



**NORTH AMERICAN PALLADIUM LTD.
ANNUAL INFORMATION FORM**

March 22, 2019

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FORWARD-LOOKING STATEMENTS

This annual information form (“**AIF**”) contains ‘forward-looking statements’ and/or ‘forward-looking information’, including future-oriented financial information, within the meaning of applicable Canadian securities laws. All statements other than statements of historical fact are forward looking statements. The words ‘expect’, ‘believe’, ‘forecast’, ‘anticipate’, ‘target’, ‘plan’, ‘may’, ‘will’, ‘intend’, ‘estimate’, and similar expressions identify forward-looking statements, although these words may not be present in all forward-looking statements.

Forward-looking statements included in this AIF include, without limitation: information as to the Company’s strategy, plans or future financial or operating performance, such as North American Palladium Ltd. and its subsidiaries (“**NAP**” or the “**Company**”) expansion plans at the Lac des Iles mine (“**LDI Mine**”), information pertaining to 2019 operating and financial information, development opportunities, project timelines, production plans or schedules, projected capital expenditures and closure cost estimates, extensions to mine life, sources of ore, liquidity, cost estimates, mining or milling methods, expected recoveries, statements with respect to exploration potential or projected exploration results, assumptions regarding metal prices and foreign exchange rates, reserve and resource estimates and other statements that express management’s expectations or estimates of future performance.

Forward-looking statements, including future-oriented financial information, are necessarily based on a number of factors and assumptions that, while considered reasonable by management, are inherently subject to significant business, economic and competitive uncertainties and contingencies. The factors and assumptions contained in this AIF, which may prove to be incorrect, include, but are not limited to, the following:

- that additional financing for the Company’s expansion plans will be available, including on reasonable terms;
- that the LDI Mine will be and will remain viable operationally and economically;
- that mill feed head grade, recovery rates and mill performance will be as expected at the LDI Mine;
- that plans for mine production, mine development projects, mill production and exploration will proceed as expected and on budget;
- that the Company will pursue future development projects;
- that market fundamentals will result in reasonable demand and prices for palladium and by-product metals in the future;
- that the Company will not be subject to any material environmental incidents, significant regulatory changes or material labour disruptions;
- that the Company’s interpretations of the ore body are accurate;
- that the information and advice the Company has received from its employees, consultants and advisors relating to matters such as mineral resource and mineral reserve estimates, engineering, mine planning, metallurgy, permitting and environmental matters is reliable and correct and, in particular, that the models used to calculate mineral reserves and mineral resources are appropriate and accurate; and
- that the Company and its contractors will be able to attract and retain sufficient qualified employees.

The Company cautions the reader that such forward-looking information involves known and unknown risks that may cause actual results to be materially different from those expressed or implied by forward-looking statements. Such risks include, but are not limited to: the possibility that commodity prices and foreign exchange rates may fluctuate; the risk that the Company may not be able to obtain financing necessary to continue its expansion plans; the risk that the Company may not be able to generate sufficient cash to service its indebtedness and may be forced to take other actions; inherent risks associated with mining

and processing including environmental hazards and risks to tailings capacity; the risk that permits and regulatory approvals necessary to conduct operations will not be available on a timely basis, on reasonable terms or at all; employment disruptions, including in connection with collective agreements between the Company and unions; uncertainty related to First Nations rights; the possibility that general economic conditions may deteriorate; the inability to meet production level and cost estimates; concentrate marketing and transportation risk; inaccuracy of mineral resource and reserve estimates; decreases in the market price of palladium or other metals may render the mining of reserves uneconomic; the demand for, and cost of, exploration, development and construction services; the risks related to future exploration programs, including the risk that future exploration will not replace mineral reserves and mineral resources that become depleted; the uncertainty as to the Company's ability to achieve or maintain projected production levels at the LDI Mine; the potential uncertainty related to title to the Company's mineral properties; environmental and other regulatory requirements; the costs of complying with environmental legislation and government regulations; loss of key personnel; competition from other producers of PGEs and from potential new producers; risks involved in current or future litigation (including class actions) or regulatory proceedings; the development of new technology or new alloys that could reduce the demand for palladium; the ability of the Company to comply with the terms of its present or future credit agreements; risks related to the Company's hedging strategies; lack of infrastructure necessary to develop the Company's projects, risks related to the Company's accounting policies and risks to information technology systems and cybersecurity.

All of the forward-looking statements made in this AIF are qualified by these cautionary statements and other cautionary statements or factors contained herein, and there can be no assurance that the projected results or developments will be realized or, even if substantially realized, that they will have the expected consequences to, or effects on, the Company. The forward-looking statements are not guarantees of future performance. All forward looking statements in this AIF are made as at December 31, 2018, unless otherwise indicated, and the Company disclaims any obligation to update or revise any forward-looking statements, whether as a result of new information, events or otherwise, except as expressly required by applicable law. Readers are cautioned not to put undue reliance on these forward-looking statements.

REPORTING CURRENCY, FINANCIAL AND RESERVE INFORMATION

The information in this AIF is presented as at December 31, 2018 unless otherwise indicated.

Unless otherwise indicated, all dollar amounts referred to herein are in Canadian dollars ("**CAD**"). References to "**US**" are to U.S. dollars.

Unless otherwise indicated, all financial information included herein has been prepared in accordance with International Financial Reporting Standards as issued by the International Accounting Standards Board ("**IFRS**").

