
- advance notice requirements to stockholders for matters to be brought at stockholder meetings;
- a supermajority stockholder vote requirement for amending certain provisions of our amended and restated certificate of incorporation and bylaws; and
- the right to issue preferred stock without stockholder approval, which could be used to dilute the stock ownership of a potential hostile acquirer.

We are also subject to provisions of the Delaware General Corporation law that, in general, prohibit any business combination with a beneficial owner of 15% or more of our common stock for three years unless the holder's acquisition of our stock was approved in advance by our board of directors or certain other conditions are satisfied.

The existence of these provisions could adversely affect the voting power of holders of common stock and limit the price that investors might be willing to pay in the future for shares of our common stock.

Our amended and restated bylaws provide that the Court of Chancery of the State of Delaware and the U.S. federal district courts will be the exclusive forums for substantially all disputes between us and our stockholders, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers or employees.

Our amended and restated bylaws provide that the Court of Chancery of the State of Delaware is the exclusive forum for the following types of actions or proceedings under Delaware statutory or common law:

- any derivative claim or cause of action brought on our behalf;
- any claim or cause of action asserting a breach of fiduciary duty;
- any claim or cause of action against us arising under DGCL;
- any claim or cause of action arising under or seeking to interpret our amended and restated certificate of incorporation or our amended and restated bylaws; and
- any claim or cause of action against us that is governed by the internal affairs doctrine.

The provisions would not apply to suits brought to enforce a duty or liability created by the Exchange Act. Furthermore, Section 22 of the Securities Act creates concurrent jurisdiction for federal and state courts over all such Securities Act actions. Accordingly, both state and federal courts have jurisdiction to entertain such claims. To prevent having to litigate claims in multiple jurisdictions and the threat of inconsistent or contrary rulings by different courts, among other considerations, our amended and restated bylaws further provide that, unless we consent to the selection of an alternate forum, the U.S. federal district courts will be the exclusive forum for resolving any complaint asserting a cause or causes of action arising under the Securities Act.

While the Delaware courts have determined that such choice of forum provisions are facially valid, a stockholder may nevertheless seek to bring a claim in a venue other than those designated in the exclusive forum provisions. In such instance, we would expect to vigorously assert the validity and enforceability of the exclusive forum provisions of our amended and restated bylaws. This may require significant additional costs associated with resolving such action in other jurisdictions and there can be no assurance that the provisions will be enforced by a court in those other jurisdictions.

These exclusive forum provisions may limit a stockholder's ability to bring a claim in a judicial forum that it finds favorable for disputes with us or our directors, officers, or other employees, which may discourage lawsuits against us and our directors, officers and other employees. If a court were to find either exclusive-forum provision in our amended and restated

bylaws to be inapplicable or unenforceable in an action, we may incur further significant additional costs associated with resolving the dispute in other jurisdictions, all of which could seriously harm our business.

GENERAL RISK FACTORS

We could be negatively affected by a security breach or other compromise, either through cyber-attack, cyber-intrusion or other significant disruption of our IT networks and related systems.

We face the risk, as does any company, of a security breach or other compromise, whether through cyber-attack or cyber-intrusion over the internet, malware, computer viruses, attachments to e-mails, persons inside our organization or persons with access to systems inside our organization, or other significant disruption of our IT networks and related systems. The risk of a security breach or disruption, particularly through cyber-attack or cyber-intrusion, including by computer hackers, foreign governments and cyber terrorists, has increased as the number, intensity and sophistication of attempted attacks and intrusions from around the world have increased. We may also experience security breaches or compromises from unintentional or accidental actions by our employees, contractors, consultants, business partners, and/or other third parties. To the extent that any security breach or disruption were to result in a loss, destruction, unavailability, alteration or dissemination of, or damage to, our data or applications, or for it to be believed or reported that any of these occurred, we could incur liability and reputational damage.

As a technology company, and particularly as a government contractor, we may face a heightened risk of a security breach, compromise or disruption from attempts to gain unauthorized access to our proprietary, confidential or classified information on our IT networks and related systems via cyber-attacks or cyber-intrusions. These types of information and IT networks and related systems are critical to the operation of our business and essential to our ability to perform day-to-day operations, and, in some cases, are critical to our operations or those of our customers. Such critical information includes our proprietary software code, which we protect as a trade secret and is critical to the competitive advantage of many of our products, which could be adversely affected if this code were stolen in a cyber-intrusion or otherwise compromised. In addition, as certain of our technological capabilities become widely known, it is possible that we may be subjected to cyber-attack or cyber-intrusion as third parties seek to gain improper access to information regarding these capabilities and cyber-attacks or cyber-intrusion could compromise our confidential information or our IT networks and systems generally, as it is not practical as a business matter to isolate all of our confidential information and trade secrets from email and internet access. A security breach, compromise or other significant disruption involving these types of information and IT networks and related systems could disrupt the proper functioning of these networks and systems and therefore our operations, compromise our confidential information and trade secrets, or damage our reputation among our customers and the public generally. We have not identified any significant security breaches or experienced other significant disruptions of these types to date. To date, we have not experienced a significant cyber-intrusion, cyber-attack or other similar disruption. There can be no assurance that our security efforts and measures will be effective or that attempted security breaches or disruptions would not be successful or damaging. Any of these developments in the future could have a negative impact on our results of operations, financial condition and cash flows.

If there are substantial sales of our common stock, or the perception that such sales may occur, our stock price could decline.

If any of our stockholders were to sell substantial amounts of our common stock, the market price of our common stock may decline, which might make it more difficult for us to sell equity or equity-related securities in the future at a time and price that we deem appropriate. Substantial sales of our common stock, or the perception that such sales may occur, may have a material adverse effect on the prevailing market price of our common stock.

We may become involved in securities class action litigation that could divert management's attention and harm our business and our insurance coverage may not be sufficient to cover all costs and damages.

The stock market has from time to time experienced significant price and volume fluctuations that have affected the market prices for the common stock of technology companies. These broad market fluctuations may cause the market price of our common stock to decline. In the past, following periods of volatility in the market price of a particular company's securities, securities class action litigation has often been brought against that company. Securities class litigation also often follows certain significant business transactions, such as the sale of a business division or a change in control transaction. We may become involved in this type of litigation in the future. Litigation often is expensive and diverts management's attention and resources, which could adversely affect our business.

We are obligated to develop and maintain proper and effective internal controls over financial reporting and any failure to maintain the adequacy of these internal controls may adversely affect investor confidence in our company and, as a result, the value of our common stock.

We are required, pursuant to Section 404 of the Sarbanes-Oxley Act to furnish a report by management on, among other things, the effectiveness of our internal control over financial reporting on an annual basis. This assessment includes disclosure of any material weaknesses identified by our management in our internal control over financial reporting.

During the evaluation and testing process of our internal controls, if we identify one or more material weaknesses in our internal control over financial reporting, we will be unable to assert that our internal control over financial reporting is effective. While we have established certain procedures and controls over our financial reporting processes, we cannot assure you that these efforts will prevent restatements of our financial statements in the future. We may not be able to remediate any future material weaknesses, or to complete our evaluation, testing and any required remediation in a timely fashion.

Any failure to maintain internal control over financial reporting could severely inhibit our ability to accurately report our financial condition or results of operations. If we are unable to conclude that our internal control over financial reporting is effective, we could lose investor confidence in the accuracy and completeness of our financial reports, the market price of our common stock could decline, and we could be subject to sanctions or investigations by the Nasdaq Stock Market, the SEC or other regulatory authorities. Failure to remedy any material weakness in our internal control over financial reporting, or to implement or maintain other effective control systems required of public companies, could also restrict our future access to the capital markets.

ITEM 1B. UNRESOLVED STAFF COMMENTS

Not applicable.

ITEM 2. PROPERTIES

The following table summarizes the location, ownership status and total square footage of space utilized for our operations and principal corporate offices as of December 31, 2021:

	Location	Square Footage
Operations facilities	12 locations in 5 US states, 2 UK counties, 1 CN province and 1 UAE city	199,000
Principal corporate offices:		
Corporate headquarters	Roanoke, Virginia (US)	4,400
OptaSense headquarters	Farnborough, Hampshire (UK)	7,500

All of our properties, including one property classified as held for sale, are leased with various end dates through 2030. We believe that our existing facilities are adequate for our current needs and suitable additional or substitute space will be available as needed to accommodate expansion of our operations.

ITEM 3. LEGAL PROCEEDINGS

From time to time, we may become involved in litigation or claims arising from our operations in the normal course of business. Management currently believes the amount of ultimate liability, if any, with respect to these actions will not materially affect our financial position, results of operations, or liquidity.

Refer to Note 15, *Commitments and Contingencies*, of the Notes to the Consolidated Financial Statements included herein for information relating to certain legal proceedings.

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

STOCKHOLDERS

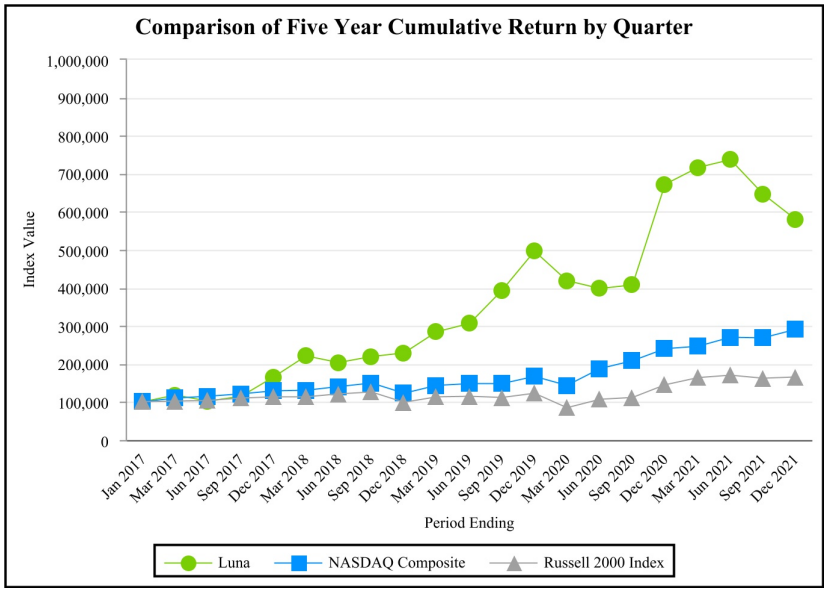
Our common stock is listed on the Nasdaq Capital Market under the symbol "LUNA." As of March 11, 2022, we had 32,298,014 shares of common stock outstanding held by 84 holders of record. The actual number of stockholders is greater than this number of record holders and includes stockholders who are beneficial owners but whose shares are held in street name by brokers and other nominees. This number of holders of record also does not include stockholders whose shares may be held in trust by other entities.

STOCK PERFORMANCE GRAPH

The graph set forth below compares the cumulative total stockholder return on our common stock for the previous five years, during which our common stock was traded on the Nasdaq Capital Market, as compared to the cumulative total return of the Nasdaq Composite Index and the Russell 2000 Index over the same period. This graph assumes the investment of $100,000 in our common stock at the closing price on January 1, 2017, and an equivalent amount in the Nasdaq Composite Index and the Russell 2000 Index on that date, and assumes the reinvestment of dividends, if any. We have never paid dividends on our common stock and have no present plans to do so.

Since there is no published industry or line-of-business index for our business reflective of our performance, nor do we believe we can reasonably identify a peer group, we measure our performance against issuers with similar market capitalizations. We selected the Russell 2000 Index because it measures the performance of a broad range of companies with lower market capitalizations than those companies included in the S&P 500 Index.

The comparisons shown in the graph below are based upon historical data. We caution that the stock price performance shown in the graph below is not necessarily indicative of, nor is it intended to forecast, the potential future performance of our common stock.



The preceding Stock Performance Graph is not deemed filed with the Securities and Exchange Commission and shall not be incorporated by reference in any of our filings under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended, whether made before or after the date hereof and irrespective of any general incorporation language in any such filing.

DIVIDEND POLICY

Since our inception, we have never declared or paid any cash dividends on our common stock. We currently expect to retain any future earnings for use in the operation and expansion of our business, and therefore do not anticipate paying any cash dividends in the foreseeable future. In addition, our debt facility with PNC Bank restricts us from paying cash dividends on our capital stock without the bank's prior written consent.

Unregistered Sales of Equity Securities

Not applicable.

Purchases of Equity Securities by the Issuer and Affiliated Parties-

The following table summarizes repurchases of our common stock during December 2021. There were no purchases during October 2021 or November 2021.

Period	Total Number of Shares Purchased	Average Price Paid per Share	Total Number of Shares Purchased as Part of a Publicly Announced Program	Approximate Dollar Value of Shares that May Yet be Purchased Under the Program
12/1/2021 - 12/31/2021	4,571 (1)	$ 8.45	—	$

(1) These shares of common stock were repurchased from employees to satisfy tax withholding obligations triggered upon vesting of restricted stock awards.

ITEM 6. RESERVED

ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

The following discussion and analysis of our financial condition and results of operations should be read in conjunction with our consolidated financial statements and the related notes to those statements included elsewhere in this report. In addition to historical financial information, the following discussion and analysis contains forward-looking statements that involve risks, uncertainties and assumptions. Our actual results and timing of selected events may differ materially from those anticipated in these forward-looking statements as a result of many factors, including those discussed under "Risk Factors" and elsewhere in this report.

Business Overview

We are a leader in advanced optical technology, providing high performance fiber optic test, measurement and control products for the telecommunications and photonics industries; and distributed fiber optic sensing solutions that measure, or "sense," the structures for industries ranging from aerospace, automotive, energy, oil and gas, security and infrastructure.

Our communications test and control products help customers test their fiber optic networks and assemblies with speed and precision in both lab and production environments, accelerating the development of fiber optic products and assuring accurate testing of optical components like photonic integrated circuits ("PICs") and coherent receivers, which are both critical elements of meeting the world's exponentially growing demand for bandwidth. Our distributed fiber optic sensing products help designers and manufacturers more efficiently develop new and innovative products by measuring stress, strain, and temperature at a high resolution for new designs or manufacturing processes. In addition, our distributed fiber optic sensing products ensure the safety and structural integrity or operational health of critical assets in the field, by monitoring stress, strain, and vibration in large civil and industrial infrastructure such as bridges, roads, pipelines and borders. We also provide applied research services, typically under research programs funded by the U.S. government, in areas of sensing and instrumentation, advanced materials, optical technologies and health sciences.

Prior to September 30, 2021, we were organized into two main reporting segments, our Lightwave segment and our Luna Labs segment. Our Lightwave segment consists of our fiber optics testing, measurement and sensing solutions. Our Luna Labs segment performed applied research principally in the areas of sensing and instrumentation, advanced materials and health sciences. Most of the government funding for our Luna Labs segment was derived from the Small Business Innovation Research ("SBIR"), program coordinated by the U.S. Small Business Administration. We now have one reportable segment, Lightwave, following the determination that our Luna Labs segment met held-for-sale and discontinued operations accounting criteria at the end of the third quarter of 2021 and the sale of substantially all of our equity interests in Luna Labs on March 8, 2022.

Our Lightwave segment develops, manufactures and markets distributed fiber optic sensing products and fiber optic communications test and control products. We develop and commercialize our fiber optic technology for sensing applications for aerospace, automotive, energy and infrastructure as well as for test and measurement applications in the telecommunications

and data communications industries. Our Lightwave segment also performs applied research principally in the areas of optical and THz technologies. Revenues from product sales are mostly derived from the sales of our sensing and communications test, measurement and control products that make use of light-transmitting optical fibers, or fiber optics.

As we develop and commercialize new products, our revenues will reflect a broader and more diversified mix of products. Our key initiative for long term growth is to become a leading provider of fiber optic communications test, measurement, control and sensing equipment. The acquisition of OptaSense in December 2020 added distributed acoustic sensing technology to our existing suite of sensing products and provided for expansion into high-growth markets such as security and perimeter detection, smart infrastructure monitoring and oil and gas. Our products have historically been strong in long-range, discrete sensing and short range, fully distributed sensing which are best when specific, known locations need to be monitored. OptaSense's product offering has helped us fill a gap for long range, fully distributed measurement, which is best for applications where signals can occur anywhere along the length of the sensor.

We may incur increasing expenses as we seek to expand our business, including expenses for research and development, sales and marketing and manufacturing capabilities. We may continue to grow our business in part through acquisitions of additional companies and complementary technologies, which could cause us to incur transaction expenses, amortization or write-offs of intangible assets and goodwill and other acquisition-related expenses. As a result, we may incur net losses in future periods, and these losses could be substantial.

Discontinued Operations

We began actively marketing our Luna Labs segment to prospective buyers during 2021 as part of our growth strategy for our Lightwave segment. After advancing those marketing efforts during the third quarter of 2021, we determined that our Luna Labs segment met held-for-sale and discontinued operations accounting criteria at the end of the third quarter. Accordingly, we began to separately report the results of our Luna Labs segment as discontinued operations in our consolidated statement of operations and the related assets and liabilities as held for sale in the consolidated balance sheets in our third quarter Form 10-Q. These changes have been applied to all periods presented in this Form 10-K. We completed the sale of substantially all of our equity interests in Luna Labs in March 2022, as described below.

Dispositions and Acquisitions

Luna Labs

On March 8, 2022, we completed the sale of substantially all of our equity interests in our Luna Labs business to certain members of Luna Labs' senior management team and a group of outside investors for an initial purchase price of $20.4 million before working capital and escrow adjustments and transaction fees. Total consideration included $13.0 million of cash received at closing, $2.5 million in the form of a convertible note and $1.7 million in the form of 60-day promissory notes. We can earn up to $1.0 million in future payments from Luna Labs upon the achievement by Luna Labs of certain financial goals. The estimated gain on the transaction is $14.0 million before tax.

LIOS Sensing

On March 10, 2022, we acquired NKT Photonics GmbH and LIOS Technology Inc. (collectively, "LIOS Sensing") for €20.0 million, or $22.1 million. LIOS Sensing, based in Cologne, Germany and formerly owned by NKT Photonics A/S, provides temperature and strain sensing products which are highly complementary to our existing portfolio of fiber optic offerings.

OptaSense

On December 3, 2020, we acquired OptaSense Holdings Limited ("OptaSense") for $38.9 million, or £29.0 million, in cash. OptaSense, based in Farnborough, United Kingdom ("UK") and formerly owned by QinetiQ Holdings Limited, is a market leader in fiber optic distributed monitoring solutions for pipelines, oilfield services, security, highways and railways, and in power and utilities monitoring systems. The acquisition of OptaSense provided us with important distributed acoustic sensing ("DAS") intellectual property and products. OptaSense's technology and products and geographic footprint are highly complementary to our Lightwave segment which we believe will accelerate our technology roadmap and overall growth.

Description of Our Revenues, Costs and Expenses

Impact of COVID-19 Pandemic

The ongoing global COVID-19 pandemic has impacted, and will likely continue to impact, the way we conduct our business, including the way in which we interface with customers, suppliers and our employees. The COVID-19 pandemic has affected how we interact with our customers by reducing face-to-face meetings and increasing our on-line and virtual presence. While increasing our on-line and virtual presence has proven effective, we are unsure of the impact if these conditions continue for an extended period. During 2021, we have experienced an increased level of disruption in our supply chain and from certain customers, all of which have resulted in delayed revenue. While we believe these disruptions are temporary and will diminish in 2022, there is no guarantee we will be able to manage through these disruptions. See “Risk Factors” for further discussion of the potential adverse impacts of the COVID-19 pandemic on our business.

Revenues

We generate revenues from product sales, commercial product development and licensing and technology development activities. Our Lightwave segment revenues reflect amounts that we receive from sales of our products or development of products for third parties and, to a lesser extent, fees paid to us in connection with licenses or sub-licenses of certain patents and other intellectual property.

We derived Luna Labs segment revenues, which are presented as discontinued operations, from providing research and development services to third parties, including government entities, academic institutions and corporations, and from achieving milestones established by some of these contracts. In general, we completed contracted research over periods ranging from six months to three years and recognize these revenues over the life of the contract as costs are incurred. Following our sale of Luna Labs in March 2022, we will no longer derive revenues from Luna Labs.

Cost of Revenues

Cost of revenues associated with Lightwave segment revenues consists of license fees for use of certain technologies, product manufacturing costs including all direct material and direct labor costs, amounts paid to our contract manufacturers, manufacturing, shipping and handling, provisions for product warranties and inventory obsolescence, as well as overhead allocated to each of these activities.

Cost of revenues associated with Luna Labs segment revenues, which are presented as discontinued operations, consisted of costs associated with performing the related research activities including direct labor, amounts paid to subcontractors and overhead allocated to Luna Labs segment activities.

Operating Expense

Operating expense consists of selling, general and administrative expense, as well as expenses related to research, development and engineering, depreciation of fixed assets, amortization of intangible assets and costs related to merger and acquisitions activities. These expenses also include compensation for employees in executive and operational functions including certain non-cash charges related to expenses from equity awards, facilities costs, professional fees, salaries, commissions, travel expense and related benefits of personnel engaged in sales, marketing, and administrative activities; costs of marketing programs and promotional materials; salaries, bonuses and related benefits of personnel engaged in our own research and development beyond the scope and activities of our historical Luna Labs segment; product development activities not provided under contracts with third parties; and overhead costs related to these activities. The operating expense of our Luna Labs segment is presented in discontinued operations.

Investment Income

Investment income consists of amounts earned on our cash equivalents. We sweep on a daily basis a portion of our cash on hand into a fund invested in U.S. government obligations.

Interest Expense

Interest expense is composed of interest paid under our term and revolving loans as well as interest accrued on our finance lease obligations.

Critical Accounting Policies and Estimates

Revenue Recognition

Products and Services

To determine the proper revenue recognition method for our product and services contracts, we evaluate whether two or more contracts should be combined and accounted for as one single contract and whether the combined or single contract should be accounted for as more than one performance obligation. For tangible products that contain software that is essential to the tangible product's functionality, we consider the product and software to be a single performance obligation and recognize revenue accordingly. For contracts with multiple performance obligations, we allocate the contract's transaction price to each performance obligation based on their relative stand-alone selling prices. In such circumstances, we use the observable price of goods or services which are sold separately in similar circumstances to similar customers. If these prices are not observable, then we will estimate the stand-alone selling price using information that is reasonably available. For the majority of our standard products and services, price list and discount structures related to customer type are available. For products and services that do not have price list and discount structures, we use the residual approach. The residual approach decreases the total transaction price by the sum of the observable standalone selling prices if either the company sells the same good or services to different customers for a broad range of amounts or the company has not established a price for the good or service and that good or service has not been sold on a standalone basis. Shipping and handling activities primarily occur after a customer obtains control and are considered fulfillment costs rather than separate performance obligations.

For standard products, we recognize revenue at a point in time when control passes to the customer. Absent substantial product acceptance clauses, this is based on the shipping terms. In instances where acceptance of the product and installation services are specified by the customer, revenue is deferred until such required acceptance criteria have been met. For custom products that require engineering and development based on customer requirements, we will recognize revenue over time using the output method for any items shipped and any finished goods or work in process that is produced for balances of open sales orders. For extended warranties and product rentals, revenue is recognized over time using the output method based on the time elapsed for the warranty or service period. In the case of warranties, we record a contract liability for amounts billed but that are not recognized until subsequent periods. A separate contract liability is recorded for the cost associated with warranty repairs based on our estimate of future expenses. For testing services where we are performing testing on an asset the customer controls, revenue is recognized over time by the output method using the performance to date. For training where the customer is receiving the benefit of training as it is occurring and for repairs to a customer-controlled asset, revenue is recognized over time by the output method using the performance to date.

In some product rental contracts, a customer may be offered a discount on the purchase of an item that would provide for a material right. When a material right has been provided to a customer, a separate performance obligation is established, and a portion of the rental revenue will be deferred until the future product is purchased or the option expires. This deferred revenue is recognized as a contract liability on the balance sheet.

Research and Development Contracts

Our contracts with agencies of the U.S. government are subject to periodic funding by the respective contracting agency. Funding for a contract may be provided in full at inception of the contract or ratably throughout the contract as the services are provided. In evaluating the probability of funding for purposes of assessing collectability of the contract price, we consider our previous experience with our customers, communication with our customers regarding funding status and our knowledge of available funding for the contract or program. If funding is not assessed as probable, revenue recognition is deferred until realization is reasonably assured.

Because of control transfers over time, revenue is recognized over time based on the extent of progress towards completion of the performance obligation. The selection of the method to measure progress towards completion requires judgment and is based on the nature of the services to be provided. We generally use the input method, more specifically the cost-to-cost measure of progress for our contracts because it best depicts the transfer of control to the customer which occurs as we incur costs on our contracts. Under the cost-to-cost measure of progress, the extent of progress towards completion is measured based on the ratio of costs incurred to date to the total estimated costs at completion of the performance obligation. The underlying bases for estimating our contract research revenues are measurable expenses, such as labor, subcontractor costs and materials, and data that are updated on a regular basis for purposes of preparing our cost estimates. Our research contracts generally have a period of performance of six months to three years, and our estimates of contract costs have historically been consistent with actual results. Revisions in these estimates between accounting periods to reflect changing facts and circumstances have not had a material impact on our operating results, and we do not expect future changes in these estimates

to be material. The cumulative impact of any revisions to estimates and the full impact of anticipated losses on any type of contract are recognized in the period in which they become known.

Income Taxes

We are subject to income taxes primarily in the United States and United Kingdom. We estimate our tax liability through calculating our current tax liability, together with assessing temporary and permanent differences resulting from the different treatment of items for tax and accounting purposes. The temporary differences result in deferred tax assets and liabilities, which we record on our balance sheet. Management then assesses the likelihood that deferred tax assets will be recovered in future periods. In assessing the need for a valuation allowance against the net deferred tax asset, management considers factors such as future reversals of existing taxable temporary differences, taxable income in prior carry back years, whether carry back is permitted under the tax law, tax planning strategies and estimated future taxable income exclusive of reversing temporary differences and carryforwards. To the extent that we cannot conclude that it is more likely than not that the benefit of such assets will be realized, we establish a valuation allowance to reduce their net carrying value. As of December 31, 2021, our valuation allowance was $3.8 million.

The tax rates used to determine deferred tax assets or liabilities are the enacted tax rates in effect for the year in which the differences are expected to reverse. Based on the evaluation of all available information, we recognize future tax benefits, such as net operating loss ("NOL") carryforwards, to the extent that realizing these benefits is considered more likely than not. Because we have NOLs carried over from a previously acquired company that are limited under Section 382, the deferred tax assets of $1.0 million as of December 31, 2021 are expected to be realized over an extended period of time (with continued earnings realized ratably through 2033). In 2021, we generated an additional NOL carryforward of $1.5 million for which will have an indefinite carryforward period.

We recognize tax benefits from an uncertain tax position only if it is more likely than not that the tax position will be sustained on examination by taxing authorities. While it is often difficult to predict the final outcome of timing of the resolution of any particular tax matter, we establish a liability at the time we determine it is probable we will be required to pay additional taxes related to certain matters. These liabilities are recorded in accrued liabilities in our consolidated balance sheets. We adjust this provision, including any impact on the related interest and penalties, in light of changing facts and circumstances, such as the progress of a tax audit. A number of years may elapse before a particular matter for which we have established a liability is audited and finally resolved. The number of years with open tax audits varies depending on the tax jurisdiction. Settlement of any particular issue would usually require the use of cash. We recognize favorable resolutions of tax matters for which we have previously established liabilities as a reduction to our income tax expense when the amounts involved become known.

Our future effective tax rates could be adversely affected if actual earnings are different than our estimates, by changes in the valuation of our deferred tax assets or liabilities, outcomes resulting from income tax examinations, or by changes or interpretations in tax laws, regulations or accounting principles.

Intangible Assets

Definite-lived intangible assets are amortized over their respective estimated useful lives and are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset might not be recoverable. Recoverability of assets to be held and used is measured by a comparison of the carrying amount of an asset to future un-discounted net cash flows expected to be generated by the asset. If such assets are considered to be impaired, the impairment to be recognized is measured by the amount by which the carrying amount of the asset exceeds the fair value of the asset. If the estimates of the useful lives should change, we will amortize the remaining book value over the remaining useful lives. As of December 31, 2021, our intangible assets, which were primarily acquired from previous acquisitions, consisted of developed technology, trade names / trademarks, backlog and customer relationships with a total carrying value of $17.2 million.

Goodwill

Goodwill is tested annually for impairment as of the first day of our fourth quarter (October 1st) and whenever events or changes in circumstances indicate the carrying value of goodwill may not be recoverable. As of December 31, 2021, we had two reporting units, Luna and OptaSense, both of which contained goodwill. Our goodwill impairment evaluation consisted of a qualitative assessment. A qualitative assessment can be performed to determine whether it is more likely than not the fair value of the reporting unit is less than its carrying value. If the reporting unit does not pass the qualitative assessment, we compare the fair value of each reporting unit to its carrying value using a quantitative assessment. If the fair value of the reporting unit exceeds its carrying value, goodwill is considered not impaired. If the fair value of the reporting unit is less than the carrying value, the difference is recorded as an impairment loss.

For the quantitative assessment, we estimate the fair value of each reporting unit using a combination of an income approach using a discounted cash flow ("DCF") analysis and a market-based valuation approach based on comparable public company trading values. Determining the fair value of a reporting unit requires the exercise of significant management judgments, including the amount and timing of projected future revenues, earnings and cash flows after considering factors such as recent operating performance, general market and industry conditions, existing and expected future contracts, changes in working capital and long-term business plans and growth initiatives. The carrying value of each reporting unit includes the assets and liabilities employed in its operations and goodwill.

As of December 31, 2021, the carrying value of our goodwill was $19.0 million. We completed our annual goodwill impairment test in the fourth quarter of 2021 and determined that no impairment existed.

Business Combinations

We account for business combinations under the acquisition method of accounting, in accordance with ASC 805 - *Business Combinations*. Under ASC 805, the total estimated purchase consideration is allocated to the acquired tangible and intangible assets and assumed liabilities based on their estimated fair values as of the acquisition date. Any excess of the fair value of acquisition consideration over the fair value of identifiable assets acquired and liabilities assumed is recorded as goodwill. Determining the fair value of acquired intangible assets is judgmental in nature and requires the use of significant estimates and assumptions, including the discount rate, revenue growth rates, projected gross margins, and estimated research and development expenses.

Results of Operations

The following table shows information derived from our consolidated statements of operations expressed as a percentage of total revenues for the periods presented.

	Years ended December 31,	
	2021	2020
Revenue	100.0 %	100.0 %
Cost of revenue	41.1	39.3
Gross profit	58.9	60.7
Operating expense	61.9	59.3
Operating (loss)/income	(3.0)	1.4
Total other (expense)/income	(0.5)	0.2
(Loss)/income from continuing operations before income taxes	(3.5)	1.6
Income tax benefit	2.3	0.8
Net (loss)/income from continuing operations	(1.2)	2.3
Income from discontinued operations, net of income taxes	2.8	3.3
Net income	1.6 %	5.6 %

Year Ended December 31, 2021 Compared to Year Ended December 31, 2020

Revenues

Revenues for the year ended December 31, 2021 increased $28.4 million, or 48%, to $87.5 million compared to $59.1 million for the year ended December 31, 2020. The vast majority of the increase in revenues was due to the revenues from OptaSense which was acquired in December 2020.

Cost of Revenues

Cost of revenues increased $12.7 million or 55% to $36.0 million for the year ended December 31, 2021 compared to $23.2 million for the year ended December 31, 2020. This increase in cost of revenues primarily resulted from the OptaSense revenues and higher sales volume in communications testing products.

Our overall gross margin for the year ended December 31, 2021 was 59% compared to 61% for the year ended December 31, 2020. This decrease was primarily driven by product mix and increased commodity costs.

Operating Expense

	Years ended December 31,			
(in thousands)	2021	2020	$ Difference	% Difference
Selling, general and administrative expense	$ 43,956	$ 28,353	$ 15,603	55.0 %
Research, development and engineering expense	10,190	6,714	3,476	51.8 %
Total operating expense	$ 54,146	$ 35,067	$ 19,079	54.4 %

Selling, general and administrative expense increased $15.6 million to $44.0 million for the year ended December 31, 2021 compared to $28.4 million for the year ended December 31, 2020. Selling, general and administrative expense increased primarily due to the acquired OptaSense operations, integration costs, amortization of intangible assets and variable costs supporting our sales growth.

Research, development and engineering expenses increased $3.5 million to $10.2 million for the year ended December 31, 2021 compared to $6.7 million for the year ended December 31, 2020 primarily due to the acquired OptaSense operations.

Acquisition related expense consisted primarily of investment banking, legal and consulting fees incurred in connection with our acquisition of OptaSense for the year ended December 31, 2020. There was no acquisition related expense for the year ended December 31, 2021.

The loss on sale of property and equipment in 2020 was primarily due to the sale of one of our buildings and related fixed assets in order to consolidate operations.

(Loss)/Income from Continuing Operations Before Income Taxes

During the year end December 31, 2021, we recognized a loss from continuing operations before income taxes of $3.1 million compared to income of $0.9 million for the year ended December 31, 2020.

Income Tax Benefit

For the years ended December 31, 2021 and December 31, 2020, we recorded an income tax benefit of $2.0 million and $0.5 million, respectively. The income tax benefit for 2021 was primarily related to the pre-tax loss and deductions on vested RSUs and stock option exercises during the year. The income tax benefit for 2020 was primarily related to R&D tax credits.

Net Income from Discontinued Operations

For the years ended December 31, 2021 and December 31, 2020, we recognized income from discontinued operations, net of income taxes, of $2.5 million and $1.9 million, respectively. The results of our discontinued operations for both years include the operations of our Luna Lab segment that is classified as held for sale. For the year ended December 31, 2020, our net income from discontinued operations included a $1.4 million after-tax loss on the sale of our High Speed Optical Receiver business.

Liquidity and Capital Resources

At December 31, 2021, our total cash and cash equivalents were $17.1 million. We require cash to: (i) fund our operating expenses, working capital requirements, and outlays for strategic acquisitions and investments, (ii) service our debt, including principal and interest; (iii) conduct research and development; (iv) incur capital expenditures; and (v) repurchase our common stock. As part of our business strategy, we review acquisition and divestiture opportunities on a regular basis. In March 2022, we completed the disposition of Luna Labs and the acquisition of LIOS Sensing, which are discussed elsewhere in this Form 10-K. The LIOS Sensing acquisition price of $22.1 million was funded from $13.0 million of initial proceeds from the disposition of Luna Labs with the remainder of funding coming from availability under our revolver and operating cash.

We believe that the key factors that could affect our internal and external sources of cash include:

- Changes in demand for our products, including as a result of the COVID-19 pandemic, competitive pricing pressures, supply chain constraints, effective management of our manufacturing capacity, our ability to achieve further reductions in operating expenses, our ability to make progress on the achievement of our business strategy goals, and our ability to make the research and development expenditures required to remain competitive in our business.

- Our access to bank financing and the debt and equity capital markets that could impair our ability to obtain needed financing on acceptable terms or to respond to business opportunities and developments as they arise, including interest rate fluctuations, macroeconomic conditions, sudden reductions in the general availability of lending from banks or the related increase in cost to obtain bank financing and our ability to maintain compliance with covenants under our debt agreements in effect from time to time.

On December 1, 2020 (the “Effective Date”), we entered into a Loan Agreement (the “Loan Agreement”) with PNC Bank, National Association, as lender (the “Lender”) and our domestic subsidiaries as guarantors. The Loan Agreement provides a $12.5 million term loan facility (the “Term Loan”) and a $15.0 million revolving credit facility (the “Revolving Line”), which include a $3.0 million letter of credit sublimit. On the Effective Date, we borrowed the full amount of the Term Loan from the Lender pursuant to a term note (the “Term Note”) and a $7.6 million revolving loan (the “Revolving Loan”) pursuant to a revolving line of credit note (the “Revolving Line of Credit Note”). We may repay and reborrow advances under the Revolving Line from time to time pursuant to the Revolving Line of Credit Note. We used the proceeds from the Term Loan and the Revolving Loan to pay, in part, the consideration for the acquisition of OptaSense in December 2020.

The Term Loan matures on December 1, 2023. The Term Loan is due and payable in 12 equal quarterly payments of principal and interest. The Term Loan bears interest at a floating per annum rate equal to the sum of (a) LIBOR plus (b) a

margin ranging from 1.75% to 2.25% depending on the Net Leverage Ratio (as defined in the Loan Agreement). We may prepay the Term Loan without penalty or premium.

The Revolving Line expires on December 1, 2023. Borrowings under the Revolving Line will bear interest at a floating per annum rate equal to the sum of (a) LIBOR plus (b) a margin ranging from 1.75% to 2.25% depending on the Net Leverage Ratio. Accrued interest will be due and payable on the first day of each month and the outstanding principal balance and any accrued but unpaid interest will be due and payable on December 1, 2023. The unused portion of the Revolving Line will accrue a fee equal to 0.20% per annum multiplied by the quarterly average unused amount.

As of December 31, 2021, we had outstanding borrowings under our Term Loan and Revolving Loan of $8.3 million and $7.6 million, respectively. Additional details of our Loan Agreement can be found in Note 10, "Debt" in the notes to our audited consolidated financial statements included elsewhere in this Form 10-K.

We believe that our cash and cash equivalents as of December 31, 2021 in addition to amounts available to us under our Revolving Line will provide adequate liquidity for us to meet our working capital needs over the next twelve months from the date of issuance of the consolidated financial statements included elsewhere in this Annual Report on Form 10-K. Additionally, we believe that should we have the need for increased capital spending to support our planned growth, we will be able to fund such growth through either third-party financing on competitive market terms or through our available cash. However, these estimates are based on assumptions that may prove to be incorrect, including as a result of the ongoing COVID-19 pandemic and its potential impacts on our business. If we require additional capital beyond our current balances of cash and cash equivalents and borrowing capacity under the Revolving Line described above, this additional capital may not be available when needed, on reasonable terms, or at all. Moreover, our ability to raise additional capital may be adversely impacted by potential worsening global economic conditions and the recent disruptions to and volatility in the credit and financial markets in the United States and worldwide resulting from the ongoing COVID-19 pandemic.

Discussion of Cash Flows

	Years ended December 31,	
(in thousands)	**2021**	**2020**
Net cash provided by operating activities	$ 4,483	$ 2,856
Net cash used in investing activities	(1,768)	(34,159)
Net cash (used in)/provided by financing activities	(1,264)	21,649
Net increase/(decrease) in cash and cash equivalents	$ 1,451	$ (9,654)

During 2021, net cash provided by operating activities was $4.5 million which increased by $1.6 million from 2020. The increase in net cash provided by operating activities was primarily due to modest growth in working capital in 2021 compared to a more significant growth in working capital in the prior year, partially offset by lower net income in 2021.

During 2021, cash used in investing activities was significantly less than the prior year due to the acquisition of OptaSense and another smaller company totaling $34.1 million in 2020. Excluding acquisitions, cash used in investing increased by $1.7 million primarily due to increased capital expenditures for normal business needs and the absence of proceeds from the sale of property and equipment and facility classified as discontinued operations in 2020.

During 2021, cash used in financing activities was $1.3 million, compared to cash provided by financing activities of $21.6 million in 2020, due to proceeds of $20.0 million from new borrowings used to fund the acquisition of OptaSense in 2020. Excluding the prior year debt borrowings, cash used in financing activities increased by $2.9 million in 2021 due to scheduled repayments of bank debt of $4.1 million partially offset by a $1.2 million increase in proceeds from exercises of stock options and purchases under our employee stock purchase plan.

Summary of Cash Requirements

The following table sets forth information concerning our current and long-term material cash requirements as of December 31, 2021 that are fixed and determinable.

(in thousands)	Total	Less than 1 year	1 - 3 years	3 - 5 years
Debt financing (1)	$ 15,840	$ 4,167	$ 11,673	$ —
Operating facility leases (2)	6,061	2,270	3,078	713
Finance leases (3)	207	53	106	48
Purchase order obligation (4)	1,800	1,800	—	—
Total	$ 23,908	$ 8,290	$ 14,857	$ 761

(1) In December 2020, we entered into a Loan Agreement with the Lender which provided us with a $12.5 million Term Loan and a $15.0 million Revolving Line. We borrowed the full amount of the Term Loan, subject to quarterly repayments, and $7.6 million against the Revolving Line. The Term Loan matures in December 2023 and the Revolving Line expires in December 2023.

(2) We lease our facilities for all of our locations under operating leases that as of December 31, 2021, are scheduled to expire between March 2022 and August 2026. Upon expiration of our office leases, we may exercise certain renewal options as specified in the leases. Rental payments associated with these option periods are not included in the table above.

(3) Our office equipment leases expire in 2022 and 2025, respectively.

(4) Purchase order obligations included outstanding orders for inventory purchases. In 2021, we executed non-cancelable purchase orders for a total amount of $2.3 million for multiple shipments of tunable lasers and component parts to be delivered over periods up to 12 months beginning in August 2021 and November 2021.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Market risk represents the risk of loss that may impact our financial position due to adverse changes in financial market prices and rates. We do not hold or issue financial instruments for trading purposes or have any derivative financial instruments. Our exposure to market risk is limited to interest rate fluctuations, due to changes in the general level of U.S. interest rates, and foreign currency exchange rates.

Interest Rate Risk

We do not use derivative financial instruments as a hedge against interest rate fluctuations, and, as a result, we are subject to interest rate risk on our Term Loan and Revolving Loan with variable interest rates based on LIBOR plus a margin as defined in the credit agreement governing the Term Loan and Revolving Loan. As of December 31, 2021, we had outstanding borrowings under our Term Loan and Revolving Loan of $8.3 million and $7.6 million, respectively, at the weighted-average variable interest rates of 2.4% and 2.4%, respectively. At this borrowing level, a 0.25% increase in interest rates would have had an unfavorable annual impact on our pre-tax earnings and cash flows by approximately $0.05 million.

Foreign Currency Exchange Rate Risk

Following our acquisition of OptaSense in December 2020, and subsequently LIOS Sensing in March 2022, we are exposed to risks from foreign currency exchange rate fluctuations on the translation of our foreign operations into U.S. dollars and on the purchase of goods by these foreign operations that are not denominated in their functional currencies. As of December 31, 2021, our exposure to foreign currency rate fluctuations is not material to our financial condition or results of operations.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

Luna Innovations Incorporated

Index to Consolidated Financial Statements

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

Board of Directors and Stockholders
Luna Innovations Incorporated

Opinion on the financial statements
We have audited the accompanying consolidated balance sheets of Luna Innovations Incorporated (a Delaware corporation) and subsidiaries (the "Company") as of December 31, 2021 and 2020, the related consolidated statements of operations, comprehensive income, changes in stockholders' equity, and cash flows for the years then ended, and the related notes and financial statement schedule included under Item 15(a) (collectively referred to as the "financial statements"). In our opinion, the 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 the years then ended, in conformity with accounting principles generally accepted in the United States of America.

Basis for opinion
These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) ("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 financial statements are free of material misstatement, whether due to error or fraud. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audits we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion.

Our audits included performing procedures to assess the risks of material misstatement of the 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 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 financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical audit matter
The critical audit matter communicated below is a matter arising from the current period audit of the 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 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 financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing separate opinions on the critical audit matter or on the accounts or disclosures to which it relates.

Revenue recognition for fixed price contracts
As described further in Note 1 to the consolidated financial statements, the Company performs technology research under fixed price contracts with the associated revenue recognized over time. The Company has revenue from fixed price contracts in both revenue from continuing operations as well as in net loss from discontinued operations. For fixed price revenue contracts recognized over time, management utilizes the input method to measure progress toward the complete satisfaction of the performance obligations based upon the cost incurred to date as a percentage of the total estimated cost. We identified revenue recognition for fixed price contracts as a critical audit matter.

The principal consideration for our determination that revenue recognition for fixed price contracts was a critical audit matter is that the measure of progress towards completion utilizes assumptions for future costs to complete the performance obligations, and those assumptions have significant estimation uncertainty. A significant change in the assumptions could affect the profitability of the contract. Auditing such assumptions required extensive audit effort due to the volume and complexity of these contracts and a high degree of auditor judgment when performing audit procedures and evaluating the results of those procedures.

Our audit procedures related to testing revenue recognition of fixed-price contracts included the following, among others.

- We evaluated the design effectiveness of controls over the Company's process for recognizing revenue over time. This included the design of controls over the initial budgeting process and proportional performance determination.
- For a sample of contracts, we inquired regarding the status of the project and obtained an understanding for significant changes in budgeted to actual costs.
- For a sample of contracts, we tested the completeness and accuracy of costs incurred to date.

/s/ GRANT THORNTON LLP

We have served as the Company's auditor since 2005.

