

Graphene Solutions

Management's Discussion and Analysis

For the three and six month periods ended  
September 30, 2020

Dated: November 23, 2020

(Expressed in Canadian Dollars)

## **Introduction**

This Management Discussion and Analysis (“MD&A”) is dated November XX, 2020 and is in respect of the three and six month periods ended September 30, 2020. The following discussion of the financial condition and results of operations of ZEN Graphene Solutions Ltd. (“ZEN” or the “Company” or the “Corporation”) constitutes management’s review of the factors that affected the Corporation’s financial and operating performance for the three and six month periods ended September 30, 2020.

This discussion should be read in conjunction with the Corporation’s condensed interim financial statements and corresponding notes to the financial statements for the six months ended September 30, 2020 and the audited annual financial statements for the year ended March 31, 2020, the most recently completed fiscal period. The Corporation’s condensed interim financial statements have been prepared in accordance with International Financial Reporting Standards (“IFRS”). Unless otherwise stated, all amounts discussed herein are denominated in Canadian dollars which is the Corporation’s functional and reporting currency.

Additional information relating to the Corporation can be found under the Corporation’s profile on SEDAR at [www.sedar.com](http://www.sedar.com).

## **Forward Looking Statements**

This MD&A of the Corporation contains certain forward-looking information and forward-looking statements, as defined in applicable securities laws (collectively referred to herein as “forward-looking statements”). These statements relate to future events or the Corporation’s future performance. All statements other than statements of historical fact are forward-looking statements. Often, but not always, forward-looking statements can be identified by the use of words such as “plans”, “expects”, “is expected”, “budget”, “scheduled”, “estimates”, “continues”, “forecasts”, “projects”, “predicts”, “intends”, “anticipates” or “believes”, or variations of, or the negatives of, such words and phrases or state that certain actions, events or results “may”, “could”, “would”, “should”, “might” or “will” be taken, occur or be achieved. Forward-looking statements involve known and unknown risks, uncertainties and other factors, which may cause actual results to differ materially from those anticipated, expressed or implied in such forward-looking statements.

Factors that could affect these statements include, without limitation, availability of financing and personnel, fluctuations in graphene prices, future deposit development activities, general business and economic conditions, social and political stability, security of title, timing and receipt of permits and licenses, the impact of changes in future legislation and regulations, changes in mining or environmental regulations, competition and currency fluctuations. The forward-looking statements in this MD&A speak only as of the date of this MD&A or as of the date specified in such statement.

Shareholders are cautioned not to place undue reliance on forward-looking information. The Corporation undertakes no obligation to update publicly or otherwise revise any forward-looking information whether as a result of new information, future events or other such factors which affect this information, except as required by law.

These factors and other risks and uncertainties are detailed in the Corporation’s reports and disclosure documents filed by the Corporation from time-to-time with Canadian securities regulatory authorities.

## **Company Overview**

ZEN is an emerging nano-materials company focused on developing its 100% owned Albany Graphite Deposit in Northern Ontario, Canada. The deposit is a large resource of igneous-hosted, fluid-derived micro-crystalline graphite mineralization contained in two adjacent breccia pipes. This unique form of graphite is proving to be ideally suited for making high-quality graphene and graphene derivative nano-material products as well as a high purity graphite product for traditional markets.

The Albany Graphite deposit was first discovered in 2011, during a drilling program testing electromagnetic conductors for the presence copper-nickel-PGE sulphide deposits. The unusual nature of the graphite in the Albany deposit and its potential economic significance motivated additional exploration drilling from 2012 to 2014, when an initial NI 43-101 compliant resource estimate was prepared by independent consultants Roscoe Postle Associates (“RPA”). Indicated Mineral Resources reported in RPA’s 2014 technical report totaled 25.1 million tonnes (“Mt”) at an average grade of 3.89% graphitic carbon (“Cg”). In addition, Inferred Mineral Resources were estimated to total 20.1 million tonnes at an average grade of 2.20% Cg.

The Corporation subsequently retained RPA to complete a Preliminary Economic Assessment (“PEA”) on the Albany Graphite Deposit based on a model of producing a high-purity graphite product for multiple market segments. The graphene nano-materials market was not considered as part of the June 2015 PEA model. The results indicated economic potential for an open pit mining operation producing 30,000 tonnes of high-purity graphite per annum for at least 22 years.

ZEN is presently in discussion with various end users of graphene product that can be produced from its unique Albany graphite. The Corporation is also working with a number of research institutions developing processes to synthesize graphene, graphene oxide and graphene quantum dots along with new applications for graphene. Potential markets for graphene include composites (e.g. concrete, rubber, plastic polymers and ceramics), sensors, water purification and filtration, coatings and solid-state lubricants, silicon-graphene and graphene aerogel anode material for next generation batteries along with aerospace and military applications to name a few.

Applications for graphene and its derivatives are experiencing significant growth due to their unique chemical, electrical and thermal properties. It is 200 times stronger than Steel, bends and stretches up to 120% of its original size, has 10x the conductivity of copper, has 1000 times the capacity of copper, is impermeable to hydrogen and can improve the speed and efficiency of computer chips. Results from preliminary testwork indicate the addition of graphene has the potential to create a much stronger concrete with a faster curing time at a cost advantage. Also, the addition of graphene in concrete has the potential to reduce the amount of cement needed which in turn reduces CO<sub>2</sub> emissions.

The mining claims comprising the Albany Graphite Project are located approximately 30 km north of the Trans-Canada Highway, near the community of the Constance Lake First Nation and 86 km northwest of the Town of Hearst, Ontario. The Project currently consists of 2 non-contiguous blocks of unpatented mining claims known as 4F and 4E (originally consisted of 28 block claims) which are 100% owned by ZEN. On April 10, 2018, the ground staked legacy claims were converted to cell claims as part of the Ontario government’s Modernizing the Mining Act (MAM) process and the Project now consist of 71 boundary claims and 266 cell claims for a total of 541 units. The current claims require a total of \$195,600 worth of assessment work per year to keep them in good standing and ZEN has a total of approximately \$5.8M in available exploration reserves. The remaining 4E and associated claims were allowed to lapse so that the Company can focus funds and efforts on the development of the Albany Graphite Deposit.

The Corporation was registered and incorporated in Ontario, Canada as 1774119 Ontario Limited on July 29, 2008. Pursuant to Articles of Amendment dated November 24, 2009, the Corporation changed its name to Zenyatta Ventures Ltd. On December 23, 2010, the Corporation became a reporting issuer in Ontario, Alberta and British Columbia. Following the receipt of approval at the 2018 Annual Meeting of Shareholders held on September 27, 2018 and subsequent approval from the TSX Venture Exchange, the Corporation implemented a name change effective January 16, 2019 to ZEN Graphene Solutions Ltd. The common shares of the Corporation commenced trading on the TSX Venture Exchange under the symbol ZEN and in the United States on the OTCQB under the symbol ZENYF and continue to trade on these exchanges under these symbols.

## **Future Outlook**

The graphene nano-materials market is an emerging high-value, technology business with excellent growth prospects as new product applications are developed and commercialized. The Corporation is presently assessing the various graphene conversion methods that can be utilized on its high-purity graphite material through its network of research partners. ZEN plans to source the appropriate equipment required for a graphene manufacturing (exfoliation) process and evaluate the associated costs for graphene production in a vertically integrated structure. The Corporation is also in discussions with various participants in the graphene market and end users of graphene products for potential off-take agreements, strategic partnerships or other business opportunities; however, there is no certainty that any of these discussions will lead to agreements.

ZEN will continue to focus on advancing the Albany graphite deposit towards initial production of a consistent, high-quality graphite and/or graphene nano-material product. The Corporation is planning to prepare an updated PEA/Pre-feasibility Study (“PFS”) which is more oriented toward the graphene nano-materials market. This will be preceded by the processing (flotation and purification) of the 110 tonne bulk sample that was collected during the Winter 2019 program and then subsequently utilized to generate more graphene product samples for market acceptance and valuation. Since the business opportunity related to the development of the Albany Graphite Deposit is closely linked to the development of innovative new process technology and product design, the Corporation is looking at re-structuring to reflect the increasing emphasis on technology development.

The Corporation is committed to developing the Albany Graphite Project to high standards of environmental and social responsibility in consultation with its local community partners. The Project is located in the traditional territory of the Constance Lake First Nation (CLFN) and ZEN is committed to developing a partnership agreement with CLFN towards collaboration on business development following the Memorandum of Understanding signed on September 27, 2018. The Corporation is also committed to minimizing the environmental footprint of the project and its impacts on the local watershed and wildlife.

At September 30, 2020, the Corporation had working capital of \$2,049,343 sufficient to fund the Company’s general administration, environmental baseline study fieldwork and other activities; however, additional financing will be required to allow the Company to continue to fund its ongoing project development activities.

## **Overall Performance**

During the six month period ended September 30, 2020, the Corporation was mainly involved in graphene R&D activities, product market development and activities related to the winter bulk sample program. No mineral exploration field activities were performed on any of the remaining properties during this period. Overall, during the six month period ended September 30, 2020, the Corporation had cash expenditures of \$1,105,988 consisting mainly of deferred exploration and evaluation costs and operating expenses.

As at September 30, 2020, the Corporation had \$25,306,833 in deferred exploration and evaluation costs as a result of its airborne survey, additional staking and exploration costs, drilling program, which includes \$1,292,500 worth of cash, shares and warrants issued to Cliffs Natural Resources Exploration Canada Inc. (“Cliffs Canada”) in connection with the Amended Albany Agreement.