Unless otherwise indicated, all reserve and resource estimates included in this annual information form have been prepared in accordance with Canadian National Instrument 43-101 – *Standards of Disclosure for Mineral Projects* ("**NI 43-101**") and the Canadian Institute of Mining, Metallurgy and Petroleum classification system. NI 43-101 is a rule developed by the Canadian Securities Administrators that establishes standards for all public disclosure an issuer makes of scientific and technical information concerning mineral projects.

CORPORATE STRUCTURE

Name, Address and Incorporation

The Company is the successor to Madeleine Mines Ltd., a company incorporated under the *Mining Companies Act* (Quebec) by letters patent in 1968. The Company completed its initial public offering in 1968 and has been listed on the Toronto Stock Exchange (the “**TSX**”) since December 19, 1968. In January 1992, Madeleine Mines Ltd. was amalgamated with 2945-2521 Quebec Inc. and the amalgamated company was wound up into the federally incorporated parent company, 2750538 Canada Inc. (“**2750538**”). 2750538 changed its name to Madeleine Mines Ltd. and, in June 1993, the name was changed to North American Palladium Ltd. The Company continues to exist under the *Canada Business Corporations Act* (“**CBCA**”). The Company has two wholly-owned subsidiaries: Lac des Iles Mines Ltd. (“**LDI**”) and 8616868 Canada Ltd. (“**8616868**”). On March 22, 2013, the Company sold its Quebec-based gold division, NAP Quebec Mines Ltd., which included the Vezza mine, the Sleeping Giant mine and mill complex and its nearby portfolio of exploration properties to Maudore Minerals Ltd.

In 1991, LDI was incorporated under the CBCA as a subsidiary of Madeleine Mines Ltd. to hold a 50% interest in the Lac des Iles palladium property located approximately 90 kms northwest of the City of Thunder Bay in the province of Ontario. In 1994, LDI acquired the remaining 50% interest in the Lac des Iles property from Sheridan Platinum Group Ltd. to become the sole owner of the property.

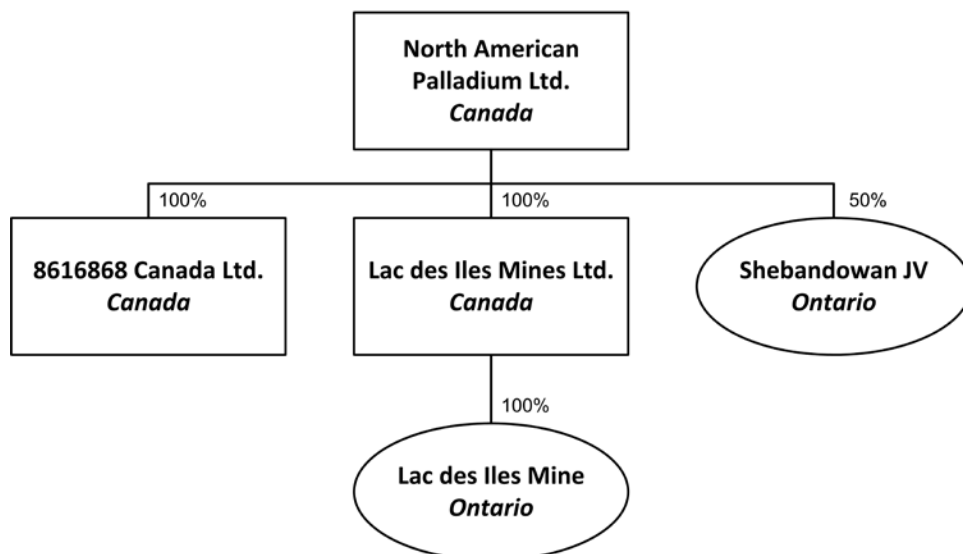
8616868 was incorporated under the CBCA on August 26, 2013. The Company, through 8616868, plans to carry out mineral exploration in Ontario and Quebec.

The Company’s head and registered office is located at One University Avenue, Suite 1601, Toronto, Ontario, M5J 2P1, Canada, Telephone: (416) 360-7590, Facsimile: (416) 360-7709.

Intercorporate Relationships

The following chart describes the Company’s subsidiaries, operating properties, and projects as at March 22, 2019. The percentage ownership is indicated for each entity.

North American Palladium Ltd. – Corporate Chart



DESCRIPTION OF THE BUSINESS AND GENERAL DEVELOPMENTS

Three Year History

2016

On January 18, 2016, the Company announced the appointment of Timothy J. Hill as Interim Vice President, Finance and Chief Financial Officer following the resignation of Interim Vice President, Finance and Chief Financial Officer, Christine Napierala.

On January 26, 2016, the Company completed de-registration filings with the Securities and Exchange Commission pursuant to which the Company ceased to be a reporting issuer in the United States.

On February 22, 2016 the Company announced financial and operational results for the year ended December 31, 2015 from the LDI Mine.

On March 24, 2016, the Company adopted a stock option plan (the “**Stock Option Plan**”) pursuant to which a maximum of 5,000,000 common shares in the capital of the Company (the “**Common Shares**”) or 8.60% of the Company’s current issued and outstanding Common Shares may be reserved for issuance pursuant to the exercise of options. The Company’s previous stock option plan was terminated, and all stock options issued and outstanding at the time were cancelled effective August 6, 2015 as a result of the Recapitalization.

On June 30, 2016, the Company announced that it has entered into an amendment of its existing secured term loan with Brookfield Business Partners L.P. (“**Brookfield**”) dated December 18, 2015, to increase available funds by US\$25 million to a maximum of US\$50 million under the same existing terms. The proceeds will be used to fund the existing capital expenditure program and for working capital at the LDI Mine.