Philadelphia, Pennsylvania
March 14, 2022

Luna Innovations Incorporated
Consolidated Balance Sheets
(in thousands, except share data)

	December 31, 2021	December 31, 2020
Assets		
Current assets:		
Cash and cash equivalents	$ 17,128	$ 15,366
Accounts receivable, net	20,913	21,928
Contract assets	5,166	4,139
Inventory	22,493	23,062
Prepaid expenses and other current assets	3,793	4,434
Assets held for sale	12,952	6,540
Total current assets	82,445	75,469
Property and equipment, net	2,988	2,917
Intangible assets, net	17,177	19,994
Goodwill	18,984	18,121
Operating lease right-of-use asset	5,075	5,984
Other non-current assets	247	369
Deferred tax asset	3,321	1,689
Non-current assets held for sale	—	6,459
Total assets	$ 130,237	$ 131,002
Liabilities and stockholders' equity		
Current liabilities:		
Current portion of long-term debt obligations	$ 4,167	$ 4,167
Accounts payable	2,809	2,851
Accrued and other current liabilities	9,258	11,325
Contract liabilities	4,649	6,147
Current portion of operating lease liability	2,101	1,876
Current liabilities held for sale	9,703	3,719
Total current liabilities	32,687	30,085
Long-term debt obligations	11,673	15,817
Long-term portion of operating lease liability	3,509	5,034
Other long-term liabilities	445	410
Non-current liabilities held for sale	—	5,214
Total liabilities	48,314	56,560
Commitments and contingencies (Note 15)		
Stockholders' equity:		
Common stock, par value $0.001, 100,000,000 shares authorized, 33,855,725 and 32,724,512 shares issued, 32,116,270 and 31,024,537 shares outstanding at December 31, 2021 and 2020, respectively	34	33
Treasury stock at cost, 1,744,206 and 1,699,975 shares at December 31, 2021 and 2020, respectively	(5,248)	(4,789)
Additional paid-in capital	98,745	92,403
Accumulated deficit	(11,575)	(12,957)
Accumulated other comprehensive loss	(33)	(248)
Total stockholders' equity	81,923	74,442
Total liabilities and stockholders' equity	$ 130,237	$ 131,002

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

Luna Innovations Incorporated
Consolidated Statements of Operations
(in thousands, except share and per share data)

	Years ended December 31,	
	2021	2020
Revenue	$ 87,513	$ 59,115
Cost of revenue	35,957	23,235
Gross profit	51,556	35,880
Operating expense:		
Selling, general and administrative	43,956	28,353
Research, development and engineering	10,190	6,714
Total operating expense	54,146	35,067
Operating (loss)/income	(2,590)	813
Other income/(expense):		
Other income, net	—	50
Investment income	—	67
Interest expense, net	(479)	(25)
Total other (expense)/income	(479)	92
(Loss)/income from continuing operations before income taxes	(3,069)	905
Income tax benefit	1,980	455
Net (loss)/income from continuing operations	(1,089)	1,360
Income from discontinued operations, net of income tax expense of $584 and $339	2,471	1,931
Net income	$ 1,382	$ 3,291
Net (loss)/income per share from continuing operations:		
Basic	$ (0.03)	$ 0.04
Diluted	$ (0.03)	$ 0.04
Net income per share from discontinued operations:		
Basic	$ 0.08	$ 0.06
Diluted	$ 0.08	$ 0.06
Net income per share attributable to common stockholders:		
Basic	$ 0.04	$ 0.11
Diluted	$ 0.04	$ 0.10
Weighted average shares:		
Basic	31,658,085	30,669,874
Diluted	31,658,085	32,578,757

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

Luna Innovations Incorporated
Consolidated Statements of Comprehensive Income
(in thousands)

	Years ended December 31,	
	2021	**2020**
Net income	$ 1,382	$ 3,291
Other comprehensive income/(loss)	215	(248)
Total other comprehensive income	$ 1,597	$ 3,043

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

Luna Innovations Incorporated
Consolidated Statements of Changes in Stockholders' Equity
(in thousands, except share data)

	Common Stock		Treasury Stock		Additional Paid in Capital	Accumulated Deficit	Accumulated Other Comprehensive Loss	Total
	Shares	$	Shares	$	$	$		$
Balance, January 1, 2020, as previously reported	30,149,105	$ 32	1,639,791	$ (4,337)	$ 88,022	$ (16,248)	$ —	$ 67,469
Exercise of stock option	792,466	1	—	—	2,275	—	—	2,276
Stock-based compensation	83,935	—	—	—	2,134	—	—	2,134
Deferred compensation issuance	47,377	—	—	—	78	—	—	78
ESPP issuance	93,368	—	—	—	456	—	—	456
Forfeitures of restricted stock	(81,530)	—	—	—	(562)	—	—	(562)
Purchase of treasury stock	(60,184)	—	60,184	(452)	—	—	—	(452)
Net income	—	—	—	—	—	3,291	—	3,291
Foreign currency translation adjustment	—	—	—	—	—	—	(248)	(248)
Balance, December 31, 2020	31,024,537	$ 33	1,699,975	$ (4,789)	$ 92,403	$ (12,957)	$ (248)	$ 74,442
Exercise of stock option	818,267	1	—	—	2,256	—	—	2,257
Stock-based compensation	169,793	—	—	—	2,955	—	—	2,955
ESPP issuance	147,724	—	—	—	1,131	—	—	1,131
Purchase of treasury stock	(44,051)	—	44,051	(459)	—	—	—	(459)
Net income	—	—	—	—	—	1,382	—	1,382
Foreign currency translation adjustment	—	—	—	—	—	—	215	215
Balance, December 31, 2021	32,116,270	$ 34	1,744,026	$ (5,248)	$ 98,745	$ (11,575)	$ (33)	$ 81,923

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

Luna Innovations Incorporated
Consolidated Statements of Cash Flows
(in thousands, except share data)

	Years ended December 31,	
	2021	2020
Cash flows provided by operating activities:		
Net income	$ 1,382	$ 3,291
Adjustments to reconcile net income to net cash provided by operating activities:		
Depreciation and amortization	4,628	2,970
Stock-based compensation	2,955	2,134
Loss on sale and disposal of property and equipment	—	644
Loss from discontinued operations, net of tax	—	1,436
Deferred tax asset	(1,501)	(522)
Bad debt expense	393	127
Changes in operating assets and liabilities:		
Accounts receivable	(280)	(3,292)
Contract assets	(1,672)	(1,504)
Inventory	939	(1,550)
Prepaid expenses and other current assets	582	(2,203)
Other long-term assets	—	(3)
Accounts payable and accrued liabilities	(3,213)	1,143
Contract liabilities	186	(29)
Other long-term liabilities	84	214
Net cash provided by operating activities	4,483	2,856
Cash flows used in investing activities:		
Acquisitions, net of cash acquired	—	(34,102)
Acquisition of property and equipment	(1,412)	(681)
Proceeds from sale of property and equipment	—	403
Intangible property costs	(356)	(379)
Proceeds from sale of discontinued operations	—	600
Net cash used in investing activities	(1,768)	(34,159)
Cash flows (used in)/provided by financing activities:		
Proceeds from debt obligations	—	19,984
Payments on debt obligations	(4,144)	—
Payments on finance lease obligations	(48)	(53)
Purchase of common stock	(459)	(452)
Proceeds from ESPP	1,131	456
Proceeds from the exercise of options and warrants	2,256	1,714
Net cash (used in)/provided by financing activities	(1,264)	21,649
Net change in cash and cash equivalents	1,451	(9,654)
Effect of exchange rate changes on cash and cash equivalents	311	14
Cash and cash equivalents—beginning of period	15,366	25,006
Cash and cash equivalents—end of period	$ 17,128	$ 15,366
Supplemental disclosure of cash flow information		
Cash paid for interest	$ 458	$ 4
Net cash received/(paid) for income taxes	$ 113	$ (1,244)

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

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

1. Organization and Summary of Significant Accounting Policies

Luna Innovations Incorporated ("we," "our" or the "Company"), headquartered in Roanoke, Virginia, was incorporated in the Commonwealth of Virginia in 1990 and reincorporated in the State of Delaware in April 2003. We are a leader in advanced optical technology, providing high performance fiber optic test, measurement and control products for the telecommunications and photonics industries; and distributed fiber optic sensing solutions that measure, or "sense," the structures for industries ranging from aerospace, automotive, energy, oil and gas, security and infrastructure.

Consolidation Policy

Our consolidated financial statements are prepared in accordance with accounting principles generally accepted in the United States ("GAAP") and include our accounts and the accounts of our wholly-owned subsidiaries. We eliminate from our financial results all intercompany transactions. We reclassified $2,204 of previously separately reported acquisition related expenses in 2020 into selling, general, and administrative expense, to conform with current year presentation.

Use of Estimates

The preparation of our consolidated financial statements in accordance with GAAP requires us to make estimates and assumptions that affect the reported amounts of assets, liabilities, revenues and expenses and the disclosure of contingent assets and liabilities in our consolidated financial statements and accompanying notes.

Although these estimates are based on our knowledge of current events and actions we may undertake in the future, actual results may differ from such estimates and assumptions.

Revenue Recognition

Products and Services

Revenues from product sales are generated by the sale of commercial products and services under various sales programs to the end user and through distribution channels. We sell fiber optic test and sensing systems to end users for use in numerous fiber optic-based measurement applications. Revenues are recorded net of applicable sales taxes collected from customers and payable to state or local governmental entities.

We evaluate whether two or more contracts should be combined and accounted for as one single contract and whether the combined or single contract should be accounted for as more than one performance obligation. We recognize revenue when the performance obligation has been satisfied by transferring control of the product or service to the customer. For tangible products that contain software that is essential to the tangible product's functionality, we consider the product and software to be a single performance obligation. For contracts with multiple performance obligations, we allocate the contract's transaction price to each performance obligation based on their relative stand-alone selling prices. In such circumstances, we use the observable price of goods or services which are sold separately in similar circumstances to similar customers. If these prices are not observable, then we will estimate the stand-alone selling price using information that is reasonably available. For the majority of our standard products and services, price list and discount structures related to customer type are available. For products and services that do not have price list and discount structures, we use the residual approach. The residual approach decreases the total transaction price by the sum of the observable standalone selling prices if either the company sells the same good or services to different customers for a broad range of amounts or the company has not established a price for the good or service and that good or service has not been sold on a standalone basis. Shipping and handling activities primarily occur after a customer obtains control and are considered fulfillment costs rather than separate performance obligations.

For standard products, we recognize revenue at a point in time when control passes to the customer. Absent substantial product acceptance clauses, this is based on the shipping terms. In instances where acceptance of the product and installation services are specified by the customer, revenue is deferred until such required acceptance criteria have been met. For custom products that require engineering and development based on customer requirements, we will recognize revenue over time using the output method for any items shipped and any finished goods or work in process that is produced for balances of open sales orders. For extended warranties and product rentals, revenue is recognized over time using the output method based on the time elapsed for the warranty or service period. In the case of warranties, we record a contract liability for amounts billed but that are not recognized until subsequent periods. A separate contract liability is recorded for the cost associated with warranty repairs based on our estimate of future expenses. For testing services where we are performing testing on an asset the customer controls, revenue is recognized over time by the output method using the performance to date. For training where the customer

is receiving the benefit of training as it is occurring and for repairs to a customer-controlled asset, revenue is recognized over time by the output method using the performance to date.

In some product rental contracts, a customer may be offered a discount on the purchase of an item that would provide for a material right. When a material right has been provided to a customer, a separate performance obligation is established, and a portion of the rental revenue will be deferred until the future product is purchased or the option expires. This deferred revenue is recognized as a contract liability on the balance sheet.

Research and Development Contracts

We perform research and development for U.S. Federal government agencies, educational institutions and commercial organizations. We account for a research contract when a contract has been executed, the rights of the parties are identified, payment terms are identified, the contract has commercial substance, and collectability of the contract price is considered probable. Revenue is earned under cost reimbursable, time and materials and fixed price contracts. Direct contract costs are expensed as incurred.

Our contracts with agencies of the U.S. government are subject to periodic funding by the respective contracting agency. Funding for a contract may be provided in full at inception of the contract or ratably throughout the contract as the services are provided. In evaluating the probability of funding for purposes of assessing collectability of the contract price, we consider our previous experience with our customers, communication with our customers regarding funding status and our knowledge of available funding for the contract or program. If funding is not assessed as probable, revenue recognition is deferred until realization is reasonably assured.

Under the typical payment terms of our U.S. government contracts, the customer pays us either performance-based payments ("PBPs") or progress payments. PBPs, which are typically used in firm fixed price contracts, are interim payments based on quantifiable measures of performance or on the achievement of specified events or milestones. Progress payments, which are typically used in our cost type contracts, are interim payments based on costs incurred as the work progresses. For our U.S. government cost-type contracts, the customer generally pays us during the performance period for 80% to 90% of our actual costs incurred. Because the customer retains a small portion of the contract price until completion of the contract and audit of allowable costs, cost type contracts generally result in revenue recognized in excess of billings which we present as contract assets on the balance sheet. Amounts billed and due from our customers are classified as receivables on the balance sheet. For non-U.S. government contracts, we typically receive interim payments as work progresses, although for some contracts, we may be entitled to receive an advance payment. We recognize a liability for these advance payments and PBPs paid in advance which are in excess of the revenue recognized and present these amounts as contract liabilities on the balance sheet.

To determine the proper revenue recognition method for research and development contracts, we evaluate whether two or more contracts should be combined and accounted for as one single modified contract and whether the combined or single contract should be accounted for as more than one performance obligation. For instances where a contract has options that were bid with the initial contract and awarded at a later date, we combine the options with the original contract when options are awarded. For most of our contracts, the customer contracts for research with multiple milestones that are interdependent. Consequently, the entire contract is accounted for as one performance obligation. The effect of the combined or modified contract on the transaction price and measure of progress for the performance obligation to which it relates, is recognized as an adjustment to revenue (either as an increase in or a reduction of revenue) on a cumulative catch-up basis.

Contract revenue recognition is measured over time as we perform because of continuous transfer of control to the customer. For U.S. government contracts which are typically subject to the Federal Acquisition Regulation, this continuous transfer of control to the customer is supported by clauses in the contract that allow the customer to unilaterally terminate the contract for convenience, pay us for cost incurred plus a reasonable profit and take control of any work in process. From time to time, as part of normal management processes, facts may change, causing revisions to estimated total costs or revenues expected. The cumulative impact of any revisions to estimates and the full impact of anticipated losses on any type of contract are recognized in the period in which they become known.

Because of control transferring over time, revenue is recognized based on the extent of progress towards completion of the performance obligation. The selection of the method to measure progress towards completion requires judgment and is based on the nature of the services to be provided. We generally use the input method, more specifically the cost-to-cost measure of progress for our contracts because it best depicts the transfer of control to the customer, which occurs as we incur costs on our contracts. Under the cost-to-cost measure of progress, the extent of progress towards completion is measured based on the ratio

of costs incurred to date to the total estimated costs at completion of the performance obligation. The underlying bases for estimating our contract research revenues are measurable expenses, such as labor, subcontractor costs and materials, and data that are updated on a regular basis for purposes of preparing our cost estimates. Our research contracts generally have a period of performance of six months to three years, and our estimates of contract costs have historically been consistent with actual results. Revisions in these estimates between accounting periods to reflect changing facts and circumstances have not had a material impact on our operating results, and we do not expect future changes in these estimates to be material. The cumulative impact of any revisions to estimates and the full impact of anticipated losses on any type of contract are recognized in the period in which they become known.

Under cost reimbursable contracts, we are reimbursed for costs that are determined to be reasonable, allowable and allocable to the contract and paid a fixed fee representing the profit negotiated between us and the contracting agency. Revenue from cost reimbursable contracts is recognized as costs are incurred plus an estimate of applicable fees earned. We consider fixed fees under cost reimbursable contracts to be earned in proportion to the allowable costs incurred in performance of the contract. Revenue from time and materials contracts is recognized based on direct labor hours expended at contract billing rates plus other billable direct costs. Fixed price contracts may include either a product delivery or specific service performance throughout a period. For fixed price contracts that are based on the proportional performance method and involve a specified number of deliverables, we recognize revenue based on the proportion of the cost of the deliverables compared to the cost of all deliverables included in the contract as this method more accurately measures performance under these arrangements. For fixed price contracts that provide for the development and delivery of a specific prototype or product, revenue is recognized based upon the percentage of completion method.

Whether certain costs under government contracts are allowable is subject to audit by the government. Certain indirect costs are charged to contracts using provisional or estimated indirect rates, which are subject to later revision based on government audits of those costs. Management is of the opinion that costs subsequently disallowed, if any, would not likely have a significant impact on revenues recognized for those contracts.

Allowance for Uncollectible Receivables

Accounts receivable are recorded at their face amount, less an allowance for doubtful accounts. We review the status of our uncollected receivables on a regular basis. In determining the need for an allowance for uncollectible receivables, we consider our customers' financial stability, past payment history and other factors that bare on the ultimate collection of such amounts. The allowance was $0.9 million at each of December 31, 2021 and 2020.

Cash and Cash Equivalents

We consider all highly liquid investments with maturities of three months or less when purchased to be cash equivalents. To date, we have not incurred losses related to cash and cash equivalents. Our foreign currency risk on cash and cash equivalents held outside of the US is not material. Cash equivalents at December 31, 2021 and 2020 included $1.0 million and $3.1 million, respectively, invested in U.S. Treasury obligations through a sweep account with our bank. The full value of amounts invested through the sweep account are convertible to cash on a daily basis. Our cash transactions are processed through reputable commercial banks. We regularly maintain cash balances with financial institutions which exceed Federal Deposit Insurance Corporation ("FDIC") insurance limits. At December 31, 2021 and 2020, we had approximately $9.5 million and $7.5 million, respectively, in excess of FDIC insured limits.

Fair Value Measurements

Our financial assets and liabilities are measured at fair value, which is defined as the price that would be received to sell an asset, or paid to transfer a liability, in an orderly transaction between market participants. Valuation techniques are based on observable or unobservable inputs. Observable inputs reflect market data obtained from independent sources, while unobservable inputs reflect our market assumptions. These two types of inputs have created the following fair value hierarchy:

- Level 1—Quoted prices for identical instruments in active markets.
- Level 2—Quoted prices for similar instruments in active markets; quoted prices for identical or similar instruments in markets that are not active; and model-derived valuations in which significant value drivers are observable.
- Level 3—Valuations derived from valuation techniques in which significant value drivers are unobservable.

The carrying values of cash and cash equivalents, accounts receivable, accounts payable and accrued liabilities approximate fair value because of the short-term nature of these instruments. The carrying amount of lease liabilities approximate fair value because these financial instruments bear interest at rates that approximate current market rates for

similar agreements with similar maturities and credit. We consider the terms of the PNC Bank, National Association debt facility, including its interest rate of LIBOR plus a margin ranging from 1.75% to 2.25%, to be at market based upon similar instruments that would be available to us.

Property and Equipment, net

Property and equipment, net, are stated at cost less accumulated depreciation. We record depreciation using the straight-line method over the following estimated useful lives:

Equipment	3 – 7 years
Furniture and fixtures	7 years
Software	3 years
Leasehold improvements	Lesser of lease term or life of improvements

Intangible Assets, net

Intangible assets consist of patents related to certain intellectual property that we have developed or acquired, and identifiable intangible assets recognized in connection with our acquisition of OptaSense Holdings Ltd. ("OptaSense") in December 2020 and other companies prior to 2020. We amortize our identified intangible assets over their estimated useful lives ranging between one and fifteen years and analyze the reasonableness of the remaining useful life whenever events or circumstances indicate that the carrying amount may not be recoverable to determine whether their carrying value has been impaired.

Goodwill

Goodwill is tested annually for impairment as of the first day of our fourth quarter (October 1st) and whenever events or changes in circumstances indicate the carrying value of goodwill may not be recoverable. Goodwill is tested for impairment at the reporting unit level. As of December 31, 2021, we had two reporting units, Luna and OptaSense, both of which contained goodwill. When changes occur in the composition of one or more reporting units, goodwill is reassigned to the reporting units affected based on their relative fair value. Our goodwill impairment evaluation consisted of a qualitative assessment. A qualitative assessment can be performed to determine whether it is more likely than not the fair value of the reporting unit is less than its carrying value. If the reporting unit does not pass the qualitative assessment, we compare the fair value of each reporting unit to its carrying value using a quantitative assessment. If the fair value of the reporting unit exceeds its carrying value, goodwill is considered not impaired. If the fair value of the reporting unit is less than the carrying value, the difference is recorded as an impairment loss.

For the quantitative assessment, the fair value of each reporting unit is estimated using a combination of an income approach using a discounted cash flow ("DCF") analysis and a market-based valuation approach based on comparable public company trading values. Determining the fair value of a reporting unit requires the exercise of significant management judgment, including the amount and timing of projected future revenues, earnings and cash flows after considering factors such as recent operating performance, general market and industry conditions, existing and expected future contracts, changes in working capital and long-term business plans and growth initiatives. The carrying value of each reporting unit includes the assets and liabilities employed in its operations and goodwill. There are no significant allocations of amounts held at the corporate level to the reporting units. We have not recorded any goodwill impairment for the years ended December 31, 2021 and 2020.

Research, Development and Engineering

Research, development and engineering expense not related to contract performance is expensed as incurred. We expensed $10.2 million and $6.7 million of non-contract related research, development and engineering expense for the years ended December 31, 2021 and 2020, respectively.

Impairment of Long-Lived Assets

We review our long-lived assets for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable. Recoverability of assets is measured by comparing the carrying amount of an asset to future undiscounted net cash flows expected to be generated by the asset. If such assets are considered to be impaired, the impairment to be recognized is measured by the amount by which the carrying amount of the assets exceeds their fair value. Assets to be disposed of by sale are reflected at the lower of their carrying amount or fair value less cost to sell.

Inventory

Inventory consists of finished goods, work in process and raw materials valued at the lower of cost (determined on the first-in, first-out basis) or net realizable value.

Net Income per Share

Basic per share data is computed by dividing net income attributable to common stockholders by the weighted average number of shares outstanding during the period. Diluted per share data is computed by dividing net income attributable to common stockholders by the weighted average shares outstanding during the period increased to include, if dilutive, the number of additional common share equivalents that would have been outstanding if potential common shares had been issued using the treasury stock method. Diluted per share data would also include the potential common share equivalents relating to convertible securities by application of the if-converted method.

The effect of 1.9 million common stock equivalents are included for the diluted per share data for the year ended December 31, 2020. Accrued stock dividends and stock options are included in our common stock equivalents for the years ended December 31, 2021 and 2020.

Stock-Based Compensation

We have two stock-based compensation plans, which are described further in Note 12. We recognize compensation expense based upon the fair value of the underlying equity award as of the date of grant. We have elected to use the Black-Scholes option pricing model to value any stock options granted. Restricted stock and restricted stock units awarded are valued at the closing price of our common stock on the date of the award. We recognize stock-based compensation for such awards on a straight-line basis over the requisite service period of the awards taking into account the effects of the expected exercise. We reduce stock-based compensation expense for the value of any forfeitures of unvested awards as such forfeitures occur.

Income Taxes

We account for income taxes using the liability method. Deferred tax assets or liabilities are determined based on the difference between the financial statement and tax basis of assets and liabilities as measured by the enacted tax rates, which will be in effect when the differences reverse. A valuation allowance against net deferred tax assets is provided unless we conclude it is more likely than not that the deferred tax assets will be realized.

We recognize deferred tax assets and liabilities for the expected future tax consequences of temporary differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases. Deferred tax assets and liabilities are measured using enacted tax rates in effect for the year in which those temporary differences are expected to be recovered or settled. We evaluate our ability to benefit from all deferred tax assets and establish valuation allowances for amounts we believe are not more-likely-than-not to be realizable. For uncertain tax positions, we use a more-likely-than-not threshold, greater than 50%, based on the technical merits of the income tax position taken. Income tax positions that meet the more-likely-than-not recognition threshold are measured in order to determine the tax benefit recognized in the financial statements. Penalties, if probable and reasonably estimable, and interest expense related to uncertain tax positions are recognized as a component of the tax provision.

Foreign Currency

For our non-U.S. dollar functional currency subsidiaries, assets and liabilities are translated into U.S. dollars using fiscal year end exchange rates. Sales and expenses are translated at average monthly exchange rates. Foreign currency translation gains and losses are included as a component of accumulated other comprehensive loss within equity. Gains and losses resulting from foreign currency transactions are included in earnings.

Recently Adopted Accounting Pronouncements

In December 2019, the FASB issued ASU 2019-12 *Simplifying the Accounting for Income Taxes*, which removes certain exceptions to the general principles of the accounting for income taxes and also improves consistent application of and simplification of other areas when accounting for income taxes. The guidance was effective for us beginning in the first quarter of fiscal year 2021. We adopted ASU 2019-12, effective January 1, 2021. The adoption of ASU 2019-12 did not have a significant impact on our consolidated financial statements.

Recently Issued Pronouncements not yet adopted

In June 2016, the FASB issued ASU 2016-13 *Financial Instruments - Credit Losses (Topic 326) - Measurement of Credit Losses on Financial Instruments*, which requires companies to measure financial assets at an amortized cost basis to be presented at the net amount expected to be collected. The new accounting rules eliminate the probable initial recognition threshold and, instead, reflect an entity's current estimate of all expected credit losses. ASU 2016-13 is applicable to our trade receivables. This pronouncement was amended under ASU 2019-10 to allow an extension on the adoption date for entities that qualify as a small reporting company. We have elected this extension and the effective date for us to adopt this standard will be for fiscal years beginning after December 15, 2022. We are currently in the process of evaluating the impact of ASU 2016-13, but we do not expect the adoption of these new accounting rules to have a significant impact on our consolidated financial statements.

2. Discontinued Operations

We actively marketed our Luna Labs segment to prospective buyers during 2021 as part of our growth strategy for our Lightwave segment. After advancing those marketing efforts during our third quarter of 2021, we previously determined that our Luna Labs segment met held-for-sale and discontinued operations accounting criteria as of September 30, 2021. Accordingly, we have separately reported the results of our Luna Labs segment as discontinued operations in our consolidated statements of operations for the years ended December 31, 2021 and 2020, and presented the related assets and liabilities as held for sale in the consolidated balance sheets as of December 31, 2021 and 2020. These changes have been applied to all periods presented. We completed the sale of substantially all of our equity interests in Luna Labs in March 2022, as described in Note 19, Subsequent Events.

The operating results of the discontinued operations only reflect revenues and expenses that are directly attributable to the Luna Labs segment that will be eliminated from continuing operations. Previously reported expenses for the Luna Labs segment have been restated to exclude certain allocated expenses that are not directly attributable to the Luna Labs segment. The key components from discontinued operations related to the Luna Labs segment are as follows *(in thousands)*:

	Years ended December 31,	
	2021	**2020**
Revenues	$ 23,722	$ 23,566
Cost of revenues	19,009	17,259
Gross profit	4,713	6,307
Selling, general and administrative expenses	1,634	1,493
Research, development & engineering expenses	24	—
Loss on sale and disposal of property and equipment	—	644
Operating income	3,055	4,170
Income tax expense	584	803
Net income from discontinued operations, net of tax	$ 2,471	$ 3,367

During the year ended December 31, 2020, we recognized a loss from discontinued operations of $1.4 million, net of income tax benefit of $0.5 million, related to a previous sales transaction.

Assets and liabilities of discontinued operations classified as held for sale in the consolidated balance sheets as of December 31, 2021 and 2020 consist of the following *(in thousands)*:

	December 31, 2021	December 31, 2020
Accounts receivable, net	$ 2,967	$ 3,023
Inventory, net	282	535
Contract assets	4,051	3,291
Prepaid expenses and other current assets	132	76
Property and equipment, net [(1)]	330	391
Intangible assets, net [(1)]	165	115
Operating lease ROU asset [(1)]	4,884	5,297
Other assets [(1)]	141	271
Assets held for sale	$ 12,952	$ 12,999
Accounts payable	1,042	1,542
Accrued liabilities	821	883
Contract liabilities	2,626	948
Current portion of operating lease ROU liability	388	346
Long-term portion of operating lease ROU liability [(1)]	4,826	5,214
Liabilities associated with assets held for sale	$ 9,703	$ 8,933

[(1)] The classification of these line items remains long-term as of December 31, 2020. Accordingly, these lines are included within the respective non-current asset or liability held for sale line in the consolidated balance sheet as of December 31, 2020.

The cash flows related to discontinued operations have not been segregated and are included in the consolidated statements of cash flows. The following table presents cash flow and non-cash information related to discontinued operations for the years ended December 31, 2021 and 2020 *(in thousands)*:

	Years ended December 31,	
	2021	2020
Depreciation and amortization	$ 112	$ 198
Share-based compensation	129	47

3. Business Acquisitions

OptaSense Holdings Limited

On December 3, 2020, we entered into and closed a Share Purchase Agreement (the “Share Purchase Agreement”) with QinetiQ Holdings Limited (“QinetiQ”) for the purchase of all of the shares of OptaSense, a recognized market leader in fiber optic distributed monitoring solutions for pipelines, oilfield services, security, highways and railways, as well as power and utilities monitoring systems. Pursuant to the Share Purchase Agreement, we acquired all outstanding shares of OptaSense for aggregate consideration of $38.9 million (£29.0 million) subject to adjustment as described in the Share Purchase Agreement (the “Transaction”). The acquisition of OptaSense provides us with important distributed acoustic sensing ("DAS") intellectual property and products. OptaSense's technology and products and geographic footprint are highly complementary to Luna, which we believe will accelerate our technology and overall growth roadmap.

The Share Purchase Agreement and a Tax Deed entered into between QinetiQ and us (the “Tax Deed”) in connection with the Share Purchase Agreement contain customary representations and warranties and indemnities. In addition, at closing of the acquisition, we obtained a warranty and indemnity insurance policy from Liberty Mutual Insurance Europe SE (LMIE) in connection with the Share Purchase Agreement and the Tax Deed.

For the period from the closing of the OptaSense acquisition through December 31, 2020, we recognized revenue of $1.5 million and an operating loss of $0.9 million. OptaSense's operating loss for the period from the closing of the acquisition

through December 31, 2020 included $0.1 million in amortization expense for the acquired intangibles and step-up in value of acquired inventory. The amortization expense for the acquired intangibles is included selling, general and administrative expense in our consolidated statements of operations.

New Ridge Technologies

On October 29, 2020, we acquired New Ridge Technologies ("NRT"), a small company that develops and manufactures fiber optic test and measurement equipment and advanced fiber optic subsystems primarily for telecommunication and radio-over-fiber applications. NRT's acquired operations will be integrated into, and reported as a part of, our Lightwave segment. This acquisition supports our growth strategy in the communications test arena. The total consideration was $0.6 million, which consisted of $0.4 million paid at closing and $0.2 million of contingent consideration related to an earn-out provision. We recorded $0.02 million of goodwill upon the completion of the purchase consideration allocation. Depending on the achievement of certain metrics during the two years following closing, we may pay the seller up to $0.1 million in contingent consideration related to the earn-out provision.

These acquisitions have been accounted for under the acquisition method of accounting in accordance with ASC 805 - *Business Combinations*. Under ASC 805, the total estimated purchase consideration is allocated to the acquired tangible and intangible assets and assumed liabilities based on their estimated fair values as of the acquisition date. Any excess of the fair value of the acquisition consideration over the identifiable assets acquired and liabilities assumed is recognized as goodwill.

The following table summarizes the allocation of the purchase consideration for the acquisition of OptaSense (excluding cash of $5.2 million):

	(in thousands)
Accounts receivable	$ 4,534
Contract assets	1,513
Inventory	12,793
Other current assets	1,026
Property and equipment	1,247
Identifiable intangible assets	11,263
Goodwill	8,520
Right of use asset	2,151
Other long-term assets	22
Accounts payable and accrued expenses	(3,925)
Contract liabilities	(3,259)
Other current liabilities	(862)
Long-term operating lease liability	(1,335)
Total purchase consideration	$ 33,688

During the second quarter of 2021, we obtained new information about facts and circumstances related to the acquisition of OptaSense that existed as of the acquisition date that resulted in a change in the fair value of assets and liabilities recognized. Accordingly, the fair values of assets and liabilities have been revised as of the acquisition date, resulting in an increase in goodwill of $0.9 million, which was primarily related to an adjustment of accounts receivable. During the third quarter of 2021, we completed the purchase accounting for OptaSense with no additional measurement period adjustments.

The identifiable intangible assets and their estimated useful lives were as follows:

	Estimated Useful Life	*(in thousands)*
Developed technology	10 years	$ 7,379
Trade names and trademarks	15 years	2,580
Backlog	3 years	699
Customer relationships	5 years	605
		$ 11,263

OptaSense's developed technology primarily consists of its DAS product solutions that deliver superior measurements for a wide range of applications from advanced industrial monitoring through high performance geophysical measurements. The developed technologies were valued using the "multi-period excess earnings" method, under the income approach. The multi-period excess earnings method reflects the present value of the projected cash flows that are expected by the developed technologies less charges representing the contribution of other assets to those cash flows. A discount rate of 17.5% was used to discount the cash flows to the present value.

Trade names and trademarks are considered a type of guarantee of a certain level of recognizability, quality or performance represented by the OptaSense brand. Trade names and trademarks were valued using the "relief from royalty" method under the income approach. This method is based on the assumption that in lieu of ownership, a market participant would be willing to pay a royalty in order to exploit the related benefits of these assets. A discount rates of 17.5% was used to discount the cash flows to the present value.

Backlog arises from unfulfilled purchase or sales order contracts. The value of OptaSense's backlog as of the acquisition date was calculated using the income approach. A discount rate of 16.5% was used to discount the cash flows attributable solely to the backlog to the present value.

Customer relationships represent the fair value of either (i) the avoidance of cost associated with the creation of a new customer relationship or (ii) the projected cash flows that will be derived from the sale of products to existing customers as of the acquisition date. OptaSense's customer relationships were valued using the cost approach based on the expected time to re-build the customer base. A discount rate of 17.5% was used to discount the cash flows to the present value.

Goodwill represents the excess of consideration transferred over the net of the acquisition date fair values of the assets acquired and the liabilities assumed in connection with the acquisition. Goodwill generated from our business acquisitions was primarily attributable to expected synergies from future customer and sales growth.

Pro forma consolidated results of operations

The following unaudited pro forma financial information presents combined results of operations for each of the periods presented as if the acquisition of OptaSense had been completed on January 1, 2019. The pro forma information includes adjustments to depreciation expense for property and equipment acquired and amortization expense for the intangible assets acquired and the elimination of transaction expenses recognized in each period. Transaction-related expenses associated with the acquisition of OptaSense and excluded from pro forma income from continuing operations were $2.2 million for the year ended December 31, 2020.

The pro forma data are for informational purposes only and are not necessarily indicative of the consolidated results of operations or the combined business had the acquisitions of OptaSense occurred on January 1, 2019, or the results of future operations of the combined business. For instance, planned or expected operational synergies following the acquisition are not reflected in the pro forma information. Consequently, actual results will differ from the unaudited pro forma information presented below.

	For the year ended December 31, 2020
(in thousands)	*(unaudited)*
Revenue	$ 103,971
Income from continuing operations	$ 1,364

4. Accounts Receivable, net

Accounts receivable, net, consists of the following:

	December 31,	
(in thousands)	**2021**	**2020**
Billed	$ 21,790	$ 22,395
Other	48	419
	21,838	22,814
Less: allowance for doubtful accounts	(925)	(886)
Accounts receivable, net	$ 20,913	$ 21,928

5. Inventory

Inventory consists of finished goods, work-in-process and raw materials valued at the lower of cost (determined on the first-in, first-out basis) or net realizable value.

Components of inventory are as follows:

	December 31,	
(in thousands)	**2021**	**2020**
Finished goods	$ 10,087	$ 11,
Work-in-process	2,318	1,
Raw materials	10,088	10,
Inventory	$ 22,493	$ 23,

6. Property and Equipment, net

Property and equipment, net, consists of the following:

	December 31,	
(in thousands)	**2021**	**2020**
Building	$ 226	$ —
Equipment	10,255	4,141
Furniture and fixtures	1,316	345
Software	72	106
Leasehold improvements	2,292	2,088
Construction in process	646	185
	14,807	6,865
Less—accumulated depreciation	(11,819)	(3,948)
Property and equipment, net	$ 2,988	$ 2,917

Depreciation for the years ended December 31, 2021 and 2020 was approximately $1.4 million and $1.0 million, respectively, and is included primarily in selling, general and administrative expense in our consolidated statements of operations.

7. Intangible Assets, net

Intangible assets, net consist of the following:

(in thousands)	Estimated Life	December 31, 2021	December 31, 2020
Patent costs	1 - 18 years	$ 9,230	$ 3,595
Developed technology	5 - 10 years	14,440	17,344
In-process research and development	N/A	2,732	1,580
Customer base	5 - 7 years	700	1,302
Trade names	3 - 15 years	550	3,122
Backlog	3 years	—	696
		27,652	27,639
Accumulated amortization		(10,475)	(7,645)
Intangible assets, net		$ 17,177	$ 19,994

Amortization for the years ended December 31, 2021 and 2020 was approximately $3.1 million and $1.7 million, respectively, and is included primarily in selling, general and administrative expense in our consolidated statements of operations.

Estimated aggregate amortization, based on the net value of intangible assets at December 31, 2021, for each of the next five years and beyond is as follows:

(in thousands)	
Year Ending December 31,	
2022	$ 2,896
2023	2,807
2024	2,403
2025	2,087
2026	1,756
2027 and beyond	5,228
	$ 17,177

We did not recognize any intangible asset impairment charges during the years ended December 31, 2021 or 2020.

8. Goodwill

The change in the carrying value of goodwill during the years ended December 31, 2021 and December 31, 2020 were as follows:

(in thousands)	
Balance as of December 31, 2019	$ 10,542
Goodwill resulting from business acquisition	7,637
Measurement period adjustment	(58)
Balance as of December 31, 2020	18,121
Measurement period adjustment	929
Foreign currency translation	(66)
Balance as of December 31, 2021	$ 18,984

After completing a qualitative assessment of our goodwill during the fourth quarter of 2021, we concluded the carrying value of goodwill was not impaired as of December 31, 2021.

9. Accrued Liabilities

Accrued liabilities consist of the following:

	December 31,	
(in thousands)	**2021**	**2020**
Accrued compensation	$ 6,798	$ 8,221
Contingent consideration	225	225
Accrued professional fees	503	825
Accrued income tax	328	281
Current portion of finance lease liability	48	48
Accrued interest	17	42
Accrued royalties	—	456
Accrued liabilities-other	1,339	1,227
Total accrued liabilities	$ 9,258	$ 11,325

10. Debt

Long-term debt consists of the following:

	Years ended December 31,	
(in thousands)	**2021**	**2020**
Term Loan (net of debt issuance costs of $44, 2.43% at December 31, 2021)	$ 8,290	$ 12,434
Revolving Loan (2.43% at December 31, 2021)	7,550	7,550
	15,840	19,984
Less: Current portion of long-term debt obligations	(4,167)	(4,167)
Long-term debt obligations	$ 11,673	$ 15,817

PNC Bank Facility

On December 1, 2020 (the "Effective Date"), we entered into a Loan Agreement (the "Loan Agreement") with PNC Bank, National Association, as lender (the "Lender") and our domestic subsidiaries as guarantors. The Loan Agreement provides a $12.5 million term loan facility (the "Term Loan") and a $15.0 million revolving credit facility (the "Revolving Line"), which includes a $3.0 million letter of credit sublimit. On the Effective Date, we borrowed the full amount of the Term Loan from the Lender pursuant to a term note (the "Term Note") and a $7.6 million revolving loan (the "Revolving Loan") pursuant to a revolving line of credit note (the "Revolving Line of Credit Note"). We may repay and reborrow advances under the Revolving Line from time to time pursuant to the Revolving Line of Credit Note.

The Term Loan matures on December 1, 2023. The Term Loan is due and payable in 12 equal quarterly payments of principal and interest. The Term Loan bears interest at a floating per annum rate equal to the sum of (a) LIBOR plus (b) a margin ranging from 1.75% to 2.25% depending on the Net Leverage Ratio (as defined in the Loan Agreement). We may prepay the Term Loan without penalty or premium.

The Revolving Line expires on December 1, 2023. Borrowings under the Revolving Line will bear interest at a floating per annum rate equal to the sum of (a) LIBOR plus (b) a margin ranging from 1.75% to 2.25% depending on the Net Leverage Ratio. Accrued interest will be due and payable on the first day of each month and the outstanding principal balance and any accrued but unpaid interest will be due and payable on December 1, 2023. The unused portion of the Revolving Line will accrue a fee equal to 0.20% per annum multiplied by the quarterly average unused amount.

Provided our obligations under the Loan Agreement have been satisfied, we may terminate the Loan Agreement at any time upon three business days' advance written notice to the Lender.

The Loan Agreement includes a number of affirmative and restrictive covenants applicable to us and our subsidiaries, including, among others, financial covenants regarding minimum net leverage and fixed charge coverage, affirmative covenants regarding delivery of financial statements, payment of taxes, and maintenance of government compliance, and restrictive covenants regarding dispositions of property, acquisitions, incurrence of additional indebtedness or liens, investments and transactions with affiliates. We are also restricted from paying dividends or making other distributions or payments on our capital stock, subject to limited exceptions. We were in compliance with these covenants as of December 31, 2021.

Upon the occurrence of certain events, including failure to satisfy our payment obligations under the Loan Agreement, failure to adhere to the financial covenants, the breach of certain of our other covenants under the Loan Agreement, cross defaults to other indebtedness or material agreements, judgment defaults and defaults related to failure to maintain governmental approvals, the Lender will have the right, among other remedies, to declare all principal and interest immediately due and payable, and to exercise secured party remedies.

Former Debt Arrangements

On December 1, 2020, we terminated our former loan agreement with Silicon Valley Bank. As of the time of termination, there were no amounts outstanding under the loan agreement.

On April 28, 2020, we were granted a loan (the "Loan") from SVB in the aggregate amount of $4.5 million, pursuant to the Paycheck Protection Program under Division A, Title I of the CARES Act, which was enacted March 27, 2020.

On May 4, 2020, we returned the full amount of the proceeds of the Loan to SVB. The decision to return the proceeds was based on the revised guidance issued by the U.S. Department of Treasury and the Small Business Administration subsequent to our application for the Loan.

Maturities on debt are as follows (*in thousands)*:

Year Ending December 31,	**Amount**
2022	$ 4,167
2023	11,673
Total	$ 15,840

Interest expense, net for the years ended December 31, 2021 and 2020 consisted of the following:

	Years ended December 31,	
(in thousands)	**2021**	**2020**
Interest expense on Term Loans	$ 247	$ 26
Interest expense on Revolving Line of Credit	164	16
Amortization of debt issuance costs	44	2
Other interest expense	27	5
Interest income	(3)	(24)
Total interest expense, net	$ 479	$ 25

11. Leases

We have operating leases for our facilities, which have remaining terms ranging from 1 to 5 years. Our leases do not have an option to extend the lease period beyond the stated term unless the new term is agreed by both parties. They also do not have an early termination clause included. Our operating lease agreements do not contain any material restrictive covenants. Some of our operating lease agreements contain variable payment provisions that provide for rental increases based on consumer price indices. The change in rent expense resulting from changes in these indices are included within variable rent.

We also have finance leases for equipment which have remaining terms ranging from 1 to 4 years. These lease agreements are for general office equipment with a 5-year useful life. These lease agreements do not have an option to extend the lease beyond the stated terms nor do they have an early termination clause. These lease agreements do not have any

variable payment provisions included. The finance lease costs consist of interest expense and amortization, and are included primarily in selling, general and administrative expense in our consolidated statement of operations.

The discount rate for both our operating and finance leases was not readily determinable in the specific lease agreements. As a result, our incremental borrowing rate was used as the discount rate when establishing the ROU assets and corresponding lease liabilities. As of December 31, 2021, we had no operating or finance leases that have not yet commenced.

Rent expense is recognized on a straight-line basis over the life of the lease. Rent expense consists of the following:

	Year Ended	
(in thousands)	**December 31, 2021**	**December 31, 2020**
Operating lease costs	$ 2,303	$ 1,647
Variable rent costs	(188)	133
Total rent expense	$ 2,115	$ 1,780

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

(in thousands)		
Year Ending December 31,	**Operating Leases**	**Finance Leases**
2022	$ 2,270	$ 53
2023	1,785	53
2024	1,293	53
2025	609	48
2026	104	—
2027 and beyond	—	—
Total future minimum lease payments	6,061	207
Less: Interest	451	11
Total lease liabilities	$ 5,610	$ 196
Current lease liability	$ 2,101	$ 48
Long-term lease liability	3,509	148
Total lease liabilities	$ 5,610	$ 196

Other information related to leases is as follows:

	Year Ended	
(in thousands, except weighted-average data)	**December 31, 2021**	**December 31, 2020**
Finance lease cost:		
Amortization of right-of-use assets	$ 48	$ 46
Interest on lease liabilities	4	5
Total finance lease cost	$ 52	$ 51
Other information:		
Cash paid for amounts included in the measurement of lease liabilities:		
Operating cash flows from operating leases	$ 2,115	$ 1,647
Finance cash flows from finance leases	$ 48	$ 53
Right-of-use assets obtained in exchange for new operating lease liabilities	$ 865	$ 10,740
Right-of-use assets obtained in exchange for new finance lease liabilities	$ —	$ 247
Weighted-average remaining lease term (years) - operating leases	8	6.3
Weighted-average remaining lease term (years) - finance leases	3.9	4.9
Weighted-average discount rate - operating leases	9 %	5 %
Weighted-average discount rate - finance leases	3 %	2 %

12. Stockholders' Equity

Equity Incentive Plans

In April 2016, we adopted our 2016 Equity Incentive Plan (the "2016 Plan") as a successor to the 2006 Plan. Under the 2016 Plan, our Board of Directors is authorized to grant both incentive and non-statutory stock options to purchase common stock and restricted stock awards to our employees, directors, and consultants. The 2016 Plan provides for the issuance of 3,500,000 shares plus any amounts forfeited from grants under the 2006 Plan after the expiration date of the 2006 Plan. Options generally have a life of 10 years and exercise price equal to or greater than the fair market value of the Common Stock as determined by the Board of Directors. Vesting typically occurs over a four-year period.