## **Results of Operations**

### Net loss

The Corporation recorded a loss of \$434,829 with basic and diluted loss per share of \$0.01 for the three month period ended September 30, 2020 (2019 – loss of \$367,856 and \$0.00). The loss for the six month period ended September 30, 2020 was \$791,156 with basic and diluted loss per share of \$0.01 (2019 – loss of \$747,257 and \$0.01).

## Revenue

The Corporation is currently in the development stage and therefore did not have revenue from operations. Interest and other income for the three month period ended September 30, 2020 was \$2,451 (2019 - \$769). Interest and other income for the six month period ended September 30, 2020 was \$2,994 (2019 - \$3,065). The premium on flow-through shares recognized for the three month period ended September 30, 2020 was \$16,577 (2019 - \$nil). The premium on flow-through shares recognized for the six month period ended September 30, 2020 was \$46,753 (2019 - \$nil). Grant income recognized for the three month period ended September 30, 2020 was \$58,316 (2019 - \$nil). Grant income recognized for the six month period ended September 30, 2020 was \$113,952 (2019 - \$nil). Grant income netted against the exploration and evaluation assets for the three month period ended September 30, 2020 was \$29,028 (2019 - \$290,193). Grant income netted against the exploration and evaluation assets for the six month period ended September 30, 2020 was \$67,119 (2019 - \$290,193).

## Expenses

Stock-based compensation costs were \$64,478 for the three month period ended September 30, 2020 (2019 - \$127,335) and \$172,290 for the six month period ended September 30, 2020 (2019 - \$207,034). Stock-based compensation was based on the fair value of the options described in Note 6(c) of the condensed interim financial statements as calculated using the Black-Scholes option pricing model. Stock-based compensation is recognized over the vesting period of the underlying options.

General and administrative expenses were \$212,900 for the three month period ended September 30, 2020 (2019 - \$132,087) and \$380,391 for the six month period ended September 30, 2020 (2019 - \$280,261). The most significant components of general and administrative expenses are wages and benefits. The following table details the material components of the Corporation's general and administrative expenses for the six month periods ended September 30, 2020 and 2019.

	<b>Six Months Ended September 30, 2020</b>	<b>Six Months Ended September 30, 2019</b>
Salaries and Benefits	\$ 206,411	\$ 106,360
Meals and Entertainment	8,981	9,756
Transfer Agent Fees	9,214	6,132
Accommodations	9,990	11,920
Investor Communications	36,359	85,883
Travel	13,483	19,425
Occupancy and Office Expenses	95,953	40,785
<b>Total</b>	<b>\$ 380,391</b>	<b>\$ 280,261</b>

Professional fees were \$98,795 for the three month period ended September 30, 2020 (2019 - \$27,820) and \$141,805 for the six month period ended September 30, 2020 (2019 - \$56,486). These fees consist primarily of the amounts charged for services provided by the Corporation's lawyers, auditors, and accountants.

Investor relations and promotion expenses were \$15,950 for the three month period ended September 30, 2020 (2019 - \$17,978) and \$23,317 for the six month period ended September 30, 2020 (2019 - \$47,537). These expenses consist primarily of the costs of consultants, marketing trips and other costs such as attending industry conferences.

Consulting fees were \$105,667 for the three month period ended September 30, 2020 (2019 - \$51,600) and \$187,752 for the six month period ended September 30, 2020 (2019 - \$125,563). The most significant component of the consulting costs incurred were for consultants working on metallurgical testwork, field program planning and graphene product development activities. Consulting costs directly related to graphene product market development for the three month period ended September 30, 2020 were \$1,713 (2019 - \$55,652) and \$19,680 for the six month period ended September 30, 2020 (2019 - \$114,679).

Contract services were \$nil for the three month period ended September 30, 2020 (2019 - \$10,500) and \$nil for the six month period ended September 30, 2020 (2019 - \$31,000). These expenses mainly relate to services provided to the Company by the Chief Financial Officer.

Amortization expense was \$10,529 for the three month period ended September 30, 2020 (2019 - \$1,305) and \$15,760 for the six month period ended September 30, 2020 (2019 - \$2,441). Amortization is taken on the capitalized cost of the Corporation's computers and equipment.

Supplies and materials expense was \$3,854 for the three month period ended September 30, 2020 (2019 - \$nil) and \$33,540 for the six month period ended September 30, 2020 (2019 - \$nil). These expenses mainly related to supplies and materials purchased to continue graphene development.

#### Cash Flows

During the six month period ended September 30, 2020, cash increased overall by \$1,420,335 (2019 – decreased by \$163,097). Operating activities resulted in a decrease in cash of \$546,763 (2019 – decrease of \$518,604) due to continued spending on consulting and professional fees and general and administrative expenses. Investing activities resulted in a decrease in cash of \$391,832 (2019 – decrease of \$676,643) due to continued spending on graphene production scale up and application development. Financing activities resulted in an increase in cash of \$2,358,930 (2019 – increase of \$1,032,150) due to net proceeds received from the issuance of units as well proceeds received from the exercise of stock options and warrants.

#### **Mineral Exploration and Development Costs**

Interest in mineral properties and related exploration/development costs capitalized were \$142,095 for the three month period ended September 30, 2020 (2019 – \$162,519) and \$241,762 for the six month period ended September 30, 2020 (2019 - \$455,749). All of these costs relate to the Albany Project. Costs capitalized relate to contracted consulting services on graphene production scale up and application development, deposit development costs, and stock-based compensation. The following table details the material components of the Corporation's exploration and evaluation assets for the six month periods ended September 30, 2020 and 2019.

<b>ALBANY PROPERTY</b>	<b>Six Months Ended September 30, 2020</b>	<b>Six Months Ended September 30, 2019</b>
Opening Balance	\$ 25,065,071	\$ 24,054,172
Contractor Services	83,125	93,044
Equipment Rental	-	4,248
Supplies	-	13,444
Processing and Testing	224,084	7,529
Metallurgical Testing	-	406,254
Site Costs	-	93,155
Flights	-	95,032
Fuel	-	17,995
Stock-Based Compensation	1,672	15,241
Cost recovery (grants)	(67,119)	(290,193)
<b>Closing Balance</b>	<b>\$ 25,306,833</b>	<b>\$ 24,509,921</b>

## **Albany Graphite Project**

### ***Land Tenure***

The Albany Graphite Deposit is located on one of the claim blocks (4F) collectively comprising the Albany Graphite Project (the “Claims”). The Corporation acquired its 100% interest in Block 4F under the terms of an option agreement with Cliffs Canada (the “Optionor”) entered into in the year ended March 31, 2010. The balance of the Claims were acquired by staking and are 100% owned by the Corporation.

An initial 80% interest in Block 4F was acquired by making certain payments totaling \$140,000 and issuing 1,000,000 units to the Optionor, (each unit being comprised of one common share and one warrant to purchase one additional common share at a price of \$1.50 any time before December 23, 2015) and incurring an aggregate of \$10 million in exploration expenditures.

On November 21, 2012, the Company reached an agreement with the Optionor to acquire the remaining 20% interest in Block 4F by issuing a total of 1,250,000 shares to the Optionor and granting a net smelter return royalty of 0.75% on Block 4F, which is now held by a third party.

The Claims are located in the traditional territory of the Constance Lake First Nation. In July 2011, ZEN and CLFN signed an exploration agreement for a mutually beneficial and co-operative relationship regarding exploration and pre-feasibility activities on the Albany Project. Under this agreement, ZEN committed to establishing a joint implementation committee and conveying preferential opportunities for employment and contracting as well as contributing to a social fund for the benefit of CLFN children, youth and elders. In 2018, the parties signed a new Memorandum of Understanding (“MOU”) under which a project partnership structure will be created in support of the development of the Albany Graphite Project (the “Project”). Under the new MOU, the parties can also consider alternative partnership structures including equity participation by CLFN in the Project. This new agreement provides for more flexibility to accommodate alternative business models as the Project progresses toward becoming a graphene nano-materials technology business. On June 22, 2019, Rick Allen was re-elected for a third consecutive term as CLFN Chief. ZEN looks forward to continue working with Chief Allen and CLFN to set up a mutually agreeable partnership structure.

The Claims comprising the Albany Graphite Project are presently held in good standing by the Corporation and there are sufficient assessment credits available to keep all of the 4F (Albany Graphite Project) claims in good standing for at least 30 years. There are no environmental liability issues related to any previous exploration work on the Claims. The Corporation has not received from any government authority, any communication or notice concerning any actual or alleged breach of any environmental laws, regulations, policies or permits.

### ***Project Exploration and Development History***

A two-phase exploration program on the Albany Project in 2011 and 2012 led to the discovery of a unique graphite deposit. Testing a large airborne EM conductor measuring 1400 m by 800 m in late 2011, the first drill hole on this target intersected an extensive graphite-rich breccia zone hosted within an alkalic intrusion. The deposit is not exposed on surface, being under glacial till overburden and a veneer of limestone. Subsequent mineralogical studies conducted by Dr. Andrew Conly of Lakehead University characterized the deposit as an unusual magmatic, fluid-related style of graphite mineralization. Follow-up work was recommended as a magmatic, fluid-related, breccia-hosted graphite deposit of this magnitude is very rare.

Subsequent drilling and geophysical surveys completed in 2012-13 delineated a large resource in two adjacent volcanic breccia pipes leading to an initial NI 43-101 compliant resource estimate announced in January 2014. Preliminary metallurgical testwork in 2013 demonstrated that a high-purity graphite product with >99.99% Carbon can be produced from the Albany graphite deposit mineralization. Initial mineralogical work confirmed the graphite material to be of high- quality, containing insignificant amounts of impurities.