On August 4, 2016 the Company appointed Timothy J. Hill as Vice President, Finance and Chief Financial Officer.

On November 30, 2016, the Company exercised its option to extend the maturity of the term loan facility with Brookfield from December 31, 2016 to December 31, 2017.

On December 21, 2016, the Company entered into a second amendment of its existing secured term loan with Brookfield dated December 18, 2015, to extend the maturity date for US\$35 million of the outstanding principle to December 31, 2018.

2017

On January 2, 2017, the Company entered into a 5-year smelter contract with one of its existing customers. Under the terms of this new agreement, payable nickel content is no longer included in smelter settlements.

On February 17, 2017, the Company entered into an amendment of its existing credit facility with The Bank of Nova Scotia (the “**Scotia Credit Facility**”), to amend its financial covenants under the agreement.

On February 22, 2017, the Company announced financial and operational results for the year ended December 31, 2016 from the LDI Mine.

On April 12, 2017, the Company completed a second amendment to the Scotia Credit Facility to include a first charge on its non-leased mobile equipment.

On May 4, 2017, the Company disclosed that construction permits for initial 2017 work at the tailings management facility ("**TMF**") had been received and self-execution of the project had commenced for the next phase of TMF construction.

On May 29, 2017, the Company provided an update on its mineral reserve and mineral resource estimates for the LDI Mine. The new estimates reflected the outcomes of a comprehensive review of all mineralized zones at the LDI Mine site.

On June 7, 2017, the Company announced the results of a feasibility study including a new Life of Mine ("**LOM**") plan for its LDI Mine site (the "**2017 Technical Report**"). The 43-101 technical report reflected an increase of 16% in estimated in-situ ounces of palladium and included a change of mining method in the lower Offset Zone from open stope blast hole to sub-level cave mining with waste fill introduced from surface. This new mining method is referred to as sub-level shrinkage ("**SLS**").

On June 7, 2017, the Company announced the filing of a preliminary base shelf prospectus allowing the Company to make offerings of Common Shares including flow-through shares, debt securities, warrants and subscription receipts in an aggregate principal amount of up to US\$75 million during the 25-month period that the base shelf prospectus remains effective.

On June 19, 2017, the Company announced the filing of the final base shelf prospectus. It was also announced that the Company would be filing a draft prospectus supplement in connection with a proposed marketed offering (the "**Proposed Offering**") of approximately \$40 million common shares in the capital of the Company and approximately \$10 million "flow-through" common shares in the capital of the Company for aggregate gross proceeds of approximately \$50 million. After assessing demand for equity investment, the Company did not issue shares in 2017 under this Proposed Offering.

On June 19, 2017, the Company announced that it had agreed to an amendment of the Scotia Credit Facility to extend the maturity of the Scotia Credit Facility from December 31, 2017 to June 30, 2018.

On June 20, 2017, the Company announced the signing of a Definitive Option Agreement (the "**Option Agreement**") with Impala Platinum Holdings Limited and Transition Metals Corp that provides the Company with the exclusive right to acquire a 75% ownership position in the Sunday Lake Project located near Thunder Bay, Ontario.

On July 6, 2017, the Company finalized the third amendment to the Scotia Credit Facility, including the extension of its maturity to June 30, 2018.

On August 1, 2017, the Company announced increased production results, largely attributable to the success of the conversion to the SLS mining method at depth during the second quarter.

On August 1, 2017, the Company announced that the LDI Mine had started overburden removal from the small Sherriff open pit and are on track to begin production by the beginning of the 2018 year.

On September 22, 2017, the Company announced that its LDI Mine has met and exceeded the targeted underground production rate of 6,000 tonnes per day ("**tpd**"), ahead of the original 2017 production plan, and had also returned to full-time mill operations several weeks ahead of schedule.

On December 22, 2017, the Company repaid principal of US\$15.0 million on its senior secured term loan that was to mature on December 31, 2017.

2018

On January 26, 2018, the Company announced it has commenced an internal evaluation of upside opportunities identified in the feasibility study published in June 2017. Significant among these was the option to forego the open pit pushback in favour of an underground mass mining approach, which would potentially recover mineral resources excluded from the pit mining shapes in a more selective fashion. A preliminary internal study had been completed, which indicated the potential to further extend the life of mine by increasing the total tonnes mined at slightly better grade with an overall improvement in the business case. As a result, the initial pre-stripping of the Roby pit, which was to begin in the latter part of 2018, was deferred until the Company completes an advanced level of engineering on this option.

On February 21, 2018, the Company announced financial and operational results for the year ended December 31, 2017 from the LDI Mine. The Company also announced its board of directors (the “**Board**”) had initiated a process to explore, review and evaluate a broad range of potential strategic alternatives focused on maximizing shareholder value, including a potential sale of the Company or a secondary sale of securities (the “**Strategic Process**”).

On March 9, 2018, the Company completed a fourth amendment to the Scotia Credit Facility, extending its maturity until December 31, 2018.

On March 27, 2018, the Company announced results from its winter exploration program on the Sunday Lake project (the “**Sunday Lake Project**”) and further expansion of the Sunday Lake Project. The Sunday Lake Project is located 25 km northeast of Thunder Bay, Ontario and is focused on a discovered platinum-group metal (“**PGM**”) deposit hosted within the region. The Sunday Lake Project exploration program results were realized in accordance with the Option Agreement.