The following table sets forth the activity of the options to purchase common stock under the 2006 Plan and the 2016 Plan. The prices represent the closing price of our Common Stock on the Nasdaq Capital Market on the respective dates.

	Options Outstanding				Options Exercisable		
(in thousands, except share, per share and weighted-average data)	Number of Shares	Price per Share Range	Weighted Average Exercise Price	Aggregate Intrinsic Value (1)	Number of Shares	Weighted Average Exercise Price	Aggregate Intrinsic Value (1)
Balance at January 1, 2019	3,160,397	$1.18 - 7.37	$ 2.72	$ 14,460	1,835,799	$ 2.28	$ 9,198
Forfeited	(108,515)	$1.27 - 7.59	3.66				
Exercised	(792,466)	$1.21 - 4.43	2.80				
Granted	70,000	$6.27 - 7.59	6.65				
Balance at December 31, 2020	2,329,416	$1.18 - 7.59	$ 2.76	$ 16,574	1,408,119	$ 2.26	$ 10,734
Forfeited	(58,860)	$3.37 - $11.40	5.91				
Exercised	(818,267)	$1.18 - $7.59	2.73				
Granted	80,735	$11.00 - $11.94	9.13				
Balance at December 31, 2021	1,533,024	$1.18 - 11.40	$ 3.00	$ 8,439	1,050,177	$ 2.45	$ 6,314

(1) The intrinsic value of an option represents the amount by which the market value of the stock exceeds the exercise price of the option of in-the-money options only.

The fair value of each option granted is estimated as of the grant date using the Black-Scholes option pricing model with the following assumptions:

	Years ended December 31,	
	2021	2020
Risk-free interest rate range	0.975%	0.685%
Expected life of option-years	7	7
Expected stock price volatility	55%	63%
Expected dividend yield	—%	—%

The risk-free interest rate is based on U.S. Treasury interest rates, the terms of which are consistent with the expected life of the stock options. Expected volatility is based upon the average historical volatility of our common stock over the period commensurate with the expected term of the related instrument. The expected life and estimated post-employment termination behavior is based upon historical experience of homogeneous groups, executives and non-executives, within our company. We do not currently pay dividends on our common stock nor do we expect to in the foreseeable future.

		Options Outstanding			Options Exercisable		
	Range of Exercise Prices	Options Outstanding	Weighted Average Remaining Life in Years	Weighted Average Exercise Price	Options Exercisable	Weighted Average Remaining Life in Years	Weighted Average Exercise Price of Options Exercisable
Year ended December 31, 2020	$1.18 - 7.59	2,329,416	6.04	$2.76	1,408,119	4.73	$2.2568
Year ended December 31, 2021	$1.18 - 11.40	1,533,024	4.73	$3.00	1,050,177	3.95	$2.45

(in thousands)	Total Intrinsic Value of Options Exercised	Total Fair Value of Options Vested
Year ended December 31, 2020	$ 3,322	$ 3,178
Year ended December 31, 2021	$ 6,288	$ 2,571

For the years ended December 31, 2021 and 2020, the weighted average grant date fair value of options granted was $11.30 and $6.65 per share, respectively. We estimate the fair value of options at the grant date using the Black-Scholes model. For all stock options granted through December 31, 2021, the weighted average remaining service period is 7.0 years.

Unamortized stock option expense at December 31, 2021 that will be amortized over the weighted-average remaining service period of 1.6 years totaled $1.2 million.

Restricted Stock and Restricted Stock Units

Historically, we have granted shares of restricted stock to certain employees that have vested in three equal annual installments on the anniversary dates of their grant. However, beginning in 2019, we altered our approach for these grants to replace the grant of restricted stock subject to time-based vesting with the grant of a combination of restricted stock units ("RSUs") subject to time-based vesting and performance-based vesting. Each RSU represents the contingent right to receive a single share of our common stock upon the vesting of the award. For the year ended December 31, 2021, we granted an aggregate of 281,384 RSUs to certain employees. Of the RSUs granted during 2021, 235,634 of such RSUs are subject to time-based vesting and are scheduled to vest in three equal annual installments on the anniversary dates of the grant. The remaining 45,750 RSUs are performance-based awards that will vest based on our achievement of long-term performance goals, in particular, based on our levels of 2023 revenue and operating income. The 45,750 shares issuable upon vesting of the performance-based RSUs represent the maximum payout under our performance-based awards, based upon 150% of our target performance for 2023 revenue and operating income (the payout of such awards based on target performance for 2023 revenue and operating income would be 41,300 shares). In the case of the time-based and performance-based RSUs, vesting is also subject to the employee's continuous service with us through vesting. In 2021, 93,333 shares of restricted stock and 91,232 RSUs granted to employees vested.

In addition, in conjunction with our 2019, 2020 and 2021 Annual Meetings of Stockholders, we granted RSUs to certain members of our Board of Directors in respect of the annual equity compensation under our non-employee director compensation policy (other members of our Board of Directors elected to receive their annual equity compensation for Board service in the form of stock units under our Deferred Compensation Plan as described below). RSUs granted to our non-employee Directors vest at the earlier of the one-year anniversary of their grant or the next annual stockholders' meeting. In 2021 and 2020, we granted 3,384 and 10,652, respectively, RSUs to non-employee members of our Board of Directors in respect of the annual equity compensation under our non-employee director compensation policy. In 2021 and 2020, 10,652 and 11,600 RSUs granted to directors, respectively, vested.

The following table summarizes the number of unvested shares underlying our restricted stock awards and RSUs and the value of our unvested restricted stock awards and RSUs in 2021 and 2020:

(in thousands, except share and weighted-average share data)	Number of Unvested Shares	Weighted Average Grant Date Fair Value	Aggregate Grant Date Fair Value of Unvested Shares
Balance at January 1, 2020	502,097	$ 3.32	$ 1,665
Granted	149,302	6.48	967
Vested	(221,932)	3.19	(708)
Forfeitures	—	—	—
Balance at December 31, 2020	429,467	$ 4.48	$ 1,924
Granted	281,384	10.71	3,014
Vested	(234,367)	4.22	(989)
Forfeitures	(7,500)	11.94	(90)
Balance at December 31, 2021	468,984	$ 8.58	$ 3,859

We recognized $3.0 million and $2.1 million in stock-based compensation expense, which is recorded in selling, general and administrative expense on the consolidated statements of operations for the years ended December 31, 2021 and 2020, respectively.

Unamortized restricted stock and RSUs expense at December 31, 2021 that will be amortized over the weighted-average remaining service period of 1.6 years totaled $2.7 million.

Employee Stock Purchase Plan

On April 7, 2020, our board of directors approved, and on May 11, 2020, our stockholders approved, the Luna Innovations Incorporated 2020 Employee Stock Purchase Plan (the "2020 ESPP"). The 2020 ESPP grants our eligible employees a purchase right to purchase up to that number of shares of common stock purchasable either with a percentage or with a maximum dollar amount, as designed by the Board of Directors, during the period that begins on the offering date and ends on the date stated in the offering. The maximum number of shares of common stock that may be issued under the 2020 ESPP is 1,200,000 shares. The 2020 ESPP is considered a compensatory plan and the fair value of the discount and the look-back period will be estimated using the Black-Scholes option pricing model and expense will be recognized over the six-month withholding period prior to the purchase date. For the years ended December 31, 2021 and 2020, we recognized $0.4 million and $0.2 million in share-based compensation expense related to the 2020 ESPP, respectively, which is included in our selling, general and administrative expense in the accompanying consolidated statements of operations.

Non-employee Director Deferred Compensation Plan

We maintain a non-employee director deferred compensation plan (the “Deferred Compensation Plan”) that permits our non-employee directors to defer receipt of certain compensation that they receive for serving on our board and board committees. The Deferred Compensation Plan has historically permitted the participants to elect to defer cash fees to which they were entitled for board and committee service. For participating directors, in lieu of payment of cash fees, we credit their accounts under the Deferred Compensation Plan with a number of stock units based on the trading price of our common stock as of the date of the deferral. These stock units vest immediately, although the participating directors do not receive the shares represented by such units until a future qualifying event.

Pursuant to our Deferred Compensation Plan, non-employee directors can also elect to defer the receipt of some or all of the equity compensation that they receive for board and committee service. Stock units representing this equity compensation vest at the earlier of the one-year anniversary of their grant or the next annual stockholders' meeting.

The following is a summary of our stock unit activity under the Deferred Compensation Plan for 2021 and 2020:

(in thousands, except stock units and weighted-average share data)	Number of Stock Units	Weighted Average Grant Date Fair Value per Share	Intrinsic Value Outstanding
Balance, December 31, 2019	629,003	2.09	$ 4,585
Granted	53,757	6.62	
Issued	(47,377)	1.65	
Balance, December 31, 2020	635,383	2.41	$ 6,278
Granted	40,576	10.6	
Issued	(47,377)	2.40	
Balance, December 31, 2021	628,582	3.06	$ 5,334

As of December 31, 2021, 23,130 outstanding stock units had not yet vested.

Stock Repurchases

The Company has historically repurchased shares of its common stock during previous stock repurchase programs. The Company currently maintains all repurchased shares under those stock repurchase programs as treasury stock. In addition, the Company repurchased 44,051 and 60,184 shares of its common stock at an aggregate cost of $0.5 million and $0.5 million, or an average price of $10.41 and $7.51 per share, in connection with the net settlement of shares issued as a result of the vesting of restricted stock units in 2021 and 2020, respectively.

13. Revenue Recognition

Disaggregation of Revenue

We disaggregate our revenue from contracts with customers by geographic location, customer type, contract type, timing of recognition, and major categories, as we believe it best depicts how the nature, amount, timing and uncertainty of our revenue and cash flows are affected by economic factors. We disaggregate revenue on the basis of where the physical goods are shipped. We also classify revenue by the customer type of entity for which it does business, which is an indicator of the diversity of our client base. We attribute revenues generated from being a subcontractor to a commercial company as government revenue when the ultimate client is a government agency or department. Disaggregation by contract mix provides insight in terms of the degree of performance risk that we have assumed. Fixed-price contracts are considered to provide the highest amount of performance risk as we are required to deliver a scope of work or level of effort for a negotiated fixed price. Cost-based contracts are considered to provide the lowest amount of performance risk since we are generally reimbursed for all contract costs incurred in performance of contract deliverables with only the amount of incentive or award fees (if applicable) dependent on the achievement of negotiated performance requirements. By classifying revenue by major product and service, we attribute revenue from a client to the major product or service that we believe to be the client's primary market.

The details are listed in the table below for the years ended December 31, 2021 and 2020:

	Years ended December 31,	
(in thousands)	**2021**	**2020**
Total Revenue by Geographic Location		
United States	$ 45,334	$ 33,706
Asia	17,183	16,181
Europe	16,928	7,144
Canada, Central and South America	8,068	2,084
Total	$ 87,513	$ 59,115
Total Revenue by Major Customer Type		
Sales to the U.S. government	$ 9,525	$ 8,196
U.S. direct commercial sales and other	35,410	25,487
Foreign commercial sales & other	42,578	25,432
Total	$ 87,513	$ 59,115
Total Revenue by Contract Type		
Fixed-price contracts	$ 84,490	$ 56,266
Cost-type contracts	3,023	2,849
Total	$ 87,513	$ 59,115
Total Revenue by Timing of Recognition		
Goods transferred at a point in time	$ 69,522	$ 50,347
Goods/services transferred over time	17,991	8,768
Total	$ 87,513	$ 59,115
Total Revenue by Major Products/Services		
Technology development	$ 7,136	$ 7,211
Test, measurement and sensing systems	78,528	50,881
Other	1,849	1,023
Total	$ 87,513	$ 59,115

Contract Balances

Our contract assets consist of unbilled amounts for technology development contracts as well as custom product contracts. Also included in contract assets are royalty revenue and carrying amounts of right of returned inventory. Long-term contract assets include the fee withholding on cost reimbursable contracts that will not be billed within a year. Contract liabilities include excess billings, subcontractor accruals, warranty expense, deferred extended warranty revenue, right of return refund, and customer deposits. The net contract assets/(liabilities) changed by $2.5 million primarily due to cost reimbursable contracts that have not reached milestones as designated in their respective contracts, but revenue has been recognized based on costs incurred.

The following table shows the components of our contract balances as of December 31, 2021 and 2020:

	December 31,	
(in thousands)	**2021**	**2020**
Contract assets	$ 5,166	$ 4,139
Contract liabilities	(4,649)	(6,147)
Net contract assets/(liabilities)	$ 517	$ (2,008)

Performance Obligations

Unfulfilled performance obligations represent amounts expected to be earned on executed contracts. Indefinite delivery and quantity contracts and unexercised options are not reported in total unfulfilled performance obligations. Unfulfilled performance obligations include funded obligations, which is the amount for which money has been directly authorized by the U.S. government and for which a purchase order has been received by a commercial customer, and unfunded obligations represent firm orders for which funding has not yet been appropriated. The approximate value of our unfulfilled performance obligations was $38.4 million at December 31, 2021. We expect to satisfy 65% of the performance obligations in 2022, 29% in 2023 and the remainder by 2025.

14. Income Taxes

Income tax expense/(benefit) from continuing operations consisted of the following for the periods indicated:

	Years ended December 31,	
(in thousands)	**2021**	**2020**
Current:		
Federal	$ 28	$ (559)
State	(40)	305
Foreign	118	27
Current	$ 106	$ (227)
Deferred:		
Federal	(1,692)	(70)
State	(390)	(161)
Foreign	$ (4)	$ 3
Deferred	$ (2,086)	$ (228)
Income tax benefit	$ (1,980)	$ (455)

Deferred tax assets and liabilities consist of the following components:

	Years ended December 31,	
(in thousands)	**2021**	**2020**
Bad debt and inventory reserve	$ 405	$ 430
UNICAP	130	113
Deferred revenue	156	109
ASC842 Lease Accounting (DTA)	1,236	1,454
ASC842 Lease Accounting (DTL)	(1,090)	(1,279)
Depreciation and amortization	(3,012)	(3,450)
Net operating loss carryforwards	6,984	5,767
Accrued liabilities	559	552
Stock-based compensation	899	829
R&D Credit Carryforward	500	—
Other	360	14
Total	$ 7,127	$ 4,539
Valuation allowance	(3,806)	(2,850)
Net deferred tax asset	$ 3,321	$ 1,689

The benefit from income taxes from continuing operations differs from the amount computed by applying the federal statutory income tax rate to our (loss)/income from continuing operations before income taxes as follows for the periods indicated:

	Years ended December 31,			
	2021		**2020**	
Income tax expense at federal statutory rate	21.00	%	21.00	%
Effect of foreign operations	28.79		1.28	
State taxes, net of federal tax effects	9.48		5.30	
Change in valuation allowance	(24.66)		19.24	
Provision to return adjustments	(0.04)		(1.86)	
Meals and entertainment	(0.11)		0.72	
Other permanent differences	(14.71)		49.34	
Equity compensation	34.43		(40.60)	
Current year R&D credit	8.80		(33.99)	
Prior year R&D credit	1.52		(100.07)	
Foreign derived intangible income benefit	3.31		—	
Reserve for uncertain tax positions	(2.73)		23.53	
Other	(0.56)		5.83	
Income tax benefit	64.52	%	(50.28)	%

The realization of our deferred income tax assets is dependent upon sufficient taxable income in future periods. In assessing whether deferred tax assets may be realized, we consider whether it is more likely than not that some portion, or all, of the deferred tax asset will be realized. We consider scheduled reversals of deferred tax liabilities, projected future taxable income and tax planning strategies that we can implement in making our assessment. We have net operating loss ("NOL") carryforwards of approximately $4.8 million for a previously acquired company expiring at varying dates through 2033. The current year NOL of $1.5 million has an indefinite carryforward period. The Company's NOL carryovers will be subject to a Section 382 limitation based on a 2015 ownership change, and there have been no subsequent ownership changes. We continue to be in a three year cumulative net income position, and based on all available positive and negative evidence, we believe our net deferred tax asset will be fully realizable.

Our OptaSense acquisition included a UK entity and a US entity which have deferred tax assets. Based on all available evidence, including cumulative history of losses, we have realized deferred tax assets only to the extent they are supported by the reversal of existing temporary differences. As a result, we have recorded a valuation allowance of $3.8 million and $2.9 million as of December 31, 2021 and December 31, 2020, respectively. OptaSense US has approximately $3.6 million of NOL carryforwards. These NOLs are subject to limitation under IRC Section 382.

The following table summarizes the activity related to our gross unrecognized tax benefits:

	Years ended December 31,	
(in thousands)	**2021**	**2020**
Unrecognized tax benefits, beginning of period	$ 211	$ —
Increases related to current period tax positions	75	81
Increases related to prior period tax positions	9	130
Unrecognized tax benefits, end of period	$ 295	$ 211

As of December 31, 2021, we had $0.3 million of unrecognized tax benefits. If these amounts are recognized in future periods, it would affect the effective tax rate on income from continuing operations for the years in which they are recognized. Interest and penalties released related to uncertain tax positions were not material for the year ended December 31, 2021. To the extent interest and penalties are not assessed with respect to uncertain tax positions, amounts accrued will be reduced and reflected as a reduction of the overall income tax provision in the period for which the event occurs requiring the adjustment. The amount of accrued interest and penalties as of December 31, 2021 is recorded in other long-term liabilities on the consolidated balance sheets. Our policy is to recognize interest and/or penalties related to income tax matters in income tax expense. We do not believe there are any positions for which it is reasonably possible that the total amount of unrecognized tax benefits will significantly increase or decrease within the next 12 months.

We file numerous consolidated and separate income tax returns in the US federal jurisdiction and in many state and foreign jurisdictions. The U.S. federal statute of limitations remains open for the year 2017 and onward. U.S. state jurisdictions have statutes of limitation generally ranging from three to seven years. Our OptaSense companies have open years for audit including UK - 2017 and forward; US - 2017 and forward; and Canada - 2016 and forward. Given that certain subsidiaries have federal or state net operating loss carryforwards, the statute for examination by the taxing authorities will typically remain open for a period following the use of such net operating loss carryforwards, extending the period for examination beyond the years indicated above. We currently have no income tax returns under examination.

The Company considers undistributed earnings of certain foreign subsidiaries to be indefinitely reinvested outside of the U.S. No taxes have been recorded with respect to our indefinitely reinvested earnings in accordance with the relevant accounting guidance for income taxes. Should the earnings be remitted as dividends, the Company may be subject to additional foreign withholding and state income taxes. As of December 31, 2021, the cumulative amount of U.S. GAAP foreign un-remitted earnings upon which additional income taxes have not been provided is not material to the financial statements. It is not practicable to estimate the amount of any additional taxes which may be payable on the undistributed earnings.

On March 27, 2020, the United States enacted the Coronavirus Aid, Relief and Economic Security Act (the "CARES Act"). The CARES Act includes significant business tax provisions that, among other things, include the removal of certain limitations on utilization of net operating losses, increase the loss carryback period for certain losses to five years, and increase the ability to deduct interest expense, as well as amending certain provisions of the previously enacted Tax Cuts and Jobs Act. We do not expect the CARES Act to have a significant impact on our tax obligations. In December 2020, the Consolidated Appropriations Act, 2021 (“CAA”) was signed into law. The CAA included additional funding through tax credits as part of its economic package for 2021. As of December 31, 2021 and December 31, 2020, we evaluated these items in our tax computation and determined that the items did not have a material impact on our financial statements.

15. Commitments and Contingencies

Litigation and other contingencies

From time to time, we may become involved in litigation in relation to claims arising from our operations in the normal course of business. While management currently believes it is not reasonably possible the amount of ultimate liability, if any, with respect to these actions will have a material adverse effect on our financial position, results of operations or liquidity, the ultimate outcome of any litigation is uncertain.

In December 2018, we received a notice of claim (the "Claim") from Macom Technology Solutions, Inc. ("Macom"), who acquired our HSOR business in August 2017 pursuant to an asset purchase agreement. Under the asset purchase agreement, we agreed to indemnify Macom for certain matters, including, among other things, the collection of accounts receivable from certain major customers, and placed $4.0 million of the purchase price into an escrow account for the potential settlement of any valid indemnity claims. As of December 31, 2019, $1.5 million of the escrow balance had been received with the remaining $2.5 million in the escrow account pending resolution of our dispute of indemnity claims received from Macom. In March 2020, we settled the dispute resulting in us receiving $0.6 million and Macom receiving $1.9 million. For the year ended December 31, 2020, we have recorded a loss from discontinued operations of $1.4 million, net of income tax benefit, to reflect the settlement of the dispute.

We have made, and will continue to make, efforts to comply with current and future environmental laws. We anticipate that we could incur additional capital and operating costs in the future to comply with existing environmental laws and new requirements arising from new or amended statutes and regulations. In addition, because the applicable regulatory agencies have not yet promulgated final standards for some existing environmental programs, we cannot at this time reasonably estimate the cost for compliance with these additional requirements. The amount of any such compliance costs could be material. We cannot predict the impact that future regulations will impose upon our business.

Obligation under Operating Leases

See Note 11 - Leases for discussion of our lease obligations.

Purchase Commitments

We executed a non-cancelable purchase order totaling $1.6 million in the fourth quarter of 2020, a non-cancelable purchase order totaling $1.5 million in the third quarter of 2021 and a non-cancelable purchase order totaling $0.8 million in the fourth quarter of 2021 for multiple shipments of tunable lasers and components to be delivered over an 18-month period. At December 31, 2021, approximately $1.8 million of these commitments remained and are expected to be delivered by May 7, 2022.

Guarantees

As of December 31, 2021, we had a total of $0.9 million in performance bond guarantees outstanding in favor of certain third parties to ensure performance of its obligations under certain customer contracts and lease arrangements. These guarantees expire at various dates through September 2027 To date, we have not incurred any charges associated with non-performance covered by such guarantees and have not accrued any liabilities as of December 31, 2021.

16. Employee Profit Sharing Plan

We maintain a salary reduction/profit-sharing plan under provisions of Section 401(k) of the Internal Revenue Code. The plan is offered to all permanent employees. We contribute 30% of the salary deferral elected by each employee up to a maximum deferral of 10% of annual salary.

We contributed approximately $0.7 million and $0.5 million to the plan for the years ended December 31, 2021 and December 31, 2020, respectively.

17. Relationship with Major Customers

During the years ended December 31, 2021 and 2020, approximately 11% and 14%, respectively, of our consolidated revenues were attributable to contracts with the U.S. government.

At December 31, 2021 and 2020, receivables with respect to contracts with the U.S. government represented 6% and 2% of total trade receivables, respectively.

18. Quarterly Results (unaudited)

The following table sets forth our unaudited historical revenues, operating (loss)/income and net income by quarter during 2021 and 2020.

(Dollars in thousands, except per share amounts)	Three Months Ended							
	March 31, 2021	**June 30, 2021**	**September 30, 2021**	**December 31, 2021**	**March 31, 2020**	**June 30, 2020**	**September 30, 2020**	**December 31, 2020**
Revenue	20,997	21,965	20,329	24,222	11,553	12,934	15,350	19,278
Gross margin	12,271	12,580	12,585	14,120	6,710	7,783	9,632	11,754
Operating (loss)/income	(1,580)	(2,034)	(11)	1,035	(845)	508	1,787	(637)
Net (loss)/income from continuing operations	(1,059)	(1,161)	(343)	1,475	(707)	287	2,725	(945)
Income from discontinued operations before income taxes	786	1,032	937	303	295	1,302	465	1,164
Income tax expense related to discontinued operations	45	101	238	203	704	219	87	284
Income from discontinued operations, net of income tax expense	741	931	699	100	(409)	1,083	378	881
Net (loss)/income	(319)	(230)	356	1,575	(1,116)	1,369	3,102	(64)
Net (loss)/income attributable to common stockholders	$ (319)	$ (230)	$ 356	$ 1,575	$ (1,116)	$ 1,369	$ 3,102	$ (64)
Net (loss)/income per share from continuing operations:								
Basic	$ (0.03)	$ (0.04)	$ (0.01)	$ 0.05	$ (0.03)	$ 0.01	$ 0.10	$ (0.03)
Diluted	$ (0.03)	$ (0.04)	$ (0.01)	$ 0.04	$ (0.03)	$ 0.01	$ 0.08	$ (0.03)
Net income per share from discontinued operations:								
Basic	$ 0.02	$ 0.03	$ 0.02	$ —	$ (0.01)	$ 0.04	$ 0.01	$ 0.03
Diluted	$ 0.02	$ 0.03	$ 0.02	$ —	$ (0.01)	$ 0.03	$ 0.01	$ 0.03
Net (loss)/income attributable to common stockholders:								
Basic	$ (0.01)	$ (0.01)	$ 0.01	$ 0.05	$ (0.04)	$ 0.05	$ 0.11	$ —
Diluted	$ (0.01)	$ (0.01)	$ 0.01	$ 0.05	$ (0.04)	$ 0.04	$ 0.10	$ —
Weighted average shares:								
Basic	30,380,345	30,589,249	30,809,896	32,014,330	28,039,080	28,246,840	28,291,297	30,159,322
Diluted	30,380,345	30,589,249	30,809,896	33,665,613	28,039,080	33,650,790	32,115,847	30,159,322

19. Subsequent Events

On March 8, 2022, we completed the sale of substantially all of our equity interests in our Luna Labs business to certain members of Luna Labs' senior management team and a group of outside investors for an initial purchase price of $20.4 million before working capital and escrow adjustments and transaction fees. Total consideration included $13.0 million of cash received at closing, $2.5 million in the form of a convertible note and $1.7 million in the form of 60-day promissory notes. We can earn up to $1.0 million in future payments from Luna Labs upon the achievement by Luna Labs of certain financial goals. The estimated gain on the transaction is $14.0 million before tax.

On March 10, 2022, we acquired NKT Photonics GmbH and LIOS Technology Inc. (collectively, "LIOS Sensing") for €20.0 million, or $22.1 million. LIOS Sensing, based in Cologne, Germany and formerly owned by NKT Photonics A/S, provides temperature and strain sensing products which are highly complementary to our existing portfolio of fiber optic offerings.

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

We maintain "disclosure controls and procedures," as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended (the "Exchange Act"), which are controls and other procedures that are designed to provide reasonable assurance that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms. Disclosure controls and procedures also include, without limitation, controls and procedures designed to provide reasonable assurance that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is accumulated and communicated to the company's management, including its principal executive and principal financial officers, as appropriate to allow timely decisions regarding required disclosure.

Management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving their objectives and management necessarily applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures. In addition, the design of any system of controls also 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, controls may become inadequate because of changes in conditions, or the degree of compliance with policies or procedures may deteriorate. Because of the inherent limitations in a control system, misstatements due to error or fraud may occur and not be detected.

Under the supervision and with the participation of our management, including our President and Chief Executive Officer and our Chief Financial Officer, we evaluated the effectiveness of the design and operation of our disclosure controls and procedures as of the end of the period covered by this report. Based on this evaluation, our President and Chief Executive Officer and our Chief Financial Officer have concluded that, as of December 31, 2021, our disclosure controls and procedures were effective.

Changes in Internal Control over Financial Reporting

There were no changes in our internal control over financial reporting (as defined in Rules 13a-15(f) and Rule 15d-15(f) under the Exchange Act) that occurred during the quarter ended December 31, 2021 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Management's Report on Internal Control over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act. Our internal control over financial reporting is designed, under the supervision of our principal executive and principal financial officers, and effected by our board of directors, management and other personnel to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with accounting principles generally accepted in the United States of America ("GAAP"). Our internal control over financial reporting includes those policies and procedures that: (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of our assets; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with GAAP, and that our receipts and expenditures are being made only in accordance with authorizations of our management and directors; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of our assets that could have a material effect on our financial statements.

There are inherent limitations in the effectiveness of any internal control over financial reporting, including the possibility of human error and the circumvention or overriding of controls. Accordingly, even effective internal control over financial reporting can provide only reasonable assurance with respect to financial statement preparation and may not prevent or detect all misstatements. Further, because of changes in conditions, effectiveness of internal control over financial reporting may vary

over time. Our internal control system was designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with GAAP.

Under the supervision and with the participation of our management, including our President and Chief Executive Officer, and our Chief Financial Officer, we conducted an evaluation of the effectiveness of our internal control over financial reporting as of December 31, 2021. This evaluation was based on the criteria established in the 2013 *Internal Control—Integrated Framework* issued by the Committee of Sponsoring Organizations of the Treadway Commission.

Based on our evaluation under the framework established in the 2013 *Internal Control—Integrated Framework*, our President and Chief Executive officer, and our Chief Financial Officer concluded that our internal control over financial reporting was effective as of December 31, 2021 to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with GAAP.

ITEM 9B. OTHER INFORMATION

None

ITEM 9C. DISCLOSURE REGARDING FOREIGN JURISDICTIONS THAT PREVENT INSPECTIONS

None

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

The information required by Item 10 of Form 10-K will be included in the proxy statement related to our 2022 Annual Meeting of Stockholders, (the "2022 Proxy Statement"), anticipated to be filed with the SEC within 120 days after December 31, 2021, and is incorporated into this report by reference.

ITEM 11. EXECUTIVE COMPENSATION

The information required by Item 11 of Form 10-K is incorporated into this report by reference to the information to be provided in our 2022 Proxy Statement.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

The information required by Item 12 of Form 10-K is incorporated into this report by reference to the information to be provided in our 2022 Proxy Statement.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE

The information required by Item 13 of Form 10-K is incorporated into this report by reference to the information to be provided in our 2022 Proxy Statement.

ITEM 14. PRINCIPAL ACCOUNTING FEES AND SERVICES

The information required by Item 14 of Form 10-K is incorporated into this report by reference to the information to be provided in our 2022 Proxy Statement.

PART IV

ITEM 15. EXHIBITS, FINANCIAL STATEMENT SCHEDULE

(a) The following documents are filed as part of this Annual Report on Form 10-K:

(i) Financial Statements. See Index to Consolidated Financial Statements at Item 8 of this Report on Form 10-K.

(ii) Schedules.

Schedule II

Luna Innovations Incorporated
Valuation and Qualifying Accounts

Column A	**Column B**	**Column C**	**Column D**	**Column E**
(in thousands)	**Balance at beginning of Period**	**Additions**	**Deductions**	**Balance at end of period**
Year Ended December 31, 2020				
Reserves deducted from assets to which they apply:				
Deferred tax valuation allowance	$ 360	$ 2,850	$ (360)	$ 2,850
Allowances for doubtful accounts	$ 930	$ 127	$ (171)	$ 886
	$ 1,290	$ 2,977	$ (531)	$ 3,736
Year Ended December 31, 2021				
Reserves deducted from assets to which they apply:				
Deferred tax valuation allowance	$ 2,850	$ 2,815	$ (1,859)	$ 3,806
Allowances for doubtful accounts	$ 886	$ 880	$ (841)	$ 925
	$ 3,736	$ 3,695	$ (2,700)	$ 4,731

All other schedules are omitted as the required information is inapplicable or the information is presented in the Consolidated Financial Statements and notes thereto in Item 8 of Part II of this Annual Report on Form 10-K.

- Exhibits. The exhibits filed as part of this report are listed under “Exhibits” at subsection (b) of this Item 15.

(b) Exhibits

EXHIBIT INDEX

Exhibit No.	Exhibit Document
2.1#	Agreement and Plan of Merger and Reorganization dated as of January 30, 2015, by and among Luna Innovations Incorporated, API Merger Sub, Inc. and Advanced Photonix, Inc. (incorporated by reference to Exhibit 2.1 to the Registrant's Current Report on Form 8-K (File No. 000-52008) filed on February 2, 2015).
2.2#	Asset Purchase Agreement, dated July 31, 2018 by and among Luna Innovations Incorporated, Advanced Photonix, Inc., Advanced Photonix Canada, Inc. and OSI Optoelectronics, Inc. (incorporated by reference to Exhibit 2.1 to the Registrant's Quarterly Report on Form 10-Q (File No. 000-52008) filed on August 1, 2018).
2.3#	Asset Purchase Agreement, dated October 15, 2018 by and among Luna Innovations Incorporated, Luna Technologies, Inc. and Micron Optics, Inc. (incorporated by reference to Exhibit 2.1 to the Registrant's Current Report on Form 8-K (File No. 000-52008) filed on October 16, 2018).
2.4#	Stock Purchase Agreement, dated March 1, 2019 by and among Luna Innovations Incorporated, Luna Technologies, Inc., Steve Yao and General Photonics Corporation (incorporated by reference to Exhibit 2.1 to the Registrant's Current Report on Form 8-K (File No. 000-52008) filed on March 4, 2019).
2.5#	Share Purchase Agreement, by and between the Company and QinetiQ Holdings Limited, dated as of December 2, 2020 (incorporated by reference to Exhibit 2.1 to the Registrant's Current Report on Form 8-K (File No. 000-52008) filed on December 3, 2020).
2.6#*	Form of Equity Purchase Agreement, by and among the Company and the Management Investors, dated as of March 7, 2022.
2.7#*	Equity Purchase Agreement, by and among the Company, Luna Labs and the Investors, dated as of March 8, 2022.
3.1	Amended and Restated Certificate of Incorporation of the Registrant (incorporated by reference to Exhibit 3.2 to the Registrant's Current Report on Form 8-K (File No. 000-52008) filed on June 8, 2006).
3.2	Certificate of Designations of the Series A Convertible Preferred Stock (incorporated by reference to Exhibit 3.1 to the Registrant's Current Report on Form 8-K (File No. 000-52008) filed on January 15, 2010).
3.3	Amended and Restated Bylaws of the Registrant (incorporated by reference to Exhibit 3.4 to the Registrant's Registration Statement on Form S-1 (File No. 333-131764) filed on February 10, 2006).
3.4	Amendment to Amended and Restated Bylaws (incorporated by reference to Exhibit 3.1 to the Registrant's Registration Statement on Form 8-K (File No. 000-52008) filed on May 10, 2010).
3.5	Amendment to Amended and Restated Bylaws (incorporated by reference to Exhibit 3.1 to the Registrant's Current Report on Form 8-K (File No. 000-52008) filed on February 2, 2015).
3.6	Amendment to Amended and Restated Bylaws (incorporated by reference to Exhibit 3.1 to the Registrant's Current Report on Form 8-K (File No. 000-52008) filed on March 4, 2021).
4.1	Specimen Common Stock certificate of the Registrant (incorporated by reference to the Exhibit 4.1 to Amendment No. 5 of the Registrant's Registration Statement on Form S-1 (File No. 333-131764) filed on May 19, 2006).
4.2	2006 Equity Incentive Plan (incorporated by reference to Exhibit 10.9 to Amendment No. 3 of the Registrant's Registration Statement on Form S-1 (File No. 333-131764) filed on April 28, 2006).
4.3	Form of Stock Option Agreement under 2006 Equity Incentive Plan (incorporated by reference to Exhibit 4.7 to the Registrant's Registration Statement on Form S-1 (File No. 333-131764) filed on February 10, 2006).
4.4	2016 Equity Incentive Plan (incorporated by reference to Exhibit 4.7 to the Registrant's Registration Statement on Form S-8 (File No. 333-211802) filed on June 3, 2016).
4.5	Form of Stock Option Grant Notice and Stock Option Agreement under 2016 Equity Incentive Plan (incorporated by reference to Exhibit 4.8 of the Registrant's Registration Statement on Form S-8 (File No. 333-211802) filed on June 3, 2016).
4.6	Form of Restricted Stock Unit Grant Notice and Restricted Stock Unit Award Agreement under 2016 Equity Incentive Plan (incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K (File No. 000-52008) filed on January 16, 2019).
4.7	Form of Restricted Stock Award Grant Notice and Restricted Stock Award Agreement under 2016 Equity Incentive Plan (incorporated by reference to Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q (File No. 000-52008) filed on August 10, 2016).

4.8	Description of the Registrant's Securities Registered Pursuant to Section 12 of the Securities Exchange Act of 1934 (incorporated by reference to Exhibit 4.8 to the Registrant's Annual Report on Form 10-K (File No. 000-52008) filed on March 13, 2020.
10.1	Form of Indemnification Agreement for directors and executive officers (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K (File No. 000-52008) filed on July 17, 2009).
10.2**	Amended and Restated License Agreement, dated March 19, 2004, by and between Virginia Tech Intellectual Properties, Inc. and Luna Innovations Incorporated (incorporated by reference to Exhibit 10.26 to Amendment No. 5 of the Registrant's Registration Statement on Form S-1 (File No. 333-131764) filed on May 19, 2006).
10.3	Asset Transfer and License Agreement by and between Luna Innovations Incorporated and Coherent, Inc. (incorporated by reference to Exhibit 10.21 to Amendment No. 1 to Registrant's Annual Report on Form 10-K (File No. 000-52008) filed on April 6, 2007).
10.4**	Development and Supply Agreement, dated December 12, 2006, by and between Luna Innovations Incorporated and Intuitive Surgical, Inc. dated June 11, 2007 (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K (File No. 000-52008) filed on June 14, 2007).
10.5	Securities Purchase and Exchange Agreement, dated January 12, 2010, by and between Luna Innovations Incorporated and Carilion Clinic (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K (File No. 000-52008) filed on January 15, 2010).
10.6	Amended and Restated Investor Rights Agreement, dated January 13, 2010, by and among Luna Innovations Incorporated, Carilion Clinic, and certain stockholders of Luna Innovations Incorporated (incorporated by reference to Exhibit 10.4 to the Registrant's Current Report on Form 8-K (File No. 000-52008) filed on January 15, 2010).
10.7	Non-Employee Directors' Deferred Compensation Plan (incorporated by reference to Exhibit 10.13 to the Registrant's Annual Report on Form 10-K (File No. 000-52008) filed on March 21, 2018).
10.8**	License Agreement, effective January 12, 2010, by and among Luna Innovations Incorporated, Luna Technologies, Inc. and Hansen Medical, Inc. (incorporated by reference to Exhibit 10.6 of the Registrant's Quarterly Report on Form 10-Q (File No. 000-52008) filed on May 17, 2010).
10.9**	License Agreement, effective January 12, 2010, by and among Luna Innovations Incorporated, Luna Technologies, Inc. and Intuitive Surgical, Inc. (incorporated by reference to Exhibit 10.8 to Registrant's Quarterly Report on Form 10-Q (File No. 000-52008) file on May 17, 2010).
10.10	Employment Agreement dated December 5, 2017, by and between Scott A. Graeff and Luna Innovations Incorporated (incorporated by reference to Exhibit 10.25 to the Registrant's Annual Report on Form 10-K (File No. 000-52008) filed on March 21, 2018).
10.11**	Cross-License Agreement by and among Luna Innovations Incorporated and Luna Technologies, Inc. and Intuitive Surgical Operations, Inc. and Intuitive Surgical International, Ltd., dated as of January 17, 2014 (incorporated by reference to Exhibit 10.2 to the Registrant's Quarterly Report on Form 10-Q (File No. 000-52008) filed on May 13, 2014).
10.12	Lease Agreement by and between SBA Tenant, LLC and Luna Innovations Incorporated dated November 2014 (incorporated by reference to Exhibit 10.49 to the Registrant's Annual Report on Form 10-K (File No. 000-52008) filed March 16, 2015).
10.13	Amended and Restated Non-Employee Director Compensation Policy, as amended as of February 26, 2019 (incorporated by reference to Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q (File No. 000-52008) filed on May 13, 2019).
10.14	Employment Agreement, dated December 2, 2019, by and between the Registrant and Eugene J. Nestro (incorporated by reference to Exhibit 10.29 to the Registrant's Annual Report on Form 10-K (File No. 000-52008) filed on March 13, 2020).
10.15	First Amendment to Commercial Lease, dated as of February 21, 2020, by and between SBA Tenant, LLC and the Registrant (incorporated by reference to Exhibit 10.30 to the Registrant's Annual Report on Form 10-K (File No. 000-52008) filed on March 13, 2020).
10.16	Luna Innovation Incorporated 2020 Employee Stock Purchase Plan (incorporated by reference to Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q (File No. 000-52008) filed on August 6, 2020).
10.17	Tax Deed, by and between the Company and QinetiQ Holdings Limited, dated as of December 2, 2020 (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K (File No. 000-52008) filed on December 3, 2020).
10.18	Loan Agreement, dated December 1, 2020, by and between the Company and PNC Bank, National Association.
10.19	Term Note, dated December 1, 2020, by and between the Company and PNC Bank, National Association.

10.20	Revolving Line of Credit Note, dated December 1, 2020, by and between the Company and PNC Bank, National Association.
10.21	Employment Agreement, dated April 28, 2021, by and between the Registrant and Brian J. Soller Incorporated by reference 5.02 to the Registrant's Current Report on Form 8-K (File No. 000-52008) filed on April 28, 2021).
10.22*	Second Amendment to Lease Agreement by and between SBA Tenant, LLC and Luna Innovations Incorporated dated August 27, 2021
21.1*	List of Subsidiaries
23.1*	Consent of Grant Thornton LLP, Independent Registered Public Accounting Firm
24.1	Power of Attorney (see signature page)
31.1*	Certification of the Principal Executive Officer pursuant to Rule 13a-14(a) and Rule 15d-14(a) of the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
31.2*	Certification of the Principal Financial Officer pursuant to Rule 13a-14(a) and Rule 15d-14(a) of the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
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.
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.
101	The following materials from the Registrant's Annual Report on Form 10-K for the year ended December 31, 2021, are formatted in XBRL (eXtensible Business Reporting Language): (i) Consolidated Balance Sheets at December 31, 2021 and 2020, (ii) Consolidated Statements of Operations for the years ended December 31, 2021 and 2020, (iii) Consolidated Statements of Changes in Stockholder's Equity for the years ended December 31, 2021 and 2020 (iv) Consolidated Statements of Cash Flows for the years ended December 31, 2021 and 2020, and (v) Notes to Audited Consolidated Financial Statements.

* Filed herewith

\# Pursuant to Item 601(b)(2) of Regulation S-K, the schedules and exhibits to this agreement are omitted, but will be furnished to the Securities and Exchange Commission upon request.

** Confidential treatment has been granted with respect to portions of this exhibit, indicated by asterisks, which has been filed separately with the Securities and Exchange Commission.

*** These certifications are being furnished solely to accompany this annual report pursuant to 18 U.S.C. Section 1350, and are not being filed for purposes of Section 18 of the Securities Exchange Act of 1934 and are not to be incorporated by reference into any filing of the registrant, whether made before or after the date hereof, regardless of any general incorporation language in such filing.

ITEM 16. FORM 10-K SUMMARY

Not applicable.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) 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.

LUNA INNOVATIONS INCORPORATED

By: /s/ Eugene J. Nestro
Eugene J. Nestro
Chief Financial Officer
(Principal Financial and Accounting Officer)

March 14, 2022

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below hereby constitutes and appoints Scott A. Graeff and Eugene J. Nestro, and each of them acting individually, as his true and lawful attorneys-in-fact and agents, with full power of each to act alone, with full powers of substitution and resubstitution, for him and in his name, place and stead, in any and all capacities, to sign any and all amendments to this Annual Report on Form 10-K with all exhibits thereto and all documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, with full power of each to act alone, 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 for all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or his or their substitutes, may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

Signature	Title	Date
/s/ Scott A. Graeff **Scott A. Graeff**	President, Chief Executive Officer and Director (Principal Executive Officer)	March 14, 2022
/s/ Eugene J. Nestro **Eugene J. Nestro**	Chief Financial Officer (Principal Financial and Accounting Officer)	March 14, 2022
/s/ N. Leigh Anderson **N. Leigh Anderson**	Director	March 14, 2022
/s/ Warren B. Phelps, III **Warren B. Phelps, III**	Director	March 14, 2022
/s/ Pamela Coe **Pamela Coe**	Director	March 14, 2022
/s/ Gary Spiegel **Gary Spiegel**	Director	March 14, 2022
/s/ Mary Beth Vitale **Mary Beth Vitale**	Director	March 14, 2022
/s/ Richard W. Roedel **Richard W. Roedel**	Chairman of the Board of Directors	March 14, 2022

Execution Version

EQUITY PURCHASE AGREEMENT

This Equity Purchase Agreement (the "***Agreement***") is made as of March 7, 2022 by and between **Luna Innovations Incorporated**, a Delaware corporation (the "***Seller***") and **_____** ("***Purchaser***"). In consideration of the mutual promises contained herein, the parties agree as follows.

1. Purchase and Sale of Equity.

(a) Purchase and Sale. Purchaser agrees to purchase from the Seller, and the Seller agrees to sell to Purchaser, the number of Class B Common Units (the "***Units***") of Luna Labs LLC (the "***Luna Labs***") set forth on the Purchaser's signature page hereto for the consideration, in the amount and in the form. set forth on the Purchaser's signature page hereto.

(b) Operating Agreement. Concurrently with the Seller's issuance of the Units to Purchaser, Purchaser shall execute a counterpart signature page, and become a party, to the Amended and Restated Limited Liability Company Operating Agreement of Luna Labs attached as **Exhibit A** to this Agreement (the "***Operating Agreement***").