Six large diameter (HQ size) holes were then drilled, three on each pipe in order to obtain two 5 tonne mini-bulk sample of graphite mineralization to proceed with a second phase of metallurgical process development at SGS Canada Inc. ('SGS') in Lakefield, Ontario, in an effort to optimize the initial flowsheet and provide material for further testing by ZEN and other interested parties who had requested samples for evaluation.

An independent Technical Report was completed in January 2014 by Roscoe Postle Associates Inc. ("RPA"), who are independent "qualified persons" as defined by National Instrument 43-101 ("NI 43-101"). RPA estimated Indicated Mineral Resources to total 25.1 million tonnes ("Mt") at an average grade of 3.89% graphitic carbon ("Cg"), containing 977,000 tonnes of Cg. In addition, Inferred Mineral Resources were estimated to total 20.1 million tonnes at an average grade of 2.20% Cg, containing 441,000 tonnes of Cg. These results are based on a cut-off grade of 0.6% Cg with an assumed market price of \$8,500 per tonne Cg. The results below, as given in the Technical Report, show that even if the assumed market price of Cg varies, any appropriate increase in the cut-off grade results in a relatively minor reduction of the resource estimate.

Classification, Cut-off Grade	Tonnage (Mt)	Grade (%Cg)	Tonnes Graphitic Carbon (t Cg)
Indicated			
2.0	20.7	4.41	914,000
1.0	24.3	3.99	971,000
0.6	25.1	3.89	977,000
0.4	25.4	3.85	978,000
Inferred			
2.0	9.4	3.34	315,000
1.0	15.9	2.57	408,000
0.6	20.1	2.20	441,000
0.4	23.0	1.98	455,000

Further metallurgical process development work on the Albany graphite mineralization was carried out by SGS in 2014. The 2014 work made significant progress toward optimizing the initial bench scale caustic bake process designed in 2013 and an innovative, flow sheet was developed for the Albany graphite deposit. A high-grade flotation concentrate containing up to 92.5% graphitic carbon ('Cg') was produced which was fed into a purification process to achieve a targeted graphite product purity of >99.9 % Cg.

Peter Wood, P.Eng., P.Geo., and Alex Mezei, M.Sc., P.Eng., were the Qualified Persons under National Instrument 43-101 who supervised the preparation of this scientific and technical information.

### ***2015 Preliminary Economic Assessment ("PEA")***

On June 1, 2015, the Corporation announced the results of a PEA on its Albany Graphite Project. The PEA was prepared by RPA with mill design input from SGS and can be found on the Corporation's website, [www.zengraphene.com](http://www.zengraphene.com). It was prepared on the assumption that the product would be a high-purity graphite material for markets specific to this material and did not consider the newly emerging graphene market.

Subsequent to completion of the 2015 PEA, most of the Albany Project work has been focused on metallurgical process development, market studies and research and development to determine the most attractive market opportunities for the Albany graphite products. Increasing interest in the Albany Graphite product as a feed material for producing graphene or graphene oxide, is motivating management to reconsider the project development model conceived for the 2015 PEA. While graphene is an emerging new nanotechnology material with limited market demand at present, initial indications from various groups involved in graphene research and development indicate potential for creating a very high-value product from the Albany Graphite deposit with excellent long term growth potential and high profit margins. Consequently, the Company is now planning to prepare an updated PEA to reflect this new market opportunity.

The results of the 2015 PEA are summarized here for reference and historical context for the current project development model focusing on nano-material technology. Ultimately, the Albany Graphite Project could be developed to serve both the high-purity graphite and the emerging graphene nano-materials markets, in proportions depending on relative profitability and market demand growth projections of each product. The 2015 PEA contemplated a 3,000-tonne per day open-pit mine and on-site process plant to produce 30,000 tonnes of high-purity (>99.9% Cg) graphite annually at a total capital expenditure of US\$411.5 million. This yielded a 22 mine life based on less than 50% of the Indicated and Inferred Resources. Based on a graphite price assumption of US\$7,500/tonne and operating costs of \$2,046/tonne, the Discounted Cash Flow (“DCF”) model showed an attractive after tax Internal Rate of Return (“IRR”) of 24% and Net Present Value (“NPV”) at a 10% discount rate of US\$438 million.

The 2015 PEA concluded that the Albany graphite project has excellent potential to be a low-cost source of high-purity graphite. Work performed by SGS, on behalf of ZEN, successfully completed and tested an innovative and relatively benign purification process for the production of consistent and highly crystalline graphite exceeding 99.9% purity from the Albany deposit. Feedback from the clean-tech sector suggests that environmental considerations are critical when sourcing raw materials for today’s high-tech applications like energy storage. Supply chain transparency is easier to track and is now demanded by consumers of such specialty materials in the clean-tech sector. The 2015 PEA is based on mineral resources that are not mineral reserves and have not demonstrated economic viability and therefore, there is no certainty that the results of this PEA will be realized.

The high-purity graphite pricing model for the 2015 PEA was derived from an extensive detailed study of targeted market segments and industry trends. The estimated annual production of 30,000 tonnes of high-quality graphite product from the Albany deposit would have represented approximately 7% of the 2017 market demand estimate. In 2015, ZEN anticipated having a targeted market application segmentation for high-purity graphite including 25-30% in LIBs, 20-25% for Fuel Cell products, 25-30% for high-purity graphite in PM and 15-30% from other applications in the list above.

The outlook for the global graphite market is very promising with demand growing rapidly from new applications, including graphene nano-materials. Graphite is now considered one of the more strategic elements by many leading industrial nations, particularly for its growing importance in high technology manufacturing and in the emerging clean-tech sector such as components of energy storage devices for electric vehicles, computers, smartphones etc.

Jason Cox, P.Eng. Executive VP – Mine Engineering - Principal Mining Engineer of RPA, Alex Mezei, M.Sc., P.Eng., Director, Engineering Technical Services at SGS Lakefield, independent consultants to ZEN, Peter Wood, P.Eng., P.Geo., VP Exploration and Dr. Bharat Chahar, P.E., VP Market Development for ZEN were the Qualified Persons under National Instrument 43-101 for the 2015 PEA.

In February 2019, the company commenced a bulk sample drill program with the goal of collecting up to 990 tonnes of graphite-mineralized material from five holes in the East Pipe and one hole in the West Pipe. Two 24-inch diameter percussive reverse circulation drill holes were completed on the East Pipe and yielded over 110 tonnes of Albany Graphite mineralization, sufficient material to produce several tonnes of purified graphite which will be used as pre-cursor graphene material for graphene applications testing. The recovered material, which is currently stored in Hearst, will be prepared for shipping and will then be processed into high-purity graphite for subsequent graphene production.

Additionally, at the end of April 2019, ZEN, ERM Canada Ltd. (ERM) and CLFN kicked off the environmental baseline study fieldwork with a surface water sampling and flow measurement program.

### **Graphene Business Development Work**

ZEN’s graphene product development is being carried out under the direction of Dr. Francis Dube, CEO. The Company has retained a consultant to assist with this work; Dr. Colin van der Kuur as Head of Research. His

work is supported by a third consultant, ZEN's Senior Government Relations and Account Manager, Ms. Monique Manaique, who is coordinating collaborative research initiatives within government institutions such as the National Research Council, NRCAN, Clean Growth Hub, FedNor, FedDev and others.

The Business Development team has been presenting ZEN to potential customers as a company focused on delivering a vertically integrated graphene product solution to industrial consumers.

ZEN's potential to provide a high-quality graphene product coupled with the potential to deliver industrial quantities for decades continues to generate considerable interest from many industrial companies. This interest was further enhanced by the potential to chemically functionalize ZEN's graphene to suit any specific requirement and/or industrial equipment or process.

The business development team, led by Greg Fenton (Chief Strategy Officer), continues to focus its efforts on applications which will potentially require high volumes of graphene. The essential business development process is generally as follows: identify strong profitable graphene applications, then target specific end users and identify key decision makers within a given organization. Once discussions commence and non-disclosure agreements are signed, work can begin on bringing graphene products through lab, pilot and full scale testing. The work to bring each of these graphene products forward may or may not include multiple points of contact with various levels of government, potentially more than one end user and potentially more than one research team from a given university. Ongoing discussions took place for potential opportunities for which some of the highlights have been disclosed in recent news releases.

ZEN announced its first significant research success on September 22, 2020, when it reported that after five months of optimization, it had developed a novel graphene-based virucidal coating with 99% effectiveness against COVID-19. Testing was conducted at Western University's ImPaKT facility Biosafety Level 3 laboratory in accordance with ISO 18184:2019. Building on this success, the ZEN team indicated that it would move rapidly towards optimization, production scale-up and commercialization of its virucidal graphene-based coating which had attracted significant interest from PPE mask and equipment manufacturers.

On November 9, 2020, in a watershed moment for the company, ZEN announced that it had signed its first significant commercial agreement, a binding letter of intent (LOI) with Trebor Rx Corp. (Trebor), a Canadian personal protective equipment mask manufacturer with an initial production facility located in Collingwood, Ontario. The LOI included the initial purchase of ZEN's patent pending graphene-based virucidal coating for a minimum of 100 million masks/filters with pricing of these mask/filters being variable based on a number of factors.

ZEN is also actively pursuing the potential use of its virucidal coating in HVAC filter and prefilter applications.

### **Metallurgical Process Development Work**

On July 16, 2018, the Corporation announced significant improvements to the metallurgical process developed for the Albany graphite mineralization including improved recovery from 75.4% in the PEA to approximately 90% with a simpler, lower energy process that has a lower reagent consumption and also permits more efficient recycling of the leach solutions.