On April 3, 2018, the Company provided an update on the Greenfields exploration activities, including a recently completed drilling program in the unexplored northern part of the Legris Lake property, known as the Stonefish Lake target.

On April 5, 2018, the Company provided an update on the LDI Mine exploration program, specifically referencing the exploration at the Offset South Zone and including the Company’s plans for the remainder of 2018.

On June 6, 2018, the Company announced the signing of a letter of intent dated June 5, 2018 (the “**LOI**”) with Kiashke Zaaging Anishinaabek, also known as the Gull Bay First Nation (the “**KZA-GBFN**”). The LOI sets out an agreement in principle pertaining to certain outstanding matters between the parties, which will be negotiated and further defined in a more detailed participation agreement in the near future. Following the signing of the LOI, KZA-GBFN members agreed to end their gathering at the primary access road to the LDI Mine on June 5, 2018.

On September 17, 2018, the Company announced the results of a feasibility study including a new LOM plan for its LDI Mine site (the “**LOM Technical Report**”). The LOM Technical Report was prompted by the positive results of the evaluation in the 2017 Technical Report. The LOM Technical Report forecasts improved margins, cash flows and net present value (“**NPV**”) by increasing reserves, adding mining areas, and optimizing the large near-surface resources using a combination of bulk and selective mining methods. The LOM Technical Report is available on the Company’s SEDAR page.

On November 22, 2018, the Company announced a new three-year collective agreement was ratified by the United Steelworkers Local 9422 (“**USW**”). The USW represents the production and maintenance employees at the LDI Mine.

On December 13, 2018, the Company announced the signing of a contract with Redpath Canada Limited of North Bay, Ontario, for underground mine development at the LDI Mine. The contract is part of a major mine expansion, detailed more fully in the LOM Technical Report. See also “Lac Des Iles Mine”. The Company also announced that the Board had concluded the Strategic Process.

On December 17, 2018, the Company announced it had entered a new US\$125 million revolving term credit facility (the “**Credit Facility**”). The Credit Facility replaced the Company’s prior term and revolving credit facilities, including the Scotia Credit Facility.

On December 24, 2018, the Company announced the closing of a non-brokered private placement (the “**Offering**”). Pursuant to the Offering, the Company issued 714,257 Flow Through Shares within the meaning of the *Income Tax Act* (Canada). The Flow-Through Shares were issued at a price of \$14.00 per share, for total gross proceeds of approximately \$10 million.

2019 Year to Date

On January 28, 2019, the Company released production results for the fourth quarter and year ending December 31, 2018 from the LDI Mine and provided production guidance for fiscal year 2019. In 2018, the Company produced a total of 237,461 ounces of payable palladium, meeting the upper half of its 2018 guidance, an 18% increase over the total production of payable palladium in 2017.

On February 11, 2019, the Company provided an update on its exploration programs at the LDI Mine, including plans to spend \$16 million on exploration in 2019, inclusive of the \$10 million in proceeds generated from the Offering.

On February 14, 2019, the Company announced financial and operational results for the year ended December 31, 2018 from the LDI Mine and declared a quarterly dividend of \$0.03 per Common Share, payable on March 15, 2019 to holders of Common Shares of record as at the close of business on March 1, 2019.

Business Overview

The following contains forward-looking statements and future-oriented financial information about the Company’s business. Reference should be made to “Forward-Looking Statements” on page 1. For a description of material factors that could cause the Company’s actual results to differ materially from the forward-looking statements in the following, please see “Risk Factors” beginning on page 54.

North American Palladium Ltd. is an established precious metals producer that has been operating its LDI Mine in Ontario, Canada since 1993. LDI is the only primary palladium (“**Pd**”) producer in the world, offering investors exposure to the price of palladium.

The Lac des Iles property (including the LDI Mine and mill complex) is the Company’s only material asset. The primary underground deposits on the property are the Offset and Roby Zones. The Company completed Phase 1 (as defined below in “*Lac des Iles Mine*”) of the underground mine expansion in 2013, including the construction of a production shaft. In 2014, the Company successfully transitioned from ramp access to shaft access.

In 2015, the Company completed the Recapitalization transaction in which a 91% ownership in NAP was acquired by Brookfield and the carrying value of the Company's debt was reduced by \$359.8 million.

For the 2018 fiscal year, the Company's revenue totalled \$396.8 million. The Company's revenue by commodity totalled \$335.9 million for palladium, \$18.1 million for platinum, \$25.9 million for gold, and \$16.9 million for copper, representing approximately 84.7%, 4.6%, 6.5%, and 4.5% respectively of its total consolidated revenue.

As of December 31, 2018, the Company had 604 employees. Of this number, 586 employees worked at the Lac des Iles property, 2 out of an exploration office in Thunder Bay, 11 at the Company's finance and administration office in Thunder Bay and 5 at the Company's corporate head office in Toronto.

Outside of the LDI Mine property, the Company's platinum group element ("PGE") greenfields exploration properties cover approximately 35,352.5 hectares (87,358 acres), including several of the most prospective geological structures in the area. The Company remains committed to maintaining a portfolio of exploration-stage projects at and near the LDI Mine property. Additionally, the Company retains a 50% ownership stake in the Shebandowan nickel-copper-PGE property with its joint venture partner, Vale Canada Ltd. ("Vale") holding the remaining 50% interest. Further, the Company signed the Definitive Option Agreement which provides the Company with the exclusive right to acquire a 75% ownership position in the Sunday Lake Project located near Thunder Bay, Ontario. The Sunday Lake Project is host to a recently discovered PGM- copper-nickel sulfide deposit located within 70 km of the Company's Lac des Iles mine.