(c) Closing. The closing of the transactions contemplated by this Agreement, including payment for and delivery of the Units, will occur at the offices of the Seller immediately following the execution of this Agreement, or at such other time and place as the parties may mutually agree.

2. Seller Representations. In connection with its sale of the Units, the Seller represents to Purchaser the following:

(a) The Seller has good and marketable right, title and interest (legal and beneficial) in and to all of the Units, free and clear of all liens, charges, pledges, covenants, restrictions or other encumbrances or adverse claims or rights of others. At the closing of the transactions contemplated by this Agreement, the Seller's entire right, title and interest in and to the Units shall be conveyed to Purchaser as set forth herein.

(b) The Seller has full power and authority to enter into this Agreement. The Seller has the full power and authority to sell, transfer, assign and otherwise dispose of the Units. The execution, delivery and performance by the Seller of this Agreement has been duly authorized by all requisite action by the Seller and this Agreement constitutes a valid and binding obligation of the Seller, enforceable against the Seller in accordance with its terms.

(c) There is no active claim, action, suit, proceeding, arbitration, complaint, charge or investigation that questions the validity of this Agreement or the right of the Seller to enter into the Agreement or to consummate the transactions contemplated by this Agreement.

3. Purchaser Representations. In connection with the purchase of the Units, Purchaser represents to the Seller the following:

(a) Purchaser has full power and authority to enter into this Agreement. The execution, delivery and performance by Purchaser of this Agreement has been duly authorized by all requisite action by Purchaser and this Agreement constitutes a valid and binding obligation of Purchaser, enforceable against Purchaser in accordance with its terms.

(b) There is no active claim, action, suit, proceeding, arbitration, complaint, charge or investigation that questions the validity of this Agreement or the right of Purchaser to enter into the Agreement or to consummate the transactions contemplated by this Agreement.

(c) Purchaser, as a current member of the management team of Luna Labs responsible for operating Luna Labs' business, is aware of the Luna Labs' business affairs and financial condition and has acquired sufficient information about Luna Labs to reach an informed and knowledgeable decision to acquire the Units. Purchaser is purchasing the Units for investment for Purchaser's own account only and

not with a view to, or for resale in connection with, any "distribution" thereof within the meaning of the Securities Act of 1933, as amended (the "***Act***").

(d) Purchaser understands that the Units have not been registered under the Act by reason of a specific exemption therefrom, which exemption depends upon, among other things, the bona fide nature of Purchaser's investment intent as expressed in this Agreement.

(e) Purchaser further acknowledges and understands that the Units must be held indefinitely unless the Units are subsequently registered under the Act or an exemption from such registration is available. Purchaser further acknowledges and understands that Luna Labs is under no obligation to register the Units.

(f) Purchaser is familiar with the provisions of Rule 144 under the Act as in effect from time to time, that, in substance, permits limited public resale of "restricted securities" acquired, directly or indirectly, from the issuer of such securities (or from an affiliate of such issuer), in a non-public offering subject to the satisfaction of certain conditions.

(g) Purchaser further understands that at the time Purchaser wishes to sell the Units there may be no public market upon which to make such a sale, and that, even if such a public market then exists, Luna Labs may not be satisfying the current public information requirements of Rule 144, and that, in such event, Purchaser may be precluded from selling the Units under Rule 144 even if the minimum holding period requirement had been satisfied.

(h) Purchaser further warrants and represents that Purchaser has either (i) preexisting personal or business relationships, with Luna Labs or any of its officers, directors or controlling persons, or (ii) the capacity to protect Purchaser's own interests in connection with the purchase of the Units by virtue of the business or financial expertise of Purchaser or of professional advisors to Purchaser who are unaffiliated with and who are not compensated by the Seller, Luna Labs or any of their affiliates, directly or indirectly.

(i) Purchaser acknowledges that Purchaser has read all tax related sections and further acknowledges Purchaser has had an opportunity to consult Purchaser's own tax, legal and financial advisors regarding the purchase of Units under this Agreement.

(j) Purchaser acknowledges and agrees that in making the decision to purchase the Units under this Agreement, Purchaser has not relied on any statement, whether written or oral, regarding the subject matter of this Agreement, except as expressly provided in this Agreement and in the attachments and exhibits to this Agreement.

(k) If Purchaser is not a United States person (as defined by Section 7701(a)(30) of the Internal Revenue Code of 1986, as amended (the "***Code***")), Purchaser has satisfied itself as to the full observance of the laws of its jurisdiction in connection with any invitation to subscribe for the Units or any use of this Agreement, including (i) the legal requirements within its jurisdiction for the purchase of the Units, (ii) any foreign exchange restrictions applicable to such purchase, (iii) any governmental or other consents that may need to be obtained and (iv) the income tax and other tax consequences, if any, that may be relevant to the purchase, holding, redemption, sale, or transfer of the Units. Purchaser's subscription and payment for and continued beneficial ownership of the Units will not violate any applicable securities or other laws of Purchaser's jurisdiction.

(l) Purchaser acknowledges that the Units are subject to certain restrictions set forth in the Operating Agreement.

(m) Purchaser has reviewed the representations and warranties regarding Luna Labs in Section 5 of the draft Equity Purchase Agreement, by and among the Seller, Luna Labs, Mereo Capital Partners I, LP and Point Lookout Capital Partners IV, LLC provided to Purchaser by the Seller on the date of this Agreement, and Purchaser is not aware of any inaccuracies in such representations and warranties, other than as disclosed in the draft Disclosure Schedule provided to Purchaser by the Seller on the date of this Agreement.

4. Release and Waiver.

(a) In consideration of the Seller's effecting the transactions contemplated by this Agreement and other good and valuable consideration, effective upon the closing of such transactions, Purchaser, on behalf of himself or herself and his or her respective successors and assigns, irrevocably and unconditionally forever discharges, acquits and releases the Seller and its officers, directors, employees, agents, attorneys, parents, subsidiaries, affiliates, partners, members, managers and joint venturers, and representatives of the foregoing (collectively, the "***Releasees***") from all rights, claims, charges, costs, losses, complaints, obligations, promises, debts, expenses (including attorneys' fees and costs actually incurred), liabilities, damages, actions, causes of action, controversies, suits, demands, orders, contracts, agreements and relationships, of whatever kind or nature, known or unknown, suspected or unsuspected, past, present or future, whether contractual or fiduciary, both at law and in equity (collectively, "***Claims***"); *provided*, *however*, that nothing in this release is intended, nor shall be construed, to release any Claims (i) based on or arising from willful misconduct or criminal activity by the Releasees, (ii) arising out of any agreement or transaction entered into by the parties after the date hereof, (iii) that are not releasable under applicable law, or (iv) arising out of the Releasees' breach of this Agreement.

(b) Purchaser, on behalf of himself or herself and his or her respective successors or assigns, has considered the possibility that Purchaser may not now fully know the nature or value of the Claims. Nevertheless, Purchaser, on behalf of himself or herself and his or her respective successors or assigns, intends to assume the risk of releasing such unknown claims. TO THAT END, PURCHAESR EXPRESSLY WAIVES HIS OR HER RIGHTS UNDER ANY STATUTORY PROVISION SIMILAR TO THE FOLLOWING: "A GENERAL RELEASE DOES NOT EXTEND TO THE CLAIMS WHICH THE CREDITOR DOES NOT KNOW OR SUSPECT TO EXIST IN HIS FAVOR AT THE TIME OF EXECUTING THE RELEASE, WHICH IF KNOWN BY HIM MUST HAVE MATERIALLY AFFECTED HIS SETTLEMENT WITH THE DEBTOR." PURCHASER, ON BEHALF OF HIMSELF OR HERSELF AND HIS OR HER RESPECTIVE SUCCESSORS OR ASSIGNS, ALSO HEREBY WAIVES THE BENEFITS OF, AND ANY RIGHTS PURCHASER MAY HAVE UNDER ANY STATUTORY OR COMMON LAW PRINCIPLE OF SIMILAR EFFECT IN ANY JURISDICTION.

5. Miscellaneous.

(a) Distribution of M&T Loan Proceeds and Repayment of Debt Financed Distribution Note. Following the consummation of the transactions contemplated by this Agreement and in connection therewith, Luna Labs will borrow from M&T Bank $6,000,000 and immediately thereafter, Luna Labs shall distribute such debt proceeds to its members in accordance with such members' respective equity capital investments, including amounts to (i) Management Members (as defined in the Operating Agreement) totaling $1,651,376.15 in the aggregate, (ii) Mereo Capital (as defined in the Operating Agreement) in the amount of $3,302,752.29 and (iii) Point Lookout (as defined in the Operating Agreement) in the amount of $825,688.07. Purchaser shall use his or her proceeds from such distribution to pay off in full the Debt Financed Distribution Note (as defined on the signature page below), and shall, promptly following receipt, pay over or cause to be paid over such amounts to the Seller in full satisfaction of the Debt Financed Distribution Note.

(b) Notices. All notices required or permitted hereunder will be in writing and will be deemed effectively given: (i) upon personal delivery to the party to be notified; (ii) when sent by confirmed electronic mail or facsimile if sent during normal business hours of the recipient, and if not sent during normal business hours of the recipient, then on the next business day; (iii) five calendar days after having been sent by registered or certified mail, return receipt requested, postage prepaid; or (iv) one business day after deposit with a nationally recognized overnight courier, specifying next day delivery, with written verification of receipt. All communications will be sent to the other party to this Agreement at such party's address hereinafter set forth on the signature page hereof, or at such other address as such party may designate by 10 days' advance written notice to the other party hereto.

(c) Successors and Assigns. This Agreement will inure to the benefit of the successors and assigns of the Seller and, subject to the restrictions on transfer herein set forth, be binding upon Purchaser, Purchaser's successors, and assigns. The parties acknowledge that Luna Labs is a direct third party beneficiary of this Agreement.

(d) Attorneys' Fees. The prevailing party in any suit or action hereunder will be entitled to recover from the losing party all costs incurred by it in enforcing the performance of, or protecting its rights under, any part of this Agreement, including reasonable costs of investigation and attorneys' fees.

(e) Governing Law; Venue. This Agreement will be governed by and construed in accordance with the laws of the State of Delaware. The parties agree that any action brought by either party to interpret or enforce any provision of this Agreement will be brought in, and each party agrees to, and does hereby, submit to the jurisdiction and venue of, the appropriate state or federal court for the district encompassing the Seller's principal place of business.

(f) Further Execution. The parties agree to take all such further actions as may reasonably be necessary to carry out and consummate this Agreement as soon as practicable, and to take whatever steps may be necessary to obtain any governmental approval in connection with or otherwise qualify the issuance of the securities that are the subject of this Agreement.

(g) Independent Counsel. Purchaser acknowledges that this Agreement has been prepared on behalf of the Seller by Cooley LLP, counsel to the Seller and that Cooley LLP does not represent, and is not acting on behalf of, Purchaser in any capacity. Purchaser has been provided with an opportunity to consult with his, her or its own counsel with respect to this Agreement.

(h) Entire Agreement; Amendment. This Agreement constitutes the entire agreement between the parties with respect to the subject matter hereof and supersedes and merges all prior agreements or understandings, whether written or oral, with respect to the subject matter hereof. This Agreement may not be amended, modified or revoked, in whole or in part, except by an agreement in writing signed by each of the parties hereto.

(i) Severability. If one or more provisions of this Agreement are held to be unenforceable under applicable law, the parties agree to renegotiate such provision in good faith. In the event that the parties cannot reach a mutually agreeable and enforceable replacement for such provision, then (i) such provision will be excluded from this Agreement, (ii) the balance of the Agreement will be interpreted as if such provision were so excluded and (iii) the balance of the Agreement will be enforceable in accordance with its terms.

(j) Counterparts. This Agreement (including any schedules and/or exhibits hereto or thereto) may be executed in two or more counterparts, each of which will be deemed an original, but all of which together will constitute one and the same instrument. Counterparts may be delivered via facsimile, electronic mail (including pdf or any electronic signature complying with the U.S. federal ESIGN Act of 2000, Uniform Electronic Transactions Act or other applicable law) or other transmission method and any counterpart so delivered will be deemed to have been duly and validly delivered and be valid and effective for all purposes.

[Signature Pages Follow]

The undersigned have executed this Equity Purchase Agreement as of the date first referenced above.

SELLER:

Luna Innovations Incorporated

By: _____

Name: _____

Title: _____

E-mail: _____

Address: 301 1st Street, SW Suite 200
Roanoke, VA 24011

The undersigned have executed this Equity Purchase Agreement as of the date first referenced above.

PURCHASER:

Name: _____

By: _____

Name: _____

Title: _____

E-mail: _____

Address _____

_____

_____

Total Equity purchased:	**_____** Class B Common Units of Luna Labs
Purchase Price per Unit:	$1.00
Total Purchase Price:	$**_____**
Form of Payment:	Cash: $**_____**
	Promissory Note in the form attached to this Agreement as **Exhibit B** (the "***Purchase Price Note***"): $**_____**
	Promissory Note in the form attached to this Agreement as **Exhibit C** (the "***Debt Financed Distribution Note***"): $**_____**

Exhibit A

AMENDED AND RESTATED LIMITED LIABILITY COMPANY OPERATING AGREEMENT

Exhibit B

Exhibit C

Exhibit C

FORM OF PROMISSORY NOTE (PURCHASE PRICE NOTE)

A.

FORM OF PROMISSORY NOTE (DEBT FINANCED DISTRIBUTION NOTE)

Exhibit C to Equity Purchase Agreement

Final Execution Version

161107.00103/127247079v.23

EQUITY PURCHASE AGREEMENT

by and among

LUNA INNOVATIONS INCORPORATED,

LUNA LABS USA, LLC

MEREO CAPITAL PARTNERS I, LP

and

POINT LOOKOUT CAPITAL PARTNERS IV, LLC

Dated as of March 8, 2022

TABLE OF CONTENTS

Exhibits and Schedules

EQUITY PURCHASE AGREEMENT

This EQUITY PURCHASE AGREEMENT (this "Agreement"), dated as of March 8, 2022 (the "Agreement Date"), is entered into by and among Luna Innovations Incorporated, a Delaware corporation ("Seller"), Luna Labs USA, LLC, a Delaware limited liability company (the "Company"), and each of Mereo Capital Partners I, LP, a Delaware limited liability company ("Mereo Capital") and Point Lookout Capital Partners IV, LLC, a Delaware limited liability company ("Point Lookout" and together with Mereo Capital, the "Investors" and each an "Investor"). Seller, the Company and the Investors are referred to collectively herein as the "Parties" and each as a "Party."

BACKGROUND

A. Seller previously operated a business unit engaged in applied research, development and commercialization of technologies in the areas of systems analytics, advanced materials and biotech/health sciences, funding of which is derived primarily from the Small Business Innovation Research (SBIR) program (the "Business").

B. On October 8, 2021, Seller contributed the assets and liabilities of the Business to the Company, a newly-formed Delaware limited liability company wholly-owned by Seller, pursuant to that certain contribution agreement (the "Original Contribution Agreement") by and between Seller and the Company. On March 7, 2022, the Original Contribution Agreement was amended to further clarify certain matters therein (the Original Contribution Agreement as updated by such amendment, the "Contribution Agreement Amendment"). The transactions described in this Paragraph B and the agreements and documents entered into in connection therewith are collectively referred to herein as the "Reorganization".

C. Following the Reorganization, on March 7, 2022 (the "Recapitalization Date"), Seller caused the Company to be recapitalized, and pursuant thereto the limited liability company agreement of the Company was amended and restated, which is attached hereto as Exhibit A (the "Company A&R Operating Agreement"), and in connection therewith, the membership interests of the Company were reclassified into Class A-1 Voting Preferred Units (the "Class A-1 Preferred Units"), Class A-2 Non-Voting Preferred Units (the "Class A-2 Preferred Units"), the Class J Common Units (the "Class J Common Units"), the Class B Common Units (the "Class B Common Units") and the Class C Units (the "Class C Units"), with Seller owning one hundred percent (100%) of the issued and outstanding Class A-1 Preferred Units, one hundred percent (100%) of the issued and outstanding Class A-2 Preferred Units, one hundred percent (100%) of the Class J Common Units and one hundred percent (100%) of the issued and outstanding Class B Common Units (with no Class C Units being issued or outstanding as of the Recapitalization Date and as of the date hereof). The transactions described in this Paragraph C and the agreements and documents entered into in connection therewith are collectively referred to herein as the "Recapitalization".

D. On March 7, 2022, certain members of the Company's senior management team, through a limited liability company controlled by each such member of the Company's senior management team (each a "Management Investor" and collectively, the "Management Investors") purchased Three Million (3,000,000) Class B Common Units in the Company from Seller in exchange for aggregate consideration of Three Million Dollars ($3,000,000) in cash and promissory notes with an principal amount of One Million Six Hundred Fifty One Thousand Three Hundred Seventy Six and 15/100 Dollars ($1,651,376.15) (representing the Management Investors' pro rata share of the Debt Distribution (defined below)) (the "Management Promissory Notes"), all pursuant to that certain Management Equity Purchase Agreement by and among the Management Investors and Seller (the "Management Equity Purchase Agreement") (with such

purchase being referred to as the "Management Purchase"). The Management Purchase resulted in the Management Investors owning eighty-eight and twenty-three hundredths percent (88.23)% of the Class B Common Units of the Company.

E. The Company A&R Operating Agreement to be entered into by the Investors in connection with Closing shall provide for the authorization and issuance of profits interests in the form of Class C Units representing up to twenty-one and one-half percent (21.50%) of the fully-diluted membership interests of the Company, issuable pursuant to the terms of the Company A&R Operating Agreement to eligible service providers of the Company or its subsidiaries.

F. The Parties desire that, subject to the terms and conditions of this Agreement, in exchange for the consideration set forth herein, including the Investor Promissory Notes, (i) Mereo Capital shall purchase from Seller that number of Class A-1 Preferred Units and that number of Class A-2 Preferred Units set forth opposite Mereo Capital's name on Schedule 2.1-A hereto and (ii) Point Lookout shall purchase from Seller that number of Class A-1 Preferred Units set forth opposite Point Lookout's name on Schedule 2.1-A (the "Investor Purchase"). The Class A-1 Preferred Units and the Class A-2 Preferred Units being purchased by the Investors pursuant hereto shall be referred to as the "Purchased Equity".

G. Immediately following the Closing, the Company shall redeem One Hundred (100) Class J Common Units (representing 100% of the issued and outstanding Class J Common Units of the Company) from Seller in exchange for (i) issuance to Seller of a convertible promissory note with a principal amount of Two Million Five Hundred Thousand Dollars ($2,500,000) that is convertible into One Hundred (100) Class J Common Units of the Company in certain circumstances pursuant to the terms and conditions set forth therein (the "Convertible Note"); and (ii) the right to earn up to One Million Dollars ($1,000,000) in future payments (the "Earnout Payments") from the Company upon the achievement by the Company of certain financial goals pursuant to that certain Seller Earnout Agreement between the Company and Seller (the "Seller Earnout Agreement"). The transaction described in this Paragraph G shall be referred to as the "Class J Redemption". Immediately following the Class J Redemption, the post-Closing capitalization of the Company, giving effect to the Recapitalization, the Management Purchase and the purchase of the Purchased Equity by the Investors, shall be as set forth on Schedule 2.1-B hereto.

H. Immediately following the Closing and the consummation of the Class J Redemption, the Company shall borrow Six Million Dollars ($6,000,000) from M&T Bank and shall distribute such debt proceeds to the members of the Company (on a post-Closing, post-Class J Redemption basis) in accordance with Section 6.8 below, in amounts intended to fund the payment in full of the Investor Promissory Notes and the Management Promissory Notes.

NOW, THEREFORE, in consideration of the mutual agreements contained herein, and intending to be legally bound hereby and incorporating the foregoing background, the Parties agree as follows:

1. Definitions. For purposes of this Agreement, the capitalized terms and variations thereof not otherwise defined in the body of this Agreement shall have the meanings ascribed to them in Schedule 1 attached hereto.

2. Purchase and Sale of the Purchased Equity; Class J Redemption.

2.1. Basic Transaction.

2.1.1 Investor Purchase. On and subject to the terms and conditions of this Agreement, at the Closing, each Investor shall purchase and accept from Seller and Seller shall sell, transfer and deliver to each Investor, good and marketable title, free and clear of any and all Liens, in and to the Purchased Equity set forth opposite such Investor's name on Schedule 2.1-A for the consideration specified herein.

2.1.2 Class J Redemption. Immediately following the Closing on the date hereof, the Company shall redeem One Hundred (100) Class J Common Units from Seller, representing all of the issued and outstanding Class J Common Units of the Company, in exchange for the Convertible Note and the right to receive the Earnout Payments from the Company upon the achievement by the Company of certain financial goals pursuant to the Seller Earnout Agreement.

2.1.3 Capitalization Post-Investor Purchase and Class J Redemption. Immediately following the Closing and the Class J Redemption (occurring immediately following the Closing), and giving effect to the Recapitalization and the Management Purchase, the capitalization of the Company shall be as set forth on Schedule 2.1-B hereto.

2.2. Purchase Price.

2.2.1 Purchase Price. Subject to the further terms and conditions set forth herein, in full consideration for Seller's sale of the Purchased Equity to the Investors, at the Closing (a) each Investor shall issue to Seller a promissory note (each an "Investor Promissory Note" and collectively, the "Investor Promissory Notes") in substantially the form attached hereto as Exhibit B, with a principal amount equal to each Investor's Pro Rata Share of the Investor Promissory Note Amount, and (b) each Investor shall pay (or cause to be paid) in cash, on a several and not joint basis, in proportion to each Investor's Pro Rata Share:

(i) by wire transfer of immediately available funds to the bank account designated in writing by Seller at least two (2) Business Days prior to the Closing Date, the Closing Payment, as adjusted by Section 2.3.1;

(ii) [reserved];

(iii) [reserved];

(iv) on behalf of the Company or Investors, as applicable, the aggregate amount of the Estimated Transaction Expenses payable to the third party service providers identified on the funds flow memorandum and in the invoices delivered pursuant to Section 2.5.1(v), by wire transfer of immediately available funds in the amount and to the bank accounts designated in writing by such third party service providers pursuant to such invoices (such invoices to have been provided prior to the Closing Date); and

(v) on behalf of Seller or the Company, as applicable, the aggregate amount of the Estimated Company Indebtedness to the holders of such Company Indebtedness, by wire transfer of immediately available funds in the amounts and to the bank accounts designated in writing by Seller at least two (2) Business Days prior to the Closing Date in the amounts included in the calculation of the Estimated Closing Statement and due to be paid to third parties pursuant to payoff letters delivered therewith; at least two (2) Business Days prior to the Closing Date, Seller will make arrangements satisfactory to the Investors for the holders of such Estimated Company Indebtedness to provide to the Investors recordable form Lien releases simultaneously with the Closing.

The aggregate payments and deliveries contemplated by the preceding clauses (i)–(v), inclusive, subject to the provisions of Section 2.3, shall collectively be referred to herein as the "Cash Purchase Price". The aggregate amount of the Cash Purchase Price plus the Investor Promissory Note Amount shall be referred to herein as the "Purchase Price".

2.3. Purchase Price Adjustments.

2.3.1 At least two (2) Business Days prior to the Closing, Seller shall have prepared and delivered to the Investors an officer's certificate of Seller (the "Estimated Closing Statement") that contains a good faith and reasonable best estimate of (i) the Net Working Capital (the "Estimated Net Working Capital"), (ii) the amount of Company Indebtedness calculated through and including the Closing that will be unpaid immediately prior to the Closing (including final bills and wire transfer instructions as applicable) (the "Estimated Company Indebtedness"), (iii) the Transaction Expenses calculated through and including the Closing that will be unpaid immediately prior to the Closing, plus the aggregate amount of the Transaction Expenses that will become payable after the Closing, to the extent calculable (the "Estimated Transaction Expenses"), and (iv) the Cash on Hand as of the Closing (the "Estimated Cash on Hand"). If the Estimated Net Working Capital exceeds the Target Net Working Capital, then the Closing Payment payable to Seller at the Closing pursuant to Section 2.2.1(i) shall be increased by such excess amount. If the Estimated Net Working Capital is less than the Target Net Working Capital, then the Closing Payment payable to Seller at the Closing pursuant to Section 2.2.1(i) shall be decreased by such shortfall amount.

2.3.2 Within ninety (90) calendar days after the Closing Date, the Investors shall prepare and deliver to Seller a statement (the "Closing Statement") setting forth the Investors' calculation of (i) the Net Working Capital (the "Net Working Capital Calculation"), (ii) the amount of Company Indebtedness calculated through and including the Closing and unpaid immediately prior to the Closing (including final bills and wire transfer instructions as applicable) (the "Closing Company Indebtedness"), and (iii) the Transaction Expenses calculated through and including the Closing and unpaid immediately prior to the Closing, plus the aggregate amount of the Transaction Expenses paid or payable after the Closing, to the extent calculable (the "Closing Transaction Expenses"), (iv) the Cash on Hand as of the Closing (the "Closing Cash on Hand") and (v) the Investors' proposed calculation of the Adjustment Calculation. On or prior to the forty fifth (45th) calendar day following the Investors' delivery of the Closing Statement, the Net Working Capital Calculation, the Closing Company Indebtedness, the Closing Transaction Expenses, the Closing Cash on Hand and the Adjustment Calculation as determined by the Investors, Seller may give the Investors a written notice stating in reasonable detail any and all of Seller's non-duplicative objections (an "Objection Notice") to the Closing Statement or the determination of the Net Working Capital Calculation, the Closing Company Indebtedness, the Closing Transaction Expenses, the Closing Cash on Hand or the Adjustment Calculation as determined by the Investors, including the amount, nature and basis of each objection (and necessary supporting documentation). During such forty fifth (45) calendar day period, the Investors shall provide Seller, with access, at reasonable times and upon reasonable prior notice, to the Company's Books and Records and the Company's personnel and accountants reasonably related to the Closing Statement. Any determination set forth on the Closing Statement to which Seller does not specifically object in the Objection Notice shall be deemed acceptable and shall be final and binding upon the Parties upon delivery of the Objection Notice. The failure by Seller to deliver an Objection Notice within such forty five (45) day period shall constitute Seller's acceptance of all items set forth in the Closing Statement, which shall be final and binding on Seller for all purposes of this Agreement.

2.3.3 Following the Investors' receipt of any Objection Notice, Seller and the Investors shall attempt to negotiate in good faith to resolve such dispute. In the event that the Parties fail to agree on any of Seller's proposed adjustments set forth in the Objection Notice, within thirty (30) days after the Investors receive the Objection Notice, the Parties agree that an Accounting Arbitrator shall make the final, binding determination, absent fraud or manifest error, regarding the proposed adjustments set forth in the Objection Notice that are not resolved by the Parties (the "Adjustment Calculation Disputed Items"). The Investors, on the one hand, and Seller, on the other hand, each shall provide the Accounting Arbitrator with their respective determinations of the Adjustment Calculation Disputed Items. The Accounting Arbitrator shall make its determination of the Adjustment Calculation Disputed Items and the resultant Final Net Working Capital Calculation (defined below), Final Company Indebtedness (defined below), Final Transaction Expenses (defined below), Final Cash on Hand (defined below) and Final Adjustment Calculation which determination shall be final and binding on the Parties. The determination of any of the Adjustment Calculation Disputed Items by the Accounting Arbitrator shall be within, and limited by, the range comprised of the respective determination of each of the Investors' and Seller's calculation with respect to such Adjustment Calculation Disputed Items. The determination of the Adjustment Calculation Disputed Items by the Accounting Arbitrator shall be based on whether such Adjustment Calculation Disputed Items have been calculated in accordance with this Agreement, including the applicable definitions contained therein, and the Accounting Arbitrator is not to make any other determination. The Investors and Seller shall promptly furnish or cause to be furnished to the Accounting Arbitrator such work papers and other documents and information relating to the Adjustment Calculation Disputed Items as the Accounting Arbitrator may reasonably request and that are available to the Investors (collectively, the "Requested Information"). The Accounting Arbitrator shall make its determination based solely on presentations and supporting material provided by the Parties and the Requested Information, and not pursuant to any independent review. The Parties shall instruct the Accounting Arbitrator to provide its determination in writing to each of them within sixty (60) days after the matter is referred to the Accounting Arbitrator. The fees, costs and expenses of the Accounting Arbitrator shall be paid pro rata by the Investors, on the one hand, and Seller, on the other hand, in relation to the proportional difference between the Accounting Arbitrator's determination of the Final Adjustment Calculation and the Investors' and Seller's respective determination of the Adjustment Calculation. Any of the Parties may require that the Accounting Arbitrator enter into a customary form of confidentiality agreement with respect to the work papers and other documents and information provided to the Accounting Arbitrator under this Section 2.3.3. As used herein, "Final Net Working Capital Calculation" means the Net Working Capital Calculation as ultimately determined in accordance with Section 2.3.2 or this Section 2.3.3, as applicable, "Final Company Indebtedness" means the amount of Closing Company Indebtedness as ultimately determined in accordance with Section 2.3.2 or this Section 2.3.3, as applicable, and "Final Transaction Expenses" means the amount of Closing Transaction Expenses as ultimately determined in accordance with Section 2.3.2 or this Section 2.3.3, as applicable. "Final Cash on Hand" means the amount of Closing Cash on Hand as ultimately determined in accordance with Section 2.3.2 or this Section 2.3.3, as applicable.

2.3.4 If the Final Adjustment Calculation is a negative number after final determination pursuant to this Section 2.3, then Seller, shall be obligated to pay to the Investors, in proportion to each Investor's Pro Rata Share, an amount equal to the absolute value of the Final Adjustment Calculation, which obligation shall be satisfied as follows: (i) if the Adjustment Escrow Amount is greater than or equal to the absolute value of the Final Adjustment Calculation, the Investors and Seller shall execute and deliver to the Escrow Agent joint written instructions directing the Escrow Agent to pay to each Investor such Investor's Pro Rata Share of an amount equal to the absolute value of the Final Adjustment Calculation out of the Adjustment Escrow Amount, or (ii) if the Adjustment Escrow Amount is less than an amount

equal to the absolute value of the Final Adjustment Calculation, (a) the Investors and Seller shall execute and deliver to the Escrow Agent joint written instructions directing the Escrow Agent to pay to each Investor such Investor's Pro Rata share of all of the Adjustment Escrow Amount and (b) Seller shall be obligated to pay the excess of an amount equal to the absolute value of the Final Adjustment Calculation over the Adjustment Escrow Amount (such amount, the "Overage Amount") to the Investors, in proportion with each Investor's Pro Rata Share, which obligation shall be satisfied by payment of the Overage Amount by Seller to the Investors by wire transfer of immediately available funds to the accounts designated in writing by each Investor. If the Final Adjustment Calculation is a positive number after final determination pursuant to this Section 2.3.4, then, within five (5) Business Days after the date of such final determination, each Investor shall pay on a several and not joint basis, by wire transfer of immediately available funds, to Seller, an amount equal to such Investor's Pro Rata Share of the Final Adjustment Calculation. For purposes of clarity, if the Final Adjustment Calculation is zero, no payment shall be made by any Person pursuant to this Section 2.3.4. The Closing Payment shall be deemed to be increased or decreased, as applicable, by any payments made pursuant to this Section 2.3.4.

2.3.5 Promptly, and in any event within five (5) Business Days following the satisfaction of any and all of Seller's obligations under this Section 2.3, including the payment of any amount owed by Seller to the Accounting Arbitrator pursuant to Section 2.3.3, Seller and the Investors shall execute and deliver to the Escrow Agent joint written instructions directing the Escrow Agent to pay out the remaining funds, if any, of the Adjustment Escrow Amount to Seller pursuant to the terms and subject to the conditions of the Escrow Agreement.

2.4. The Closing. The closing of the transactions contemplated by this Agreement (other than the matters described in Section 2.1.2, the "Closing") shall take place concurrently with the execution of this Agreement (the "Closing Date") remotely via the electronic exchange of execution versions of the agreements, instruments, certificates and other documents to be entered into or delivered by any party under this Agreement and the signature pages thereto via facsimile or via e-mail by .pdf and the wire transfer of immediately available funds to the applicable parties as required at the Closing. Notwithstanding anything herein, the matters described in Section 2.1.2 and known as the Class J Redemption shall be deemed to separately be consummated immediately following the Closing.

2.5. Deliveries at the Closing.

2.5.1 Closing Deliveries by Seller. At the Closing (or such earlier date if specified below), Seller, or the Company on behalf of Seller, shall deliver the following items to the Investors, each in form and substance satisfactory to the Investors:

(i) assignment documents, assigning and transferring the ownership of the Purchased Equity, duly executed by Seller;

(ii) a counterpart of the Escrow Agreement, duly executed by Seller;

(iii) an employment agreement, dated the date hereof, duly executed by the Company and James Garrett, and offer letters and invention assignment and restrictive covenant agreements, dated as of the date hereof, duly executed by the Company and each individual listed on Schedule 2.5.1(iii) (the "Employment Agreements");

(iv) the resignations, effective as of the Closing, of those managers and officers of the Company set forth on Schedule 2.5.1(iv);

(v) evidence of the satisfaction of all payment obligations for Transaction Expenses and Company Indebtedness outstanding as of the Closing Date (including any interest, prepayment premiums or penalties and other fees and charges) or evidence of the arrangement of Seller or the Company, as applicable, to satisfy such payment obligations on the Closing Date pursuant to the terms of this Agreement, including true, correct and complete invoices or releases reflecting all Transaction Expenses and payoff letters or similar releases with respect to such Company Indebtedness, and the release of any Liens (except Permitted Liens) on the properties and assets of the Company and the termination of all UCC financing statements which have been filed with respect to such Company Indebtedness;

(vi) evidence that the notices to and Consents of, as applicable, the Governmental Authorities and the other Persons set forth on Schedule 2.5.1(vi) shall have been delivered, received or obtained, as applicable;

(vii) a copy of (a) the certificate of formation (or its equivalent) (together with any and all amendments thereto) of the Company, certified by the Secretary of State of the jurisdiction in which the Company was formed, as of a date not earlier than five (5) Business Days prior to the Closing, and (b) the Company A&R Operating Agreement and the operating agreement (together with any and all amendments thereto) of the Company, accompanied by a certificate of an authorized officer of the Company, dated as of the Closing Date, stating that no amendments have been made to such certificates of formation (or their equivalents) or operating agreements, except as provided in such attachments and except for the Second Amended and Restated Operating Agreement of the Company to be executed and delivered by the Parties at Closing;

(viii) the Company A&R Operating Agreement of the Company duly executed by Seller and the Management Investors;

(ix) a good standing certificate (or its equivalent) for the Company from the Secretary of State of the jurisdiction in which the Company is formed and from the Secretary of State in each other jurisdiction in which the Company is qualified to do business;

(x) a certificate of an authorized officer of the Company and of Seller certifying (A) the names and signatures of the officers of the Company and Seller authorized to sign the agreements, instruments, certificates and documents delivered by or on behalf of the Company and Seller pursuant to this Agreement, and (B) the resolutions of the board of directors of Seller, and resolutions of the managers and members of the Company, as applicable, approving this Agreement and the other agreements, instruments, certificates and documents delivered by or on behalf of Seller and the Company pursuant to this Agreement;

(xi) [reserved];

(xii) a properly completed and duly executed IRS Form W-9 from Seller;

(xiii) copies of all documents evidencing the Reorganization and the Recapitalization, including without limitation the Novation Agreements, the Original Contribution Agreement and the Contribution Agreement Amendment, duly executed by the parties thereto;

(xiv) copies of the Management Equity Purchase Agreement and the Management Promissory Notes, duly executed by the parties thereto;

(xv) copies of all documents evidencing the Class J Redemption, including without limitation, an assignment of the Class J Common Units, the Convertible Note and the Seller Earnout Agreement;

(xvi) evidence satisfactory to the Investors of the novation from Seller to the Company of all Government Contracts of the Business that are the subject of the Original Contribution Agreement;

(xvii) an Advisory Services Agreement by and among the Investors and the Company, duly executed by the Company (the "Advisory Agreement");

(xviii) the Loan and Security Documents, duly executed by the Company;

(xix) a Transition Services Agreement by and between the Company and Seller, in a form approved by the Investors (the "Transition Services Agreement"), duly executed by the Company and Seller;

(xx) the Original Contribution Agreement and the Contribution Agreement Amendment, duly executed by Seller and the Company; and

(xxi) such other agreements, instruments, certificates and documents as the Investors may reasonably request for the purpose of facilitating the consummation or performance of the transactions contemplated hereby.

2.5.2 Closing Deliveries of the Investors. At the Closing (or such earlier date if specified below), the Investors shall deliver the following items to Seller, each in form and substance satisfactory to Seller:

(i) the payments and deliveries on account of the Cash Purchase Price contemplated by Section 2.2.1;

(ii) the Investor Promissory Notes, duly executed by the Investors;

(iii) a counterpart of the Escrow Agreement, duly executed by the Investors and the Escrow Agent;

(iv) a certificate of an officer of each Investor certifying the names and signatures of the officers of such Investor authorized to sign this Agreement and the other agreements, instruments, certificates and documents delivered by or on behalf of such Investor pursuant to this Agreement;

(v) the Company A&R Operating Agreement of the Company duly executed by the Investors; and

(vi) a copy of the Advisory Agreement, duly executed by the Investors.

3. Representations and Warranties of the Investors. As a material inducement to Seller to enter into this Agreement, each Investor, severally and not jointly, hereby represents and warrants to Seller as set forth below:

3.1. Organization of Investors. The Investor is a limited liability company duly formed, validly existing, and in good standing under the Laws of the State of Delaware, and it has the requisite power and authority to conduct its business as it is now being conducted except where the failure to have such power or authority would not prevent the consummation of the transactions contemplated hereby.

3.2. Authorization of Transaction. The Investor has the requisite legal power and authority to sign, deliver, and perform, in accordance with their terms, this Agreement and any other agreements, instruments, certificates and documents contemplated hereby to which such Investor is a party and to consummate the transactions contemplated hereby and thereby. This Agreement and each other agreement, instrument, certificate and document contemplated hereby to which such Investor is a party has been duly and validly executed and delivered by such Investor. Assuming this Agreement and the other agreements, instruments, certificates and documents contemplated hereby to which such Investor is a party are duly and validly executed and delivered by the other parties hereto and thereto, this Agreement and each other agreement, instrument, certificate and document contemplated hereby to which such Investor is a party are the valid and legally binding obligations of such Investor, enforceable against such Investor in accordance with their respective terms.

3.3. Noncontravention. Neither the execution and the delivery of this Agreement and any other agreement, instrument, certificate and document contemplated hereby to which the Investor is a party, nor the consummation of the transactions contemplated hereby and thereby, will (i) violate any Law to which such Investor is subject or any provision of its organizational documents or (ii) conflict with, result in a breach of, constitute a default under, result in the acceleration of, create in any party the right to accelerate, terminate, modify, or cancel, or require any notice under any agreement, Contract, lease, Authorization, instrument, or other arrangement to which the Investor is a party or by which it is bound or to which any of its assets is subject (or result in the imposition of any Lien upon any of its assets).

3.4. Investment. The Investor is acquiring the Purchased Equity for its own account, for investment purposes only, and not with a view to any resale or public distribution thereof.

3.5. Broker Fees. The Investor has no liability or obligation to pay any fees or commissions to any broker, finder or agent with respect to the transactions contemplated by this Agreement for which Seller or the Company could become liable or obligated.

3.6. Litigation. There is no (i) outstanding Order, writ, injunction, fine, citation, award, decree or any other judgment of any kind whatsoever of any Governmental Authority against the Investor or (ii) Proceeding pending or, to the Investor's knowledge, threatened against such Investor, that in either case, challenge, or may have the effect of preventing, delaying, making illegal or otherwise interfering with the ability of such Investor to enter into this Agreement or the other agreements, instruments, certificates and documents contemplated hereby or to consummate the transactions contemplated hereby or thereby.

3.7. No Other Representations. The Investors acknowledge that, other than as set forth in Section 4, Section 5 and Section 9.1 of this Agreement, and the certificates delivered by Seller and the Company pursuant hereto, neither Seller, the Company nor any of their directors, officers, employees, Affiliates, stockholders, agents or representatives makes or has

made any representation or warranty to Investors, either express or implied, as to the Business or the Company, including (x) as to the accuracy or completeness of any of the information provided to the Investor or any of its agents, representatives, lenders or Affiliates or (y) with respect to any projections, forecasts, estimates, plans or budgets of future revenues, expenses or expenditures, future results of operations, future cash flows or future financial condition of the Business provided to the Investor or any of its agents, representatives, lenders or Affiliates, and, other than to the extent included or reflected in the representations and warranties expressly set forth in Section 4, Section 5 and Section 9.1 of this Agreement, and the certificates delivered by Seller and the Company pursuant hereto, no statement contained in any materials provided to the Investors relating to the matters described in clause (x) and (y) above shall be deemed to be relied upon by the Investors in executing, delivering and performing this Agreement. Notwithstanding anything herein, the representations and warranties expressly set forth in Section 4 and Section 5 of this Agreement are bargained for assurances and shall survive pursuant to their terms notwithstanding any knowledge or investigation of any Investor with respect thereto.

3.8. Restricted Securities; No Public Market. The Investor understands that the Purchased Equity has not been, nor will be, registered under the Securities Act, by reason of a specific exemption from the registration provisions of the Securities Act which depends upon, among other things, the bona fide nature of the investment intent and the accuracy of the Investor's representations as expressed herein. The Investor understands that the Purchased Equity is comprised of "restricted securities" under applicable U.S. federal and state securities Laws and that, pursuant to these Laws, the Investor must hold such securities indefinitely unless they are registered with the U.S. Securities and Exchange Commission and qualified by state authorities, or an exemption from such registration and qualification requirements is available. The Investor acknowledges that the Company has no obligation to register or qualify the Purchased Equity, or any class or type of equity into which any of the Purchased Equity may be converted, for resale except as may be set forth in the Second Amended and Restated Operating Agreement of the Company to be executed and delivered by the Parties at Closing. The Investor understands that no public market now exists for the Purchased Equity, and that the Company has made no assurances that a public market will ever exist for such securities.

3.9. Accredited Investor. The Investor is an accredited investor as defined in Rule 501(a) of Regulation D promulgated under the Securities Act.

3.10. No General Solicitation. Neither the Investor, nor any of its officers, directors, employees, agents, stockholders or partners has either directly or indirectly, including, through a broker or finder (i) engaged in any general solicitation, or (ii) published any advertisement in connection with the offer and sale of the Purchased Equity.

3.11. Non-Foreign Person. The Investor is not a "foreign person" within the meaning of the Defense Production Act of 1950, as amended, including all implementing regulations thereof, nor a "foreign person" within the meaning of the NISPOM.

3.12 Investor Expenses. The Investors confirm and agree that the Investor Expenses as of the Closing will not exceed One Million Sixty-Six Thousand One Hundred Four Dollars ($1,066,104). For the avoidance of doubt, the amount set forth in the immediately preceding sentence does not include the $250,000 Closing Fee as defined in and as provided under Advisory Agreement, which Seller has agreed to fund on behalf of the Company thereunder.

4. Representations and Warranties Regarding Seller. As a material inducement to the Investors to enter into this Agreement, Seller hereby represent and warrant to the Investors as set forth below:

4.1. Organization of Seller. Seller is a corporation duly incorporated, validly existing and in good standing under the Laws of the State of Delaware.

4.2. Authorization. Seller has the requisite legal power and authority to sign, deliver and perform, in accordance with their terms, this Agreement and any other agreements, instruments, certificates and documents contemplated hereby (including, for the avoidance of doubt, the Original Contribution Agreement, the Contribution Agreement Amendment and all other documents in connection with the Reorganization, the Recapitalization and the Management Purchase) to which Seller is a party and to consummate the transactions contemplated hereby and thereby. This Agreement and each other agreement, instrument, certificate and document contemplated hereby to which Seller is a party (including, for the avoidance of doubt, the Original Contribution Agreement, the Contribution Agreement Amendment and all other documents in connection with the Reorganization, the Recapitalization and the Management Purchase) have been duly and validly executed and delivered by Seller. Assuming this Agreement and the other agreements, instruments, certificates and documents contemplated hereby to which Seller is a party are duly and validly executed and delivered by the other parties hereto and thereto, this Agreement and each other agreement, instrument, certificate and document contemplated hereby to which Seller is a party are the valid and legally binding obligations of Seller, enforceable against Seller in accordance with their respective terms (subject to applicable bankruptcy, insolvency, reorganization, moratorium or other Laws affecting generally the enforcement of creditors' rights and subject to general principles of equity).

4.3. Ownership of the Purchased Equity. As of immediately prior to Closing, Seller is the sole record and beneficial owner of, free and clear of all Liens, and has good, valid and marketable title to, the Purchased Equity. Seller is not the subject of any bankruptcy, reorganization or similar Proceeding. Except for this Agreement and the Management Equity Purchase Agreement, (i) there are no outstanding Contracts or understandings between Seller and any other Person with respect to the acquisition, disposition, transfer, registration or voting of or any other matters in any way pertaining or relating to, or any other restrictions on any of the Purchased Equity or any other security of the Company and (ii) neither Seller nor any Management Investor has any right whatsoever to receive or acquire any membership interests, ownership interests, transferable interests or other securities in the Company.