The testwork program investigated a process based on high-pressure caustic leaching of graphite concentrate followed by acid leaching (ZEN Pressure Leach or ZPL). It was concluded that a purity of 97.5% Cg, representing 85% impurity removal, could be consistently achieved. Process conditions chosen for the tests were kept within industry proven limits of temperature and caustic concentration. A second stage acidic fluoride leach (ZHL) process was also investigated to upgrade the ZPL product to >99% purity. ZHL purification using a solution containing a mixture of  $\text{NH}_4\text{F}$  and  $\text{HCl}$  yielded a minimum graphite purity of 99.8% Cg. The process operates at  $50^\circ\text{C}$ , will require relatively simple equipment and has a low reagent and energy consumption. During the quarter ended March 31, 2019, ZEN provided an update on the Company's locked cycle purification tests on the new process which successfully simulated an industrial process which was utilized to purify Albany Graphite concentrate. This successful test was a significant step forward towards industrial graphene production.

A final product purity of approximately 99.8% Cg appears to be the practical upper limit of this hydrometallurgical processing. This final product will be used as a precursor material for the Company's developing graphene applications such as graphene enhanced concrete and other composites. This work was carried at SGS under the direction of James Jordan, P.Eng., Project Manager.

The updated process flowsheet (flotation and purification) will also be further tested and verified for scale-up with the 110 tonne bulk sample. Once this material has been purified to approximately 99.8%, it will be exfoliated into graphene and graphene oxide products for continued larger scale end user evaluation. The graphene conversion process is also under investigation for improvements in process efficiency under three university research collaborations (discussed above under Business Development).

With the new information on the process flowsheet and on the graphene product demand and pricing, ZEN will decide to proceed with the preparation of an updated PEA to reflect the new graphene focused development model or to proceed directly to a PFS (Pre-Feasibility Study). Given the fact that graphene continues to be an emerging market opportunity with excellent growth potential, the updated PEA/PFS will reflect a staged development approach starting at a modest scale with low initial capital expenditures, then expanding production as markets grow. Accordingly, initial development by underground mining methods is being contemplated as a more appropriate mine development model for this approach. This has the additional benefit of a greatly reduced environmental footprint compared to the original open pit model developed for the 2015 PEA.

More recently on March 26, 2020, ZEN announced that it had purchased and was commissioning a purification autoclave to commence the production of high-purity Albany graphene precursor material. The autoclave has been installed and commissioned and several test runs have been completed. Subsequent graphite assay results confirmed a purity of 99.8% was achieved.

#### ***Administration and Investor Relations***

ZEN's recent administration and investor relations activities for 2020 are summarized below:

On January 28, 2020, 50,000 stock options with an exercise price of \$0.50 and 100,000 stock options with an exercise price of \$0.40 expired.

On February 4, 2020, as the Company moves forward towards graphene production and applications development, ZEN announced that James Jordan, P.Eng., was promoted to Chief Operating Officer (COO). Additionally, Colin van der Kuur was appointed as Head of Research, and Monique Manaire as Senior Government Relations and Account Manager.

ZEN also reported the issuance of shares in connection with its previously announced shares for debt agreement with Alphabet Creative. The Company issued 47,222 common shares at a deemed price of \$0.36 per common share in settlement of a debt of \$17,000 owed by the Company. The common shares issued in connection with the shares for debt agreement are subject to a hold period until May 1, 2020 in accordance with applicable securities laws.

Subsequently, ZEN reported that further to the December 20, 2019, closing of its private placement of flow-through common shares, an aggregate amount of \$54,840 in finders' fees as well as an aggregate amount of 137,100 broker warrants were paid to certain brokers in connection to the offering. These broker warrants will expire on December 19, 2021 and have an exercise price of \$0.50 per warrant share.

On February 10, 2020, 250,000 stock options with an exercise price of \$0.53 expired.

On April 21, 2020, 100,000 stock options with an exercise price of \$1.87 expired.

On May 8, 2020, ZEN reported on the following corporate activities and agreements:

#### Warrants Extension

ZEN applied to the TSX Venture Exchange (the “Exchange”) for approval to extend the expiry date of 655,848 common share purchase warrants. On June 22, 2018, the Corporation completed a private placement issuing 1,311,693 units (the “Units”) at a price of \$0.55 per Unit. Each Unit was comprised of one common share in the capital stock of the Company and one-half ( $\frac{1}{2}$ ) of one purchase warrant (a “Warrant”), with each whole such Warrant exercisable into one common share at an exercise price of \$0.80 per common share until June 22, 2020.

The Company proposed to extend the expiry date of the warrants by an additional 12 months to June 22, 2021. All other terms and conditions of the warrants will remain the same. The proposed extension of the expiry date is conditional upon the receipt of approval from the Exchange.

#### Shares for Debt Agreements

ZEN has also entered into an agreement to issue 115,711 Common Shares to settle an aggregate amount of \$45,200 owed to AGORA Internet Relations Corp. All securities issued in exchange for debt will be subject to a hold period from the date of issuance in accordance with applicable securities laws.

The Company also reported the issuance of shares in connection with its previously announced shares for debt agreement with Alphabet Creative. The Company issued 47,222 common shares at a deemed price of \$0.36 per common share in settlement of a debt of \$17,000 owed by the Company. The common shares issued in connection with the shares for debt agreement were subject to a hold period until May 1, 2020, in accordance with applicable securities laws.

#### Stock Option Grant

The Board of Directors of ZEN has also granted stock options (“Options”) today, to its directors and certain officers, employees and consultants. These Options are exercisable for an aggregate of 750,000 Common Shares, at an exercise price of \$0.40 per Common Share for a period of five years from the date of grant. Each director of the Company was granted 50,000 options which will vest as to one-third ( $\frac{1}{3}$ ) on the date of grant, one-third ( $\frac{1}{3}$ ) after six months of the date of grant and one-third ( $\frac{1}{3}$ ) after 12 months of the date of grant. The remaining 500,000 options issued to officers, employees and consultants will vest as to one-third ( $\frac{1}{3}$ ) on the date of grant, one-third ( $\frac{1}{3}$ ) on the first anniversary of the date of grant and one-third ( $\frac{1}{3}$ ) on the second anniversary of the date of grant.

On May 16, 2020, ZEN granted 100,000 stock options to a consultant with an exercise price of \$0.40 per share and an expiry date of May 16, 2025. The vesting period of the options granted to the consultant is as follows: one-third ( $\frac{1}{3}$ ) on the date of grant, one-third ( $\frac{1}{3}$ ) after six months of the date of grant and one-third ( $\frac{1}{3}$ ) after 12 months of the date of grant.

On June 15, 2020, ZEN announced an offering of units (the “Units”) of the Company on a non-brokered private placement basis. Each Unit was offered at a price of \$0.60. The Offering was subject to TSX Venture Exchange (the “Exchange”) approval.

Each Unit will be comprised of one Common Share of the Company and one-half of one non-transferable Common Share purchase warrant (a “Warrant”). Each whole Warrant will entitle the holder to acquire one Common Share at a price of \$0.80 for a period of 24 months from the date of issuance. All Warrants issued in connection with the Offering will be subject to an acceleration clause. If the Company’s share price trades at or above \$1.00 per share for a period of ten (10) consecutive trading days during the exercise period, the Company indicated that it may accelerate the expiry date of the Warrants to 30 calendar days from the date on which the Company gives a written notice to the Warrant holders.

ZEN also reported that the proceeds of the Offering would be used to fund ongoing work on the Albany Graphite Project including graphene research and scale up, COVID-19 initiatives and other graphene applications development and for general corporate purposes.

On June 17, 2020, ZEN provided an update on the private placement and indicated it had received expressions of interest from investors in an amount of \$1,777,000 for the Offering which was announced on June 15, 2020. These expressions of interest far exceeded management's expectations and, subject to TSX Venture Exchange approval, the Company was working diligently to complete the Offering. Management believed that this highlights the progress ZEN has made in becoming an advanced materials graphene company. Following the completion of the Offering, ZEN's cash balance exceeded any balance in recent years thereby ensuring that the Company could continue executing its business plan during the COVID-19 pandemic.

On July 6, 2020, 100,000 stock options were issued to a consultant under the stock option plan described in Note 6(c). The stock options have an exercise price of \$0.68 per share and an expiry date of July 6, 2025. The vesting period of the options granted to the consultant is as follows: 1/3 at July 6, 2020; 1/3 at July 6, 2021; 1/3 at July 6, 2022.

On July 6, 2020, the Company completed the second and final tranche of a private placement resulting in the issuance of 1,621,175 units at a price of \$0.60 per unit for gross proceeds of \$972,705. Each unit consisted of one common share of the Company and one half of one non-transferable share purchase warrant. Each whole warrant will entitle the holder thereof to acquire one additional common share at an exercise price of \$0.80 per warrant, exercisable for a period of twenty-four months from the closing of the offering.

On July 14, 2020, the Company retained Hybrid Financial Ltd. ("Hybrid") to provide marketing services. Hybrid was engaged to heighten market and brand awareness for ZEN Graphene Solutions and to broaden the Company's reach within the investment community. Hybrid was engaged for an initial period of 6 months starting July 10, 2020 (the "Initial Term") which could then be renewed for successive 3 month periods thereafter, unless terminated by the Company in accordance with the Agreement.

From July 16, 2020 to July 29, 2020, two option holders, who are neither directors nor officers of the Company, exercised a total of 500,000 options at an exercise price of \$0.53 per option resulting in proceeds of \$265,000 to the Company.