The Company's principal product is a palladium-rich concentrate which it sold to two smelters in 2018. Palladium is a metal which is primarily used in the manufacture of catalytic converters for automobiles.

The Company is not dependent upon any patents, licenses or new manufacturing processes other than those entered into in the ordinary course of its business.

The Lac des Iles Property

For a description of the meaning of certain technical terms used in this AIF, please see the "Glossary of Terms" beginning on page 74.

The Company's only material asset is the Lac des Iles property. The property is located approximately 90 km northwest of the City of Thunder Bay, Ontario, Canada. The property consists of an inactive open pit, an underground mine accessible by ramp or by shaft, and a mill with a nominal capacity of approximately 13,500 tonnes per day. The primary deposits on the property are the Roby Zone and the Offset Zone; both disseminated magmatic nickel-copper-PGE deposits. The Company has also identified other mineralized areas on the property, including the B2, Sheriff and North VT Rim Zones.

The Company began mining the Roby Zone open pit in 1993 and in April 2006, the Company also began commercial production underground by mining the higher-grade portion of the Roby Zone. On October 29, 2008, the LDI Mine was placed on temporary care and maintenance due to declining metal prices during the global financial crisis.

On December 8, 2009, following improvements in palladium prices, the Company announced its intention to restart underground operations in the Roby Zone. On April 14, 2010, the Company announced that it had resumed production of the Roby Zone.

In late 2010, the Company commenced the expansion of its LDI Mine in order to access the Offset Zone located adjacent to and below the Roby Zone. The purpose of the expansion was to transition operations from mining via ramp access to mining via shaft while utilizing a high volume, bulk mining method. As part of the expansion, the Company installed a shaft to a depth of approximately 825 meters below surface and extended the ramp from the Roby Zone to the Offset Zone.

Historically, underground mining was focused in the Offset Zone between the 735-meter level and the 905-meter level utilizing longhole open stoping with unconsolidated rock fill. Throughout 2016, the Company transitioned to a SLS mining method in the lower portion of the Offset zone below 905 level. Development of a fill raise to surface began in 2016. SLS production counted for approximately 7% of underground production in 2016, 60% of underground production in 2017, and 67% of underground production in 2018.

During 2016, the Company completed exploration drilling and geological interpretation of the B2 Zone. The B2 Zone is a vertical, pipe shaped structural conduit, approximately 325 in height and up to 60 meters in diameter. It is directly adjacent to the southern part of the upper Offset Zone. Development towards the upper portion of the B2 Zone began in 2016.

In addition to underground ore production, lower grade ore that was stockpiled during the open pit mining, was processed through the Mill.

The following is an up-to-date description of the LDI Mine property that has been summarized from the LOM Technical Report entitled *“Feasibility Study for Lac des Iles Mine Incorporating the Underground Mining of Roby Zone”* with an effective date of July 4, 2018 prepared by the Company in collaboration with engineering consultants from SRK Consulting (“SRK”), Mining Plus, Power Geotechnical Pty Ltd. and DST Consulting Engineers Inc. (collectively, the “Consultants”), and authored by Denis Decharte, P.Eng., Toby Hofton, P.Eng., Gord Marrs, P.Eng., Steve Olson, P.Eng., Dave Peck, P.Geo., Chris Perusse, P.Eng., Chris Roney, P.Geo., Stephen Taylor, P.Eng., Denis Thibodeau, P.Eng. and Brian Young, P.Eng.

Readers should consult the LOM Technical Report to obtain further particulars regarding the LDI Mine. The LOM Technical Report is available for review under the Company’s profile on SEDAR at www.sedar.com. The information below is subject to the assumptions, qualifications and procedures set out in the LOM Technical Report and is qualified in its entirety with reference to the full text of the LOM Technical Report.

Dave Peck, P.Geo., an employee of the Company and a “Qualified Person” within the meaning of NI 43-101, has reviewed and approved the scientific and technical information in this section on the LDI Mine.

LAC DES ILES MINE

Certain information below with respect to the LDI Mine has been excerpted or derived from the LOM Technical Report prepared in compliance with NI 43-101 prepared by NAP in collaboration with engineering advisors from SRK, the Consultants, and authored by Denis Decharte, P.Eng., Toby Hofton, P.Eng., Gord Marrs, P.Eng., Steve Olson, P.Eng., Dave Peck, P.Geo., Chris Perusse, P.Eng., Chris Roney, P.Geo., Stephen Taylor, P.Eng., Denis Thibodeau, P.Eng. and Brian Young, P.Eng.

Readers should consult the LOM Technical Report to obtain further particulars regarding the LDI Mine. All capitalized terms used in this section “Lac des Iles Mine” and not defined herein have the meaning ascribed to them in the LOM Technical Report. The LOM Technical Report is available for review under the Company’s profile on SEDAR at www.sedar.com. The information below is subject to the assumptions, qualifications and

procedures set out in the LOM Technical Report and is qualified in its entirety with reference to the full text of the LOM Technical Report.

Project Description, Location and Access

Description and Location

The LDI Mine is located at latitude 49°10' north, longitude 89°37' west, 90 km northwest of the city of Thunder Bay in northwestern Ontario. The mine property is comprised of approximately 103.6 km² (10,361 ha) of mining leases and mineral claims. LDI, a wholly-owned subsidiary of the Company, holds the mineral rights to the mining leases and mineral claims.