4.4. Noncontravention. Except as set forth on Schedule 4.4, no Consent, exemption declaration by, filing with, other action by or notification to any Governmental Authority or any other Person is required in connection with the execution, delivery and performance by Seller of this Agreement or the other agreements, instruments, certificates and documents contemplated hereby to which Seller is a party or the consummation of the transactions contemplated hereby or thereby.

4.5. Proceedings. Except as set forth on Schedule 4.5, there are no (i) outstanding Orders against Seller, (ii) Proceedings pending or, to the Knowledge of Seller, threatened against Seller, or (iii) investigations by any Governmental Authority that are pending or, to the Knowledge of Seller, threatened against Seller that would reasonably be expected to give rise to any legal restraint or a prohibition against the transactions contemplated in this Agreement or seek to prevent, impair or delay Seller's ability to consummate the transactions contemplated by this Agreement.

4.6. Broker Fees. Except as set forth on Schedule 4.6, there are and will be no claims for brokerage commissions, finders' fees or similar compensation in connection with the transactions contemplated by this Agreement based on any Contract, arrangement or agreement to which Seller is a party or to which Seller is subject for which the Company, any Investor or any of their respective Affiliates could become obligated or incur as a Liability.

4.7. Foreign Person. Seller is not a "foreign person" as such term is defined in Section 1445 of the Code.

5. Representations and Warranties Regarding the Company. As a material inducement to the Investors to enter into this Agreement, Seller hereby represents and warrants to the Investors, except as set forth in a Disclosure Schedule explicitly referenced in this Section 5, as set forth below. For the avoidance of doubt, references in this Section 5 (other than those in Sections 5.1.1-5.1.3, 5.2, 5.3, 5.4, and 5.11) to the Company, include Seller to the extent such representations and warranties relate to the Business (i) prior to the execution of the Original Contribution Agreement (and, solely to the extent relating to additional assets and liabilities contributed to the Company by the Contribution Agreement Amendment, prior to the execution of the Contribution Agreement Amendment) or (ii), where the context relates to employees and independent contractors prior to termination of Employees and Independent Contractors by Seller and onboarding of the same with the Company.

5.1. Organization and Authority.

5.1.1 The Company is a limited liability company duly formed and validly existing under the Laws of the State of Delaware, is authorized to do business and in good standing in the State of Delaware and has complied with all filing requirements of the Secretary of State of the State of Delaware. The Company has all requisite power and authority to own, lease and operate its properties and carry on its business as now conducted. The Company has all requisite power and authority to enter into and deliver the agreements, instruments, certificates and documents contemplated hereby to which it is a party and to perform its obligations thereunder.

5.1.2 The Company is qualified to do business and is in good standing (or equivalent status) in each jurisdiction in which the property leased or operated by it or the nature of the business conducted by it makes such qualification necessary.

5.1.3 The copies of the Company's Governing Documents, which have been made available to the Investors, reflect all amendments thereto and are true, correct and complete in all respects.

5.1.4 The Books and Records of the Company which have been made available to the Investors are true, correct and complete in all material respects.

5.2. Authorization.

5.2.1 The execution, delivery and performance by the Company of the agreements, instruments, certificates and documents contemplated hereby to which the Company is a party and the consummation of the transactions contemplated hereby and thereby have been duly and validly authorized by all necessary limited liability company action.

5.2.2 Each such agreement, instrument, certificate and document contemplated hereby to which the Company is a party has been duly and validly executed and delivered by the Company.

5.2.3 Assuming the agreements, instruments, certificates and documents contemplated hereby to which the Company is a party are duly and validly executed and delivered by the other parties thereto, each such other agreement, instrument, certificate and document contemplated hereby to which the Company is a party are the valid and legally binding obligations of the Company, enforceable against the Company in accordance with their respective terms, except (i) to the extent that enforceability may be limited by applicable bankruptcy, insolvency, reorganization, moratorium or other laws affecting the enforcement of creditors' rights generally and (ii) that the availability of equitable remedies, including, specific performance, is subject to the discretion of the court before which any proceeding thereof may be brought.

5.3. Capitalization.

5.3.1 Schedule 5.3.1 accurately sets forth the authorized, issued and outstanding units, membership interests, ownership interests, transferable interests or other securities of the Company and the name and number of such securities held by each owner thereof.

5.3.2 All of the Class A-1 Preferred Units, the Class A-2 Preferred Units, Class J Common Units and Class B Common Units have been duly authorized, are validly issued, fully paid and nonassessable, and are owned of record and beneficially by Seller and the Management Investors, as applicable in accordance with Schedule 5.3.1, free and clear of all Liens, and are not subject to any preemptive, subscription or similar rights that will survive the Closing. Other than the Class A-1 Preferred Units, the Class A-2 Preferred Units, Class J Common Units and Class B Common Units held by Seller and the Class B Common Units held by Management Investors, there are no other membership interests, ownership interests, transferable interests, securities, participations or other equivalents (however designated and whether voting or nonvoting) of the Company issued or outstanding. No Class C Units are issued or outstanding. No current or former equity holder of the Company or any other Person is contesting the ownership of the Class A-1 Preferred Units, Class A-2 Preferred Units, Class J Common Units or Class B Common Units or any dividends, distributions or contributions relating thereto.

5.3.3 Except for this Agreement and as may be set forth on Schedule 5.3.3, there are no outstanding or authorized options, warrants, rights, Contracts, pledges, calls, puts, rights to subscribe, redeem, repurchase or otherwise acquire, conversion rights or other agreements, commitments or obligations (contingent or otherwise) to which the Company is a party or which is binding upon the Company providing for the issuance, sale, disposition or acquisition of any equity or any rights or interests exercisable therefor. There are no outstanding or authorized equity appreciation, phantom equity or similar rights with respect to the Company. The Company has not violated any foreign, federal or state securities or "blue sky" Laws in connection with the offer, sale or issuance of its membership interests (including the Class A-1 Preferred Units, the Class A-2 Preferred Units, Class J Common Units and the Class B Common Units). Except as set forth herein and except as set forth on Schedule 5.3.3, there are no Contracts to which the Company, any Management Investor or Seller is a party with respect to the voting or transfer of the Class A-1 Preferred Units, the Class A-2 Preferred Units, Class J Common Units, the Class B Common Units, the membership interests of the Company (including the Class C Units) or any other securities of the Company.

5.3.4 The Company does not own, directly or indirectly, (i) any Subsidiaries, (ii) with respect to any Person that is a corporation, any shares, interests, participations or other equivalents (however designated and whether voting or nonvoting) of capital stock of such Person or any right, warrant or option to acquire any of the foregoing, or

(iii) with respect to any Person that is not a corporation, any general partnership interests, limited partnership interests, membership or limited liability company interests, beneficial interests or other equity interests of or in such Person (including any common, preferred or other interest in the capital or profits of such Person, and whether or not having voting or similar rights), or any right, warrant or option to acquire any of the foregoing.

5.4. Noncontravention. Except as set forth on Schedule 5.4, the execution, delivery and performance of this Agreement and the other agreements, instruments, certificates and documents contemplated hereby to which the Company is a party, the consummation by the Company of each of the transactions contemplated hereby or thereby, and compliance by the Company with any provision hereof or thereof will not: (i) violate, conflict with, result in any breach or constitute a default (with or without notice or lapse of time, or both) under, result in, or give rise to a right of, termination, amendment, modification, cancellation or acceleration of any right or obligation under, or the loss of any benefit under, create in any party (including any Governmental Authority) the right to accelerate, terminate, modify, amend or cancel under, or require any notice or Consent under the Company's Governing Documents or any Material Contract or Authorization to which the Company is a party or by which any of its properties or assets are bound; (ii) result in the creation or imposition of any Lien (other than Permitted Liens) upon any property or assets, or any of the equity (including the Class A-1 Preferred Units, the Class A-2 Preferred Units, Class J Common Units and the Class B Common Units) or other securities, of the Company; (iii) contravene, conflict with, require any Consent or notice under or result in a violation or breach of the terms or requirements of any Law, Order to which the Company is subject or Authorization; or (iv) require any Consent, Order, declaration, filing, exemption or other action by or material notice to any Governmental Authority or other Person, except for filings pursuant to applicable securities Laws that will be made by the Company as required.

5.5. Real and Personal Property; Title to and Sufficiency of Assets.

5.5.1 The Company does not own any real property. Schedule 5.5.1 sets forth the address of each Leased Real Property, and a true and complete list of all Real Property Leases (including all amendments, extensions, renewals, guaranties and other agreements with respect thereto) for each such Leased Real Property (including the date and name of the parties to such Real Property Lease document). The Company has made available to the Investors true and complete copies of each of the Real Property Leases. Each Real Property Lease is legal, valid and binding on the Company, and, to Seller's Knowledge, enforceable in accordance with its terms against the Company and to Seller's Knowledge, the other party thereto (subject to applicable bankruptcy, insolvency, reorganization, moratorium or other laws affecting generally the enforcement of creditors' rights and subject to general principles of equity). The Company, and, to Seller's Knowledge, each of the other parties thereto, has performed in all material respects all obligations required to be performed by it under each Real Property Lease, and neither the Company nor, to Seller's Knowledge, any other party thereto is in breach of or in default in any material respect under any such Real Property Lease. Except as disclosed on Schedule 5.5.1, as of the date hereof (i) there are no written or oral subleases, concessions or other Contracts granting to any Person other than the Company the right to use or occupy any Leased Real Property, (ii) there are no outstanding options or rights of first refusal to purchase all or a portion of such properties, (iii) the Company's possession and quiet enjoyment of the Leased Real Property under such Real Property Lease is not being disturbed, and there are no disputes with respect to such Real Property Lease, and (iv) the Company has not assigned or granted any other security interest in such Real Property Lease or any interest therein.

5.5.2 Except as set forth on Schedule 5.5.2,

(a) the Company has a valid leasehold interest in all Leased Real Property and all leased Tangible Personal Property;

(b) the Company has good and valid title to all Tangible Personal Property;

(c) Each of the Original Contribution Agreement and the Contribution Agreement Amendment is valid, binding and enforceable among the parties thereto, and effectively transferred to the Company good and valid title to, leasehold interest in, and enforceable license or other right to use, all of the assets used in the operation of the Business, except for those assets and services to be provided to the Company pursuant to the Transition Services Agreement and the rights provided pursuant to Section 6.9 (Use of Name) of this Agreement;

(d) the Company owns all of its assets free and clear of all Liens (other than Permitted Liens); and

(e) (i) Except for those assets and services to be provided to the Company pursuant to the Transition Services Agreement and the rights provided pursuant to Section 6.9 (Use of Name) of this Agreement, the properties and assets (including any Intellectual Property) that were contributed to the Company pursuant to the Original Contribution Agreement and the Contribution Agreement Amendment, are sufficient for the continued conduct by the Company of the Business after the Closing in substantially the same manner as conducted immediately prior to the Reorganization, including without limitation being sufficient to permit the Company to perform its obligations under the Contracts assigned by Seller to the Company pursuant to the Original Contribution Agreement and the Contribution Agreement Amendment and (ii) the properties and assets currently owned by the Company (including any Intellectual Property) are sufficient for the continued conduct of the Company's business after the Closing in substantially the same manner as conducted immediately prior to the Closing, and constitute all of the rights, property, and assets necessary to conduct the business of the Company as currently conducted.

5.5.3 The Tangible Personal Property and Leased Real Property are in operating condition and repair (ordinary wear and tear excepted), and are adequate for the uses to which they are being put, and none of such Tangible Personal Property and to the Seller's Knowledge the Leased Real Property are in need of maintenance or repairs except for ordinary course, routine maintenance and repairs that are not material in nature or cost.

5.6. Broker Fees. Neither Seller nor the Company has Liabilities to pay any broker, finder, agent or any other fees or commissions in connection with the transactions contemplated by this Agreement. Seller, the Company and their Affiliates have not entered into any agreement that will result in Liabilities to the Investors for any broker, finder, agent or any other fees or commissions in connection with the transactions contemplated by this Agreement.

5.7. Financial Statements.

5.7.1 Attached as Schedule 5.7.1(i) are the following financial statements of the Business (the "Financial Statements"): the unaudited balance sheets of the Business as of December 31, 2021 (the "Latest Balance Sheet") and December 31, 2020 and the related unaudited statements of income for the annual periods then ended. The Financial Statements are consistent with and prepared in accordance with the Books and Records of Seller and the Company, present fairly in all material respects the financial condition of the Business as of the respective dates indicated and the results of operations for the respective periods covered

thereby. The Financial Statements have been prepared and determined in accordance with GAAP, consistently applied throughout, except for the deviations from GAAP set forth on Schedule 5.7.1(ii). Seller and the Company maintain systems of internal controls designed to provide reasonable assurances regarding the reliability of the Financial Statements in all material respects. There are no material or significant deficiencies in the internal controls of Seller or the Company that limit the reliability of the Financial Statements.

5.7.2 Schedule 5.7.2 sets forth a true, correct and complete list of (i) all bank accounts or other accounts, certificates of deposit, marketable securities, other investments and safe deposit boxes, lock boxes and safes of the Company and all Persons who are signatories thereunder or who have access thereto, and (ii) the names of all Persons holding general or special powers of attorney from the Company and a summary of the terms thereof. Effective at the Closing, assuming the consummation of the transactions contemplated herein, and except for the transactions contemplated by the Loan and Security Documents and herein (including for the avoidance of doubt the Earnout Payments), the Company will not have any Indebtedness.

5.7.3 All accounts receivable of the Business reflected on the Latest Balance Sheet, and all such accounts receivable generated since the date of the Latest Balance Sheet, are valid, bona fide obligations in favor of the Company arising from sales actually made or services actually rendered in the ordinary course of business of the Business. All of the accounts receivable of the Business are reflected properly on the Company's Books and Records There is no material contest, claim or right of set-off, other than returns or discounts in the ordinary course of business, under any Contract with any obligor of an accounts receivable relating to the amount or validity of such accounts receivable. The Company has remitted all payments to each of its suppliers, vendors and other third parties that are necessary to ensure that none of the accounts payable of the Business are overdue or in any condition other than good standing (according to each applicable supplier's, vendor's or other third party's terms) on the Closing Date, except where the amount thereof is being contested in good faith or would be immaterial.

5.8. No Undisclosed Liabilities. The Company has no Liabilities (whether absolute or contingent, matured or unmatured, known or unknown), including as a result of COVID-19 or any COVID-19 Measures, other than (i) Liabilities reflected on the Latest Balance Sheet, (ii) Liabilities which have arisen after the date of the Latest Balance Sheet in the ordinary course of business (none of which is a Liability related to any failure to perform, improper performance, warranty or other breach, default, violation, tort, infringement, claim or Proceeding), and (iii) executory obligations under Contracts to which the Company is a party or by which it is bound (but only to the extent that such Liabilities thereunder are required to be performed after the Closing Date, were incurred in the ordinary course of business and do not relate to any failure to perform, improper performance, warranty or other material breach, default or violation by Seller or the Company on or prior to the Closing or that result from the consummation of the transactions contemplated hereby).

5.9. Absence of Certain Changes. Since the date of the Latest Balance Sheet, Seller and the Company have operated the Business in the ordinary course of business, and except as set forth on Schedule 5.9:

5.9.1 there has not been any event, change, occurrence or circumstance in the operation of the Business (including any event, change, occurrence or circumstance caused by or related to COVID-19 or any COVID-19 Measures) that has had, or would be reasonably expected to have, a Material Adverse Effect;

5.9.2 the Company and Seller (solely with respect to the Business) have not sold, leased, transferred, licensed or assigned any material asset of the Business, excluding any inventory of the Business sold in the ordinary course of business;

5.9.3 the Company and Seller (solely with respect to the Business) have not experienced any damage, destruction or loss (whether or not covered by insurance) of the assets of the Business, involving more than $10,000 in any individual case of $20,000 in the aggregate;

5.9.4 the Company and Seller (solely with respect to the Business) have not canceled, compromised, waived or released any rights or claims or any payment owed to them in any case, involving more than $10,000 in the aggregate as solely related to the Business;

5.9.5 the Company and Seller (solely with respect to the Business) have not (i) granted or announced any increase in the base compensation, incentive awards, bonus or other compensation or employee benefits payable or to be provided to any of executive officers, employees or consultants of the Business (other than annual base salary increases for non-officer employees in the ordinary course of business consistent with past practice), (ii) established, adopted, amended or terminated any Employee Benefit Plan, (iii) taken any action to institute or grant any new severance or termination pay practices with respect to any current or former executive officers or employees, (iv) hired (other than to fill any vacancy) or fired any employee, or engaged or terminated any consultant, or (v) entered into, amended or terminated any collective bargaining agreement, works council agreement or similar agreement;

5.9.6 the Company and Seller (solely with respect to the Business) have (i) not adopted or changed any of their accounting (financial or Tax), practices, methods, reporting or procedures relating to the Business, (ii) made or changed any election in respect of Taxes relating to the Business, (iii) settled or compromised any Tax Liability, claim or assessment relating to the Business, (iv) entered into any closing agreement with a Taxing Authority relating to any Tax relating to the Business, (v) agreed to an extension or waiver of a statute of limitations period applicable to any Tax claim or assessment relating to the Business, (vi) failed to pay any Tax of the Business when due and payable, (vii) affirmatively surrendered any right to claim a Tax refund of the Business, or (viii) prepared or filed any Tax Return relating to the Business (or amendment thereof) unless such Tax Return shall have been prepared in a manner materially consistent with past practice of the Business;

5.9.7 the Company and Seller (solely with respect to the Business) have not implemented any plant closing or layoff of employees of the Business that could implicate the Worker Adjustment Retraining and Notification Act of 1988, as amended, or any similar state or local statute, rule or regulation;

5.9.8 the Company and Seller (solely with respect to the Business) have not amended, modified or terminated any employment or consulting agreement of any employee or consultant of the Business with annual cash compensation greater than $100,000;

5.9.9 the Company and Seller (solely with respect to the Business) have not sold, transferred, licensed, assigned, abandoned or otherwise disposed of any Intellectual Property of the Business, other than any abandonment or non-exclusive license of Intellectual Property to customers in the ordinary course of business;

5.9.10 the Company and Seller (solely with respect to the Business) have not modified, changed or terminated, or received written notice of termination or modification of, any Material Contract, Government Contract or Real Property Lease;

5.9.11 the Company and Seller (solely with respect to the Business) have not made any capital expenditure or commitments for capital expenditures relating to the Business, individually or in the aggregate, in excess of $25,000, or entered into any lease of capital equipment or real property for the Business;

5.9.12 other than in connection with the Reorganization, and pursuant to documents made available to the Investors by Seller, the Governing Documents of the Company have not been amended, restated or amended and restated;

5.9.13 the Company and Seller (solely with respect to the Business) have not entered into any settlement, conciliation or similar Contract relating to the Business, released any claims possessed by them relating to the Business, canceled any Indebtedness owed to them relating to the Business, or waived any rights of value of the Business, in each case involving amounts in excess of $20,000 in the aggregate;

5.9.14 the Company and Seller (solely with respect to the Business) have not conducted their cash management customs and practices other than in the ordinary course of business (including with respect to collection of accounts receivable, repairs and maintenance, payment of accounts payable, accrued expenses or other liabilities, levels of capital expenditures, pricing and credit practices and operation of cash management practices generally); and

5.9.15 the Company and Seller (solely with respect to the Business) have not agreed or committed to any of the foregoing.

5.10. Legal Compliance.

5.10.1 The Company and Seller (solely with respect to the Business) are in compliance in all material respects with all applicable Laws, Orders and Authorizations (including Laws relating to the import or export of goods, technology, or services or trading embargoes or other trading restrictions) applicable to its assets, properties or operation or the Business. All Authorizations required for the Company to own, lease, operate or use its assets and properties and to conduct the Business as currently conducted have been obtained and are valid and in full force and effect, except as set forth on Schedule 5.10. The Authorizations listed on Schedule 5.10 constitute all of the material Authorizations necessary for the Company to lawfully conduct and operate the Business as currently conducted and operated and to own and use its assets and properties as currently owned and used. The Company has obtained and is in compliance with all Authorizations listed on Schedule 5.10.

5.10.2 The Company is not, and has not been during the past three (3) years, in default under, or violation of, any such Authorization (and during the past three (3) years, the Company has not received any written notice of any such default or violation). To the Knowledge of Seller, no events, circumstances or state of facts exists which, with notice or the lapse of time or both, would reasonably be expected to constitute a default or violation of any such Authorization. There are no, and during the past three (3) years there have been no, Proceedings pending or, to the Knowledge of Seller, threatened relating to the nonrenewal, cancellation, suspension, revocation, termination or modification of any such Authorization. No Proceeding by any Governmental Authority with respect to the Company or the Business is pending or, to the Knowledge of Seller, threatened, nor has any Governmental Authority provided written notice to the Company of its intention to conduct the same. The Company (i) has not been charged with, and, to the Knowledge of Seller, is not under investigation with respect to, any actual or alleged violation of any applicable Law or other requirement of a Governmental Authority, (ii) is not party to or bound by any Order, and (iii) has not failed to file any report required to be filed with any Governmental Authority, except where the failure file

any such report would not reasonably be expected to be material to the Business or to any Material Contract.

5.11. Tax Matters. Except as set forth on Schedule 5.11:

5.11.1 The Company and Seller (solely with respect to the Business) have timely (taking into account automatic extensions of time not exceeding seven (7) months) filed all income and other material Tax Returns that they were required to file and have timely paid all Taxes (whether or not shown or required to be shown on such Tax Returns) on or before the Closing Date. The Company and Seller (solely with respect to the Business) are not currently the beneficiary of any extension of time within which to file any Tax Return other than automatic extensions of time not exceeding seven (7) months. All income and other material Tax Returns filed by the Company and Seller (with respect to the Business) were true complete and correct in all material respects and were prepared in substantial compliance with all applicable Laws. Seller (solely with respect to the Business) has not participated in a "listed transaction" as such term is defined in Treasury Regulation Section 1.6011-4(b)(2).

5.11.2 No deficiency in Taxes of the Company or Seller (solely with respect to the Business) for any Tax period has been asserted in writing by any Taxing Authority which remains unpaid at the date hereof. There is no action, suit, proceeding, audit, investigation or claim pending or, to Seller's Knowledge, threatened in respect of any Taxes for which the Company or Seller (solely with respect to the Business) is or may become liable, nor has any deficiency or claim for any such Taxes been proposed or asserted in writing or, to Seller's Knowledge, threatened. No written claim has ever been made in writing by a Taxing Authority in a jurisdiction in which the Company or Seller (solely with respect to the Business) does not file Tax Returns that the Company or Seller (solely with respect to the Business) is or may be subject to taxation in that jurisdiction. Seller has made available to the Investors accurate and complete copies of pro forma federal and state income (or franchise) Tax Returns filed by or solely with respect to the Company since its formation. The Company and Seller (solely with respect to the Business) do not currently have, and have never had, a permanent establishment (as defined by applicable tax treaty) in any foreign country.

5.11.3 Each of the Company and Seller (solely with respect to the Business) have materially complied with the provisions of the Code relating to the withholding and payment of Taxes, including the withholding and reporting requirements under Code Sections 1441 through 1464, 3401 through 3406, and 6041 through 6049, as well as similar provisions under any other Laws, and have, within the time and in the manner prescribed by applicable Law, withheld from employee wages and paid over to the proper Taxing Authority all amounts required to be remitted with respect thereto. During the three (3) year period prior to Closing, each of the Company and Seller (solely with respect to the Business) (i) have collected and remitted all applicable sales and/or use Taxes to the appropriate Taxing Authority, or (ii) have obtained, or made good faith efforts to obtain, any applicable sales and/or use Tax exemption certificates.

5.11.4 There are no outstanding written requests, agreements, consents or waivers to extend the statutory period of limitations applicable to the assessment or collection of any Taxes or deficiencies against Seller (solely with respect to the Business), other than pursuant to automatic extensions of time to file Tax Returns not exceeding seven (7) months.

5.11.5 There are no Liens (other than Permitted Liens) for Taxes (other than for Taxes not yet due and payable or which have been reflected on the Financial Statements) upon the assets of the Business.

5.11.6 Except as set forth on Schedule 5.11.6, Seller (solely with respect to the Business) has (i) properly complied with all requirements of applicable Tax Law in order to defer the amount of the employer's share of any "applicable employment taxes" under Section 2302 of the CARES Act, (ii) to the extent applicable, properly complied with all requirements of applicable Tax Law and duly accounted for any available Tax credits under Sections 7001 through 7005 of the Families First Coronavirus Response Act and Section 2301 of the CARES Act, and (iii) not sought (nor has any Affiliate that would be aggregated with the Company and treated as one employer for purposes of Section 2301 of the CARES Act sought) a covered loan under paragraph (36) of Section 7(a) of the Small Business Act (15 U.S.C. 636(a)), as added by Section 1102 of the CARES Act.

5.11.7 The Company is not a party to any joint venture, partnership, or contract that is treated as a partnership for federal income Tax purposes, in each case other than pursuant to the transactions contemplated by this Agreement. Neither the Company nor Seller (solely with respect to the Business) has ever owned, directly or indirectly, any equity interest in any controlled foreign corporation (as defined in Section 957 of the Code) or passive foreign investment company (as defined in Section 1297 of the Code).

5.11.8 For federal state and local Income Tax purposes, Luna Labs USA, LLC has been a "partnership" or "disregarded entity" as such terms are defined in Treasury Regulation Sections 301.7701-3(b)(i) and (ii) (and any corresponding provision of state or local Tax Law) at all times since the date of its formation and will be a partnership on the Closing Date. Luna Labs USA is a "partnership" on the date that the transactions that are the subject of this Agreement are consummated.

5.12. Government Contracts.

5.12.1 Schedule 5.12.1 sets forth (i) each Government Contact where either the period of performance has not yet expired or terminated or for which final payment and closeout have not yet occurred (the "Current Government Contracts"); (ii) Government Bids for which no award has yet been made; and (iii) each active Teaming Agreement.

5.12.2 Since January 1, 2016, the Company and Seller have materially complied with all terms and conditions of each Government Contract and Government Bid, as well as all Laws applicable to each Government Contract and Government Bid. Since January 1, 2016, neither any Governmental Authority nor any prime contractor or higher-tier subcontractor under a Government Contract has notified the Company or Seller in writing of any actual or alleged material violation or breach of any term or condition of a Government Contract, or of any actual or alleged material violation of any Law applicable to a Government Contract, and, to Seller's Knowledge, no such material violation or breach has occurred.

5.12.3 Since January 1, 2016, all representations and certification executed, acknowledged or set forth in all Government Contracts and Government Bids, have been and were current, accurate, and complete as of the date such representations and certifications were made, and the Company and Seller have complied with all such representations and certifications.

5.12.4 Since January 1, 2016, none of the Company's Government Contracts have been terminated for default, cause, or failure to comply with a material term or condition, nor has the Company received any written notice terminating any Government Contract for convenience or indicating an intention to terminate any Government Contract for convenience. Since January 1, 2016, no stop work orders, show cause notices, or cure notices have been issued to the Company with respect to any Government Contract.

5.12.5 Neither the Company, Seller, nor any of their officers, managers, directors, or, to Seller's Knowledge, employees is currently debarred or suspended, or proposed for debarment or suspension, from doing business with any Governmental Authority. No Governmental Authority has asked the Company or Seller, nor any of its officers, managers, or directors to show cause why they should not be debarred or suspended or to demonstrate their present responsibility for contracting. Neither the Company nor any of its owners, managers, directors, or, to Seller's Knowledge, employees have, since January 1, 2016, been accused of, convicted of, or had a civil judgment rendered against them for, the commission of fraud or a criminal offense in connection with a Government Contract or Government Bid.

5.12.6 The Company and Seller do not have credible evidence (i) that the Company, a Principal, Employee, Agent, or Subcontractor (as such terms are defined in FAR 52.203-13(a)) of the Company has committed a violation of federal criminal Law involving fraud, conflict of interest, bribery, or gratuity violations found in Title 18 of the United States Code or a violation of the civil False Claims Act; or (ii) of any significant overpayment(s) on any Government Contracts, and the Company and Seller have not conducted, and are not currently conducting, an investigation to determine whether credible evidence exists of such a violation or overpayment.

5.12.7 There exist (i) no outstanding claims or requests for equitable adjustment by or asserted in writing against or, to Seller's Knowledge, threatened claims or requests for equitable adjustment against the Company or Seller (solely with respect to the Business) by a Governmental Authority or by any prime contractor or subcontractor arising under any Government Contract, and (ii) no disputes between the Company or Seller (solely with respect to the Business) and a Governmental Authority or any prime contractor or subcontractor arising under any Government Contract, including but not limited to disputes under the Contract Disputes Act, 41 U.S.C. §§ 7101-7109. No Governmental Authority or higher tier contractor is withholding or setting off, or attempting to withhold or set off, amounts of money otherwise due to the Company or Seller (solely with respect to the Business) under any Current Government Contract. Since January 1, 2016, there has not been any withholding or setoff of any material payments by a Governmental Authority, prime contractor or higher-tier subcontractor of any payments due to the Company or Seller (solely with respect to the Business) under any Government Contract. To Seller's Knowledge, no Current Government Contract or outstanding Government Bid is the subject of a bid protest or size protest proceedings or any Governmental Authority corrective action enacted in response to a previous bid protest or size protest proceeding.

5.12.8 Since January 1, 2016, the Company and Seller have not received written notice that they are (or since January 1, 2016, have been) under administrative, civil or criminal investigation relating to a Government Contract or Government Bid, by any Governmental Authority, and, to Seller's Knowledge, there is no pending or threatened audit or investigation of the Company by any Governmental Authority with respect to any alleged material irregularity, misstatement, omission or violation of Law arising under or relating to a Government Contract or Government Bid.

5.12.9 Except as set forth in Schedule 5.12.9 (setting forth the relevant Government Contract, fiscal year, or other subject being audited, investigated, surveyed, or examined, as well as whether a report was issued and the result of any such audit, investigation, survey, or examination), since January 1, 2016, there has not been any audit, investigation, inspection, survey or examination of records by a Governmental Authority of the Company or its owners, or any of their Government Contracts or Government Bids, or of the Company or owner employee or representative with respect to such Government Contracts or Government Bids.

The written findings or reports of all audits, investigations, inspections, surveys, and examinations of records set forth in Schedule 5.12.9 have been made available to the Investors.

5.12.10 Except as set forth in Schedule 5.12.10, no (i) Current Government Contract of the Company or its owners was awarded to the Company or Seller (solely with respect to the Business) pursuant to a procurement process that was restricted or set aside to bidders having socioeconomic preferential status (small business, small disadvantaged business, 8(a) concern, woman owned small business, veteran owned business, service disabled veteran owned small business, HUBZone, disadvantaged business entity, minority business entity, etc.) under the Small Business Act, as amended, or any other similar federal, state, or local law ("Preferred Bidder Status"), and (ii) no outstanding Government Bids, if awarded to the Company would result in a Government Contract reserved or set-aside for companies having a Preferred Bidder Status

5.12.11 Since January 1, 2016, the Company and Seller (solely with respect to the Business) have not received a substantially adverse or negative past performance evaluation or rating (including but not limited to reports issued in the Contractor Performance Assessment and Rating System ("CPARS")), and no such past performance evaluation or rating has assessed an adjectival rating less favorable than "Satisfactory" or has stated that a contracting official would not award a contract to the Company or Seller (solely with respect to the Business). All existing CPARS reports issued since January 1, 2016 relating to the Company or Seller (solely with respect to the Business) and in the Company or Seller's possession have been made available to the Investors.

5.12.12 The Company and Seller (solely with respect to the Business) have timely reported subject inventions, have timely elected title in patents, and have timely applied for patents as required under the terms of the Company's and Sellers' (solely with respect to the Business) Government Contracts, and have taken all other measures required by Law or reasonably necessary to prevent to the greatest extent possible a Governmental Authority from taking title in any patents or subject inventions material to the Company. The Company and Seller (solely with respect to the Business) have timely, accurately, and in the proper form filed assertions and placed markings required to grant each Governmental Authority no more than the minimum rights required by Law and the terms of the Company's and Seller's Governmental Contracts for computer software or technical data delivered, ordered, or subject to deferred ordering under the Company's and Sellers' (solely with respect to the Business) Government Contracts.

5.12.13 Schedule 5.12.13 lists all requests by the Company and Seller (solely with respect to the Business) made to Governmental Authorities, prime contractors, and higher-tier subcontractors pursuant to Government Contracts seeking reimbursement for paid leave provided to contractor employees to keep them in a ready state pursuant to Section 3610 of the CARES Act. All such Section 3610 reimbursement requests were made in good faith and in full compliance with the terms and conditions of Government Contracts, the CARES Act, and any agency implementing regulations, directives, or class deviations or policies.

5.12.14 The Company and Seller (solely with respect to the Business) is not currently performing any Current Government Contract, and is not performing work in anticipation of award of a Government Contract or option under a Current Government Contract, prior to award, option exercise or modification or making any expenditures or incurring costs or obligations in excess of any applicable limitation of government liability, limitation of cost, limitation of funds or similar clause limiting the U.S. Government's liability on any Current Government Contract or anticipated Government Contract, including but not limited to any work being performed "at risk" in advance of receipt of funding or funding commitments.

5.12.15 The Company and Seller have complied in all respects with (i) all requirements relating to the safeguarding of, and access to, classified information under each Government Contract and (ii) any Law relating to the safeguarding of, and access to, classified information; and all violations thereof have been reported to the appropriate Governmental Authority and contracting parties as required by any Government Contracts or any Law relating to the safeguarding of, and access to, classified information.

5.12.17 Since January 1, 2016, the Company and Seller have complied in all material respects with all necessary data security, cybersecurity, and physical security systems and procedures and all applicable Laws and Government Contract requirements restricting the access to, or dissemination of sensitive information, including 48 C.F.R. 252.204-7012, National Institute of Standards and Technology Special Publication 800-171, the International Traffic in Arms Regulations (22 C.F.R. Subchapter M), and the National Industry Security Program Operating Manual (32 C.F.R. Part 117). Any data security, cybersecurity or physical security breaches related to any Government Contract has been reported to any applicable Governmental Authority or higher tier contractor to the extent required by Law or Government Contract.

5.12.18 Seller has requested that the Defense Counterintelligence and Security Agency ("DCSA") transfer ownership of the facility clearance belonging to Seller under Commercial and Government Entity Code 8JML8 to the Company, and Seller and the Company have provided all information requested or required by DCSA to effectuate the change in ownership.

5.13. Intellectual Property.

5.13.1 Schedule 5.13.1 lists all Intellectual Property currently owned or purported to be owned by the Company that is: (i) subject to any issuance, registration, application or other filing by, to or with any Governmental Authority or authorized private registrar in any jurisdiction, indicating for each, the applicable jurisdiction, title, registration number (or application number), and the date issued (or date filed) (the "Intellectual Property Registrations"); and (ii) material to the operation of the Business, but are not subject to any issuance, registration, application or other filing by, to or with any Governmental Authority or authorized private registrar in any jurisdiction. All required filings and fees related to Intellectual Property Registrations have been timely filed with and paid to the relevant Governmental Authorities and authorized registrars.

5.13.2 Schedule 5.13.2 contains a complete and accurate list of all Software owned or purported to be owned by the Company which is material to the operation of the Business (the "Purchased Software"), including (i) the name of the Software, and (ii) a description of the Software. Neither the Company nor any Person acting on the Company's behalf has disclosed, delivered or licensed to any Person, agreed to disclose, deliver or license to any Person, or permitted the disclosure or delivery to any escrow agent or other Person of, any source code to the Purchased Software ("Company Source Code"). No event has occurred, and no circumstance or condition exists, that (with or without notice or lapse of time or both) will, or would reasonably be expected to, result in the disclosure or delivery by or on behalf of the Company of any Company Source Code. The Company possesses and otherwise maintains at least one (1) copy of the Company Source Code.

5.13.3 Schedule 5.13.3 contains a complete and accurate list of all Publicly Available Software that is incorporated into any Software distributed by the Company. The Company is in, and in the past three (3) years has been in, compliance in all material respects with all applicable licenses with respect to Publicly Available Software, including all

notice and attribution requirements. None of the Purchased Software incorporates, embeds, or is distributed or installed with, statically or dynamically links with, or otherwise interacts with any Publicly Available Software or other elements in a manner that results in any obligation to distribute, license or otherwise make available Purchased Software, either in whole or in part: (i) in source code form; (ii) on a royalty-free basis; (iii) for the purpose of making derivative works; or (iv) in a manner that would obligate the Company to covenant not to sue third persons for infringement of the Company Intellectual Property.

5.13.4 Schedule 5.13.4 contains a complete and accurate list of (i) all Contracts by or through which other Persons grant the Company rights or interests in or to any Intellectual Property that necessary for the conduct of the Business (excluding Contracts for COTS Software, Contracts between the Company and its employees that are in the Company's standard form of proprietary information and inventions assignment agreements, and Contracts for Publicly Available Software), and (ii) all Contracts by or through which the Company grants other Persons rights or interests in or to any Intellectual Property (excluding non-exclusive licenses to customers and other end users pursuant to the Company's standard form of agreements, in each case without material deviation therefrom) (the "Intellectual Property Licenses"). The Company has provided the Investors with true, correct and complete copies of all Intellectual Property Licenses. All Intellectual Property Licenses are valid, binding and enforceable between the Company and, to the Knowledge of Seller, the other parties thereto. The Company is not and, to the Knowledge of Seller, no other party thereto is in material breach of or default under (or is alleged to be in material breach of or default under) or has provided or received any written notice of material breach or default of or any intention to terminate for material breach or default, any Intellectual Property License. The consummation of the transactions contemplated by this Agreement will not cause the termination or impairment of any rights granted under any Intellectual Property License.

5.13.5 The Company exclusively owns all right, title and interest in and to, free and clear of Liens (other than Permitted Liens), or has the right to use pursuant to a valid and enforceable written Intellectual Property License, all of Intellectual Property that is necessary for the conduct of the Business as presently conducted, including the Intellectual Property owned or purported to be owned by the Company and the Intellectual Property licensed to the Company pursuant to the Intellectual Property Licenses (collectively, the "Company Intellectual Property"). The Company Intellectual Property will be owned and available for use by the Company following the Closing on substantially identical terms and conditions as it was owned or available for use by the Company prior to the Closing. The Company Intellectual Property, together with the Intellectual Property licensed to the Company pursuant to the Intellectual Property Licenses, constitutes all of the Intellectual Property necessary for the conduct of the Business as currently conducted.

5.13.6 Neither the Company Intellectual Property owned or purported to be owned by the Company, nor the Company's conduct of the Business, as currently conducted and has been conducted during the six (6) years prior to the date hereof, has or does infringe(d), violate(d) or misappropriate(d) any Intellectual Property right of any Person. None of the Company Intellectual Property is subject to any outstanding Order and the Company has not received any communication, and no Proceeding has been instituted, settled or, to the Knowledge of Seller, threatened that alleges any such infringement, violation or misappropriation. The Company is not aware of any facts or circumstances that could reasonably be expected to give rise to any such Proceeding. To the Knowledge of Seller, no Person is misappropriating, violating or infringing upon, or has misappropriated, violated or infringed during the six (6) years prior to the date hereof, the Company Intellectual Property owned or purported to be owned by the Company. No employee or consultant of the Company has claimed rights to or any interests in or to any of the Company Intellectual Property.

5.13.7 Except as set forth on Schedule 5.13.7, the Company has entered into written Contracts, in the form of the Company's standard form agreement, with each current and former employee, consultant, or independent contractor who has contributed to the invention, creation, or development of any Company Intellectual Property Rights during the course of employment or engagement with the Company whereby such Person: (i) acknowledges the Company's exclusive ownership of all Intellectual Property invented, created, or developed by such Person within the scope of such Person's engagement or other relationship with the Company; (ii) grants to the Company an assignment of any and all ownership interests such Person may have in or to such Intellectual Property; and (iii) waives any right or interest regarding any such Intellectual Property, to the extent permitted by applicable Law. To the extent such Contracts relating to the Business were entered into with Seller, such Contracts have been assigned to the Company prior to Closing.

5.13.8 The Company has taken reasonable and appropriate steps to protect the Company's rights in confidential information and trade secrets of the Company or provided by any other Person to the Company. Without limiting the foregoing, the Company has, and enforce, policies requiring each employee, consultant, and contractor to execute proprietary information, confidentiality and assignment agreements substantially in the Company's standard forms, and all current and former employees, consultants and contractors of the Company have executed such an agreement in substantially the Company's standard form. To the extent such Contracts relating to the Business were entered into with Seller, such Contracts have been assigned to the Company prior to Closing.

5.13.9 Neither this Agreement nor the transactions contemplated by this Agreement will result in: (i) the Company granting to any third party any right to or with respect to any Company Intellectual Property, (ii) the Company being bound by or subject to, any exclusivity obligations, non-compete or other restriction on the operation or scope of the Business, or (iii) the Company being obligated to pay any royalties or other material amounts to any third party in excess of those payable in the absence of this Agreement or the transactions contemplated hereby.

5.13.10 No Company Intellectual Property owned or purported to be owned by the Company is subject to any proceeding or outstanding decree, order, judgment or settlement agreement or stipulation that restricts in any manner the use, transfer or commercialization thereof by the Company.

5.13.11 Except as set forth on Schedule 5.13.11(a), no funding, facilities or resources of a Governmental Authority or a university, college, other educational institution or research center was used in the development of the Company Intellectual Property owned or purported to be owned by the Company, and except as set forth on Schedule 5.13.11(a) (setting forth the funding Contract or instrument, an identification of the segregable item of Company Intellectual Property, and the rights that have been asserted by the Company and its owners to the Governmental Authority), no Governmental Authority, university, college, other educational institution or research center has any claim or right in or to the Company Intellectual Property owned or purported to be owned by the Company, beyond those non-exclusive rights granted by the Company to its customers in the ordinary course of business on Company's standard form so customer Contracts. Except as set forth on Schedule 5.13.11(b), no current or former employee, consultant or independent contractor of the Company who contributed to, the creation or development of any Company Intellectual Property was simultaneously engaged to provide services for the government, a university, college or other educational institution, or a research center, during the period of time during which such employee, consultant or independent contractor was also employed or engaged to perform services for the Company.

5.14. Contracts and Commitments.

5.14.1 Schedule 5.14.1 sets forth a true, correct and complete list of the following Contracts (together with any amendments, modifications and supplements thereto or waivers thereunder) to which the Company is currently a party, other than Current Government Contracts and Government Bids, which are listed on Schedule 5.12.1, and Intellectual Property Licenses, which are listed on Schedule 5.13.4 (collectively, and together with the Government Contracts and Government Bids set forth on Schedule 5.12.1 and the Intellectual Property Licenses set forth on Schedule 5.13.4, the "Material Contracts"):

(a) all Contracts (or group of related Contracts with respect to a single transaction or series of related transactions) that that involve future payments, performance of services or delivery of goods or materials (including for the avoidance of doubt any Contract for capital expenditures or the acquisition or construction of fixed assets) of any amount or value reasonably expected to exceed $250,000 in any future twelve (12)-month period, except for employment agreements or offer letters with employees of the Company;

(b) all agreements with a Transferred Employee pursuant to which such Transferred Employee is entitled to receive base annual compensation or fees in excess of $150,000 from the Company or Seller;

(c) severance, termination, retention, non-competition or change of control agreement with any Employee, officer or Independent Contractor or agreements relating to loans to officers, managers, members, Employees, Independent Contractors or Affiliates, in all cases, that provide for in excess of $10,000 in any instance, or any collective bargaining agreement or any other Contract with any labor union, labor organization or other representative of employees;

(d) all Contracts relating to any Employee Benefit Plan;

(e) all security agreements, purchase money agreements, conditional sales contracts, capital leases or other similar agreements created or assumed by, or permitted to be created by written document made or accepted by, the Company and any other Contract, in each case granting a Lien on any asset of the Company;

(f) all franchise, distributorship, partnership or joint venture agreements or other agreements involving a sharing of profits and losses by the Company with any other Person (other than marketing or endorsement agreements under which aggregate annual payments do not exceed $10,000);

(g) all agreements for the acquisition or sale of substantially all of the assets or any of the outstanding voting equity securities of any Person or any business and each agreement relating to a merger or consolidation with any Person with respect to the Business (other than this Agreement);

(h) all Contracts with a Material Customer or Material Supplier;

(i) all Contracts between the Company, on the one hand, and an Affiliate of the Company, on the other hand;

(j) all Contracts relating to indebtedness (including guarantees thereof) of the Company;

(k) all Contracts under which the Company is a lessee of, holds or operates, Tangible Personal Property owned by any other Person, except for any agreement under which the aggregate rental payments would not reasonably be expected to exceed $100,000 in any future twelve (12)-month period;

(l) all Contracts under which the Company is a lessor of or permits any Person to hold or operate any Tangible Personal Property owned or controlled by the Company, except for any agreement under which the aggregate rental payments would not reasonably be expected to exceed $25,000 in any future twelve (12)-month period;

(m) Contracts or agreements containing any covenants that in any way purport to restrict the Company's business activity, location or limit the freedom of the Company to engage in any line of business, to compete with any Person or to employ or solicit, hire or engage the services of any Person, including most favored customer/nation or supplier provisions, rights of first refusal or rights of first negotiation or similar rights, requirements to purchase or sell a stated portion of the requirements or outputs of the Business or that contain "take or pay" provisions, exclusivity provisions or other limitations on the Company's right to sell any product or service or to purchase or otherwise obtain intellectual property of any nature whatsoever;

(n) the Original Contribution Agreement and the Contribution Agreement Amendment;

(o) the Novation Agreements;

(p) all agreements that relate to a settlement, release, compromise or waiver of any material rights, claims, obligations, duties or Liabilities that relate exclusively to the Business

(q) any Contract for the sale of any assets, properties or rights of the Company other than the sale of services or products in the ordinary course of business;

(r) all Real Property Leases and any Contract pursuant to which the Company is a lessor of real property under which the aggregate annual rent or lease payments do not exceed $50,000;

(s) any Contract providing for payments, rebates, discounts or other allowances, credits or deductions to or by any Person based on sales, purchases or profits, and a description of any Liability with respect to any such payments, rebates, discounts or other allowances, credits or deductions that the Company will or may have to any Person based on sales, purchases or profits that occurred prior to the Closing;

(t) each written warranty, guaranty or other similar undertaking with respect to contractual performance extended by the Company, other than in the ordinary course of business; and

(u) any other Contract that is material to the Company or the Business and it not terminable upon ninety (90) days' notice or less without any Liability to the Company, except Liabilities with respect to products or services ordered before the termination thereof any not previously disclosed pursuant to this Section 5.14.1.