### ***Graphene Research and Development, and Project Development Activities***

In January 2018, ZEN announced a new strategic focus on the extraordinary nano-material called graphene, which is easily converted from the Company's highly crystalline Albany graphite deposit. Graphene is emerging as the most promising new material in modern times for enhancing applications in various industries due to its unique combination of mechanical, electrical and thermal properties. Graphene, a single sheet of carbon discovered in 2004 at the University of Manchester, can perform all of these functions.

Many corporate and academic R&D facilities around the world are currently competing to find the most effective, cost efficient and scalable process to produce high-quality graphene. These companies still require a consistent source (or precursor) material for conversion to graphene which is then applied to their various products for enhancement. ZEN has a significant competitive advantage with the ownership of a large and high-quality supply of source material, Albany graphite, in Canada. The Company is continually assessing the various simple graphene conversion methods being utilized on its high-purity graphite material by its network of collaborative partners with the goal of defining a scalable, low cost, low energy and environmentally friendly exfoliation process. In the near future, ZEN plans to source the appropriate equipment required for a graphene manufacturing (exfoliation) process and also evaluate the associated costs for graphene production in a vertically integrated structure.

Advanced testing on potential new processes for commercial graphene production is also underway. ZEN continues to work with two universities on different processes that could potentially lead to a more efficient process for ZEN's commercialized graphene production, at a lower cost than those previously anticipated. These processes are also producing high-yield results with low energy requirements and minimal environmental impacts.

ZEN's graphene R&D, and project development activities for 2020 are summarized below:

In January 2020, Colin van der Kuur visited the Graphene Engineering Innovation Centre (GEIC) at the University of Manchester and attended also the Batterieforum in Berlin, Germany where DLR and ZEN presented a poster of the encouraging battery results of the newly developed graphene aerogel composite anode material.

On February 4, 2020, ZEN announced the grand opening of its Guelph facility on March 3, 2020. The facility will be used for small scale pilot plant production to produce future Albany Pure™ graphene products as well as further research and development work. The company is currently sourcing and purchasing the necessary equipment to build a small-scale graphite purification pilot plant that will produce 99.8% high-purity graphite from the flotation concentrate (86%).

On March 2, 2020, ZEN announced the launch of Albany Pure™ graphene products on their website at <https://shop.zengraphene.com/>. The Company plans to expand its product line to bring Graphene Quantum Dots, Graphene Oxide, Reduced Graphene Oxide, and other graphene-based products to the market.

Subsequently, on March 26, 2020, the company announced that it had commenced scale-up and engineering studies on processes for the production of Albany Pure™ Graphene products at the Company's research and development facility in Guelph, Ontario. The priority is to increase graphene production in anticipation of future demand as the Company launched graphene product sales in early March 2020. At this time, ZEN also started to commission its new purification autoclave to commence the production of high-purity Albany graphene precursor material.

ZEN also reported that its graphene products would bear the Albany Pure™ Seal of Authenticity which represents that the material was sourced from its unique Albany Graphite and meets the Company's high-quality standards.

On April 30, 2020, ZEN announced an international collaboration with UK-based Graphene Composites Ltd. (GC) to fight COVID-19 by developing a potential virucidal graphene-based composite coating that can be applied to fabrics including N95 face masks and other personal protective equipment (PPE) for significantly increased protection. The Company reported that once the development, testing, and confirmation of the graphene coating's virucidal ability have been completed, the coating would then be incorporated into fabrics used for PPE.

Under the collaboration, ZEN synthesized a silver nanoparticle-graphene oxide composite coating at their lab in Guelph, Ontario that has been documented by previous researchers to kill earlier versions of coronavirus. Once testing is complete, the ZEN/GC graphene coating will then be incorporated into a fabric to be included into masks and filters designed by GC.

Efficacy testing of the silver-graphene oxide-based coating to kill the COVID 19 virus (SARS-CoV-2) was conducted at Western University's ImPaKT Facility Biosafety Level 3 lab in Ontario.

On June 8, 2020, ZEN reported that it would be providing Albany Pure™ Graphene Oxide produced by its Guelph facility for development of a rapid, ultrasensitive and low cost bio-sensor to detect the presence of the SARS-CoV-2 antigen and/or antibodies in COVID-19 suspected patients. This research is led by Prof. Maxim Berezovski, a full Professor at the University of Ottawa. Prof. Berezovski leads the Berezovski Research Group and the Bioanalytical and Molecular Interaction Laboratory. This research is funded by an initial grant of approximately \$400,000 from the National Sciences and Engineering Council (NSERC).

Additionally, ZEN reported that it had partnered with Prof. Aicheng Chen, Canada Research Chair Tier 1 in Electrochemistry and Nanoscience, who was awarded a \$50,000 NSERC Alliance COVID-19 grant for a proposal titled "Development of Advanced Graphene-Based Antiviral Nanocomposites against COVID-19."

ZEN will be providing an in-kind contribution of \$26,700 in materials, staff salaries and access to its Guelph facility. The project builds directly on results and IP from previous NSERC CRD/OCE VIP II projects.

The company also reported that it was continuing the development of a potential virucidal graphene oxide-based coating that could be applied to fabrics including N95 face masks and other personal protective equipment (PPE) for significantly increased protection. The Company had produced two batches of samples using different formulations that were being tested by Western University's ImPaKT Facility Biosafety Level 3 lab for antiviral activity. Additionally, ZEN reported that it had discontinued its collaboration with Graphene Composites Ltd. previously announced on April 30, 2020.

On June 9, 2020, ZEN announced it will be commencing a new research collaboration with Prof. Mohammad Arjmand and his team at the University of British Columbia (UBC)-Okanagan Campus, with a \$200,000 Department of National Defence (DND) Innovation for Defence Excellence and Security (IDEaS) contract. ZEN will be providing in-kind contributions of Albany Pure™ materials and consultation with its technical team.

The goal of the collaborative research project is to develop electrically conductive, molded and 3D printed graphene/polymer nanocomposites as more versatile replacements for metallic electromagnetic shields that are currently in use. The new shields will be lightweight and corrosion resistant along with the additional benefits of low cost, ease of processing and improved design options compared to current metallic shields. In this collaboration, the developed conductive polymer shields will protect sensitive electronic equipment in satellites; however, the shields will also have use in a broad spectrum of applications in various industries, such as information technology, medical sciences, automotive, defence, and aerospace. The technology of developing 3D printing multifunctional polymer nanocomposite filaments will also allow for the rapid, low-cost fabrication of complex geometries of multifunctional polymer nanocomposites such as artificial electromagnetic shields. If DND elects to advance the project to Phase 2, it will support the research with a \$1 million contract.

On June 11, 2020, the company announced that it had received a report on the first batch of samples that were submitted to Western University's ImPaKT Facility Biosafety Level 3 lab (UWO) for virucidal efficacy testing. The batch-testing program's focus was to confirm and measure virucidal potency of the graphene oxide-based silver nanoparticle composite coatings that were produced at ZEN's Guelph lab.

The company prepared five different formulations with varying oxygen contents and silver nanoparticle loadings for testing at a concentration of 4g/L. All five variations with concentrations diluted to as low as 0.16g/L reduced viral replication. These formulations slowed growth of the COVID-19 Coronavirus in a media designed to replicate human cells. The June 10, 2020, Western University ImPaKT Facility report included the following results: "all compounds that were undiluted, 1:5, and 1:25 dilutions had reduced viral replication (of the SARS-CoV-2 (COVID-19) coronavirus) compared to the no-drug control, potentially reflecting a 25-50% reduction in virus replication."

On July 9, 2020, Evercloak Inc. (Evercloak) and ZEN were awarded \$125,000 each as part of a Next Generation Manufacturing Canada (NGen) Project. The project entitled "Advancing Large-Scale Graphene and Thin-Film Membrane Manufacturing" will support the scale up of graphene oxide (GO) production by ZEN to supply GO to Evercloak for their scale up and optimizing activities. NGen supports collaborative technology projects that enable the development of world-leading advanced manufacturing capabilities in Canada.

On July 30, 2020, ZEN announced that it had commenced collaborations with research teams at a number of personal protective equipment (PPE) manufacturers to incorporate ZEN's virucidal graphene coating into commercial products, including masks, gloves, gowns and other clothing. This followed ZEN's promising results for an antiviral, graphene-based coating formulation from Western University's ImPaKT Facility, Biosafety Level 3 lab. The Company also reported that it continued to optimize its proprietary formulation for dosage and delivery mechanism for highest antiviral impact. The next phase of testing was underway at the ImPaKT Facility and included a preferred mask fabric, from one of ZEN's collaborators, coated in its virucidal coating exposed to and tested against the COVID-19 virus.

On August 6, 2020, the Company reported that a recent peer reviewed research article clearly demonstrated that ZEN’s Albany Graphite exfoliates more easily than other commercially available flake graphite test samples. Significantly, this article provided quantitative data that ZEN’s Albany Pure™ Graphite has the highest exfoliation rate constant of the materials tested, indicating that it exfoliates more easily than the other materials.

This University of Connecticut (UConn) study was published in the peer reviewed journal, Carbon, and utilizes an interfacial trapping exfoliation process which is spontaneous and driven by the spreading of graphene at a liquid-liquid interface between two immiscible fluids (e.g. oil and water) and thus lowering the free energy of the system. The article reported “the time to reach full emulsion for the Albany Pure™ material was much shorter than for other graphite reference material (Figure 1). The paper also concluded that “the source of the graphite plays a role in the exfoliation in addition to the flake size”. This advantage will likely translate into a more efficient and economic exfoliation process as the company advances towards commercialization. Additional testing was also conducted to compare the purified East Pipe and West Pipe material and confirmed very similar exfoliation rates for the two pipes (Figure 2).