LDI holds a 100% interest in six mining leases encompassing 3,513.2 ha. Contiguous to these mining leases are 360 single and boundary cell mining claim units, also held 100% by LDI, covering an additional 6,847.5 ha, for a total area of 10,360.95 ha.

Accessibility, Climate, Local Resources, Infrastructure and Physiography

Access to the LDI Mine property is provided by a 16 km, year-round gravel road that connects to the paved Provincial Highway 527 located east of the mine. Rail access is not available at or near the site. The nearest access to rail transport is in Thunder Bay, 90 km to the south, or in Armstrong, 133 km to the north. Air access is available in Armstrong, Ontario and Thunder Bay, Ontario, with Thunder Bay having an international airport serviced by several major airlines. The site's proximity to Thunder Bay provides access to experienced staff and personnel with good mining and processing experience. Consumables for the mine and mill, including fuel, propane, and cement, are readily available. Hydro One Limited supplies electrical power, and the Company has approval for a maximum allowable draw of 47 megawatts. The Company has three Permits to Take Water that allow for a total daily water consumption of approximately 62 million litres.

Ore is processed on site at the Lac des Iles mill, and tailings are stored in three tailings impoundments that collectively form the TMF. The TMF is expanded on an ongoing basis to meet the production requirements of the mine plan. Waste rock stockpiled on the surface is removed as required for backfill underground or for TMF construction purposes.

The LDI Mine property experiences hot summers and cold winters, with minimum and maximum temperatures ranging from a low of approximately -30°C in the winter months to a high of approximately 38°C in the summer months. The average summer temperature is 14.8°C and the average winter temperature is -13.0°C. The area is snow-covered for approximately 5.5 months per year, with the annual snowfall averaging approximately 150 centimeters. Rain precipitation averages 454 millimeters for the year. Prevailing winds on the property are from the north-west. The relative humidity ranges from 50% to 77%. Weather conditions are rarely severe enough to halt mining operations with the main issue from adverse weather conditions being related to safe traction on surface roads and ramps and shutting down the mine hoist during lightning storms. Except for feed inputs and the tailings thickener, mill operations are entirely enclosed and therefore isolated from the weather.

The LDI Mine is located in northwestern Ontario within the Superior Province of the Canadian Shield. The LDI Mine is in a boreal forest region typified by uplands forested mostly of black spruce, birch, poplar, and jack pine, as well as low-lying areas comprising lakes, streams, and bogs, which is typical of this part of the Canadian boreal forest region. Site drainage generally flows in a southerly direction towards Lake Superior. Local land use is primarily related to forestry. The topography of the site is generally of low relief and favourable for the siting of facilities. Mine site elevations range from 418 m above sea level to 550 m above sea level, excluding mining operations.

Royalties

A 5% net smelter return (“**NSR**”) royalty is paid to Sheridan Platinum Group Ltd. (“**SPG**”) as a result of a 1994 settlement. The terms of the settlement saw the Company buy SPG’s interest in the LDI Mine in exchange for cash, stock, and a reserved net smelter return royalty interest of 3%, increasing to 5% after the year 2000. SPG also received \$10 million and 2,000,000 Common Shares.

History

Geological investigations in the area of the LDI Mine began with reconnaissance mapping in the early 1930s, and again in the late 1960s, sparked by the discovery of aeromagnetic anomalies in the late 1950s. Various exploration programs were undertaken over the next 25 years by a number of companies. Significant milestones prior to acquisition by the Company included the discovery by Gunnex of mineralization in the Baker Zone through prospecting in 1963 and the intersection of the Roby Zone by Boston Bay Mining in drill holes in 1974.

In 1992, the Company acquired the LDI Mine property, with open pit production commencing in 1993. Until 2008, the Company operated a combined open pit and underground mine from the Roby Zone and a 15,000 tpd processing plant, producing a bulk nickel-copper-PGE concentrate with gold credits. On October 21, 2008, NAP announced that it was temporarily placing the LDI Mine on care and maintenance effective October 29, 2008 in response to a significant decline in the price of palladium. The LDI Mine produced 212,046 oz of palladium in 2008 prior to going on care and maintenance.

When palladium prices began to recover in December 2009, NAP announced that it would restart operations exclusively from underground reserves. On April 14, 2010, NAP announced that the Roby underground mine was back in production with a potential two- to three-year mine life. In 2011 the Company took the decision to expand the underground mine to extract ore from the Offset Zone from a new vertical shaft. Shaft sinking was completed in 2013. In 2014 the Offset Zone underground mine was ramped up to planned production. In 2016 the Company began to transition from a long hole stoping mining method to a SLS mining method for the Offset Zone. Production from the upper levels of the SLS was achieved in the second half of 2016. In 2018 the Company produced a new feasibility study for the Roby and Offset zones featuring multiple underground feed sources and targeting 12,000 tonnes per day of underground production with supplemental feed from surface sources and a 9-year mine life.

Geological Setting, Mineralization and Deposit Types

Regional Geology

The LDI Mine property is underlain by mafic to ultramafic rocks of the Lac des Iles intrusive complex (“**LDI-IC**”). The LDI-IC is the best documented of a suite of Neoproterozoic mafic to ultramafic intrusive bodies occurring within a sub-circular area of approximately 35 km by 40 km in the Wabigoon Subprovince of the Canadian Shield. The intrusions are located immediately to the north of the Quetico Subprovince and directly west of the Nipigon embayment of the Mid-continent Rift System. At the time of writing of the LOM Technical Report, the Company owned or had options to acquire a majority interest in most of the known Lac des Iles suite intrusions including parts or all of the following bodies: LDI-IC; Legris Lake intrusive complex; Wakino Lake intrusion; Demars Lake intrusion; Taman Lake intrusion; Dog River intrusion; Buck Lake intrusion; Shelby Lake Intrusion, Towle Lake intrusion and Tib Lake intrusive complex.