5.14.2 Seller has made available to the Investors true, correct and complete copies of all Material Contracts and true, correct and complete descriptions of all

material terms of any oral Contracts described therein. With respect to each of the Material Contracts: (i) such Contract is in full force and effect and is the legal, valid and binding obligation of the Company and, to the Knowledge of Seller, of the other parties thereto and enforceable against the Company and, to the Knowledge of Seller, against the other parties thereto in accordance with its terms (in each case, subject to any applicable bankruptcy, insolvency, reorganization, moratorium or other Laws affecting generally the enforcement of creditors' rights and subject to general principles of equity); (ii) the Company is not in breach or default (other than a *de minimis* breach or default) under any such Contract, and to the Knowledge of Seller, nor is any other party thereunder, and no event has occurred that, with the lapse of time or the giving of notice or both, would constitute a breach or default (other than a *de minimis* breach or default) by the Company or, to the Knowledge of Seller, any other party thereunder, give the Company or any other party thereunder the right to exercise any remedy under, or to accelerate the maturity or performance of, or payment under, or to cancel, terminate or modify, any such Contract (including as a result of COVID-19 or COVID-19 Measures), or cause the creation of any Lien on any of the Company's assets; and (iii) no party to any of such Contracts has given written notice or, to the Knowledge of Seller, oral notice of any dispute with respect to such Contract. No other party to any Contract required to be listed in Schedule 5.14.1 or any Government Contract or Government Bid has given written notice or, to the Knowledge of Seller, oral notice of its intention to cancel or terminate any such Contract or to decrease, limit or modify the goods or services purchased from, or provided to, the Company under any such Contract.

5.14.3 There are no Material Contracts that cannot be readily fulfilled or performed by the Company without undue or unusual expenditure of money or preparation, action or arrangement outside of the ordinary course of business as a result of COVID-19 or any Laws related thereto. No counterparty to any Material Contract has indicated a desire to renegotiate such Material Contract as a result of COVID-19 or any Laws related thereto. The Company has not received any written notice pursuant to a force majeure clause of any Material Contract from any counterparty to such Material Contract to excuse non-performance of contractual obligations due to business interruptions or losses caused by COVID-19.

5.15. Product and Service Warranties. Except as set forth on Schedule 5.15(i) or specifically reflected, reserved against (all such reserves being made in accordance with GAAP) or otherwise disclosed on the Latest Balance Sheet, there are no pending or, to the Knowledge of Seller, threatened claims, Proceedings or investigations with respect to any unresolved warranty or guarantee concerning any product sold by the Company or any services rendered by the Company. Schedule 5.15(ii) sets forth a list of all customer claims with respect to any warranty or guarantee with respect to products sold or services offered by the Company or Seller (solely with respect to the Business) in the prior two (2) years.

5.16. Insurance. Schedule 5.16 sets forth an accurate description of each insurance policy (including whether such policy is claims made or occurrence based) currently utilized and/or maintained by the Company with respect to its properties, assets, employees and Business issued by responsible insurance companies, in such types and amounts and covering such risks as are necessary for the operation of the Business. All of such insurance policies are, and immediately following the Closing will continue to be, legal, valid, binding and enforceable and in full force and effect, and the Company is not in breach or default (or with the giving of notice or lapse of time or both, would be in breach or default) with respect to its obligations under such insurance policies (including with respect to payment of premiums). Except as set forth on Schedule 5.16, the Company maintains all insurance policies required to be maintained by them pursuant to the terms and conditions of any active Contract with any customer or supplier of the Business. As of the date hereof, the Company has not received (i) notice of cancellation or notice of failure to renew of any such insurance policy or refusal of coverage

thereunder, (ii) written notice that any issuer of such policy has filed for protection under applicable bankruptcy Laws or is otherwise in the process of liquidating or has been liquidated, (iii) notice of any material adjustment in the amount of the premiums payable with respect to any such insurance policy, nor (iv) any other notice that such policies are no longer in full force or effect or that the issuer of any such policy is no longer willing or able to perform its obligations thereunder. All premiums payable with respect to such policies that are due and payable have been paid, and the Company has timely filed all claims under such insurance policies. Except as set forth on Schedule 5.16, there is no pending claim under any such insurance policy.

5.17. Litigation. Except as set forth on Schedule 5.17(i), there is no (i) outstanding Order, writ, injunction, fine, citation, award, decree or any other judgment of any kind whatsoever of any Governmental Authority against Seller, the Company, the Business or any of their properties or assets, or (ii) pending Proceeding of any kind or nature whatsoever, or to the Knowledge of Seller, threatened, against Seller or the Company (including any of their assets or properties) or the Business, and Seller has no Knowledge of any basis for any of the foregoing. There are no Proceedings pending or, to the Knowledge of Seller, threatened, against Seller, the Company or the Business which would give rise to any right of indemnification on the part of any officer, equity holder, manager, director, employee or agent of the Company or heirs, executors or administrators thereof against the Company or any successors. Schedule 5.17(ii) sets forth each Proceeding against Seller (solely with respect to the Business), the Company or the Business in the three (3) years prior to the date hereof that has been fully adjudicated, settled, resolved or otherwise is no longer pending as of the Closing Date.

5.18. Employees and Independent Contractors.

5.18.1 Schedule 5.18.1 contains a complete list of the names of all Persons who are Employees or Independent Contractors of the Company as of the date hereof, specifying (i) with respect to each hourly Employee, the title, rate of hourly pay and location(s) where such Employee works, in each case, as of the Closing Date, (ii) with respect to each salaried Employee, the title, rate of salary and commission, incentive-based compensation and bonus structure and location(s) as of the Closing Date, (iii) with respect to each Independent Contractor, location(s) where such Independent Contractor performs services, amounts earned for such services in 2020, and the compensation arrangement as of the Closing Date, and (iv) with respect to each such Person (a) the date of hire or engagement, and (b) if an Employee, (1) whether the Employee is classified as exempt or non-exempt under any of the following: the Fair Labor Standards Act and any other applicable wage and hour Law, (2) whether or not such Employee is furloughed, on a leave of absence, on short or long term disability, or out of work as a result of a workers' compensation claim and, if so, the date such absence began and the anticipated date of return, (3) the state and country in which such Person is employed and (4) any outstanding loans or advances made to them. Except as set forth on Schedule 5.18.1, the Company has the right to terminate the employment of each of its employees at will, and to terminate the engagement of any of their Independent Contractors or leased Employees without payment (whether for compensation or benefits) to such leased Employee or Independent Contractor other than for services rendered through termination. The Employees, Independent Contractors and leased Employees previously employed or engaged by Seller and whose work pertains to the Business have been terminated by Seller and hired or engaged by or on behalf of the Company prior to the date of this Agreement. Prior to the date hereof, the Company (for purposes of this sentence only, the Company shall only be interpreted to include Luna Labs USA, LLC) has never had any Employees or Independent Contractors.

5.18.2 To the Knowledge of Seller, no outside sales representatives, consultants, independent contractors, expressly including contract or leased workers employed by temporary hiring agencies which provide services to or one behalf of the Company, in all

cases, providing services to the Business (collectively, "Independent Contractors") has any reasonable basis to claim status as an Employee of the Company. Each of the Company and Seller (solely with respect to the Business) have accurately classified all service providers as either employees or independent contractors for all Tax purposes. The Company has not incurred, and to Seller's Knowledge, no circumstances exist under which the Company likely would incur, any Liability arising from the misclassification of Independent Contractors. During the three (3) year period prior to Closing, the Company has accurately reported the compensation of each Independent Contractor on IRS Form 1099 or other applicable Tax forms for independent contractors when required to do so. To Seller's Knowledge, there are no facts or circumstances that would be likely to cause Liability to the Company from an Independent Contractor being deemed an Employee of the Company.

5.18.3 Except as set forth on Schedule 5.18.3, no Proceeding is pending or has existed during the past three (3) years, or, to the Knowledge of Seller, is threatened against the Company by or on behalf of any past or present Employee or applicant for such employment with the Company, or any past or present Independent Contractor or any Governmental Authority as to any Employee or Independent Contractor. There is currently no, and during the past three (3) years, there has been no, material violation of any Contract between the Company, on one hand, and any Employee, leased employee of the Company or Independent Contractor, on the other hand. Excluding amounts to be paid under the current payroll cycle, the Company has paid in full to all of its Employees and Independent Contractors all wages, salaries, bonuses, earned commissions and other compensation due and payable to them or otherwise arising under any applicable Law, plan, policy, practice, program or agreement and has not unlawfully withheld any such wages, salaries, bonuses, benefits, commissions or other compensation. The Company has properly withheld all amounts required by Law or agreement to be withheld from the wages or salaries due to its employees. Except as set forth on Schedule 5.18.3, there are no outstanding, and during the past three (3) years there have been no, Orders or settlements to which the Company is a party or which otherwise binds the Company with respect to any Liability related to its Employees or former Employees, its leased Employees or former leased Employees, its Independent Contractors or former Independent Contractors, or the Business.

5.18.4 The Company is, and has been for the past three (3) years, in compliance in all material respects with all applicable Laws relating to employment and employment practices (including the appropriate designation of individuals as contractors or Employees, and the proper designation of certain employees as "exempt"), workers' compensation, terms and conditions of employment, worker safety (including the federal Occupational Safety and Health Act and any related applicable state or local Laws relating to COVID-19 workplace requirements), wages and hours, employee accommodation and leave issues (including the federal Americans with Disabilities Act, Family and Medical Leave Act, Emergency Paid Sick Leave Act, the Emergency Family and Medical Leave Expansion Act, and any related applicable state or local Laws relating to COVID-19 leave), civil rights, discrimination, harassment, retaliation, whistleblowing, immigration, and plant closing and layoffs (including WARN). The Company has not effectuated a "plant closing" or "mass layoff" (each as defined in WARN) or taken any other action that would trigger notice or Liability under any applicable state, local or foreign plant closing and/or mass layoff notice Law. The Company is, and has been, in compliance with WARN. The Company has not had any mass layoffs of Employees within ninety (90) calendar days prior to the Closing Date. All Employees are, and all former employees of the Company whose employment was terminated, voluntarily or involuntarily, within the three (3) years prior to the date of this Agreement, were legally authorized to work in the United States. Further, at all times prior to the date of this Agreement, the Company was in material compliance with both the applicable employment verification provisions (including the paperwork and documentation requirements and completion of I-9 Forms). The Company has complied in all material respects with all regulations, including all

applicable state and local orders, and Occupational Safety and Health Administration and Centers for Disease Control and Prevention requirements, pertaining to conducting business in light of COVID-19.

5.18.5 Except as set forth on Schedule 5.18.5, to Seller's Knowledge, no Employee is a party to or is bound by any confidentiality agreement, non-competition agreement or other Contract (with any Person) that would be reasonably likely to have an adverse effect on the performance by such Employee of any of his duties or responsibilities as an Employee.

5.18.6 Except as set forth on Schedule 5.18.6, no Employee paid in excess of $100,000 has terminated his or her employment, or to Seller's Knowledge, intends to terminate his or her employment, within six (6) months prior to the date hereof. During the three (3) year period prior to Closing, the Company has utilized proper risk classification codes and descriptions in accordance with all applicable workers' compensation Laws. No Employee has made a workers' compensation claim based on or relating to COVID-19.

5.18.7 Except as set forth on Schedule 5.18.7, the Company is not subject to any strike, picketing, work slowdown, work stoppage or lockout or, to the Knowledge of Seller, any threats thereof, nor has there been any such activity within the past three (3) years. The Company is not party to, and are not otherwise bound by, any Contract, collective bargaining agreement or any other type of agreement with any labor organization or other representative of any of their respective Employees, and no such Contract, collective bargaining agreement or other agreement is currently being negotiated by or on behalf of the Company or, to Seller's Knowledge, any Employees, nor, to Seller's Knowledge, is any Employee represented by a union or labor organization or subject to a collective bargaining agreement. To the Knowledge of Seller, within the last three years, no organizational attempt has been made on behalf of any union or collective bargaining unit with respect to any of the employees of the Company. There is no unfair labor practice, labor dispute (other than routine individual grievances), demand or Proceeding pending or, to the Knowledge of Seller, threatened, involving, on one hand, any Employee or former employee of the Company or labor organization (or other representative) and, on the other hand, the Company.

5.18.8 To the Knowledge of Seller, in the last five (5) years, (i) no written or otherwise reported allegations of sexual harassment have been made against any officer of the Company, and (ii) the Company has not entered into any settlement agreements related to allegations of sexual harassment or misconduct by an officer of the Company. The Company is not party to a settlement agreement with a current or former officer, employee or independent contractor resolving allegations of sexual harassment by either (A) an officer of the Company or (B) an Employee.

5.19. Employee Benefits.

5.19.1 Schedule 5.19.1 sets forth a true, correct and complete list of all of the Employee Benefit Plans which the Company, or any ERISA Affiliate, sponsors, maintains or contributes to, is required to contribute to, or has or could reasonably be expected to have any Liability of any nature with respect to, for the benefit of one or more present or former Employee, leased Employee, Independent Contractors, officers, directors, managers or members of the Company or any of their respective dependents or beneficiaries (referred to collectively as the "Company Employee Benefit Plans" and individually as a "Company Employee Benefit Plan". True, correct and complete copies of the following have been provided to the Investors: (a) all of the Company Employee Benefit Plans (or, with respect to any Company Employee Benefit Plan that is not set forth in writing, a written description of such plan), (b) with respect to the Company Employee Benefit Plan that is intended to be a qualified plan within the meaning of

Section 401(a) of the Code, the most recent determination letter issued by the IRS, or, if such plan is a prototype, the IRS opinion or advisory letter on which the Company may rely, (c) Forms 5500 (including attachments thereto) for the past three (3) years, and (d) all summary plan descriptions, service agreements, stop loss insurance policies, all related Contracts and documents (including all compliance reports and testing results for the past three (3) years and all material correspondence with any Governmental Authority with respect to any Company Employee Benefit Plan.

5.19.2 The Company has never sponsored, maintained, established, participated in, contributed to, been required to contribute to, and the Company has no Liability (including any contingent Liability resulting from the Company being considered an ERISA Affiliate of any Person) with respect to, any of the following: (i) any plan subject to Section 302, 303 or 304 of ERISA, Title IV of ERISA, or Sections 412, 430, 431 or 432 of the Code; (ii) any "multiemployer pension plan" as such term is defined in Section 3(37) of ERISA; (iii) any multiple employer plan as described in Section 413(c) of the Code; (iv) any welfare plan funded by a "voluntary employee beneficiary association" as such term is defined in Section 501(c)(9) of the Code; (v) any "multiple employer welfare arrangement" as such term is defined in Section 3(40) of ERISA; or (vi) any plan providing a self-insured benefit. None of the Company Employee Benefit Plans promises or provides health, life or other welfare benefits to retirees or former employees, or severance benefits, except as required by Code Section 4980B, Sections 601 through 609 of ERISA, or comparable state Laws.

5.19.3 The Company (i) has not and has had no Liability (whether or not assessed) for a penalty or assessable payment under Section 4980H of the Code and does not reasonably expect to have any Liability for such a penalty or assessable payment for any month and (ii) has timely and accurately filed and distributed Forms 1094-C and 1095-C in accordance with the requirements of Sections 6055 and 6056 of the Code and the regulations and related guidance promulgated thereunder. With respect to the Company Employee Benefit Plans, the Company has made, on or before the Closing Date, all payments required to be made by them on or before the Closing Date and have accrued (in accordance with GAAP) as of the Closing Date all payments due but not yet payable as of the Closing Date. Schedule 5.19.3 sets forth all accrued sick time, vacation time or any other paid time off or related obligations as of the Closing, listed by employee.

5.19.4 All of the Company Employee Benefit Plans are, and have been, operated in all material respects in compliance with their provisions and with all applicable Laws including ERISA and the Code and the regulations and rulings thereunder. With respect to each of the Company Employee Benefit Plans that is intended to be qualified under Section 401(a) of the Code, each such plan has been determined by the IRS to be so qualified, and no circumstances exist that would cause such qualified status to be revoked for any period.

5.19.5 Neither the execution of this Agreement or any other agreement, instrument, certificate or document contemplated hereby nor the consummation of the transactions contemplated hereby or thereby, alone or in connection with another event, will (i) entitle any current or former Employee, leased Employee or Independent Contractor of the Company to severance pay or any other payment or benefit, including any Transaction Bonus, other than those Transaction Bonuses set forth on Schedule 2.2.1(iii); (ii) accelerate the time of payment or vesting of, or increase the amount of, any compensation or benefit due to any current Employee, leased Employee or Independent Contractor of the Company; (iii) directly or indirectly cause the Company to transfer or set aside any assets to fund any benefits under any Company Employee Benefit Plan; (iv) otherwise give rise to any material Liability under any Company Employee Benefit Plan, or (v) result in any payment or benefit to any current or former Employee, leased Employee or Independent Contractor of the Company under any Company

Employee Benefit Plan or otherwise that would not be deductible by reason of Section 280G of the Code or would be subject to an excise tax under Section 4999 of the Code. The Company is not obligated to make any "gross-up" payment with respect to, nor does the Company have any indemnity obligation for, any Taxes or penalties imposed under Sections 4999 or 409A of the Code.

5.19.6 There are no Proceedings that have been asserted, instituted or threatened against or in connection with any of the Company Employee Benefit Plans. Each Company Employee Benefit Plan may be terminated upon not more than thirty (30) days' notice without further material Liability to the Company.

5.20. Customers and Suppliers.

5.20.1 Schedule 5.20.1 sets forth (i) the top twenty (20) largest customers of the Business as measured by the dollar amount of purchases thereby for each of the years ended December 31, 2021 and December 31, 2020, showing the total sales by the Business to each customer for each such period (the "Material Customers") and (ii) the top ten (10) suppliers to the Business for each of the years ended December 31, 2021 and December 31, 2020, showing the total sales by each such supplier to the Business during each such period (the "Material Suppliers").

5.20.2 Except as set forth on Schedule 5.20.2, since December 31, 2019, no Material Customer or Material Supplier has terminated its relationship with the Company or materially reduced or changed the pricing, volume, timing or other terms of its business with the Company and, except as set forth on Schedule 5.20.2, no Material Customer or Material Supplier has notified the Company that it intends to terminate or materially reduce or change the pricing, volume, timing or other terms of its business with the Company.

5.21. Related Party Transactions. Except as disclosed on Schedule 5.21, for employment agreements with any employee of the Company, and the purchase of Common Units of the Company pursuant to the Management Equity Purchase Agreement, no Seller, director, manager, member, officer or, to Seller's Knowledge, employee of the Company or any Affiliate thereof, (i) is a party to any agreement, Contract, commitment or transaction with the Company or, any of its directors, managers or officers, or to Seller's Knowledge, any of its equityholders, members, employees or Affiliates, or has any interest in any property or assets used by the Company, or (ii) is the direct or indirect owner of an interest in any Person that is a competitor, supplier or customer of the Company. Except as set forth and described on Schedule 5.21, none of the assets or properties, tangible or intangible, that are used by the Company are owned by Seller or its Affiliates (other than the Company).

5.22. Information Technology and Privacy Laws.

5.22.1 All Software, computer hardware, microprocessors, networks, servers, data centers, firmware and other information technology and communications equipment used in the Business ("Information Technology") is either owned by, or leased or licensed to, the Company, except to the extent provided by Seller pursuant to the Transaction Services Agreement. All of the Information Technology owned or purported to be owned by the Company is held by the Company as the sole, legal and beneficial owner and is held free of all Liens (other than Permitted Liens) or any other similar third party rights or interests. The Information Technology has the capacity and performance necessary to fulfill the requirements that it currently performs. As of the Closing, no such Information Technology contains any device or feature designed to disrupt, disable, or otherwise impair the functioning of any Software or any virus, malware, "back door," "time bomb," "Trojan horse," "worm," "drop dead

device," or other code or routines that permit unauthorized access to or the unauthorized disablement or erasure of the Information Technology, Company Intellectual Property, or information or data contained in the Information Technology or other Software of users. In the past twelve (12) months, there has been no failure or other substandard performance of any Information Technology which has caused any disruption to the Business. The Company maintains back-up and recovery capabilities and business continuity plans, procedures, and facilities designed to ensure that a problem with all or a part of the Information Technology does not impact in any material respect the Business. The Company has tested such back-ups, disaster recovery, and business continuity, procedures, and facilities and determined they function effectively. There have been no material breaches of the Company's security procedures or any material unauthorized incidents, whether attempted or successful, of access, use, disclosure, modification or destruction of information (including Personal or Protected Information), data, or software, or interference with systems operations in all or any portion of the Information Technology.

5.22.2 The Company's receipt, collection, monitoring, maintenance, creation, transmission, use, analysis, disclosure, storage, disposal, processing and security (collectively, "Processing") of Personal or Protected Information has complied, and complies, with all: (i) Contracts to which the Company is a party; (ii) all applicable Laws, including all Information Privacy and Security Laws; (iii) requirements under the Payment Card Industry Data Security Standard ("PCI DSS"), to the extent applicable to the Company; (iv) Authorizations that relate to the Company's receipt, access, use and disclosure of Personal or Protected Information; and (v) applicable privacy policies adopted by the Company or otherwise utilized in the Business (collectively, (i)–(v), the "Privacy Requirements"). The Company has taken reasonable steps to protect Personal or Protected Information against loss, and against unauthorized access, use, modification, disclosure, or other misuse. The Company has all necessary authority, consents, and authorizations to Process the Personal or Protected Information in the Company's possession or under its control in connection with the operation of the Business. No Proceeding has been asserted or threatened against the Company alleging a violation of any Person's privacy rights, personal information rights, or data rights, and the consummation of the transactions contemplated by this Agreement and the continued operation of the Business thereafter will not result in any such violation or in any violation of any Privacy Requirement. There has been no unauthorized access to, or use, disclosure, or loss, of Personal or Protected Information where the Company was required by any Privacy Requirement to notify any third party (including the individual data subject, any Governmental Authority, or any customer) of such incident. The Company does not collect, use or disseminate Personal or Protected Information or any other personal data of residents of the European Union or the European Economic Area.

5.22.3 In connection with each third-party servicing or outsourcing arrangements in which the Company provides such third party service provider with access to Personal or Protected Information, the Company has contractually obligated any such service provider to (i) comply with the applicable Information Privacy and Security Laws with respect to Personal and Protected Information, to the extent applicable, (ii) take reasonable steps to protect and secure Personal and Protected Information from unauthorized disclosure, and (iii) only use Personal and Protected Information for purposes of providing the services to the Company under the arrangement. Except for such third-party servicing or outsourcing arrangements, the Company has not sold, rented or otherwise made available, and do not sell, rent or otherwise make available, to third parties any Personal and Protected Information.

5.23. Inventory. Except as set forth on Schedule 5.23, all Inventory, whether or not reflected on the Latest Balance Sheet, is the property of the Company, free and clear of any Liens (other than Permitted Liens), have not been pledged as collateral, is not held on

consignment from others and conforms in all material respects to all standards applicable to each item of Inventory or its use or sale imposed by Governmental Authorities.

5.24. Certain Payments. Except as set forth on Schedule 5.24, neither the Company nor any director, manager, officer, agent or employee thereof, or any other Person associated with or acting for or on behalf of the Company or the Business, has directly or indirectly (a) made any contribution, gift, bribe, rebate, payoff, influence payment, kickback or other payment to any Person, private or public (i) to obtain favorable treatment in securing business, (ii) to pay for favorable treatment in securing business or favorable disposition of a Governmental Authority, (iii) to obtain special concessions or for special concessions already obtained, for or in respect of the Company or the Business, (b) violated (i) the Foreign Corrupt Practices Act of 1977, as amended, or (ii) applicable state or local anti-bribery statutes or ordinances or (c) established or maintained any fund or asset that has not been recorded in the Books and Records of the Company. Except as set forth on Schedule 5.24, no Proceeding is pending or, to Seller's Knowledge, threatened alleging facts or circumstances that, if found to be true, would constitute a breach of the representations and warranties set forth in this 5.24.

5.25. Environmental Matters.

5.25.1 The Company has obtained and is in material compliance with all Authorizations required under Environmental Laws to carry on the Business (each of which is identified on Schedule 5.25.1) and, to the Seller's Knowledge, there are no circumstances that may prevent or interfere with such compliance in the future, nor are there any capital expenditures required to maintain or achieve compliance.

5.25.2 The operation of the Business and the Company is an has been in compliance in all material respects with all Environmental Laws. The Company has not generated, manufactured, refined, transported, treated, stored, handled, disposed, released, produced or processed any Hazardous Materials at or upon any current or former owned or Leased Real Property of the Company, except in compliance with all Environmental Laws.

5.25.3 There are no pending or, to the Knowledge of the Seller and the Company, threatened claims, Liens, or other restrictions of any nature arising under or pursuant to any Environmental Law with respect to or affecting any Leased Real Property or any other property or asset (whether real, personal or mixed) used by the Seller or in which the Seller has an interest.

5.25.4 The Company has not received, and to the Knowledge of the Seller and the Company, does not expect, with respect to the Business or the Company's assets, any written notice of violation or other actual or threatened order, notice, or other communication of actual or potential or Liability under, any Environmental Law, nor does the Company have any unresolved Liability under any Environmental Law.

5.25.5 There has been no Release or Threat of Release of any Hazardous Materials at or from any Leased Real Property or at any other location where any Hazardous Materials were generated, manufactured, refined, transferred, produced, imported, used, disposed, recycled, received or processed by the Company or the Seller, or from any other property or asset (whether real, personal or mixed) in which the Seller has or had an interest, or to the Knowledge of the Seller and the Company, any geologically or hydrologically adjoining property, whether by the Seller or any other Person.

5.25.6 The Company has made available to the Investors copies of all environmental audits, assessments and reports and all other material environmental documents relating to the Business or the Company's assets.

6. Covenants of the Parties.

6.1. Further Assurances. Subject to the terms and conditions provided herein, at any time from and after the Closing, at the request of a Party and without further consideration, each other Party shall promptly execute and deliver such further agreements, instruments, certificates and documents and perform such other actions as the requesting party may reasonably request in order to fully consummate the transactions contemplated hereby and carry out the purposes and intent of this Agreement and any agreements, instruments, certificates and documents delivered hereby.

6.2. Record Retention. For a period of six (6) years after Closing, subject to the attorney-client privilege, work product doctrine, or other similar privilege (unless pursuant to a joint defense or similar agreement), solely for the purposes of (i) complying with Section 8.3, or (ii) allowing Seller to defend a Third Party Claim in accordance with Section 7.3.2, the Investors shall cause the Company to provide Seller with reasonable access, during normal business hours and upon reasonable prior written notice, to the applicable Books and Records of the Company pertaining or relating to the period on or before the Closing Date.

6.3. Public Announcements. Except as compelled by judicial or administrative process or by other requirements of Law, each Party agrees not to issue nor permit the issuance of any reports, statements or releases, in each case relating to this Agreement or any other agreement, instrument, certificate or document contemplated hereby or the transactions contemplated hereby or thereby, without the prior written consent of the other Parties, which consent shall not unreasonably be withheld. To the extent compelled by Law, each Party shall have the right to review any report, statement or release as promptly as possible prior to its publication and to reasonably consult with the other Parties with respect to the content thereof. Notwithstanding the foregoing, (a) subject to providing the Investors with prior notice and an opportunity to review and propose reasonable comments (which Seller shall consider in good faith), Seller (or its Affiliates) may make any disclosures required for financial reporting purposes and to the extent included in public releases or announcements made by Seller or its Affiliates in accordance with the public filing practices of Seller or its Affiliates or otherwise as required by any listing agreement with any applicable national or regional securities exchange or market, securities Laws or any other applicable Law, and (b) nothing contained or implied herein shall preclude any Party from releasing any information in connection with enforcing its rights under this Agreement or the documents contemplated hereby or in connection with the preparation and filing such Party's Tax Returns.

6.4. Employment Matters. The parties agree and acknowledge that as a matter of mutual convenience, the Seller shall retain all of the employees set forth on Schedule 6.4 (collectively, the "Transferred Employees") during the period beginning upon the Closing and ending on March 14, 2022 (the "Interim Period"). The obligations of the parties during the Interim Period with regard to the Transferred Employees shall be governed by the terms of the Transition Services Agreement. Seller shall terminate the Transferred Employees on March 14, 2022. On March 14, 2022, following the termination described in the immediately preceding sentence, the Company shall promptly offer at-will employment to each such Transferred Employee at salaries or hourly wages at least equal to their current rate of pay, with benefits substantially comparable, in the aggregate, to the benefits provided to the Transferred Employees prior to the Closing Date (for the avoidance of doubt, the Seller shall not bear any such responsibility for establishing such benefit plans, programs, policies and arrangements at the

Company), provided that the Company shall not be obligated to offer employment to any Transferred Employee whose employment is terminated for any reason during the Interim Period. Except as provided in the Transition Services Agreement, nothing in this Agreement shall in any way establish any requirements or create any other Liability from Investors or the Company to any employee of Seller or the Company or to any former or future employee of Seller or the Company, including any duty, requirement, obligation or other Liability relating to continued employment, compensation, benefit plans, programs, policies and arrangements, and any other matter in connection with their employment. Except for the obligations of the Company expressly set forth in this Section 6.4 and except as provided in the Transition Services Agreement, neither the Company nor the Investors shall be responsible for any Liabilities arising or relating to the termination of employment of any employee of Seller on or before March 14, 2022, and Seller shall bear the full amount of any such Liability.

6.5. Confidentiality. Seller shall at all times maintain the confidentiality of Confidential Information of the Business, the Company and its Affiliates, and Seller shall not disclose any such information to any Person, nor shall Seller use Confidential Information for any purpose except for the benefit of the Company. "Confidential Information" shall mean the following: (i) trade secrets concerning the Company, including product specifications, data, know-how, formulae, compositions, processes, designs, sketches, photographs, graphs, drawings, samples, inventions and ideas, past, current and planned research and development, current and planned manufacturing or distribution methods and processes, customer lists, current and anticipated customer requirements, advertising methods, sales methods, price lists, market studies, business plans, computer software and programs (including object code and source code), computer software and database technologies, systems, structures and architectures (and related formulae, compositions, processes, improvements, devices, know-how, inventions, discoveries, concepts, ideas, designs, methods and information), and any other information, however documented, that is a trade secret under applicable Law; (ii) confidential or proprietary information concerning the Company or the Business (which includes historical financial statements, financial projections and budgets, historical and projected sales, capital spending budgets and plans, the names and backgrounds of key personnel, personnel training and techniques and materials and operating procedures), however documented; (iii) notes, analyses, compilations, studies, summaries and other material prepared by or for the Company or the Business containing or based, in whole or in part, on any information included in the foregoing; and (iv) the terms of this Agreement and any other agreement, certificate, instrument and document contemplated hereby. The restrictions contained in this 6.5 shall apply regardless of whether such Confidential Information (a) is in written, graphic, recorded, photographic or any machine readable form or is orally conveyed to, or memorized by Seller, or (b) has been labeled, marked or otherwise identified as confidential or proprietary. The duty of confidentiality of Seller with regard to the Confidential Information shall not extend to: (i) any Confidential Information that, at the time of disclosure, had been previously published and was generally available and part of the public domain; (ii) any Confidential Information that is published and becomes generally available and part of the public domain after disclosure, unless such publication is a breach of this Agreement by Seller, as applicable; and (iii) any Confidential Information that is obtained by Seller from a third person who: (a) is lawfully in possession of that Confidential Information; (b) is not in violation of any contractual, legal, or fiduciary obligation to the Company, the Investors or their Affiliates with respect to the Confidential Information; and (c) does not prohibit Seller from disclosing the Confidential Information to other Persons. In the event that Seller is requested or required (by oral questions, interrogatories, requests for information or documents, subpoena or other process or legal obligation) to disclose any Confidential Information (including the terms of this Agreement), Seller agrees to: (i) give prompt written notice to the Investors of such request or subpoena in order to allow the Investors and the Company an opportunity to seek an appropriate protective order or to waive compliance with the provisions of this Agreement; and (ii) cooperate with the Investors, the Company and

their respective counsel in responding to such request or subpoena as provided below. If the Investors and the Company fail to obtain a protective order and does not waive its rights to confidential treatment under this Agreement, then Seller may disclose only that portion of any Confidential Information which Seller's counsel reasonably advises in writing that Seller is compelled to disclose pursuant to Law. Seller further agrees that in no event will Seller oppose action to obtain an appropriate protective order or other reliable promises that confidential treatment will be accorded to the Confidential Information.

6.6. Non-Competition; Non-Solicitation.

6.6.1 For a period (such applicable period, the "Restricted Period") commencing on the Closing Date and ending on the fifth (5^{th}) anniversary of the Closing Date, Seller shall not, and shall not permit any of Seller's Affiliates to, directly or indirectly, within the Territory, (a) engage in or assist others in engaging in the Competitive Business; (b) have an interest in any Person that engages directly or indirectly in the Competitive Business in any capacity, including as a partner, equityholder, member, employee, principal, agent, trustee or consultant; or (c) solicit, cause, induce or encourage any material actual or prospective client, customer, supplier, manufacturer or licensor of the Company in the Competitive Business (including any existing or former client or customer of the Company or of Seller (relating solely to the Business) as predecessor to the Company), or any other Person who has a material business relationship with the Company with respect to the Competitive Business, to terminate or modify any such actual or prospective relationship. Notwithstanding the foregoing, Seller may (i) own the Class B Common Units in the Company that it will own immediately following the Closing, and (ii) own, directly or indirectly, solely as an investment, securities of any Person traded on any national securities exchange if Seller is not a controlling Person of, or a member of a group which controls, such Person and does not, directly or indirectly, own five percent (5%) or more of any class of securities of such Person, so long as Seller has no active participation in the business of such Person.

6.6.2 During the Restricted Period, Seller shall not, directly or indirectly, within the Territory, (i) hire or solicit any Person who is or was in the last twelve (12) months employed by the Company (including, for the avoidance of doubt, prior employees of Seller, as predecessor to the Company, working in connection with the Business) or encourage any such employee to leave such employment, (ii) engage or solicit any Person who is or was in the last twelve (12) months engaged as a consultant by the Company (including, for the avoidance of doubt, a consultant of Seller, as predecessor to the Company, engaged in connection with the Business), where such actions would reasonably be expected to cause such consultant to cease, terminate, or materially adversely change its relationship with the Company, or (iii) make statements or representations, or otherwise communicate, directly or indirectly, in writing, orally or otherwise, that would reasonably be expected to, directly or indirectly, disparage the Company or any of its Affiliates or any of its officers, directors, managers, members, partners, employees, advisors or businesses, or its or their reputations, except in the course of such Person's employment or engagement with the Company or any Affiliate thereof; provided that these limitations shall not be violated by truthful statements in connection with any legal or administrative proceeding, response to legal process, governmental testimony or filings, or administrative or arbitral proceedings (including, without limitation, pleadings, depositions or other discovery in connection with such proceedings). Notwithstanding the foregoing, the solicitation restrictions in this Section 6.6.2 shall not be violated by general advertising or general solicitation not specifically targeted at the Company's employees, consultants, or independent contractors.

6.6.3 Seller acknowledges that a breach or threatened breach of Section 6.5 or this Section 6.6 would give rise to irreparable harm to the Investors, for which monetary

damages would not be an adequate remedy, and hereby agrees that in the event of a breach or a threatened breach by such party of any such obligations, the Investors shall, in addition to any and all other rights and remedies that may be available to it in respect of such breach, be entitled to equitable relief, including a temporary restraining order, an injunction, specific performance and any other relief that may be available from a court of competent jurisdiction (without any requirement to post bond). Further, Seller acknowledges that the Investors' damages shall not be limited to the amount of the Purchase Price that is allocated to the covenants set forth in Section 6.5 or this Section 6.6 pursuant to Section 8.5.

6.6.4 Seller acknowledges that the restrictions contained in Section 6.5 and this Section 6.6 are reasonable and necessary to protect the legitimate interests of the Investors and constitute a material inducement to the Investors to enter into this Agreement and consummate the transactions contemplated by this Agreement. In the event that any covenant contained in Section 6.5 or this Section 6.6 should ever be adjudicated to exceed the time, geographic, product or service or other limitations permitted by applicable Law in any jurisdiction, then any court is expressly empowered to reform such covenant, and such covenant shall be deemed reformed, in such jurisdiction to the maximum time, geographic, product or service or other limitations permitted by applicable Law. The covenants contained in Section 6.5 and this Section 6.6 and each provision thereof and hereof are severable and distinct covenants and provisions. Notwithstanding anything herein, in the event of any breach by Seller of the covenants set forth in this Section 6.6 the Restricted Period shall be extended by the period of the duration of such breach. The invalidity or unenforceability of any such covenant or provision as written shall not invalidate or render unenforceable the remaining covenants or provisions hereof, and any such invalidity or unenforceability in any jurisdiction shall not invalidate or render unenforceable such covenant or provision in any other jurisdiction.

6.7. Insurance Policies. Prior to or at the Closing, Seller shall purchase, at Seller's sole expense, on behalf of the Company, tail insurance for any policy set forth on Section 6.7, each such tail insurance policy to cover the period set forth on Schedule 6.7. Any such tail insurance policy shall provide at least the same coverage and amount and contain terms and conditions that are no less favorable to the Company than the applicable policy maintained by the Company and Seller (related to the Business) immediately prior to the Closing and the Reorganization.

6.8. Distribution of M&T Loan Proceeds and Repayment of Investor Promissory Notes. In connection with the consummation of the transactions contemplated hereby, the Company will borrow from M&T Bank Six Million Dollars ($6,000,000) pursuant to the Loan and Security Documents, and immediately thereafter the Company shall distribute such debt proceeds its members (on a post-Closing basis) in accordance with their respective equity capital investments, including amounts to (i) the Management Members totaling One Million Six Hundred Fifty-One Thousand Three Hundred Seventy-Six and 15/100 Dollars ($1,651,376.15) in the aggregate, (ii) Mereo Capital in the amount of Three Million Three Hundred Two Thousand Seven Hundred Fifty-Two and 29/100 Dollars ($3,302,752.29) and (iii) Point Lookout in the amount of Eight Hundred Twenty-Five Thousand Six Hundred Eighty-Eight and 07/100 Dollars $825,688.07). Mereo Capital and Point Lookout shall use such debt proceeds distribution to pay off in full their respective Investor Promissory Note, and shall, promptly following receipt, pay over or cause to be paid over such amounts to Seller in full satisfaction of such Investor Promissory Notes. For the avoidance of doubt, either or both of Mereo Capital and Point Lookout may instruct, at Closing and in connection with the funds flow of the transactions contemplated hereby, M&T Bank to directly pay over to Seller Mereo Capital's and/or Point Lookout's allocated portion of the debt proceeds distribution in full satisfaction of their respective Investor Promissory Notes. Seller confirms that the Management Members have

covenanted pursuant to the Management Equity Purchase Agreement to use such debt proceeds distribution to pay off in full the Management Promissory Notes promptly upon receipt.

6.9. Use of Name. Subject to the terms and conditions of this Section 6.9, Seller hereby consents to, and grants to the Company, from the Closing Date until December 31, 2023 (the "License Term"), a worldwide, royalty-free, fully paid-up, non-sublicensable (except as provided in Section 6.9.3), limited license to use the LUNA LABS trademark, service mark, and all other proprietary indicia of goods and services, including logos and other source identifies, that include the LUNA LABS trademark, whether registered or unregistered, that were used by the Company in connection with the Business on or before the Closing Date (collectively, the "Luna Marks") for the purpose of managing, operating, and otherwise conducting the Business (such license grant, the "License").

6.9.1 Any and all goodwill in the Luna Marks arising from use of the Luna Marks by the Company shall inure solely to the benefit of Seller. In the event that the Company is deemed by operation of law to own any rights in the Luna Marks, the Company hereby assigns such rights to Seller. The Company agrees not to, directly or indirectly, register or attempt to register in any jurisdiction any trademark or service mark that is confusingly similar to any of the Luna Marks or which would reasonably be expected to result in dilution of the Luna Marks.

6.9.2 With respect to any of the Luna Marks that includes the phrase "LUNA LABS" (such Luna Marks, the "Exclusive Marks"), the License granted to the Company shall be exclusive. With respect to any of the Luna Marks other than the Exclusive Marks, including, for the avoidance of doubt, any of the Luna Marks that includes the word "Luna" without the word "Labs," the License granted to the Company shall be non-exclusive.

6.9.3 The Company may grant sublicenses under the License to (a) any current or future wholly-owned subsidiary of the Company; and (b) manufacturers, distributors, and other contractors solely for the purpose of providing services to the Company or otherwise acting on the Company's behalf. All sublicenses must: (i) be subject to and consistent with the applicable terms and conditions of this Section 6.9; and (ii) terminate automatically effective as of the expiration of the License Term. The Company shall ensure that each sublicensee complies with the applicable terms and conditions of this Section 6.9.

6.9.4 The Company shall promptly notify Seller in writing of any actual, suspected, or threatened infringement, dilution, or other conflicting use of the Luna Marks by any third party of which it becomes aware. Seller has the sole right, in its discretion, to bring any action or proceeding with respect to any such infringement, dilution, or other conflict and to control the conduct of, and retain any monetary recovery resulting from, any such action or proceeding (including any settlement); *provided*, *however,* that if Seller does not to pursue any such infringement, dilution, or other conflict relating to the Exclusive Marks within twenty (20) days of the Company's written notice, the Company shall have a right, in its discretion, upon written notice to Seller, to bring any action or proceeding with respect to any such infringement, dilution, or other conflict and to control the conduct of, and retain any monetary recovery resulting from, any such action or proceeding (including any settlement). Each Party shall provide the other Party with all assistance that the other Party may reasonably request, at the enforcing Party's expense, in connection with any such action or proceeding.

6.9.5 Upon the expiration of the License Term, the Company hereby agrees and covenants to: (a) immediately discontinue all use of the Luna Marks with no penalty or cost whatsoever to Seller, and (b) take any and all actions necessary and appropriate to change the name of the Company, including but not limited to, the filing with the Secretary of State of Delaware of an amendment to the certificate of formation of the Company for such purpose and any other relevant filings in other jurisdictions or with other government agencies implementing such change.

6.9.6 Notwithstanding anything to the contrary herein, the Company and Seller shall attempt in good faith to resolve any dispute arising out of or relating to the License promptly by negotiation between executives who have authority to settle the controversy.

6.9.7 Each Party acknowledges that the other Party would be irreparably harmed by any breach of Section 6.9 and that damages alone may not be an adequate remedy for the breach of any of the provisions of this Section 6.9. Accordingly, without prejudice to any other rights and remedies either Party may have, each Party shall be entitled to seek the granting of equitable relief (including without limitation injunctive relief) concerning any threatened or actual breach of any of the provisions of this Section 6.9.

6.10 Escrow Amounts. No later than ninety (90) days after the Closing Date, Seller shall deposit (a) Five Hundred Thousand Dollars ($500,000) (the "Indemnity Escrow Amount") and (b) Two Hundred Fifty Thousand Dollars ($250,000) (such amount, the "Adjustment Escrow Amount"), by wire transfer of immediately available funds, into an escrow account (the "Escrow Account") to be established and maintained by the Escrow Agent pursuant to the terms and conditions of an escrow agreement to be entered into by the Investors, Seller, and the Escrow Agent on the date hereof (the "Escrow Agreement"). For each day after the ninetieth day (90th) that Seller fails to fund the Indemnity Escrow Amount or the Adjustment Escrow Account in accordance with the first sentence of Section 6.10, the Indemnity Escrow Amount shall be increased $50,000 per week.

6.11 Transfer of Certain Contracts. Following the Closing Date, the Parties shall commit to enter into a novation agreement with respect to any and all Government Contracts related to the Business that were awarded to the Seller. If the Seller receives any payments with respect to such Government Contracts to be novated to the Company pursuant to this Section 6.11, the Seller shall pay such amounts to the Company within sixty (60) days of their receipt of such amounts.