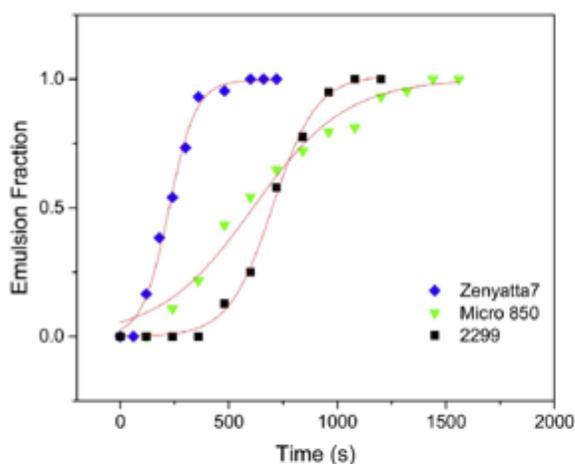


Figure 1: Plot showing ZEN vs. other Graphite (Zenyatta7 = Zen\_W1016F)

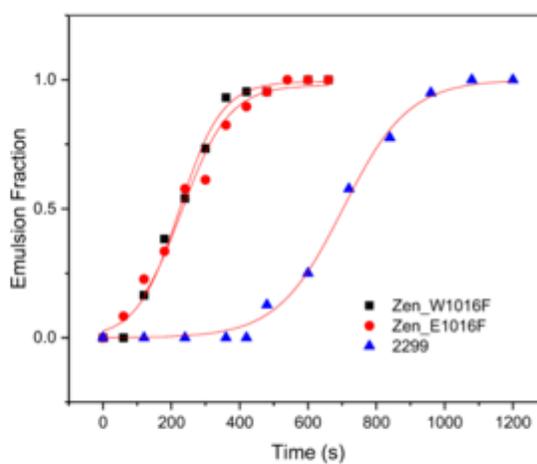


Figure 2: Plot showing East vs. West Pipe

These results provided additional third-party confirmation that Albany Pure™ Graphite exfoliates more easily than other commercially available graphite material and supports the results that were published by Dr. Yoshihiko Arai, Assistant Professor in the Department of Chemical Engineering at Tokyo Tech and reported in an October 16, 2018 news release. It was reported in the article that the particle size was linked to the ease of producing graphene from graphite through exfoliation – the smaller the feed graphite particle, the easier to exfoliate. The researchers further concluded that, due to the size of its flakes, the exfoliation productivity of graphite derived from ZEN’s Albany Pure™ Graphite performed up to 1500% better than the researchers’ reference flake graphite materials. Interestingly, in the UConn study, the ZEN samples had a slightly larger flake size than the other graphite samples, yet still showed faster exfoliation. The company surmised that the turbostratic nature along with the slightly larger d-spacing between the layers were the reason why Albany Pure™ Graphite performed better in this study.

On September 3, 2020, ZEN reported that industry and university laboratories had fully re-opened in late July-early August after a 4 month hiatus due to the COVID-19 pandemic and they had re-started ZEN’s collaborative R&D programs.

The company is also announced the award of two NSERC Alliance COVID-19 project grants, a Mitacs Elevate Postdoctoral Fellowship grant, and two Mitacs Accelerate grants for a total of \$355,000 to its university

collaborators increasing ZEN's total research and development budget for the next 12 months to over \$1.4M. The new grants and research topics are outlined below:

- University of Guelph, Prof. Aicheng Chen, "Development of Advanced Graphene-Based Antiviral Nanocomposites against COVID-19" (\$50,000 NSERC Alliance COVID-19 and \$150,000 Mitacs Accelerate over one year);
- University of Ottawa, Prof. Jean-Michel Ménard, "Graphene-based surface coating to prevent fomite transmission of COVID-19" (\$50,000 NSERC Alliance COVID-19 over one year);
- University of British Columbia – Okanagan, Prof. Mohammad Arjmand (Supervisor), Dr. Seyyedarash Haddadi (Postdoctoral Fellow), "Graphene-based Corrosion Protective Coatings" (\$60,000 Mitacs Elevate over one year and renewable for a second year); and
- University of Toronto, Prof. Daman Panesar (Supervisor), Dr. Tanvir Qureshi (Intern), "Nano-engineered concrete and composites with advanced graphene-based 2D nanomaterials" (\$45,000 Mitacs Accelerate over one year)

#### Environmental Baseline Program Update

Additionally, the Company reported that, after a necessary break in travel and field activities due to the COVID-19 pandemic, it had re-engaged ERM Canada Ltd. ("ERM") and CSA Global ("CSA", an ERM company) to continue with an abbreviated environmental baseline program for the Albany Project. This program will focus on project definition and planning, and on a laboratory-based geochemical baseline study.

The key aim of the work will be to consider the potential approach to mining the Albany resource based on ZEN's current Vision of Project, and then to develop a roadmap to identify the key work that will be required to advance the Project to the next stage. Integrated project planning will include work to be completed across corporate, engineering, environment, social, and permitting functions.

On September 22, 2020, ZEN reported that after 5 months of optimization, it had developed a novel graphene-based virucidal coating with 99% effectiveness against COVID-19. The company received test results on its proprietary, virucidal graphene-based coating formulation from Western University's ImPaKT facility Biosafety Level 3 laboratory. Two graphene-based coating samples at different concentrations were applied to N95 mask filtration media and then exposed to the SARS-CoV-2 virus that causes COVID-19 and tested for antiviral properties in accordance with ISO 18184:2019. Very significant virucidal activity was recorded and reported, achieving 99% inactivation of the virus for both samples in three separate tests each and verified through a second round of testing. Of significance, the antiviral effect of the second round of testing was on material that had been prepared 35 days earlier demonstrating the ongoing virucidal activity of ZEN's proprietary coating.

At this time, ZEN also reported that it was developing plans to bring this novel virucidal coating to commercial production including working with regulatory authorities and government agencies to fast track this product to Canadian and global markets to help the fight against the Coronavirus pandemic. ZEN also expanded the testing of its graphene-based coating formulation to include pathogenic bacteria and fungi.

On September 28, 2020, ZEN announced that the University of Guelph had filed a provisional patent regarding an electrochemical exfoliation (ECE) process to produce graphene oxide (GO) from Albany Pure™ Graphite. As reported in the November 14, 2019 news release, ZEN had signed an 18-month exclusive initial option agreement with Guelph for intellectual property regarding the ECE process that was being developed by Prof. Aicheng Chen and his group. The current exclusive global license agreement with Guelph formalizes and extends this initial option agreement which now has no expiry providing that all agreed payments continue to be made on an annual basis.

Additionally, ZEN continued to work closely with Prof. Chen and his team to optimize and scale-up the ECE process to produce GO from its unique precursor Albany Pure™ Graphite through the NGen grant that was awarded in July 2020. This novel process was designed to be scalable, low cost, low energy, and environmentally friendly to produce high quality, few-layer graphene oxide at ZEN's Guelph facility.

ZEN reported that it could also produce GO through a proprietary chemical method which was filed as part of the virucidal coating provisional patent. This novel method, which was tested at bench scale, takes advantage of ZEN's unique Albany Pure™ Graphite and has several advantages over the improved Hummers' method as it uses significantly less chemical reagents and no phosphoric acid. In addition, ZEN indicated that it would be moving rapidly towards optimization, production scale-up and commercialization of its graphene-based coating which has attracted significant interest since its 99% virucidal activity against COVID-19 was announced on September 22, 2020.

Finally, on September 30, 2020, ZEN reported that the Naval Material Technology Management (NMTM) section of the Royal Canadian Navy (RCN) had partnered with ZEN and Evercloak Inc. (Evercloak) as a testing organization, and agreed to provide in-kind donations of test services from the Naval Engineering Test Establishment (NETE). The tests will compare the efficiency of an HVAC unit produced with the Evercloak dehumidification membrane technology to the incumbent HVAC system that is currently in use on the RCN's Halifax-class frigates.

Evercloak is currently evaluating the advantages of its dehumidification membrane technology against the current dehumidification system used by the RCN. Based on lab testing and modelling, Evercloak estimates up to 75% energy savings and anticipates that the equipment will have a smaller footprint and also require minimal maintenance as there will be fewer parts to replace. As reported in ZEN's July 9, 2020 news release, Evercloak and ZEN were awarded \$125,000 each as part of a Next Generation Manufacturing Canada (NGen) Project which will support the scale up of graphene oxide (GO) production by ZEN to supply GO to Evercloak for their scale up and optimization activities.

### **Subsequent Events**

Subsequent to the three month period ended September 30, 2020, numerous warrant holders exercised a total of 978,093 warrants at exercise prices ranging from \$0.50 to \$0.80 per warrant resulting in proceeds of \$587,922 to the Company.

On October 6, 2020, 400,000 stock options were issued to directors and officers under the stock option plan described in Note 6(c). The stock options have an exercise price of \$0.75 per share and an expiry date of October 6, 2025. The vesting period of the options granted to the directors and officers is as follows: 1/3 at October 6, 2020; 1/3 at April 6, 2021; 1/3 at October 6, 2021.

On October 9, 2020, ZEN signed a 2 year extension with Chemisar Laboratories Inc. ("Chemisar") to provide various consulting services which will include the use of 4,300 square feet of office and laboratory space in Guelph, Ontario commencing on January 1, 2021. The additional 2000 sq ft will be utilized to work on scale up effort for the company's patent pending Virucidal Coating manufacturing in response to the significant demand the company has received since announcing the patent filing on September 22, 2020. ZEN also negotiated a right of first refusal for the purchase of the facility in the new agreement.