The easternmost bodies of the Lac des Iles suite of intrusions are the LDI-IC and the Legris Lake complex. Both the LDI-IC and the Legris Lake complex appear to have been emplaced along northeast-trending splay structures (e.g., Shelby Lake fault) emanating from the Quetico Fault Zone. The Quetico Fault Zone is a

collisional structural boundary between the Quetico and Wabigoon subprovinces that formed during the Shebandowanian orogeny approximately 2,695 million years ago (“**Ma**”). Similarly, many of the Lac des Iles suite intrusions located in the western part of the Lac des Iles area are spatially associated with northeast to north striking faults that splay off this collisional boundary (e.g., Gull Lake and Dog River faults).

General descriptions of the regional geology of the area covered by the Lac des Iles suite intrusions can be found in Pye (1968), Sutcliffe et al. (1986), Stone et al. (2003), and Stone and Davis (2006). The Lac des Iles suite of intrusions are predominantly mafic in composition although some complexes, including the North Lac des Iles intrusion, contain more ultramafic than mafic rocks. Uranium-lead age determinations for zircons contained in the mafic rocks showed that the Lac des Iles suite intrusions were likely emplaced between 2,699 and 2,686 Ma.

Most of the known Lac des Iles suite intrusions host economically interesting (e.g., greater than 1 g/t combined palladium + platinum) PGE ± copper-nickel sulfide mineralization in the form of surface showings and/or shallow drilling intersections. The best documented member of the suite is the LDI-IC that remains the only member of the suite in which NI 43-101 compliant PGE resources have been defined.

Property Geology

The LDI Mine property captures the known extents of two discrete intrusive complexes including:

- The North Lac des Iles intrusive complex, characterized by a series of relatively flat-lying and nested ultramafic bodies with subordinate mafic rocks, and interpreted to be the product of two discrete magmatic episodes; and
- The South Lac des Iles intrusive complex, comprising the former mine block, South Lac des Iles and Camp Lake intrusions, but having been re-interpreted by NAP exploration personnel in 2018 as representing the product of three discrete magmatic episodes.

To date, NAP’s exploration and mining activities have been focused on the northern and western parts of the South Lac des Iles intrusive complex.

Mineralization

All past and current mineral resources described on the LDI Mine property are located in the northwestern part of the South Lac des Iles intrusive complex. PGE and gold (“**Au**”) mineralization in the South Lac des Iles complex is most commonly associated with 1% to 2% of fine- to medium-grained disseminated iron-copper-nickel sulphides within broadly stratabound zones of PGE and Au enrichment. A majority of the known PGE-rich sulphide mineralization consists of approximately 50% pyrrhotite, 25% pentlandite and 25% chalcopyrite. In some mineralized zones, pyrite is the dominant iron sulphide mineral but these areas tend to have low PGE + gold grades (e.g., less than 1 ppm combined). Minor millerite is locally present in the PGE-rich mineral zones. Sulphides occur as polycrystalline aggregates that generally reflect the grain sizes and shapes of adjacent silicate minerals. The coarsest sulphide blebs observed at the LDI Mine are up to several centimeters long but typical sulphide aggregate sizes are less than two centimeters. Rare massive sulphide occurrences up to approximately one meter thick are also reported from the LDI Mine property. Primary sulphide textures were commonly destroyed during late magmatic hydrous alteration such that the schistose pyroxenite unit contains very fine-grained disseminated sulphides that are difficult to observe without the aid of a hand lens.

The principal, current pay metals for the concentrate produced at the LDI Mine are palladium, platinum, gold and copper. Nickel is not payable under the principal, existing smelter agreement but has been in recent years. Typical mill feed grades at the LDI Mine are as follows: palladium equals 1 g/t to 5 g/t;

platinum; gold equals 0.1 g/t to 0.5 g/t; and copper and nickel equals 0.03% to 0.2%. At low concentrations of less than 0.05%, nickel is dominantly present as unrecoverable silicate nickel typically bound in primary orthopyroxene or secondary chlorite crystals. Palladium grades show a strong positive correlation with platinum and nickel grades and a moderate positive correlation with gold and copper abundances. All metal grades show a positive correlation with total sulphide content.

In comparison to other PGE deposits, the Lac des Iles deposits are unusually enriched in palladium over platinum with palladium:platinum ratios commonly exceeding 10:1 and locally exceeding 20:1. In addition, and in contrast to most other PGE deposits, the palladium:platinum ratio at Lac des Iles shows a systematic increase with increasing palladium grades. Most other PGE deposits have consistent palladium:platinum ratios close to unity, varying from approximately 0.5 in the Merensky and UG2 reefs in the Bushveld Complex to 2:1 to 4:1 in a majority of magmatic sulphide deposits. Mineral probe analysis of selected, representative palladium ore from Lac des Iles indicates that much of the pentlandite contains detectable palladium in solid solution with maximum values reaching approximately 0.3% Pd. Accordingly, high-temperature nickel-rich sulphide liquid is considered to have been a primary collector of palladium at Lac des Iles intrusion with palladium, at lower temperatures, substituting for nickel in pentlandite crystallized from this sulphide liquid.