6.12 Accounts Receivable Collection. After the Effective Time and for a period of 180 days thereafter, the Company shall: (i) use reasonable commercial efforts to collect any and all accounts receivable or portions thereof of the Business reflected on the Latest Balance Sheet or generated by the Business since the date of the Latest Balance Sheet that are included in the Final Net Working Capital Calculation (the "Accounts Receivable"); (ii) apply the Seller's written standard accounts receivable collection practices in all material respects in the collection of the Accounts Receivable; and (iii) not intentionally compromise, cancel, excuse or modify in any material respect any Accounts Receivable without Seller's prior written consent, which consent shall not be unreasonably withheld.

6.13 Pursuit of Outstanding Consents. After the Effective Time and for a period of 180 days thereafter, the Company shall: (i) use commercially reasonable efforts to obtain any and all consents reflected on Schedule 2.5.1(vi) that have not been obtained prior to Closing.

6.14 Reimbursement of Company Expenses. Within 90 days following the Closing, the Company shall reimburse Seller for expenses paid by Seller on behalf of the Company with respect to post-Closing operational expenses in the amount of $27,000.

7. Indemnification.

7.1. Seller's Indemnification. Seller shall defend, indemnify and hold harmless the Investors, their Affiliates (including the Company after Closing) and their respective successors and assigns, directors, officers, managers, members, partners, equity holders, employees, agents and representatives (collectively, the "Investor Group"), from and against any and all Losses arising out of, or caused by, or relating to any of the following:

7.1.1 Misrepresentation. Any inaccuracy in or breach of any representation or warranty of Seller contained in this Agreement or in any other certificate delivered by or on behalf of Seller under the terms of this Agreement.

7.1.2 Nonperformance. Any breach or failure to perform any covenant or agreement of Seller or the Company (to the extent the Company's performance is to occur prior to or at the Closing) in this Agreement or in any other agreement, instrument, certificate or document delivered under the terms of this Agreement to be performed by Seller or the Company prior to or at the Closing or by Seller after the Closing.

7.1.3 Taxes. Any and all Indemnified Taxes.

7.1.4 Transaction Expenses. Any and all of Seller's and the Company's Transaction Expenses to the extent not paid concurrent with the Closing.

7.1.5 Indebtedness. Any and all of Seller's Indebtedness and the Company Indebtedness to the extent not paid concurrent with the Closing.

7.1.6 Accounts Receivable. Any and all accounts receivable or portions thereof of the Business reflected on the Latest Balance Sheet or generated by the Business since the date of the Latest Balance Sheet that are included in the Final Net Working Capital Calculation and have not actually been collected by the Company on or before the date that is 180 days following the Closing Date.

7.1.7 Unclaimed Property Liabilities. Uncashed checks to vendors that have been outstanding for over one (1) year and any obligations relating to a failure to comply with all applicable escheat laws.

7.1.8 Excluded Liabilities Under Original Contribution Agreement/Contribution Agreement Amendment. Any and all Excluded Liabilities as such term is defined in the Original Contribution Agreement as amended by the Contribution Agreement Amendment to the extent such Excluded Liabilities are not expressly disclosed on the Disclosure Schedule and to the extent the subject of a third party claim; *provided that* if a claim under this Section 7.1.8 is to be made by the Investors, to the extent that the Losses associated with such Section 7.1.8 claim can reasonably be recovered pursuant to a claim under Section 7.1.1, then Investors shall pursue such claim under Section 7.1.1 (but only to the extent such Section 7.1.8 claim can reasonably be recovered pursuant to a claim under Section 7.1.1) for so long as such claim is available under Section 7.1.1 in accordance with Section 7.4 hereof.

7.2. Investors' Indemnification. each Investor shall defend, indemnify and hold harmless Seller and its Affiliates, successors and assigns and the directors, officers,

managers, members, partners, employees, agents and representatives of any of them (collectively, the "Seller Group"), from and against any and all Losses arising out of, or caused by, or relating to any of the following:

7.2.1 Misrepresentation. Any inaccuracy in or breach of any representation or warranty of such Investor contained in this Agreement or in any certificate delivered by such Investor under the terms of this Agreement.

7.2.2 Nonperformance. Any breach or failure to perform any covenant or agreement of such Investor in this Agreement or in any other agreement, instrument, certificate or document delivered under the terms of this Agreement to be performed by such Investor.

7.3. Indemnification Procedures. With respect to each event, occurrence or matter ("Indemnification Matter") as to which any member of the Investor Group or the Seller Group, as the case may be (in either case, referred to as, the "Indemnitee"), is or may reasonably be entitled to indemnification from Seller under Section 7.1 or from the Investors under Section 7.2, as the case may be (in either case, referred to as, the "Indemnitor"):

7.3.1 Notice. Within thirty (30) calendar days after the Indemnitee receives written documents underlying the Indemnification Matter or, if the Indemnification Matter does not involve a Third Party Claim, as promptly as practicable after the Indemnitee first has actual knowledge of the Indemnification Matter or of other matters from which an Indemnification Matter is reasonably likely to result, the Indemnitee shall give prompt written notice to the Indemnitor of the nature of the Indemnification Matter and the amount demanded or claimed in connection therewith ("Indemnification Notice"), together with copies of any such written documents. No delay or deficiency by an Indemnitee to give notice in respect of a Loss in the manner required by this Section 7.3.1 shall relieve the Indemnitor of any Liability under this Agreement in respect of such Loss except to the extent that such delay or deficiency actually and materially prejudices the rights of the Indemnitor with respect thereto.

7.3.2 Defense. If a third-party action, suit, claim or demand (a "Third Party Claim") gives rise to an Indemnitor's obligation to provide indemnification under Section 7.1 or Section 7.2, then, upon receipt of the Indemnification Notice, the Indemnitor shall have ten (10) calendar days after said notice is given to elect, by written notice given to the Indemnitee, to undertake, conduct and control, through counsel of its own choosing which is reasonably acceptable to the Indemnitee and at its sole risk and expense, the good faith defense of such claim, provided that (i) Indemnitor acknowledges and accepts in writing full liability for the applicable Indemnification Matter, and the Indemnitee shall cooperate with the Indemnitor in connection therewith; (ii) such Third Party Claim involves (and continues to involve) solely monetary damages which are not reasonably likely, in the Indemnitee's discretion, to exceed the amount of the Indemnity Escrow Amount deposited and remaining in the Indemnity Escrow Amount; (iii) such Third Party Claim does not relate to or arise in connection with any criminal action, the Indemnitee's relationship with any customer, supplier, manufacturer or employee, any investigation, audit or Third Party Claim of any Governmental Authority; and (iv) the Indemnitor makes reasonably adequate provision to satisfy the Indemnitee of the Indemnitor's ability to defend, satisfy and discharge such Third Party Claim (collectively, the "Defense Conditions"). Any Indemnitee shall have the right to employ separate counsel in any such Third Party Claim and to participate in the defense thereof, but the fees and expenses of such counsel shall not be an expense of the Indemnitor unless (a) the Indemnitor shall have failed, within ten (10) calendar days after the Indemnification Notice is given by the Indemnitee as provided in the preceding sentence, to undertake, conduct and control the defense of such Third Party Claim, (b) any of the Defense Conditions fails to be satisfied, (c) the employment of such counsel has been

specifically authorized by the Indemnitor, (d) there exists, in the Indemnitee's discretion, a conflict between the interests of the Indemnitor and the Indemnitee or (e) a defense exists, in the Indemnitee's discretion, for the Indemnitee which is not available to the Indemnitor. If the Defense Conditions are satisfied and the Indemnitor elects to undertake, conduct and control the defense of a Third Party Claim as provided herein, then: (i) the Indemnitor will not be liable for any settlement of such Third Party Claim effected without its consent, which consent will not be unreasonably withheld or delayed; (ii) the Indemnitor may settle such Third Party Claim without the consent of the Indemnitee only if (a) all monetary damages payable in respect of the Third Party Claim are paid by the Indemnitor, (b) the Indemnitee receives a full, complete and unconditional release in respect of the Third Party Claim without any admission or finding of obligation, Liability, fault or guilt (criminal or otherwise) with respect to the Third Party Claim, and (c) no injunctive, extraordinary, equitable or other relief of any kind is imposed on the Indemnitee or any of its Affiliates; and (iii) the Indemnitor may otherwise settle such Third Party Claim only with the written consent of the Indemnitee, which consent will not unreasonably be withheld or delayed. Notwithstanding anything above in this Section 7.3.2, the Investors shall be entitled to control any Third Party Claim with respect to which the Defense Conditions are not satisfied, including, for the avoidance of doubt any Third Party Claims brought by a Governmental Authority. If the Indemnitor fails to proceed with the good faith defense or settlement of any Third Party Claim after making an election to undertake, conduct and control the good faith defense of such claim, then, in either such event, the Indemnitee shall have the right to contest, settle or compromise such claim at its exclusive discretion, at the risk and expense of the Indemnitor.

7.3.3 Payments. Except as otherwise provided in Section 8, all amounts owed by the Indemnitor to the Indemnitee (if any), and not to be paid from the Indemnity Escrow Amount, shall be paid in full within two (2) Business Days upon the earlier to occur of (a) a final settlement or agreement as to the amount owed is agreed and executed (unless otherwise provided in such final settlement or agreement) or (b) a final, nonappealable judgment has been rendered requiring such indemnification payment. Such payments shall be paid by wire transfer of immediately available funds to the bank accounts designated in writing by such Indemnitee. If any indemnification payment is to be made from the Indemnity Escrow Amount, such payment will be made in accordance with the terms of the Escrow Agreement and the parties shall cause such payment(s) to be made in accordance therewith.

7.4. Survival. All representations and warranties, and all covenants and agreements to be performed prior to or at the Closing shall survive the execution and delivery hereof and the Closing hereunder until the close of business on the fifteen (15) month anniversary of the date hereof (or if such date is not a Business Day, on the next Business Day after such date); *provided*, that (i) the Fundamental Representations other than those set forth in Section 5.11 (Tax Matters) shall survive until the date that is six (6) years following the Closing Date and those set forth in Section 5.11 (Tax Matters) shall survive until the date that is sixty (60) days after the expiration of the applicable statute of limitations, and (ii) the covenants of the Parties to be performed after the Closing Date shall survive indefinitely (subject to any specific time limitations specified in this Agreement). Any claims for Losses arising out of, or caused by or relating to the matters set forth in Section 7.1.3 shall survive until the date that is sixty (60) days after the expiration of the applicable statute of limitations. Any claims for Losses arising out of, or caused by or relating to Section 7.1.2, Section 7.1.4, Section 7.1.5, Section 7.1.6, Section 7.1.7 and Section 7.1.8 and any claims for Losses arising out of, or caused by or relating to Fraud shall each survive indefinitely. The Parties agree that the Parties intend the survival periods contractually agreed in this Section 7.4 to apply to claims as specified herein notwithstanding the three (3) year general statute of limitations applicable to a claim for breach of contract pursuant to Section 8106(a) of the Delaware Code (10 Del.C. § 8106(a)).

7.5. Amount of Losses.

7.5.1 Subject to Section 7.5.4, (i) Seller shall not have any liability for Losses under Section 7.1.1 or Section 7.1.8 unless and until the aggregate amount of all such Losses exceeds $153,000 (the "Basket"), in which event Seller shall be required to pay the entire amount of such Losses from the first $1 of Losses, and (ii) the Investors shall not have any liability for Losses under Section 7.2.1, unless and until the aggregate amount of all such Losses exceeds the Basket, in which event the Investors shall be required to pay the entire amount of such Losses from the first $1 of Losses.

7.5.2 Subject to Section 7.5.4, (i) the maximum liability of Seller for Losses under Section 7.1.1 shall not exceed an amount equal to $2,040,000 (the "Cap"), (ii) the maximum liability of Seller for Losses under Section 7.1.8 shall not exceed an amount equal to $3,000,000 (the "Excluded Liability Cap"), (iii) the maximum liability of the Investors for Losses under Section 7.2.1 shall not exceed the Cap, and (iv) the maximum liability of Seller for Losses under Section 7.1.7 shall not exceed an amount equal to $18,000 plus reasonable attorneys' fees associated with any required compliance effort.

7.5.3 Subject to Section 7.5.4, with respect to any Losses for which the Investor Group is entitled to be indemnified under Section 7.1.1 and Section 7.1.8, the Investor Group shall seek payment for such Losses as follows: (a) first, from the Indemnity Escrow Amount in accordance with the Escrow Agreement; and (b) second, to the extent that the Indemnity Escrow Amount is not sufficient to satisfy the payment of such Losses (whether because the Indemnity Escrow Amount has not yet been funded, has been fully exhausted, or otherwise), directly from Seller.

7.5.4 Notwithstanding anything set forth herein to the contrary, the limitations contained in Section 7.5.1, Section 7.5.2. and Section 7.5.3 shall not apply in the case of any Losses arising out of, based upon, caused by, relating or with respect to, or by reason of (i) any inaccuracy in or breach of the Fundamental Representations, or (ii) Fraud.

7.5.5 For the avoidance of doubt, the limitations contained in Section 7.5.1, Section 7.5.2, and Section 7.5.3 shall not apply in the case of any Losses with respect to which (i) the Investor Group is to be indemnified under Section 7.1.2, Section 7.1.3, Section 7.1.4, Section 7.1.5, Section 7.1.6, Section 7.1.7 (except it is agreed that the limitation set forth in Section 7.5.2(iii) shall be in effect with regard to Section 7.1.7), or (ii) the Seller Group is to be indemnified under Section 7.2.2.

7.5.6 Except in the case of Fraud, in no event shall the aggregate indemnification amounts paid by Seller under Section 7.1 or the aggregate indemnification amounts paid by the Investors under Section 7.2 exceed an amount equal $19,040,000.

7.5.7 Notwithstanding anything to the contrary in this Agreement, (i) no investigation by the Investors shall affect the representations and warranties of Seller under this Agreement or the representations and warranties of Seller or the Company contained in any other agreement, instrument, certificate or document delivered under the terms of this Agreement, (ii) such representations and warranties shall not be affected or deemed waived by reason of the fact that the Investors knew or should have known that any of the same is or might be inaccurate in any respect and (iii) such representations and warranties shall be deemed to be bargained for assurances. In determining whether an inaccuracy in or a breach of any representation, warranty, agreement or covenant has occurred and the amount of any Losses suffered by an Indemnitee related to any inaccuracy in or breach of any representation, warranty, agreement or covenant, all qualifications or exceptions in such representation, warranty, agreement or covenant relating to

or referring to "materiality" or any similar term or phrase shall be disregarded; *provided* that (w) the word "material" in the second sentence of Section 5.7 (Financial Statements) shall not be disregarded, (x) the phrase "Material Adverse Effect" in Section 5.9.1 (Absence of Certain Changes) shall not be disregarded; (y) the word "Material" in the defined terms "Material Customer" and "Material Supplier" shall not be disregarded; and (z) the word "material" shall not be disregarded in any representation or warranty in Section 3.9 or Section 4.8 that calls for the completeness or accuracy of a list of documents or other items to be set forth in a disclosure Schedule which disclosures were based upon any such materiality qualifier.

7.5.8 Notwithstanding anything to the contrary set forth herein, no Party shall be liable for any punitive or exemplary damages or losses, relating to any breach of representation, warranty or covenant contained in this Agreement, except in each case, to the extent required to be paid to a third party pursuant to a final, non-appealable judgment or a reasonable settlement in connection with a Third Party Claim to which the other Party has consented.

7.6. Exclusive Remedy. The Investors and Seller acknowledge and agree that, except for the remedies provided herein to address disputes or objections to the calculations and adjustments described herein or as otherwise specifically provided herein (including Sections 6.9 and 9.13 hereof), the indemnification and related provisions in this Section 7 shall be the exclusive remedy for monetary damages of the Investors and Seller with respect to this Agreement; *provided*, *however*, that, for clarity, no limitation set forth in this Agreement, including the limitations set forth in this Section 7, shall limit (i) any remedy that may be available to the Investors or Seller, directly or indirectly, against the other or against any other party pursuant to the Company A&R Operating Agreement, the Advisory Agreement and the Transition Services Agreement, (ii) any remedy that may be available to the Investors or Seller against any other Party on account of Fraud, or (iii) rights or remedies expressly provided for in this Agreement or any other agreement entered into in connection with this Agreement or rights or remedies that, as a matter of applicable Law or public policy, cannot be limited or waived. The provisions of this Section 7.6 together with the other provisions of this Section 7, were specifically bargained for among the Investors and Seller in arriving at the Purchase Price. In agreeing to the Purchase Price and in agreeing to provide the specific representations and warranties set forth in this Agreement and in any other agreement, instrument, certificate or document delivered under the terms of this Agreement, the Investors and Seller have specifically relied upon this Section 7.6 and the limitations on remedies provided in this Section 7. The obligations of Seller to indemnify the Investor Group pursuant to the terms of this Agreement are the primary obligations of Seller, subject to the limitations set forth herein. Seller hereby waives any right to seek or obtain indemnification or contribution from the Company for Losses arising from this Agreement. Notwithstanding anything herein, Investors shall be permitted, and nothing herein shall inhibit the Investors' ability or right, to prosecute, on behalf of the Company, any indemnity claim permitted pursuant to the terms of the Original Contribution Agreement as amended by the Contribution Agreement Amendment.

7.7. Insurance Coverage. In determining the amount of Losses in respect of a claim under this Section 7, there shall be deducted an amount equal to the amount of any third-party insurance proceeds actually received (net of direct collection expenses) by an Indemnitee making such claim with respect to such Losses less the cost of any increase in insurance premiums over the projected period of such increase as a result of making a claim for such Losses, provided, however that the foregoing shall not (i) require an Indemnitee to proceed or seek action or recovery from any such third-party as a requirement hereunder or as a condition to seeking or recovering indemnification from any Indemnitor hereunder, or (ii) be construed or interpreted as a guaranty of any level or amount of insurance recovery with respect to any Losses

hereunder or as a requirement to maintain any insurance or to make any claim for insurance as a condition to any indemnification hereunder.

7.8. No Contribution. Notwithstanding anything contained in any statute, organizational documents or agreement to the contrary, neither Seller nor the Company nor any of their respective Affiliates (including any director, officer, manager, employee, agent or other representative of any of the foregoing) shall have any right of contribution, subrogation, indemnification, advancement of expenses or other claim against the Company with respect to any claims by the Investors or any Investor Indemnified Party in respect of this Agreement, any other agreement, instrument, certificate, or document contemplated hereby or the transactions contemplated hereby and thereby.

7.9. Tax Treatment of Indemnity Payments. The Parties agree to treat any indemnification payments made to the Investors pursuant to this Agreement as an adjustment to the final Purchase Price to the extent permitted by applicable Law.

7.10. Distributions from Indemnity Escrow Amount.

7.10.1 In the event that (i) Seller shall not have objected to the amount claimed by the Investors or any other member of the Investor Group for indemnification with respect to any Loss in accordance with the procedures set forth in the Escrow Agreement or (ii) Seller has delivered notice of their disagreement as to the amount of any indemnification requested by the Investors or any other member of the Investor Group in accordance with the terms of this Agreement and the Escrow Agreement and either (a) Seller and the Investors shall have, subsequent to the giving of such notice, mutually agreed that Seller is obligated to indemnify the Investors or any other member of the Investor Group for a specified amount and the Investors and Seller shall have so jointly notified the Escrow Agent or (b) a final, nonappealable judgment shall have been rendered by the court having jurisdiction over the matters relating to such claim by the Investors or any other member of the Investor Group for indemnification from Seller, and the Escrow Agent shall have received in the case of clause (a) above, written instructions from Seller and the Investors or, in the case of clause (b) above, a copy of the final, nonappealable judgment of the court, Investors and Seller shall, or in the case of subclause (b), Investors may, instruct the Escrow Agent to deliver to Investors or any member of the Investor Group from the Indemnity Escrow Amount the amount determined to be owed to the Investors or any other member of the Investor Group as set forth in such written instructions or such final, nonappealable judgement, as applicable, in accordance with the Escrow Agreement.

7.10.2 As soon as practical following the fifteen (15) month anniversary of the Closing Date and in any event no later than the fifth (5th) Business Day after the Escrow Termination Date (as defined in the Escrow Agreement), the Investors and Seller shall provide a joint written instruction, the Escrow Agent to distribute to Seller, in accordance with the instructions provided by Seller, the remaining Indemnity Escrow Amount (if any) in excess of any portion of the Indemnity Escrow Amount that is necessary to satisfy the aggregate amount associated with any Indemnification Matter for which Seller has received notice pursuant to this Section 7 that has not, by such date, been finally resolved and paid in full in accordance with Section 7 (for clarity, inclusive of all unresolved, unsatisfied or disputed Indemnification Matters for which Seller has received notice pursuant to this Section 7) (each such claim, a "Continuing Claim"). Upon the resolution of each such Continuing Claim (following the application of Section 7.10.1 with respect to such Continuing Claim that has been resolved), the Investors and Seller shall provide a joint written instruction to the Escrow Agent to shall release and pay over to Seller the portion of the remaining Indemnity Escrow Amount (if any) in excess of the amount

that would be required to satisfy all then remaining Continuing Claims in the manner alleged, if any.

7.11. Set-off Rights. In addition to all other rights and remedies that the Investors may have under this Agreement, the Investors and the Investor Group shall have the right (but not the obligation) to set-off (or cause the Company to set-off) against (i) any principal and accrued interest under the Convertible Note or (ii) any distributions owed to Seller by the Company on account of Seller's ownership of Class B Common Units or Class J Common Units (if the Convertible Note is converted on the terms set forth therein) on or after the date hereof, any sum for which any of the Investor Group is entitled to indemnification pursuant to this Section 7. If, on the date that payment of principal or interest under the Convertible Note or distributions are due to Seller, any of the Investor Group has made a claim against Seller for indemnification under this Section 7, then such Investor Group member shall have the option, in its sole discretion, to direct the Company, subject to the application of the limits set forth in this Section 7, to retain the amount in dispute until the date of resolution of such claim (such amount to be held without interest) and such retention and non-payment shall not constitute a breach, default or other violation of the terms of the Convertible Note or the Company A&R Operating Agreement, as applicable. If the amount in dispute is less than the amounts or distributions due to be paid to Seller on such date, the Company shall pay the balance of any such amount to Seller pursuant to the terms of the Convertible Note or the Company A&R Operating Agreement, as applicable. Upon the resolution of any such claim, the Company shall (x)(i) pay over to Seller the portion of the withheld amount in excess of the amount that would be required to satisfy the claim, if any, and (ii) pay over to the Investors the portion of the withheld amount required to satisfy the claim, and/or (y) amend the Convertible Note (provided that Seller hereby covenants to cooperate with the Company and to take all actions necessary to effect such amendment) to reduce the amount of principal and/or interest payable thereunder by the amount required to satisfy the claim.

8. Tax Matters.

8.1. Tax Apportionment. In the case of Taxes that are payable with respect to a Straddle Tax Period, the portion of any such Tax that is allocable to the portion of the Straddle Tax Period ending on the Closing Date will be (i) in the case of Taxes that are either (x) based upon or related to income or receipts or (y) imposed in connection with any sale or other transfer or assignment of property (real or personal, tangible or intangible), deemed equal to the amount which would be payable if the taxable period ended as of the close of business on the Closing Date; *provided*, *however*, that all exemptions, allowances, or deductions for the Straddle Tax Period which are calculated on an annual basis (including depreciation and amortization deductions) shall be allocated in proportion to the number of days in each period; and (ii) in the case of Taxes imposed on a periodic basis with respect to the assets of the Company, or otherwise measured by the level of any item, deemed to be the amount of such Taxes for the entire period (or, in the case of such Taxes determined on an arrears basis, the amount of such Taxes for the immediately preceding period), multiplied by a fraction the numerator of which is the number of calendar days in the period ending on the Closing Date and the denominator of which is the number of calendar days in the entire period. Any Taxes that would be computed at the end of a Tax year, including Taxes computed pursuant to Subpart F of the Code, Global Intangible Low-Taxed Income and income from any pass-through entities shall be computed as if the applicable Tax year of such entity ended on the Closing Date and any Taxes owed by the Company for such period shall be treated as incurred in the portion of the Straddle Tax Period ending on the Closing Date.

8.2. Transfer Taxes. Notwithstanding any other provision of this Agreement, all transfer, documentary, recording, notarial, sales, use, registration, stamp and other similar

Taxes or fees imposed by any Taxing Authority in connection with the transactions contemplated by this Agreement, as well as the costs of preparing and filing any associated Tax Returns ("Transfer Taxes") will be borne equally by Seller, on one hand, and the Investors, on the other hand. Seller will prepare and file all necessary Tax Returns and other documentation with respect to all such Taxes and, if required by applicable Law, the Investors will join in the execution of any such Tax Returns or other documentation.

8.3. Cooperation on Tax Matters. The Investors and Seller shall cooperate fully, as and to the extent reasonably requested by the other Party, in connection with the filing of Tax Returns and any Tax Proceedings. Notwithstanding anything in Section 6.2 to the contrary, Seller and the Investors shall (i) retain all Books and Records with respect to Tax matters pertinent to the Business relating to any taxable period beginning before the Closing Date until expiration of the statute of limitations (and, to the extent notified by the Investors or Seller, any extensions thereof) of the respective taxable periods, and to abide by all record retention agreements entered into with any Taxing Authority, and (ii) give the other Party reasonable written notice prior to transferring, destroying, or discarding any such books and records and, if the other Party so requests, allow such Party to take possession of such books and records.

8.4. Section 754 Election. Seller and Investors Tax Representative shall cause the Company to make an election under Section 754 of the Code for the tax year that includes Closing (the "754 Election"). For purposes of complying with the 754 Election reporting requirements set forth in Treasury Regulation Section 1.743-1(k): (i) Investors shall provide to the Company, within one hundred twenty (120) days following the Closing Date, written notice which describes: (a) the name, address and taxpayer ID number of Seller (which such taxpayer ID number shall be provided by Seller to the Investors within thirty (30) days following the Closing Date); (b) the name, address and taxpayer ID number of the Investors; and (c) the aggregate purchase price paid by Investors for the Preferred Units and the Common Units; and (ii) the Company shall attach a statement to its Tax Return for the 2022 tax year setting forth: (x) the name, address, and taxpayer ID number of the Investors; and (y) the computation of the adjustments to the Company's assets pursuant to Code Sections 743(b) and 755 and the Treasury Regulations promulgated thereunder (the "754 Adjustments") which shall be computed in accordance with 8.5. Any accounting Tax preparation or other administrative expenses incurred (or to be incurred) by the Company and/or the Investors in connection with the preparation of the 754 Adjustments, shall be an expense of the Company.

8.5. Asset Allocation Statement. The 754 Adjustments shall be set forth in a Schedule (the "Asset Allocation Statement") which shall be prepared by Investors Tax Representative in accordance with Section 1060 of the Code and the applicable Treasury Regulations thereunder and shall be delivered to Seller within ninety days (90) following the final determination of the Purchase Price pursuant to Section 2.3. Within thirty (30) days of Seller's receipt of the Asset Allocation Statement, Seller shall provide in writing (such writing, the "Allocation Objection") to Investors Tax Representative any proposed changes thereto, together with a written explanation setting forth in reasonable detail the basis of any proposed changes. If Seller does not provide Investors Tax Representative with an Allocation Objection or an Allocation Objection that contains Seller's proposed allocation of the Purchase Price within such 30-day period, the Asset Allocation Statement shall become final and binding on the Parties. If Seller delivers an Allocation Objection to Investors Tax Representative in accordance with the foregoing within such 30-day period, Investors Tax Representative and Seller shall negotiate in good faith to resolve any dispute within twenty (20) days after Investors Tax Representatives' receipt of the Allocation Objection. If Investors Tax Representative and Seller are unable to resolve the dispute within such 20-day period, the Accounting Arbitrator shall thereafter resolve the issues in dispute. The Accounting Arbitrator shall resolve such issues in

accordance with Section 1060 of the Code and the applicable Treasury Regulations and the Asset Allocation Statement shall be modified accordingly. The Asset Allocation Statement (as finally determined pursuant to this Section 8.5) shall be binding upon the Parties for federal and applicable state, foreign and local Tax purposes. The Parties agree that they shall file and shall cause their Affiliates to file their Tax Returns consistent with the Asset Allocation Statement and no Party shall agree to any proposed adjustment to the Asset Allocation Statement by any Taxing Authority.

8.6. Withholding. The Parties will be entitled to deduct and withhold from any amount payable pursuant to this Agreement (including payments of the Purchase Price) such amounts as are required to be deducted and withheld with respect to the making of such payment under the Code or any other provision of applicable Tax Law. To the extent that amounts are so withheld and timely paid over to the appropriate Governmental Authority, such withheld amounts will be treated for all purposes of this Agreement as having been paid to the Person in respect of whom such deduction and withholding were made.

8.7. Investors Tax Representative. The Investors hereby appoint the Investors Tax Representative, on behalf of the Investors, to perform the covenants to be performed by Investors Tax Representative on behalf of the Investors pursuant to this Section 8, and to give and receive all notices required or permitted by Investors Tax Representative pursuant to this Section 8. Seller shall be entitled to rely exclusively upon any communication given or other action taken or omitted to be taken by the Investors Tax Representative pursuant to this Section 8, all of which actions or omissions shall be legally binding upon Seller.

8.8. Tax Returns. Notwithstanding anything in the operating agreement of the Company to the contrary, Seller shall prepare and timely file, or shall cause to be prepared and timely filed, all Tax Returns in respect of the Company that relate to Pre-Closing Tax Period that are required to be filed after the Closing Date. Seller shall deliver to the Investors Tax Representative at least ten (10) days prior to the due date (taking into account any extension) for the filing of such Tax Returns that are income or other material Tax Returns a draft of such Tax Returns for the Investors Tax Representative's review and comment. Seller shall consider in good faith any comment that Investors Tax Representative submits in writing to Seller no less than five (5) days prior to the due date of such Tax Returns.

8.9. Tax Contests. Notwithstanding anything in the operating agreement of the Company to the contrary, Seller shall have sole control of the conduct of all inquiries, claims, assessments, audits, Proceedings or similar events with respect to Taxes of or with respect to the Company relating to a Pre-Closing Tax Period (any such inquiry, claim, assessment, audit or similar event, a "Tax Contest"), including any settlement or compromise thereof, provided, however, that Seller shall keep the Investors Tax Representative reasonably informed of the progress of any Tax Contest and shall not effect any such settlement or compromise with respect to which Investors are liable without obtaining the Investors Tax Representative's prior written consent thereto, which shall not be unreasonably withheld or delayed.

9. Additional Terms and Provisions.

9.1. Release of Claims.

9.1.1 In consideration of the terms of this Agreement, including Seller's receipt of the Purchase Price, Seller, on behalf of Seller and Seller's representatives, Affiliates, controlling persons, Subsidiaries, officers, directors, predecessors, successors and assigns (collectively, "Related Persons"), hereby unconditionally releases and forever discharges Company and each of its Related Persons (the "Released Parties"), from any and all actions,

Proceedings, Liabilities, Orders, Contracts, Indebtedness and Losses whatsoever, whether known or unknown, suspected or unsuspected, whether in law or in equity (collectively, "Claims"), which Seller or any of its Related Persons, may now have, has ever had, or may hereafter have against any of the Released Parties that arise out of or in any way relate any matter, event, cause or thing, act or failure to act, whatsoever occurring at any time at or prior to Closing, except that this release shall not apply to the enforcement of the terms of this Agreement and any other agreement, instrument, certificate, or document delivered by the Parties pursuant hereby.

9.1.2 Seller hereby irrevocably covenants to refrain from, directly or indirectly, asserting any claim or demand, or commencing, instituting or causing to be commenced, any Proceeding of any kind against any Released Party, based upon any matter purported to be released hereby. Further, Seller hereby warrants, represents and agrees that Seller has not heretofore assigned, subrogated or transferred, or purported to assign, subrogate or transfer, to any Person any Claim purported to be released hereby.

9.1.3 Seller understands the legal effect of this Section 9.1 and has had the opportunity to obtain all information necessary for its decision to enter into this Agreement and this Section 9.1. Seller is aware that Seller may hereafter discover Claims or facts in addition to or different from those Seller now knows or believes to be true with respect to the matters related herein. Nevertheless, it is Seller's intention to fully, finally and forever settle and release all matters purported to be released hereby and all Claims relative thereto, which now exist or heretofore have existed. In furtherance of such intention, the releases given herein will remain in effect as full and complete releases of all such matters notwithstanding the discovery or existence of any additional or different Claims or facts related thereto. Seller hereby warrants and represents that, in executing this Agreement and the terms of this Section 9.1, Seller does so with full knowledge of any and all rights that Seller may have with respect to the matters set forth and the Claims released in this Section 9.1, and Seller has received legal advice with respect to the matters set forth and the Claims released in this Section 9.1 and with respect to the rights and asserted rights arising out of such matters. The Released Parties are intended beneficiaries of this Section 9.1 and therefore are entitled to enforce the provisions of Section 9.1 against Seller.

9.2. No Third-Party Beneficiaries. Except as expressly set forth herein (including (i) the Investor Group, and the Released Parties, members of which shall be express third party beneficiaries hereof, and (ii) the Seller Group, members of which shall be express third party beneficiaries hereof), this Agreement shall not confer any rights or remedies upon any Person other than the Parties and their respective successors and permitted assigns, personal representatives, heirs and estates, as the case may be.

9.3. Entire Agreement; Full Understanding. This Agreement and the other certificates, instruments, agreements and documents referenced herein (including the schedules and the exhibits) constitute the entire agreement among the Parties with respect to the transactions contemplated hereby and supersede any prior understandings or agreements by or among the Parties, written or oral, to the extent they related in any way to the subject matter hereof. Each of the Parties hereby acknowledges and confirms that each such Party has read and understands the entirety of this Agreement, including the representations and warranties, covenants and indemnification obligations contained herein. The Parties negotiated this Agreement at arm's-length, jointly participated in drafting it, and received advice from independent legal counsel before they signed it. Accordingly, any court or other Governmental Authority or arbitrator construing or interpreting this Agreement will do so as if the Parties jointly drafted it and will not apply any presumption, rule of construction, or burden of proof favoring or disfavoring a Party because that party (or its representatives) drafted any part of this Agreement.

9.4. Assignment. All the terms and provisions of this Agreement shall be binding upon and inure to the benefit of the Parties and their respective successors and permitted assigns, personal representatives, heirs and estates, as the case may be. No Party shall assign this Agreement or any part hereof without the prior written consent of the other Parties, and any assignment in contravention of the foregoing shall be null and void; *provided*, *however*, the Investors may assign this Agreement and their rights and obligations under this Agreement, in whole or in part, without consent, to any of their respective Subsidiaries or Affiliates or any Person that acquires all or substantially all of the equity or assets of such Investor or the Company. Further, the Investors and the Company may assign any of their respective rights, interests or obligations hereunder for collateral security purposes to any lender providing financing to the Investors or their Affiliates and any such lender may exercise all of the rights and remedies of the Investors and the Company hereunder, as applicable.

9.5. Notices. All notices, requests, claims, demands and other communications hereunder shall be in writing and shall be given or made by delivery in person, by an internationally recognized overnight courier service, email or registered or certified mail (postage prepaid, return receipt requested) to the respective Parties at the following addresses (or at such other address for a party as shall be specified in a notice given in accordance with this Section 9.5):

If to Seller, to:

Luna Innovations Incorporated
301 1st Street, SW, Suite 200
Roanoke, VA 24011
Attention: Scott A. Graeff
Email:

with copies (which shall not constitute notice) to:

Cooley LLP
1299 Pennsylvania Avenue, NW, Suite 700
Washington, DC 20004-2400
Attention: Aaron Binstock
Email: abinstock@cooley.com

If to Mereo Capital, to:

Mereo Capital Partners I, LP
c/o Mereo Capital Partners, LLC
100 Front St Suite 900
Conshohocken, PA 19428
Attention: Leo Helmers, John O'Hare and Adam Bowie
Email: lhelmers@mereocap.com, johare@mereocap.com and abowie@mereocap.com

with copies (which shall not constitute notice) to:

Blank Rome LLP
One Logan Square
130 North 18th Street
Philadelphia, PA 19103
Attention: Louis M. Rappaport, Molly Crane and
Rachel Packer
Email: louis.rappaport@blankrome.com, molly.crane@blankrome and
rachel.packer@blankrome.com

If to Point Lookout, to:

Point Lookout Capital Partners IV, LLC
c/o Point Lookout Capital Partners
295 Madison Avenue, 12th Floor
New York, New York 10017
Attention: Michael Monteleone
Email: mm@pointlookoutcapital.com

or to such other address or addresses as the Parties may from time to time designate in writing. Any notice which is delivered personally or by email (and no "bounce back" message is received) in the manner provided herein shall be deemed to have been duly given to the party to whom it is directed on the date of delivery or transmission, respectively. Any notice which is addressed and mailed in the manner herein provided shall be conclusively presumed to have been duly given to the party to which it is addressed at the close of business, local time of the recipient, on the fourth Business Day after the day it is so placed in the mail (or on the first Business Day after placed in the mail if sent by overnight courier) or, if earlier, the time of actual receipt.

9.6. Controlling Law. THIS AGREEMENT IS MADE UNDER, AND SHALL BE CONSTRUED AND ENFORCED IN ACCORDANCE WITH, THE LAWS OF THE STATE OF DELAWARE, APPLICABLE TO AGREEMENTS MADE AND TO BE PERFORMED SOLELY THEREIN, WITHOUT GIVING EFFECT TO PRINCIPLES OF CONFLICTS OF LAW.

9.7. Jurisdiction, Process and Waiver of Jury Trial. ANY LEGAL ACTION ARISING OUT OF OR BASED UPON THIS AGREEMENT OR THE TRANSACTIONS CONTEMPLATED HEREBY MAY BE INSTITUTED IN THE STATE OR FEDERAL COURTS LOCATED IN THE CITY OF WILMINGTON, STATE OF DELAWARE, AND EACH PARTY IRREVOCABLY SUBMITS TO THE EXCLUSIVE JURISDICTION OF SUCH COURTS IN ANY SUCH ACTION. THE PARTIES IRREVOCABLY AND UNCONDITIONALLY WAIVE ANY OBJECTION TO THE LAYING OF VENUE OF ANY ACTION IN SUCH COURTS AND IRREVOCABLY WAIVE AND AGREE NOT TO PLEAD OR CLAIM IN ANY SUCH COURT THAT ANY SUCH ACTION BROUGHT IN ANY SUCH COURT HAS BEEN BROUGHT IN AN INCONVENIENT FORUM. THE PARTIES HEREBY WAIVE ANY RIGHT TO TRIAL BY JURY IN ANY ACTION OR PROCEEDING ARISING OUT OF OR RELATING TO THIS AGREEMENT OR ANY TRANSACTION CONTEMPLATED HEREBY, NOW EXISTING OR HEREAFTER ARISING, AND WHETHER IN CONTRACT, TORT OR OTHERWISE. THE PARTIES AGREE THAT ANY OF THEM MAY FILE A COPY OF THIS PARAGRAPH WITH ANY COURT AS WRITTEN EVIDENCE OF THE KNOWING, VOLUNTARY AND BARGAINED-FOR AGREEMENT AMONG THE PARTIES IRREVOCABLY TO WAIVE TRIAL BY JURY AND THAT ANY

ACTION OR PROCEEDING WHATSOEVER BETWEEN THEM RELATING TO THIS AGREEMENT OR ANY TRANSACTION CONTEMPLATED HEREBY SHALL INSTEAD BE TRIED IN A COURT OF COMPETENT JURISDICTION BY A JUDGE SITTING WITHOUT A JURY.

9.8. Amendments and Waivers; Severability; No Waiver. No amendment of any provision of this Agreement shall be valid unless the same shall be in writing and signed by the Investors and Seller. By an instrument in writing the Investors, on the one hand, or Seller, on the other hand, may waive compliance by the other with any term or provision hereof that such Party was or is obligated to comply with or perform. A Party's waiver does not waive any other earlier, concurrent, or later breach or compliance. Any term or provision of this Agreement that is invalid or unenforceable in any situation in any jurisdiction shall not affect the validity or enforceability of the remaining terms and provisions hereof or the validity or enforceability of the offending term or provision in any other situation or in any other jurisdiction. Except as otherwise expressly provided herein, no failure to exercise, delay in exercising, or single or partial exercise of any right, power or remedy by any Party, and no course of dealing between or among any of the Parties, shall constitute a waiver of, or shall preclude any other or further exercise of, any right, power or remedy.

9.9. Expenses. Except as otherwise provided in this Agreement, the Investors will bear their own fees, costs and expenses, and Seller will bear the Company's and the Seller's fees, costs and expenses (including legal, accounting and other professional fees) incurred in connection with the preparation, negotiation, execution and performance of this Agreement, the transactions contemplated herein, and including fees, costs and expenses (including legal, accounting and other professional fees) associated with the Reorganization, Recapitalization and the Management Purchase. Notwithstanding the foregoing, the Investors shall be reimbursed for fees, costs and expenses (including legal, accounting and other professional fees) incurred by the Investors, their respective Affiliates (including the Company) and representatives incident to this Agreement, the transactions contemplated herein and/or any other agreements related hereto (the "Investor Expenses"), with reimbursement for Investor Expenses incurred through the Closing Date being a use of funds at the Closing and constituting a Transaction Expense (thus as a deduct to the Closing Payment). Any such Investor Expenses incurred after the Closing shall be reimbursed by the Company, provided that Seller will be funding the Closing Fee (as defined in the Advisory Agreement) on a post-Closing basis in accordance with the Advisory Agreement. For the avoidance of doubt, Seller shall have no further reimbursement obligations with respect to Investor Expenses after the Closing, provided that nothing in this sentence is intended to derogate or otherwise impact Seller's obligation with regard to the Closing Fee as provided in the Advisory Agreement.

9.10. Construction. In construing this Agreement, including the exhibits and schedules hereto, the following principles shall be followed: (i) the terms "herein," "hereof," "hereby," "hereunder" and other similar terms refer to this Agreement as a whole and not only to the particular Article, Section or other subdivision in which any such terms may be employed; (ii) except as otherwise set forth herein, references to Articles, Sections, schedules and exhibits refer to the Articles, Sections, schedules and exhibits of this Agreement, which are incorporated in and made a part of this Agreement; (iii) a reference to any Person shall include such Person's predecessors; (iv) unless the context otherwise requires, all accounting terms not otherwise defined herein have the meanings assigned to them in accordance with GAAP consistently applied; (v) no consideration shall be given to the headings of the Articles, Sections, schedules, exhibits, subdivisions, subsections or clauses, which are inserted for convenience in locating the provisions of this Agreement and not as an aid in its construction; (vi) the word "includes" and "including" and their syntactical variants mean "includes, but is not limited to" and "including, without limitation," and corresponding syntactical variant expressions; (vii) a defined term has

its defined meaning throughout this Agreement, regardless of whether it appears before or after the place in this Agreement where it is defined, including in any Schedule or exhibit; (viii) the word "dollar" and the symbol "$" refer to the lawful currency of the United States of America; (ix) the plural shall be deemed to include the singular and vice versa; (x) unless the context of this Agreement clearly requires otherwise, words importing the masculine gender shall include the feminine and neutral genders and vice versa; (xi) references to the transactions contemplated by this Agreement and the documents contemplated hereby or pursuant hereto shall include all documents in connection with the Contribution, the Reorganization and the Recapitalization; and (xii) any document will be deemed "delivered", "provided", or "made available" by Seller to the Investors within the meaning of this Agreement if such document is accessible to the Investors in the electronic data room for Project Hoya hosted by Datasite (the "Data Room") prior to 12:01 a.m. Eastern time at least one (1) Business Day prior to the date hereof or the date so specified (if other than the date hereof).

9.11. Counterparts. This Agreement may be executed in one or more counterparts, each of which shall be deemed an original but all of which together will constitute one and the same instrument. A signed copy of this Agreement delivered by facsimile, electronic mail or other means of electronic transmission shall be deemed to have the same legal effect as delivery of an original signed copy of this Agreement.

9.12. Non-Recourse. Except with respect to the named parties to this Agreement, no past, present or future incorporator, organizer, manager, member, partner, stockholder, equity holder, director, officer, employee, representative, agent, Affiliate or attorney of any Party shall have any Liability for any obligations or liabilities of any Party under this Agreement or for any claim based on, in respect of, or by reason of, the transactions contemplated hereunder; *provided*, that the foregoing is not intended to limit the ability of the Company, the Investors and Seller to (i) enforce the terms of this Agreement or any other agreement, certificate, instrument and document contemplated hereby to which they are a party or (ii) bring a claim against any party for their acts or omissions on or following the date hereof. The provisions of this Section 9.12 are intended to be for the benefit of, and enforceable by, any incorporator, organizer, manager, member, partner, stockholder, equity holder, director, officer, employee, representative, agent, Affiliate or attorney of each Party, and each such Person shall be a third party beneficiary as described in this Section 9.12.

9.13. Specific Performance. The Parties each acknowledge that the rights of each party to consummate the transactions contemplated by this Agreement are special, unique and of extraordinary character and that, in the event that any Party violates or fails or refuses to perform any covenant or agreement made by it in this Agreement, the non-breaching party may be without an adequate remedy at Law. The Parties agree, therefore, that in the event that any Party violates or fails or refuses to perform any covenant or agreement made by such Party in this Agreement, the non-breaching party or parties may, subject to the terms of this Agreement and in addition to any remedies at Law for damages or other relief, institute and prosecute an action in any court of competent jurisdiction to enforce specific performance of such covenant or agreement or seek any other equitable relief (without any requirement to post bond).