At this time, the company also announced that it had received \$419,000 in the last few months from the exercise of warrants and options.

On October 15, 2020, ZEN announced that it had signed a new research collaboration agreement with the Deutsches Zentrum für Luft- und Raumfahrt ("DLR", the German Aerospace Center) to investigate the use of Albany Pure™ graphene-based nanomaterials in the fabrication of novel carbon aerogel composites. The goal of this collaborative research project titled, "Development of Innovative Composites based on Carbon Aerogels", is to develop electrode materials for new generation batteries and will build on the collaboration between ZEN, DLR and Dr. Lukas Bichler at the University of British Columbia-Okanagan Campus (UBC-O) that was previously reported on October 15, 2018 and November 1, 2019.

Significantly, on November 9, 2020, ZEN announced that it had signed a binding letter of intent (LOI) with Trebor Rx Corp. (Trebor), a Canadian personal protective equipment mask manufacturer with an initial production facility located in Collingwood, Ontario. This binding LOI included the initial purchase of ZEN's patent pending graphene-based viricidal coating for a minimum of 100 million masks/filters with pricing of these mask/filters being variable based on a number of factors. This initial minimum order is for the first year and is subject to Health Canada approvals.

Trebor has developed a new standard of N95 mask, its patent pending Pro+ Respirator Mask (Pro+). The Pro+ mask, combined with ZEN's viricidal coating, will set a new standard of protection while solving problems of costs, comfort, and medical waste. The Pro+ is both reusable and also 99% recyclable making it one of the best environmental choices. Trebor will also be offering a 3-ply surgical mask with ZEN's proven viricidal protection.

Finally, on November 12, 2020, ZEN announced that it had signed a three year lease with an option for another 3 years on 25,680 square feet of newly built B.1 industrial zoning space in Guelph, Ontario. The new space will become ZEN's manufacturing facility and corporate headquarters. ZEN reported that engineering work plus the purchase of the equipment required to produce ZEN's graphene-based viricidal coating at commercial scale is ongoing. Initial production is expected to commence during Q4 2020 for incorporation into masks, other PPE and for HVAC filters and prefilters.

### Selected Financial Information

The following table sets forth selected financial information with respect to the Corporation as at and for the years ended March 31, 2020 and 2019, and the six month periods ended September 30, 2020 and 2019. The selected financial information has been derived from the audited financial statements of the Corporation for the financial years indicated. The following should be read in conjunction with the said financial statements and related notes thereto.

	Six months ended September 30,	Six months ended September 30,	Year ended March 31,	Year ended March 31,
	2020 (unaudited)	2019 (unaudited)	2020 (Audited)	2019 (Audited)
Total Revenue	\$ 163,699	\$ 3,065	\$ 136,998	\$ 40,302
Net Loss	\$(791,156)	\$(747,257)	\$(1,540,877)	\$(2,428,153)
# Shares Outstanding	82,601,349	77,333,569	80,405,791	74,333,569
Net Loss per Share (Basic)	\$(0.01)	\$(0.01)	\$(0.02)	\$(0.04)
Net Loss per Share (Diluted)	\$(0.01)	\$(0.01)	\$(0.02)	\$(0.04)
Total Assets	\$ 27,942,513	\$ 25,674,339	\$ 26,238,658	\$ 25,541,869
Total Financial Liabilities	\$ 444,494	\$ 271,944	\$ 527,575	\$ 646,642
Total Equity	\$ 27,498,019	\$ 25,402,395	\$ 25,711,083	\$ 24,895,227

## Summary of Quarterly Results

The following table sets out selected quarterly information for the eight most recently completed quarters, for which financial statements are prepared.

	Sep. 30, 2020	Jun. 30, 2020	Mar. 31, 2020	Dec. 31, 2019	Sep. 30, 2019	Jun. 30, 2019	Mar. 31, 2019	Dec. 31, 2018
Revenue	\$77,344	\$86,355	\$(233,999)	\$367,932	\$769	\$2,296	\$4,756	\$24,617
Loss	\$434,829	\$356,327	\$636,146	\$157,474	\$367,856	\$379,401	\$606,307	\$558,820
Loss per Share (Basic)	\$0.01	\$0.00	\$0.01	\$0.00	\$0.00	\$0.01	\$0.01	\$0.01
Loss per Share (Diluted)	\$0.01	\$0.00	\$0.01	\$0.00	\$0.00	\$0.01	\$0.01	\$0.01

## Liquidity and Capital Resources

As at September 30, 2020, the Corporation had working capital of \$2,049,343 (2019: \$872,032) and cash of \$2,226,282 (2019: \$1,058,395). The Corporation funded operations during the six month period ended September 30, 2020 through the net proceeds of units issued and stock options and warrants exercised as well as the use of existing cash.

The Corporation will need to raise additional funding to finance future research and development. The availability of equity capital, and the price at which additional equity could be issued, is dependent upon the success of the Corporation's activities, and upon the state of the capital markets generally. Additional financing may not be available on terms favourable to the Corporation or at all. If the Corporation does not receive future financing, it may not be possible for the Corporation to advance the graphene market development.

## Off-Balance Sheet Arrangements

There are currently no off-balance sheet arrangements which could have an effect on current or future results or operations, or the financial condition of the Corporation.

## Transactions with Related Parties

The total transactions with companies controlled by members of key management personnel during the six month periods ended September 30, 2020 and 2019 were as follows:

- a) Exploration and evaluation assets - \$83,039 (2019: \$93,368)
- b) General and administrative - \$1,854 (2019: \$14,025)

Included in accounts payable and accrued liabilities are amounts owing to related parties of \$34 (2019 - \$11,300). The amounts owing are unsecured, non-interest bearing and are repayable under normal terms and conditions.

The remuneration of directors and other members of key management personnel during the six month periods ended September 30, 2020 and 2019 were as follows:

- a) Short-term benefits - \$222,167 (2019: \$76,000)
- b) Share-based payments - \$75,417 (2019: \$169,323)

In accordance with IAS 24, key management personnel are those persons having authority and responsibility for planning, directing and controlling the activities of the Corporation directly or indirectly, including any directors (executive and non-executive) of the Corporation.

The remuneration of directors and key executives is determined by the board of directors having regard to the performance of individuals and market trends.

## **Current and Future Changes in Accounting Policy**

### *Statement of Compliance*

The condensed interim financial statements, including comparatives for the six month period ended September 30, 2020, have been prepared using accounting policies in compliance with International Financial Reporting Standards (“IFRS”) as issued by the International Accounting Standards Board (“IASB”).

## **Financial Instruments and Other Instruments**

The Corporation’s financial instruments consist of cash, amounts and other receivables, and accounts payable and accrued liabilities. Unless otherwise noted, the Corporation does not expect to be exposed to significant interest, currency or credit risks arising from these financial instruments. The Corporation estimates that the fair value of these financial instruments approximate carrying values.

Financial instruments as at September 30, 2020 included cash and amounts and other receivables, which are classified as loans and receivables and are measured at amortized cost. Accounts payable and accrued liabilities are classified as other financial liabilities, which are measured at amortized cost. As at September 30, 2020, the carrying and fair value amounts of the Corporation's financial instruments are approximately the same. As at September 30, 2020, the Company does not have any financial instruments recorded at fair value and that require classification within the fair value hierarchy.

Fair value estimates are made at the balance sheet date based on relevant market information and information about the financial instrument. These estimates are subjective in nature and involve uncertainties in significant matters of judgment and therefore cannot be determined with precision. Changes in assumptions could significantly affect these estimates.

## **Disclosure of Outstanding Share Data**

The Corporation is authorized to issue an unlimited number of shares, of which 84,601,349 (2019: 77,333,569) shares were issued and outstanding as fully paid and non-assessable as at September 30, 2020. Also, 4,839,128 warrants (2019: 3,525,033) were outstanding as at September 30, 2020.

Refer to Note 6(c) of the condensed interim financial statements for details regarding stock options issued and exercisable as at September 30, 2020.

As at November 23, 2020, the Corporation had 85,579,442 shares which were issued and outstanding as fully paid and non-assessable. The Corporation also had 3,861,038 warrants and 5,425,000 stock options outstanding as at November 23, 2020.

## **Risks and Uncertainties**

The Corporation's risk exposures and the impact on the Corporation's financial instruments are summarized below. As at September 30, 2020, there had been no changes in the risks, objectives, policies and procedures from the previous period.

### *Credit risk*

As at September 30, 2020, the Corporation's credit risk was primarily attributable to cash and amounts and other receivables. The Corporation has no significant concentration of credit risk arising from operations.

Financial instruments included in accounts and other receivables consisted of harmonized sales tax due from the Federal Government of Canada. The Corporation's cash is held with reputable financial institutions. Management believes that the credit risk with respect to financial instruments included in accounts and other receivables is remote.

#### *Liquidity risk*

The Corporation's approach to managing liquidity risk is to ensure that it will have sufficient liquidity to meet liabilities when due. As of September 30, 2020, the Corporation had a cash balance of \$2,226,282 to settle current liabilities of \$444,494. The Corporation's ability to continue operations and fund its exploration property expenditures is dependent on management's ability to secure additional financing. Management is continuing to pursue various financing initiatives in order to provide sufficient cash flow to finance operations as well as funding its exploration expenditures. All of the Corporation's financial liabilities have contractual maturities of less than 30 days and are subject to normal trade terms.

#### *Interest rate risk*

The Corporation has cash balances. The Corporation's current policy is to invest excess cash in investment-grade short-term deposit certificates issued by its banking institutions. The Corporation periodically monitors the investments it makes and is satisfied with the credit ratings of its banks. The Corporation closely monitors interest rates to determine the appropriate course of action to be taken by the Corporation.