-Signature Page Follows-

IN WITNESS WHEREOF, the Parties have executed this Agreement as of the Agreement Date.

INVESTORS:

MEREO CAPITAL PARTNERS I, LP

By: Mero Capital Partners I GP LLC,
in its capacity as General Partner

Name: Leo Helmers
Title: Managing Partner

POINT LOOKOUT CAPITAL PARTNERS IV, LLC

By: /s/ Michael A. Monteleone
Name: Michael A. Monteleone
Title: Managing Partner

[Signature Page to Equity Purchase Agreement]

SELLER:

LUNA INNOVATIONS INCORPORATED

By: /s/ Scott Graeff
Name: Scott Graeff
Title: Chief Executive Officer

Company:

LUNA LABS USA, LLC

By: /s/ Scott Graeff
Name: Scott Graeff
Title: Manager

[Signature Page to Equity Purchase Agreement]

Schedule 1

Defined Terms

"754 Adjustments" has the meaning set forth in Section 8.4.

"754 Election" has the meaning set forth in Section 8.4.

"Accounting Arbitrator" means an independent accounting firm of nationally recognized standing mutually agreed upon by the Investors and Seller; provided that (i) if the Investors and Seller are unable to agree on a such an accounting firm to act as Accounting Arbitrator, Seller and the Investors shall each select an independent accounting firm of nationally recognized standing and such firms together shall select an independent accounting firm of nationally recognized standing to act as the Accounting Arbitrator and (ii) if any Party does not select a an independent accounting firm of nationally recognized standing within ten (10) days of written demand therefor by the other Party, the firm selected by the other Party shall act as the Accounting Arbitrator.

"Adjustment Calculation" means an amount, which may be positive or negative, equal to (i) the Net Working Capital Calculation minus the Estimated Net Working Capital, minus (ii) the Closing Company Indebtedness minus the Estimated Company Indebtedness, minus (iii) the Closing Transaction Expenses minus the Estimated Transaction Expenses, plus (iv) the Closing Cash on Hand minus the Estimated Cash on Hand.

"Adjustment Calculation Disputed Items" has the meaning set forth in Section 2.3.3.

"Adjustment Escrow Amount" has the meaning set forth in Section 2.2.1(ii).

"Advisory Agreement" has the meaning set forth in Section 2.5.1(xvi).

"Affiliate" has the meaning set forth in Rule 12b-2 of the regulations promulgated under the Securities Exchange Act.

"Affiliated Group" means any affiliated group within the meaning of Section 1504(a) of the Code, or any similar group defined under a similar provision of Law.

"Agreement" has the meaning set forth in the Preamble.

"Agreement Date" has the meaning set forth in the Preamble.

"Allocation Objection" has the meaning set forth in Section 8.5.

"Asset Allocation Statement" has the meaning set forth in Section 8.5.

"Authorizations" shall mean, as to any Person, all licenses, permits, franchises, orders, accreditations, memberships, approvals, concessions, clearances, registrations, qualifications and authorizations issued or granted to such Person under applicable Law by any Governmental Authority or Person.

"Base Cash Purchase Price" means Seven Million Five Hundred Thousand Dollars ($7,500,000).

"Basket" has the meaning set forth in Section 7.5.1.

"Benefits Liabilities" means all obligations of the Company, payable or accrued through the Closing, to any employee (or former employee) of the Company or any Affiliate or Family of the foregoing, including (i) any accrued salary, accrued paid time off, accrued bonuses, accrued benefits under any Employee Benefit Plan or similar accruals, any severance, termination or separation pay, insurance, supplemental pension, deferred compensation, "stay" or retention or other incentive bonuses, change-in-control, success or similar bonuses (to the extent not included in Transaction Expenses), or other discretionary or compensatory amounts, and (ii) the amount of any outstanding or accrued Company contributions pursuant to any Employee Benefit Plan, including any profit sharing or similar arrangement.

"Books and Records" shall mean business records (in any form or medium).

"Business" has the meaning set forth in the Background.

"Business Day" means any day excluding Saturday, Sunday and any day which is a legal holiday under the Laws of the State of Delaware or is a day on which banking institutions located in the State of Delaware are authorized or required by Law or other governmental action to close.

"Cap" has the meaning set forth in Section 7.5.2.

"CARES Act" means the Coronavirus Aid, Relief, and Economic Security Act, Pub. L. 116-136, March 27, 2020, as amended, and any administrative or other guidance published with respect thereto by any Governmental Authority.

"Cash on Hand" means, with respect to the Company, any cash on hand, cash in bank or other accounts, readily marketable securities, and other cash-equivalent liquid assets of any nature as of the Effective Time (but giving effect to any pre-Closing distributions to Seller or Management Investor on the Closing Date), determined in accordance with GAAP. For avoidance of doubt, Cash on Hand shall (i) include checks, wires and drafts deposited for the account of the Company but not yet reflected as available proceeds in the Company's accounts and (ii) exclude any Cash on Hand that is the subject of checks or payments written and uncleared, any restricted cash or client cash held by the Company and any deposits under Real Property Leases.

"Claims" has the meaning set forth in Section 9.1.1.

"Class A-1 Preferred Units" has the meaning set forth in the Background.

"Class A-2 Preferred Units" has the meaning set forth in the Background.

"Class B Common Units" has the meaning set forth in the Background.

"Class C Units" has the meaning set forth in the Background.

"Class J Common Units" has the meaning set forth in the Background.

"Class J Redemption" has the meaning set forth in the Background.

"Closing" has the meaning set forth in Section 2.4.

"Closing Date" has the meaning set forth in Section 2.4.

"Closing Company Indebtedness" has the meaning set forth in Section 2.3.2.

"Closing Cash on Hand" has the meaning set forth in Section 2.3.2.

"Closing Payment" means an amount equal to (i) the Base Cash Purchase Price, minus (ii) the sum of the Estimated Transaction Expenses, minus (iii) the sum of the Estimated Company Indebtedness, plus (iv) the sum of the Estimated Cash on Hand, all as further adjusted pursuant to Section 2.3.1 (with respect to adjustments associated with Estimated Net Working Capital).

"Closing Statement" has the meaning set forth in Section 2.3.2.

"Closing Transaction Expenses" has the meaning set forth in Section 2.3.2.

"Code" means the Internal Revenue Code of 1986, as amended.

"Common Units" has the meaning set forth in the Background.

"Company" has the meaning set forth in the Preamble.

"Company A&R Operating Agreement" has the meaning set forth in the Background.

"Company Employee Benefit Plan(s)" has the meaning set forth in Section 5.19.1.

"Company Indebtedness" means the aggregate amount of Indebtedness of the Company as of immediately prior to the Closing, regardless of when such Indebtedness is identified. For the avoidance of doubt, if an item of Indebtedness of the Company exists as of immediately prior to the Closing, but is not disclosed or otherwise identified until after the Closing, such item of Indebtedness constitutes Company Indebtedness for purposes herein, including without limitation, for purposes of Section 7.1.5 hereof.

"Company Intellectual Property" has the meaning set forth in Section 5.13.5.

"Company Source Code" has the meaning set forth in Section 5.13.2.

"Competitive Business" means any business or business activity that is competitive with or in competition with providing applied research services under research programs funded by the U.S. government in areas of advanced materials and health sciences; subsequent product development in those aforementioned areas; and the Company's technology portfolio with the applications of corrosion sensing systems and equipment, multimodal corrosion analysis, gas separation, life-like bleeding control training, paints and coatings, concrete repair, hydration tracking, opioid withdrawal detection, biomarker assays, E. coli detection.

"Confidential Information" has the meaning set forth in Section 6.5.

"Consent" means any approval, consent, ratification, novation, waiver, exemption or other authorization.

"Contract" means, whether written or oral, any note, bond, mortgage, indenture, contract, including any Government Bid or Government Contract, agreement, permit, license, lease,

sublease, purchase order, sales order, call order, delivery order, task order, grant, cooperative arrangement, cooperative research and development agreement, other transactions authority agreement, arrangement or other commitment, obligation or understanding, express or implied, to which a Person is a party or by which a Person or its assets or properties are bound.

"Contribution Agreement Amendment" has the meaning set forth in the Background.

"COTS Software" shall mean commercially available non-custom software or hosted-service or software-as-a-service platforms, that are made available in executable form on standard, non-negotiated terms involving annual payments from the Company for less than $5,000 in the aggregate.

"COVID-19" means SARS-CoV-2 or COVID-19, and any evolutions thereof or related or associate epidemic, pandemic or disease outbreaks.

"COVID-19 Measures" means any quarantine, "shelter in place," "stay at home," workforce reduction, social distancing, shut down, closure, sequester or any other Law, order, directive, guidelines or recommendations by any Government Authority in connection with or in response to COVID-19, including the CARES Act.

"Current Government Contracts" has the meaning set forth in Section 5.12.1.

"Defense Conditions" has the meaning set forth in Section 7.3.2.

"Deferred Purchase Price" means any amount owed to a Person for any property or services received by the Company or Seller (with respect to the Business) that has not been paid as of the Closing Date, provided that the foregoing shall be deemed to exclude any liability that would be properly characterized as a current liability under Net Working Capital.

"Disclosure Schedule" means the disclosure schedule delivered by Seller and the Company to the Investors concurrently with the execution and delivery of this Agreement.

"Earnout Payments" has the meaning set forth in the Preamble.

"Effective Time" means 12:01 a.m. eastern time on the Closing Date.

"Employee" means any individual employed directly by Seller primarily in connection with the Business, or by the Company, or through Seller's or Company's Professional Employer Organization ("PEO").

"Employee Benefit Plan" means any employee benefit plan as defined in Section 3(3) of ERISA, any "voluntary employees' beneficiary association" within the meaning of Section 501(c)(9) of the Code, "welfare benefit fund" within the meaning of Section 419 of the Code, or "qualified asset account" within the meaning of Section 419A of the Code, and any other plan, program, policy, agreement, contract or arrangement, whether formal or informal, whether or not set forth in writing, for or regarding bonuses, commissions, incentive compensation, severance, vacation, deferred compensation, pensions, profit sharing, retirement, payroll savings, equity options, equity purchases, equity awards, equity ownership, phantom equity, equity appreciation rights, equity compensation, medical/dental expense payment or reimbursement, disability income or protection, sick pay, paid-time off, group insurance, self-insurance, death benefits, employee welfare or fringe benefits of any nature, but does not include at-will employment or service agreements providing no requirement for a termination notice

period, severance or other post-termination benefits (other than notice periods, payments or benefits continuation coverage required by Law).

"Employment Agreements" has the meaning set forth in Section 2.5.1(iii).

"Environmental Laws" means any Law and any implementing regulations or written agency guidance or policy as well as common laws relating to the environment, protection of human health and safety relating to the environment, or workplace health and safety relating to the environment.

"ERISA" means the Employee Retirement Income Security Act of 1974, as amended, and all rulings and regulations promulgated thereunder.

"ERISA Affiliate" means any Person or business part of the same controlled group with (or under common control with), an affiliated service group with, or another arrangement that includes, the Company or any ERISA Affiliate within the meaning of Code Section 414(b), (c), (m) or (o).

"Escrow Account" has the meaning set forth in Section 6.10.

"Escrow Agent" means Citibank, N.A.

"Escrow Agreement" has the meaning set forth in Section 2.2.1.

"Escrow Amounts" means the Adjustment Escrow Amount plus the Indemnity Escrow Amount.

"Estimated Cash on Hand" has the meaning set forth in Section 2.3.1.

"Estimated Closing Statement" has the meaning set forth in Section 2.3.1.

"Estimated Company Indebtedness" has the meaning set forth in Section 2.3.1.

"Estimated Net Working Capital" has the meaning set forth in Section 2.3.1.

"Estimated Transaction Expenses" has the meaning set forth in Section 2.3.1.

"Exclusive Marks" has the meaning set forth in Section 6.9.2.

"Family" of an individual includes (i) the individual, (ii) the individual's spouse, (iii) any other natural person who is related to the individual or the individual's spouse within the second degree, and (iv) any other natural person who resides with such individual.

"Final Adjustment Calculation" means an amount, which may be positive or negative, equal to (i) the Adjustment Calculation if the Investors do not receive an Objection Notice pursuant to and in accordance with Section 2.3.2 or (ii) otherwise, (a) the Final Net Working Capital Calculation minus the Estimated Net Working Capital, minus (b) the Final Company Indebtedness minus the Estimated Company Indebtedness, minus (c) the Final Transaction Expenses minus the Estimated Transaction Expenses, plus (d) Final Cash on Hand minus Estimated Cash on Hand.

"Final Cash on Hand" has the meaning set forth in Section 2.3.3.

"Final Closing Payment" means the Closing Payment, as increased or decreased, as applicable, by any payments made pursuant to Section 2.3.4.

"Final Company Indebtedness" has the meaning set forth in Section 2.3.3.

"Final Net Working Capital Calculation" has the meaning set forth in Section 2.3.3.

"Final Transaction Expenses" has the meaning set forth in Section 2.3.3.

"Financial Statements" has the meaning set forth in Section 5.7.

"Fraud" means shall mean fraud as defined by and construed under the Laws of the State of Delaware.

"Fundamental Representations" means those representations and warranties set forth in Section 3.1 (Organization of Investors), Section 3.2 (Authorization of Transaction), Section 3.5 (Broker Fees), Section 4.1 (Organization of Seller), Section 4.2 (Authorization), Section 4.3 (Ownership of Purchased Equity), Section 4.4 (Noncontravention), Section 4.6 (Broker Fees), Section 5.1 (excluding Section 5.1.2) (Organization and Authority), Section 5.2 (Authorization), Section 5.3 (Capitalization), Sections 5.4(i) and (ii) (Noncontravention), Section 5.5.2 (Title to and Sufficiency of Assets), Section 5.6 (Broker Fees), and Section 5.11 (Tax Matters).

"GAAP" means United States generally accepted accounting principles as in effect from time to time. From and after the Closing, any management judgment required for the interpretation or application of GAAP shall be made by the management of the Investors.

"Governing Documents" means (i) in the case of a Person that is a corporation, its articles or certificate of incorporation and its bylaws, regulations or similar governing instruments required by the Laws of its jurisdiction of formation or organization; (ii) in the case of a Person that is a partnership, its articles or certificate of partnership, formation or association, and its partnership agreement (in each case, limited, limited liability, general or otherwise); (iii) in the case of a Person that is a limited liability company, its articles or certificate of formation or organization, and its limited liability company agreement or operating agreement; (iv) in the case of a Person that is a trust, its declaration of trust, trust agreement, certificates of ownership or similar governing instruments required by the Laws of its jurisdiction of formation; and (v) in the case of a Person that is none of a corporation, partnership (limited, limited liability, general or otherwise), limited liability company, trust or natural Person, its governing instruments as required or contemplated by the Laws of its jurisdiction of organization.

"Government Bid" means any proposal or offer, solicited or unsolicited, made by the Company with respect to the Business prior to the Closing Date which, if accepted, would result or would have resulted in a Government Contract.

"Government Contract" means any Contract between the Company, on the one hand, and (i) any Governmental Authority, including any administrative agreement or consent agreement with any Governmental Authority relating to compliance with such Government Contract, (ii) any prime contractor of a Governmental Authority in its capacity as a prime contractor, or (iii) any subcontractor at any tier with respect to any Contract of a type described in clauses (i) or (ii) above, on the other hand.

"Governmental Authority" means any entity exercising executive, legislative, judicial, regulatory or administrative functions of or pertaining to government, including any federal,

state, local or foreign government or any subdivision, agency, instrumentality, authority (including any regulatory, administrative, and self-regulatory authority), department, commission, board or bureau thereof or any federal, state, local or foreign court, arbitrator or tribunal.

"Hazardous Materials" means any toxic or hazardous substance, material, or waste, and any other contaminant or pollutant, whether liquid, solid, semi solid, sludge and/or gaseous, including chemicals, compounds, by products, pesticides, asbestos containing materials, petroleum or petroleum products, and polychlorinated biphenyls, and any other material or substance subject of any Environmental Law.

"Indebtedness" means, with respect to any Person, all Liabilities, contingent or otherwise, as obligor or otherwise, for or with respect to (i) all obligations for borrowed money, including, without limitation, as arising from corporate credit cards, which obligations shall include the principal, accreted value, accrued and unpaid interest, unpaid fees or expenses and other monetary obligations or other interest-bearing indebtedness, whether current or funded, secured or unsecured, (ii) all obligations evidenced by a note, bond or debenture, (iii) all obligations for Deferred Purchase Price, (iv) all obligations created or arising under any conditional sale or other title retention agreement with respect to property acquired, including any "earnout" or similar payments or any noncompete payments, (v) all obligations secured by a purchase money mortgage or other lien to secure all or part of the purchase price of property subject to such mortgage or lien, (vi) all obligations under leases which will have been or should be, in accordance with GAAP, recorded as capital leases or under vehicle leases (other than, for the avoidance of doubt, the Charlottesville Real Property Lease), (vii) all obligations in respect of bankers' acceptances, letters of credit or similar credit transactions, (viii) all obligations secured by Liens on property acquired, whether or not such obligations were assumed at the time of acquisition of such property, (ix) any off balance sheet financial obligations in the nature of indebtedness, including synthetic leases and project financing, (x) the face value of any surety bonds, performance bonds or security deposits held for the benefit of third parties, (xi) breakage or similar costs for interest rate hedges, (xii) all obligations of the Company to Seller, manager, director, member, stockholder, officer or employee (or any former manager, director, member, stockholder, officer or employee) of the Company or to any Affiliate or Family of the foregoing, other than Benefits Liabilities, (xiv) all Benefits Liabilities, (xvi) the amount of any outstanding settlement or similar agreement or obligations, (xvii) to the extent incurred by the Company or otherwise sought from the Company, all unpaid fees, costs, charges, expenses and obligations that have been or are incurred by the Seller and its Affiliates (other than the Company) in contemplation of, in connection with or relating to the preparation for, and consummation of, the transactions contemplated by this Agreement and all other agreements, certificates, instruments and documents delivered under the terms of this Agreement and the transactions contemplated hereby and thereby, including (A) the preparation, negotiation and execution of this Agreement and all other agreements, certificates, instruments and documents delivered under the terms of this Agreement and the transactions contemplated hereby and thereby; (B) financial advisory and professional services provided by the Seller's and its Affiliates' (other than the Company) bankers, counsel (including, without limitation, Cooley LLP), brokers, consultants, accountants, advisors, agents and representatives; and (C) any Transaction Bonuses payable by Seller, (xviii) all obligations of a type referred to above which are directly or indirectly guaranteed by the Company or which the Company has agreed (contingently or otherwise) to purchase or otherwise acquire or in respect of which it has otherwise assured a credit against loss, and/or (xix) all other Liabilities that, in accordance with GAAP, should be classified on the balance sheet of the Company as indebtedness. For the avoidance of doubt, Indebtedness shall not include any Taxes nor any amounts included as liabilities in the calculation of the Final Net

Working Capital. For the avoidance of doubt, Indebtedness shall not include the line of credit from M&T Bank pursuant to the Loan and Security Documents.

"Indemnification Matter" has the meaning set forth in Section 7.3.

"Indemnification Notice" has the meaning set forth in Section 7.3.1.

"Indemnified Taxes" means, without duplication, any of the following Taxes (in each case to the extent not included in the Net Working Capital Calculation (as finally determined pursuant to Section 2.3)): (i) any Tax in respect of the Company for any Pre-Closing Tax Period or portion of a Straddle Tax Period ending on or before the Closing Date (as determined under Section 8.1); (ii) any Tax that the Company is liable for as a result of being a member of (or leaving) an Affiliated Group on or before the Closing Date or any similar provisions of federal, state or local Law imposing successor or transferee liability for Taxes; (iii) the share of Transfer Taxes that are the responsibility of Seller pursuant to Section 8.2; and (iv) any Taxes of Seller; provided that Indemnified Taxes shall not include any Taxes incurred with respect to any transaction not contemplated by this Agreement or outside the ordinary course of business on the Closing Date after the Closing.

"Indemnitee" has the meaning set forth in Section 7.3.

"Indemnitor" has the meaning set forth in Section 7.3.

"Indemnity Escrow Amount" has the meaning set forth in Section 6.10.

"Independent Contractors" has the meaning set forth in Section 5.18.2.

"Information Privacy and Security Laws" means all Laws applicable to the Company's Processing of Personal Information, or to the privacy or security of Personal Information, including security breach notification and all regulations promulgated thereunder.

"Information Technology" has the meaning set forth in Section 5.22.1.

"Intellectual Property" means all of the following and similar intangible property and related proprietary rights, interests and protections, however arising, pursuant to the Laws of any jurisdiction throughout the world: (i) trademarks, service marks, trade names, brand names, logos, trade dress and other proprietary indicia of goods and services, whether registered or unregistered, and all registrations and applications for registration of such trademarks, including all issuances, extensions and renewals of such registrations and applications and the goodwill connected with the use of and symbolized by any of the foregoing; (ii) internet domain names, social media handle or page name; (iii) original works of authorship in any medium of expression, whether or not published, all copyrights (whether registered or unregistered), all registrations and applications for registration of such copyrights, and all issuances, extensions and renewals of such registrations and applications; (iv) confidential information, ideas, formulas, designs, devices, technology, know-how, research and development, inventions, methods, data (including technical data), databases, processes, compositions and other trade secrets, whether or not patentable; (v) patents, inventions, whether or not patentable, whether or not reduced to practice or whether or not yet made the subject of a pending patent application, patent applications, provisional patent applications, industrial designs, industrial models, including all reissues, divisions, continuations, extensions and reexaminations, and all rights therein provided by multinational treaties or conventions; (vi) Software; and (vii) all rights to sue

and recover and retain damages, costs and attorneys' fees for past, present and future infringement and any other rights relating to any of the foregoing.

"Intellectual Property Licenses" has the meaning set forth in Section 5.13.4.

"Intellectual Property Registrations" has the meaning set forth in Section 5.13.1.

"Interim Period" has the meaning set forth in Section 6.4.

"Inventory" means all inventories of the Business wherever located, including inventory in transit, raw materials, works in process and finished goods.

"Investor(s)" has the meaning set forth in the Preamble.

"Investor Expenses" has the meaning set forth in Section 9.9.

"Investor Group" has the meaning set forth in Section 7.1.

"Investor Purchase" has the meaning set forth in the Background.

"Investor Promissory Note Amount" means Four Million One Hundred Twenty Eight Thousand Six Hundred Dollars ($4,128,600).

"Investors Tax Representative" means Mereo Capital.

"IRS" means the Internal Revenue Service.

"Knowledge of Seller," "to Seller's Knowledge" and similar phrases mean the knowledge of Scott Graeff, Gene Nestro, James Garrett and Bhaskar Banerjee after reasonable inquiry.

"Latest Balance Sheet" has the meaning set forth in Section 5.7.

"Law" means any statute, law (including common, statutory, civil, criminal, domestic and foreign law), ordinance, regulation, rule, code (including competition law or regulation, statutory instruments, guidance notes, circulars, directives, decisions, rules and regulations), Order, executive order, legislation, constitution, treaty, convention, judgment, decree, or other requirement or rule of law of any Governmental Authority.

"Leased Real Property" means all leasehold or subleasehold estates and other rights to use or occupy any land, buildings, structures, improvements, fixtures or other interest in real property held by the Company.

"Liabilities" means any liability or obligation of any kind (including as related to Taxes), whether known or unknown, asserted or unasserted, absolute or contingent, accrued or unaccrued, determined or indeterminable, disputed or undisputed, liquidated or unliquidated, joint or several, secured or unsecured, vested or unvested, and whether due or to become due, regardless of when asserted, and whether or not the same is required to be accrued on financial statements.

"License" has the meaning set forth in Section 6.9.

"License Term" has the meaning set forth in Section 6.9.

"Liens" means and includes security interests, mortgages, liens (including all tax liens, warrants, and similar items), licenses, pledges, charges, easements, encroachments, reservations, restrictions, including contractual, claims, clouds, servitudes, rights of way, options, rights of first refusal or options, community or other marital property interests, equitable interests, trust or similar restriction, restrictions of any kind, including, any voting or other transfer restrictions, receipt of income or exercise of any other attribute of ownership restrictions, conditional sale or other title retention agreements, any agreement to provide any of the foregoing and all other encumbrances of any nature or any other statutory liens created under any applicable Law.

"Loan and Security Documents" means that certain Credit Agreement entered into between the Company and M&T Bank on the date hereof and the security documents and other agreements referenced therein.

"Losses" or "Loss" of a Person means any and all losses (including a diminution in value of assets or securities of the Company and lost profits), Liabilities, damages, claims, awards, judgments, Taxes, settlements, fines, penalties, assessments, costs and expenses suffered, sustained or incurred by such Person, whether or not foreseeable; *provided*, that Losses shall not include any exemplary or punitive damages other than amounts payable pursuant to a Third Party Claim.

"Luna Marks" has the meaning set forth in Section 6.9.

"Management Equity Purchase Agreement" has the meaning set forth in the Background.

"Management Rights Letters" has the meaning set forth in Section 2.5.1(xvii).

"Management Investors" has the meaning set forth in the Background.

"Management Promissory Notes" has the meaning set forth in the Background.

"Management Purchase" has the meaning set forth in the Background.

"Material Adverse Effect" means, with respect to any Person, any change, effect, event, circumstance, occurrence or state of facts that has had or is reasonably likely to have, individually or in the aggregate, a material adverse effect on the Business (financial or otherwise), Liabilities, employee relations, customer or supplier relations, or assets, the Company's assets or results of operations of such Person and its Subsidiaries, taken as a whole.

"Material Contracts" has the meaning set forth in Section 5.14.1.

"Material Customers" has the meaning set forth in Section 5.20.1.

"Material Suppliers" has the meaning set forth in Section 5.20.1.

"Mereo Capital" has the meaning set forth in the Preamble.

"Net Working Capital" means, the difference between (i) current assets of the Company as of the Effective Time (excluding Cash on Hand and restricted cash), and (ii) current liabilities of the Company as of the Effective Time (excluding Indebtedness and Transaction Expenses), in each case as calculated in accordance with GAAP and the illustrative calculation set forth on Exhibit C hereto.

"Net Working Capital Calculation" has the meaning set forth in Section 2.3.2.

"Novation Agreement(s)" means the agreement(s) between Seller, the Company, and the U.S. Government through which the U.S. Government consents to the transaction between Seller and the Company and recognizes the Company as the successor in interest to the Government Contracts, per 48 C.F.R. 42.1204 et seq.

"Objection Notice" has the meaning set forth in Section 2.3.2.

"Orders" means judgments, writs, decrees, compliance agreements, injunctions or judicial or administrative or arbitral orders, fines, citations or awards, including COVID-19 Measures, and legally binding determinations of any Governmental Authority, including any arbitrator.

"Original Contribution Agreement" has the meaning set forth in the Background.

"Overage Amount" has the meaning set forth in Section 2.3.4.

"Party(ies)" has the meaning set forth in the Preamble.

"PCI DSS" has the meaning set forth in Section 5.22.2.

"Person" means an individual, a partnership, a corporation, limited liability company, an association, a joint stock company, a trust, a joint venture, an unincorporated organization or any other entity, including a Governmental Authority.

"Permitted Liens" means (i) mechanic's, materialmen's, carriers', repairers' and other Liens arising or incurred in the ordinary course of business for amounts that are not delinquent or are being contested in good faith by appropriate proceeding, (ii) Liens for Taxes that are not yet delinquent or that are being contested in good faith by appropriate proceedings, and for which appropriate reserves have been recorded on the Financial Statements, (iii) Liens granted to any lender at the Closing in connection with any financing by the Investors of the transactions contemplated hereby, (iv) zoning, building codes and other land use laws regulating the use or occupancy of real property or the activities conducted thereon which are imposed by any Governmental Authority having jurisdiction over such real property and which are not violated by the current use or occupancy of such real property or the operation of the Business or any violation of which would not materially interfere with the ordinary conduct of the Business, (v) Liens described on Schedule 1.1, and (vi) other Liens or imperfections of title that are not material in character, amount and extent and which do not detract from the value or interfere with the use of the properties they affect.

"Personal or Protected Information" means any information, in any form, that: (i) is about an identified or identifiable natural person and is collected, used, disclosed, processed, or retained by the Company; (ii) is governed, regulated or protected by one or more Information Privacy and Security Laws; (iii) is covered by PCI DSS; (iv) the Company received from or on behalf of a customer of the Company; or (v) is subject to a data security or confidentiality obligation.

"Point Lookout" has the meaning set forth in the Preamble.

"Pre-Closing Tax Periods" means any Tax period ending on or before the Closing Date, including the portion of any Straddle Tax Period that ends on the Closing Date.

"Preferred Units" has the meaning set forth in the Background.

"Privacy Requirements" has the meaning set forth in Section 5.22.2.

"Pro Rata Share" means the following percentages with respect to each Investor:

Mereo Capital	80%
Point Lookout	20%

"Proceedings" means audits, examinations, actions, suits, claims, demands, charges, complaints, allegations, litigation, reviews, hearings and investigations and legal, administrative or arbitration proceedings (including trademark oppositions and cancellation actions).

"Publicly Available Software" means each of (i) any Software that contains, or is derived in any manner (in whole or in part) from, any software that is distributed as free software, open source software, or similar licensing and distribution models, and (ii) any Software that requires as a condition of use, modification, and/or distribution of such software that such Software or other Software incorporated into, derived from, or distributed with such Software (a) be disclosed or distributed in source code form, (b) be licensed for the purpose of making derivative works, or (c) be redistributed at no or minimal charge.

"Purchase Price" has the meaning set forth in Section 2.2.1.

"Purchased Equity" has the meaning set forth in the Background.

"Purchased Software" has the meaning set forth in Section 5.13.2.

"Real Property Leases" means all leases, subleases, licenses, concessions and other agreements (written or oral) pursuant to which the Company holds the Leased Real Property, including the right to all security deposits and other amounts and instruments deposited by or on behalf of the Company thereunder.

"Recapitalization" has the meaning set forth in the Background.

"Recapitalization Date" has the meaning set forth in the Background.

"Related Persons" has the meaning set forth in Section 9.1.1.

"Released Parties" has the meaning set forth in Section 9.1.1.

"Reorganization" has the meaning set forth in the Background.

"Requested Information" has the meaning set forth in Section 2.3.3.

"Restricted Period" has the meaning set forth in Section 6.6.1.

"Securities Act" meant the Securities Act of 1933, as amended.

"Securities Exchange Act" means the Securities Exchange Act of 1934, as amended.

"Seller" has the meaning set forth in the Preamble.

Schedule 1

"Seller Earnout Agreement" has the meaning set forth in the Background.

"Seller Group" has the meaning set forth in 7.2.

"Software" means computer software programs and software systems, including all databases, algorithms, compilations, tool sets, templates, compilers, higher level or "proprietary" languages, related documentation and materials, whether in source code, object code or human readable form.

"Straddle Tax Period" means any Tax period that begins on or before the Closing Date and ends after the Closing Date.

"Subsidiary(ies)" means any entity with respect to which a specified Person (or a Subsidiary thereof) owns a majority of the equity securities (including securities exercisable for such equity securities) or has the power to vote or direct the voting of sufficient securities to elect a majority of the board of directors (or any equivalent governing body).

"Tangible Personal Property" means all furniture, fixtures, equipment, machinery, tools, vehicles, equipment, supplies and other tangible personal property owned by the Company.

"Target Net Working Capital" means Four Million Dollars ($4,000,000).

"Tax" or "Taxes" means any foreign, federal, state, provincial or local income, earnings, profits, gross receipts, franchise, capital stock, net worth, sales, use, value added, occupancy, general property, real property, personal property, intangible property, escheat or unclaimed property, transfer, fuel, excise, payroll, withholding (including under Section 409A of the Code), unemployment compensation, social security, retirement, environmental or other tax of any nature, including any addition to tax, interest or penalty imposed with respect to any of the foregoing.

"Tax Returns" means all returns and reports (including Foreign Bank Account Reports), amended returns, information returns, statements, declarations, estimates, schedules, notices, notifications, forms, elections, certificates or other documents required to be filed or submitted to any Taxing Authority with respect to the determination, assessment, collection or payment of any Tax or in connection with the administration, implementation or enforcement of, or compliance with, any Tax.

"Taxing Authority" means any domestic, foreign, federal, national, state, county or municipal or other local government, any subdivision, agency, commission or authority thereof, or any quasi-governmental body exercising tax regulatory authority.

"Teaming Agreement" means any written agreement between the Company (or Seller relating to the Business) on the one hand and any other Person, on the other hand, that establishes a "contractor team arrangement" as defined in Federal Acquisition Regulation 9.601.

"Territory" means the United States of America.

"Third Party Claim" has the meaning set forth in Section 7.3.2.

"Transaction Bonuses" means any bonuses, success fees, severance payments, change of control payments, amounts earned, accrued, payable or otherwise existing as a Liability of the Company under any Employee Benefit Plan, and any other amounts payable and unpaid at

Closing to any Person by the Company or Seller in connection with the transactions contemplated by this Agreement (including the Company's portion of any payroll Taxes associated therewith).

"Transaction Expenses" means all fees, costs, charges, expenses and obligations unpaid at Closing that are incurred by the Company (but for clarity not those incurred by Seller, which are classified as Indebtedness) in contemplation of, in connection with or relating to the preparation for, and consummation of, the transactions contemplated by this Agreement and all other agreements, certificates, instruments and documents delivered under the terms of this Agreement and the transactions contemplated hereby and thereby, including (i) the preparation, negotiation and execution of this Agreement and all other agreements, certificates, instruments and documents delivered under the terms of this Agreement and the transactions contemplated hereby and thereby; (ii) financial advisory and professional services provided by the Company's bankers, counsel, brokers, consultants, accountants, advisors, agents and representatives; and (iii) any Transaction Bonuses payable by the Company. In addition, the Investor Expenses incurred through the Closing Date to be reimbursed to the Investors as a use of funds at the Closing, pursuant to Section 9.9 hereof, shall be deemed to be additional Transaction Expenses for purposes herein.

"Transition Services Agreement" has the meaning set forth in Section 2.5.1(xix).

"Treasury Regulations" means the income tax Treasury Regulations promulgated under the Code, as the same may be amended from time to time.

"WARN" means the Worker Adjustment, Retraining and Notification Act, 29 U.S.C. § 2101, et seq. and any similar state laws, rules or regulations.

Schedule 1

Exhibit A

Company A&R Operating Agreement

See attached.

Exhibit B

Form of Investor Promissory Note

See attached.

Exhibit C

Illustrative Calculation of Net Working Capital

See attached.

SECOND AMENDMENT TO LEASE AGREEMENT

This Second Amendment to Lease Agreement (**"Second Amendment"**), dated as of the 27th day of August, 2021 (for purposes of this Amendment, the **"Second Amendment Effective Date"**), is entered into between SBA TENANT, LLC, a Virginia limited liability company (**"Landlord"**) and LUNA INNOVATIONS INCORPORATED, a Virginia corporation (**"Tenant"** and, together with Landlord, collectively referred to herein as the **"Parties"**).

WHEREAS, Landlord and Tenant entered into that certain Lease Agreement dated as of November 25, 2014, with the term commencing on April 1, 2015 and ending on March 31, 2021, relating to certain premises within the first floor office space located at 301 1st Street, SW, Suite 200, Roanoke, Virginia 24011, containing approximately 4,423 square feet of office space as more particularly described therein, as the same has been amended by that certain Lease Addendum for Storage Unit dated as of November 25, 2014 and that certain First Amendment to Lease Agreement dated as of February 21, 2020 (collectively, together with this Second Amendment, the **"Lease"**);

WHEREAS, the Lease did not terminate on March 31, 2021 and has renewed on a month-to-month basis.

WHEREAS, Landlord and Tenant have agreed to amend the Lease, upon the terms and conditions hereinafter described; and

WHEREAS, unless specficed otherwise herein, all capitalized terms used but not defined in this Amendment shall have the meanings given to them in the Lease.

NOW, THEREFORE, for good and valuable consideration paid by Tenant to Landlord and the mutual covenants, terms, and conditions, set forth herein, the receipt and sufficiency of which are hereby acknowledged, the Parties hereby amend the Lease on the terms hereof as of the Effective Date as follows:

1. Lease Term. The following sentence of Section (1)(A) of the Lease, as amended by Section 1 of the First Amendment to Lease Agreement, is hereby deleted: "Subject to the terms and conditions in this Section, the term of this Lease shall commence on April 1, 2015 (the "**Commencement Date**") and end on March 31, 2021." The deleted sentence is replaced with the following language: "Subject to the terms and conditions in this Section, the term of this Lease shall commence on April 1, 2015 (the "**Commencement Date**") and end on August 31, 2026."

2. Rent. Section (2)(A) of the Lease is hereby amended to add the following language:

> Nothwithstanding anything provided to the contrary in the Lease including but not limited to in Section 2(A) and (B), commencing on September 1, 2021, and for the remainder of the term of the Lease, Tenant covenants to pay a base annual rent in monthly installments in advance on the first day of each month in accordance with the following schedule:

Lease Year	Annual Rental	Monthly Rental
September 1, 2021 to August 31, 2022	$138,896.00	$11,574.67
September 1, 2022 to August 31, 2023	$143,062.88	$11,921.91
September 1, 2023 to August 31, 2024	$147,354.77	$12,279.56
September 1, 2024 to August 31, 2025	$151,775.41	$12,647.95
September 1, 2025 to August 31, 2026	$156,328.67	$13,027.39

3. Property Description. The definition of Leased Premises in the Lease is hereby deleted and superseded in its entirety and replaced with the following:

> "That for and in consideration of the rents and covenants hereinafter set forth, Landlord hereby agrees to Lease, and Tenant hereby rents from Landlord, the following described premises together with all improvements thereon called the "**Leased Premises**" to-wit: the first floor office space located at 301 1st Street, SW, Suite 200, Roanoke, Virginia 24011 and deemed to be 4,432 square feet of office space (the "**Original Office Space**"); an additional 1,180 square feet of office space on the first floor of 301 1st Street, SW, Roanoke, Virginia 24011 (the "**New Office Space**"); 900 square feet of storage space in storage unit numbers 100 and 200 at 301 1st Street, SW, Roanoke, Virginia, 24011 as shown in Exhibit A of Lease Addendum for Storage Unit (the "**Storage Space**"); and a total of 18 parking spaces at 0 Kirk Street, SW, Roanoke, Virginia 24011 (the "**Parking Space**")."

4. Tenant Improvements. The Lease is hereby amended to insert the following after the bulleted list in Section (8):

> "Square 1, Inc. has been engaged by Landlord to perform certain tenant improvements to the New Office Space as detailed in architectural drawings titled "Parkway 301, Suite 200 Expansion, rev.2" dated as of July 2, 2021 by with Architecture and signed by Kevin W. Jones, Architect (the "**New Office Space Tenant Improvements**"); provided, that, Landlord's responsibility to commence such improvements shall begin on the Second Amendment Effective Date."

5. Construction Supervision. Landlord shall manage Square 1, Inc, the contractor engaged to perform the New Office Space Tenant Improvements.

6. Cost of New Office Space Tenant Improvements. Landlord and Tenant agree to evenly split the cost of the New Office Space Tenant Improvements, as detailed in the contract with Square 1, Inc. dated as of July 1, 2021 ("**Contractor Contract**") and at the cost of $107,974.00. Landlord shall have full and sole discretion to approve or reject change orders to the Contractor Contract. Landlord shall be solely responsible for any and all costs associated with change orders to the Contractor Contract.

7. Progress Payments. Landlord and Tenant agree to make progress payments to Square 1, Inc. according to the terms of the Contractor Contract. All progress payments will be split evenly, with the exception of any change orders, as stipulated in Section 6 of this Second Amendment.

8. Landlord Improvements. Landlord shall clean carpets of the Original Office Space and provide additional improvements to the Original Office Space up to $5,000.00 (the "**Landlord Improvements**"). Landlord shall arrange for and manage a contractor in order to complete the Landlord Improvements as outlined in the Scope of Work List dated as of as of the date hereof.

9. Additional New Office Space Costs. Landlord shall be solely responsible for the cost of securing permit drawings for the New Office Space. Tenant shall be solely responsible for all other costs, including furniture, fixtures, and equipment costs for the New Office Space, including design, furniture, and audio-visual equipment. Tenant shall also be solely responsible for the costs of any and all signage and graphic work within the New Office Space.

10. No Default. Landlord and Tenant hereby affirm that as of the Second Amendment Effective Date, no breach, default, or other act, error, or omission which, with the giving of notice or passage of time or both, would constitute a breach or default by either party, has occurred and is continuing under the Lease.

11. Affirmation of Lease Terms. Except as modified by this Second Amendment, Landlord and Tenant hereby ratify the Lease and agree that the Lease remains unchanged and in full force and effect. In the event there is any conflict between the terms of the Lease and the terms set forth in this Second Amendment, the terms specifically set out in this Second Amendment shall control. From and after the Effective Date, any and all references to "the Lease" or "this Lease" in the Lease shall mean the Lease as modified by this Second Amendment.

12. Mutual Authorization Representation. Each of Landlord and Tenant hereby represent and warrant to each other that: (a) this Second Amendment (and each term and provision hereof) has been duly and appropriately authorized by such party through proper written corporate action and approval; and (b) no additional consent, agreement, or approval is required with respect hereto.

13. Miscellaneous.

(a) Entire Agreement. This Second Amendment contains the entire understanding between the Parties with respect to the matters being amended as contained herein.

(b) Amendment and Modification. This Second Amendment may not be changed or modified orally, but only by an agreement in writing signed by the party against whom enforcement of any waiver, change, or modification is sought.

(c) Further Assurances. Each of the Parties shall deliver to the other any further instruments or documents which may be reasonably required to establish to the satisfaction of the other party that it has agreed to be bound by and become liable under the terms and conditions of the Lease and this Second Amendment.

(d) Counterparts. This Second Amendment may be executed in counterparts, each of which shall be deemed an original.

[SIGNATURE PAGE FOLLOWS]

IN WITNESS WHEREOF, the Parties hereto have executed this Second Amendment as of the date first written above.

LANDLORD:
SBA TENANT, LLC,
a Virginia limited liability company

By: Bill Chapman
Name: Bill Chapman
Title: Manager

TENANT:
LUNA INNOVATIONS INCORPORATED,
a Virginia corporation

By:
Name: Scott A. Graeff
Title: CEO

[*Signature Page to Second Amendment to Lease Agreement*]

SUBSIDIARIES

Luna Technologies, Inc.
General Photonics Corporation
OptaSense Holdings Limited
OptaSense Limited
OptaSense Inc.
OptaSense Canada Ltd.

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We have issued our report dated March 14, 2022, with respect to the consolidated financial statements in the Annual Report of Luna Innovations Incorporated on Form 10-K for the year ended December 31, 2021. We consent to the incorporation by reference of said report in the Registration Statements of Luna Innovations Incorporated on Form S-3 (File No. 333-191809), on Form S-4 (File No. 333-201956) and on Forms S-8 (File No. 333-211802, File No. 333-204435, File No. 333-138745 and File No 333-239362).

/s/ GRANT THORNTON LLP

Philadelphia, Pennsylvania
March 14, 2022

Exhibit 31.1

CERTIFICATION OF PRINCIPAL EXECUTIVE OFFICER PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Scott A. Graeff, certify that:

1. I have reviewed this annual report on Form 10-K of Luna Innovations Incorporated;

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 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 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 14, 2022

/s/ Scott A. Graeff

Scott A. Graeff
President and Chief Executive Officer
(principal executive officer)

Exhibit 31.2

CERTIFICATION OF PRINCIPAL FINANCIAL OFFICER PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Eugene J. Nestro, certify that:

1. I have reviewed this annual report on Form 10-K of Luna Innovations Incorporated;

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 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 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 14, 2022

/s/ Eugene J. Nestro

Eugene J. Nestro
Chief Financial Officer
(principal financial officer)

Exhibit 32.1

CERTIFICATION OF PRINCIPAL EXECUTIVE OFFICER PURSUANT TO SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the annual report of Luna Innovations Incorporated (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, Scott A. Graeff, President and Chief Executive Officer of the Company, certify, pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002, that to my knowledge:

(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 results of operations of the Company.

This certification accompanies this Report to which it relates, shall not be deemed "filed" with the Securities and Exchange Commission and is not to be incorporated by reference into any filing of the Company under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended (whether made before or after the date of the Report), irrespective of any general incorporation language contained in such filing.

/s/ Scott A. Graeff

Scott A. Graeff
President and Chief Executive Officer
(principal executive officer)

March 14, 2022

Exhibit 32.2

CERTIFICATION OF PRINCIPAL FINANCIAL OFFICER PURSUANT TO SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the annual report of Luna Innovations Incorporated (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, Eugene J. Nestro, Chief Financial Officer of the Company, certify, pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002, that to my knowledge:

(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 results of operations of the Company.

This certification accompanies this Report to which it relates, shall not be deemed "filed" with the Securities and Exchange Commission and is not to be incorporated by reference into any filing of the Company under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended (whether made before or after the date of the Report), irrespective of any general incorporation language contained in such filing.

/s/ Eugene J. Nestro

Eugene J. Nestro
Chief Financial Officer
(principal financial officer)

March 14, 2022