#### *Price risk*

The Corporation is exposed to price risk with respect to commodity prices. The Corporation closely monitors commodity prices to determine the appropriate course of action to be taken by the Corporation.

#### *Exploration risk*

Mineral exploration and development involve a high degree of risk and few projects are ultimately developed into producing mines. There is no assurance that the Corporation's future exploration and development activities will result in the definition of a body of commercial ore. Whether an ore body will be commercially viable depends on a number of factors including the particular attributes of the deposit such as size, grade and proximity to infrastructure, as well as mineral prices and government regulations, including environmental regulations.

#### *Financial Capability and Additional Financing*

The Corporation's development programs will require additional funds. The only sources of future funds presently available to the Corporation are the sale of additional equity capital or the entering into of joint venture arrangements or other strategic alliances in which the funding sources could become entitled to an interest in the properties or the projects. The Corporation's capital resources are largely determined by the strength of the junior resource market and by the status of the Corporation's projects in relation to these markets, and its ability to compete for investor support of its projects.

There is no assurance that the Corporation will be successful in raising sufficient funds to meet its obligations or to complete all of the currently proposed exploration programs. If the Corporation does not raise the necessary capital to meet its obligations under current contractual obligations, the Corporation may have to forfeit its interest in properties or prospects earned or assumed under such contracts. In addition, if the Corporation does not raise the funds to complete the currently proposed exploration programs, the viability of the Corporation could be jeopardized.

#### *Permits and Government Regulation*

Although the Corporation believes it has all of the necessary permits to carry out the proposed exploration programs, the operations of the Corporation may require licenses and permits from time to time from various governmental authorities to carry out exploration and development at its projects. Obtaining permits can be a complex, time-consuming process. There can be no assurance that the Corporation will be able to obtain the

necessary licenses and permits on acceptable terms, in a timely manner or at all. The costs and delays associated with obtaining permits and complying with these permits and applicable laws and regulations could stop or materially delay or restrict the Corporation from continuing or proceeding with existing or future operations or projects. Any failure to comply with permits and applicable laws and regulations, even if inadvertent, could result in the interruption or closure of operations or material fines, penalties or other liabilities. In addition, the requirements applicable to sustain existing permits and licenses may change or become more stringent over time and there is no assurance that the Corporation will have the resources or expertise to meet its obligations under such licenses and permits.

The mineral exploration activities of the Corporation are subject to various laws governing prospecting, development, production, taxes, labour standards, occupational health, mine safety, waste disposal, toxic substances and other matters. Mining and exploration activities are also subject to various laws and regulations relating to the protection of the environment, historical and archaeological sites and endangered and protected species of plants and animals. Although the exploration activities of the Corporation are currently carried out in material compliance with all applicable rules and regulations, no assurance can be given that new rules and regulations will not be enacted or that existing rules and regulations will not be applied in a manner which could limit or curtail exploration or development. New rules and regulations may be enacted or existing rules and regulations may be applied to the operations and activities of the Corporation and could have a substantial adverse impact on the Corporation.

#### *Fluctuating Prices*

The profitability of the Corporation's operations will be dependent upon the market price of mineral commodities. Mineral prices fluctuate widely and are affected by numerous factors beyond the control of the Corporation. The level of interest rates, rate of inflation, world supply of mineral commodities, consumption patterns, sales of nickel and copper, forward sales by producers, production, industrial and consumer demand, speculative activities and stability of exchange rates can all cause significant fluctuations in prices. Such external economic factors are in turn influenced by changes in international investment patterns, monetary systems and political developments. The prices of mineral commodities have fluctuated widely in recent years. Current and future price declines could cause commercial production to be impracticable. The prices of commodities are affected by numerous factors beyond the Corporation's control.

#### *Risks Associated with NI 43-101 Estimates and Technical Reports*

The figures for resources presented herein, including the anticipated tonnages and grades that may be achieved or the indicated level of recovery that may be realized, are estimates and no assurances can be given as to their accuracy. Such estimates are, in large part, based on interpretations of geological data obtained from drill holes and other sampling techniques. Actual mineralization or formations may be different from those predicted. It may also take many years from the initial phase of drilling before production is possible, and during that time the economic feasibility of exploiting a deposit may change.

Few properties that are explored are ultimately developed into producing mines. Major expenses may be required to establish ore reserves by drilling, to develop metallurgical processes, to extract the metals from the ore and to construct mining and processing facilities at a site. There is no guarantee that any property on which the Company intends to incur explorations expenditures or in which it has mining interests will ever reach the stage of commercial production.

#### *Environmental Regulation*

The Corporation's activities are subject to environmental laws and regulations which may materially and adversely affect its future operations. These laws and regulations control the exploration and development of the Albany Project and their effects on the environment, including air and water quality, waste handling and disposal, the protection of different species of plant and animal life, and the preservation of lands. These laws and regulations will require the Corporation to acquire permits and other authorizations for certain activities. There can be no assurance that the Corporation will be able to acquire such necessary permits or authorizations on

a timely basis, if at all.

Further, environmental legislation is evolving in a manner which will require stricter standards and enforcement, increased fines and penalties for non-compliance, more stringent environmental assessments of proposed projects and a heightened degree of responsibility for companies and their officers, directors and employees. There is no assurance that future changes in environmental regulation, if any, will not adversely affect the Corporation's operations.

The Corporation is not currently insured against most environmental risks. Without such insurance, and if the Corporation becomes subject to environmental liabilities, the payment of such liabilities would reduce or eliminate its available funds or could exceed the funds the Corporation has to pay such liabilities and result in bankruptcy.

### **Proposed Transactions**

As is typical of the mineral exploration and development industry, the Corporation is continually reviewing potential merger, acquisition, investment and joint venture transactions and opportunities that could enhance shareholder value. At present, there are no transactions being contemplated by management or the board that would affect the financial condition, results of operations and cash flows of any asset of the Corporation.

### **Employment Agreements**

The Company has renewed the consulting agreement with its Vice-President Exploration and Chief Geologist dated July 1, 2018 and the individual was also promoted to company Vice President. On September 14, 2018, the individual was promoted to the position of company President and Chief Operating Officer. The current salary level for the individual pursuant to the employment agreement will remain at \$180,000 annually.

The Corporation has an employment agreement with its Chief Executive Officer dated August 1, 2018. The current salary level for the individual pursuant to the employment agreement is \$150,000 annually.

The Corporation has an employment agreement with its Chief Financial Officer dated January 15, 2019. The current salary level for the individual pursuant to the employment agreement is \$80,000 annually.

### **Exploration Agreement**

On July 13, 2011, the Corporation entered into an agreement with Constance Lake First Nation ("CLFN") governing the relationship between them concerning the Corporation's exploration on traditional lands of CLFN.

#### **Cost of Implementation Committee**

On a yearly basis, commencing on the date that the implementation committee is formed and continuing for the following twelve (12) months, the Corporation shall make a total contribution of \$22,000, and in years following the year in which this agreement is executed, an additional amount equivalent to the increase in the Ontario consumer price index for the preceding year, to pay: the reasonable expenses of the Corporation's implementation committee members; the reasonable costs of an archaeologist for any archaeological assessments.

#### **Cost of Annual Gathering**

On an annual basis, \$1,200, and in years following the year in which this agreement is executed, an additional amount equivalent to the increase in the Ontario consumer price index for the preceding year, for CLFN and the Corporation to have a community "feast" and conduct an information session with

CLFN members about the exploration, this agreement and any issues pertaining to this agreement's implementation.

Following the signing of a new MOU during the Quarter, the Corporation is now in discussion with CLFN toward establishing a new partnership agreement that would replace the 2011 agreement.

### **Other Commitments**

As part of previous flow-through share issuances, the Company is committed to incurring approximately \$520,000 in qualifying exploration and evaluation expenditures on or before December 31, 2020.

### **Contingent Liabilities**

In September 2018, the Company received a statement of claim from a former employee. The Company is in the process of defending the claim, but views the claim as unmeritorious. On March 24, 2020, the Company commenced an action claim against the former employee for relief relating to contracts and transactions between that employee and the Company, seeking to set aside those agreements and, where applicable, seeking disgorgement of unspecified amounts relating to benefits obtained under those agreements.

### **Critical Accounting Estimates**

A detailed summary of all of the Corporation's significant accounting policies is included in Note 2 to the March 31, 2020 audited annual financial statements.

### **Internal Controls over Financial Reporting**

Management is responsible for the design of internal controls over financial reporting to provide reasonable assurance regarding the reliability of financial reporting and the preparation of the financial statements in accordance with accounting principles generally accepted in Canada. Based on regular reviews of its internal control procedures during and at the end of the period covered by this MD&A, management believes its internal controls and procedures are effective in providing reasonable assurance that financial information is recorded, processed, summarized and reported in a timely manner.

### **Changes to Internal Control over Financial Reporting**

There have been no significant changes to the Corporation's internal controls over financial reporting that occurred during the six months ended September 30, 2020 that have materially affected, or are reasonably likely to materially affect, the Corporation's internal control over financial reporting.

### **Disclosure Controls**

Management is also responsible for the design and effectiveness of disclosure controls and procedures to provide reasonable assurance that material information related to the Corporation is made known to the Corporation's certifying officers. The Corporation's Chief Executive Officer and Chief Financial Officer have each evaluated the effectiveness of the Corporation's disclosure controls and procedures as of September 30, 2020 and have concluded that these controls and procedures are effective in providing reasonable assurance that material information relating to the Corporation is made known to them by others within the Corporation.