Most of the past and present mineral resources are contained in the semi-contiguous Roby and Offset Zones. These two zones are considered to have been part of a single, vertically-oriented, south plunging disseminated magmatic sulphide deposit that was subsequently affected by post-magmatic displacement along the east-northeast striking and north dipping Offset Fault. Several satellite zones containing similar, Pd-rich disseminated sulphide mineralization have been identified in the immediate vicinity of the Roby and Offset zones. Most of these take the form of vertically elongated, semi-circular zones comprising brecciated noritic rocks having cross sectional areas of 50 to 100m. The largest known satellite zone is the B2 Zone, which was discovered in 2013 and put into production in 2017.

Deposit Types

All of the PGE-Cu-Ni mineralization documented on the LDI Mine property is classified as magmatic sulphide mineralization. Conventional magmatic sulphide deposits are defined as disseminated to massive sulphide deposits hosted by ultramafic or mafic rocks that contain economic concentrations of base metals and/or precious metals (PGE, Au, Ag). These deposits can occur in intrusions or lava flows. Recent advances in the understanding of the relationships between the geology, structure, alteration intensity, metal grades, geochemistry and geophysical characteristics at Lac des Iles show that the majority of the known mineral zones can be explained by physical sorting of dense sulphide liquid droplets, silicate melt and gangue minerals within vertically oriented feeder structures and fault intersections.

Exploration

For exploration work completed prior to the acquisition of the LDI Mine by the Company, please see “History”, above. The following paragraphs under this “Exploration” section summarize the results of the 2018 surface and underground exploration programs:

A total of 11,850 meters in 31 surface diamond drilling holes were completed on the property in 2018. A majority of the drilling was done in the eastern part of the property referred to as the East Mine Block target area. Highlights from the drilling are discussed in the Company’s February 11, 2019 news release. In addition to the drilling, a total of 700 meters were excavated in two trenches in the eastern part of the LDI Mine property. The trenches were designed to cover areas of prospective geology where outcrops are limited and drilling information is sparse. In Q3 and Q4 of 2018, the Company completed a major new geophysical survey program that included a drone-supported airborne magnetic survey, surface and borehole induced

polarization surveys and surface magnetotelluric surveys. The results of this work will guide future exploration on the East Mine Block target area.

A total of 12,022 meters were completed in 29 underground exploration drill holes targeting the southern part of the Offset Zone below the current shaft bottom, the footwall to the Offset Zone and the newly recognized B3 zone. Significant results are discussed in the Company's February 11 news release.

The Company completed 5,591 meters in 9 surface diamond drill holes on the Sunday Lake project. Significant results from this drilling are discussed in the Company's March 27, 2018 news release. Borehole electromagnetic surveys were completed during the drilling program in eight drill holes. A surface magnetotelluric survey comprising 13.5 line kilometers and 95 stations was completed in the fourth quarter.

On its Greenfields exploration properties the Company completed both ground and airborne gravity surveys, collected 141 surface rock samples for routine geochemical analysis, and drilled 2,124 meters in six surface diamond drill holes on the Stonefish Lake geophysical target. This target is part of the Company's Legris Lake property, located directly adjacent to and southeast of the LDI mine property. Results from the Stonefish Lake area drilling program are included in the Company's April 3, 2018 news release.

See also "Exploration, Development and Production".

Drilling

The Company's drill hole database contains information on all known surface and underground diamond drilling on the property. Prior owners completed 143 surface drill holes totaling 22,862 m between the years 1964 and 1976. There was no drilling from 1977 to 1985.

NAP, including its predecessor Madeleine Mines Ltd. and subsidiary companies, have drilled a total of approximately 2,267 surface and underground exploration holes totaling approximately 813,911 meters at the LDI Mine since 1986. The LDI Mine site utilizes a localized coordinate system known as the 'Mine Grid'. The North bearing of this Mine Grid is at a True North azimuth of 359.725 degrees. All diamond drill hole collars, including both underground and surface collars, are surveyed using the Mine Grid system. Collar surveys are conducted using both a Reflex TM Gyrocompass and a Leica TM Viva TS15 total station. Underground and surface surveys are performed during the initial setup of the drill hole. The Reflex TM Gyrocompass is utilized to align the drill and to provide a comparison for the final collar survey taken by the Leica TM Viva TS15 total station after 1-3 m has been drilled. Since 1995, all diamond drill holes have been routinely surveyed along-the-hole using a variety of tools. These have included magnetic based tools (Tropari, Reflex TM Multishots), non-magnetic based tools (Reflex TM Maxibor), north-seeking gyros (Halliburton TM) and incremental gyros (Icefield Tools, Reflex TM, Halliburton TM). Down hole surveys are currently conducted using an incremental Reflex TM Gyro. Surveys are performed at regular consistently spaced intervals for drill holes greater than 500 m in length and at the end of hole for all drill holes.

Core boxes are delivered to the core logging facility from the drill site by the drill contractor as soon as practicable at the end of each shift. For drill core and its samples, a continuous chain of custody is maintained and tracked through each step of the handling process from the drillers through logging, sampling, shipping, analysis, reject and pulp storage at the lab, reject and pulp return delivery to the Company and, finally, core and sample storage at the LDI Mine. Standardized steps are used to prepare and verify the drill core prior to geological logging or sampling.

Since 2008, the Company's exploration department has utilized the Fusion Data Management ("Fusion") suite of software by Datamine International Limited (previously CAE Mining International Limited) ("Datamine") to manage the drill hole data, including analytical results. Geologists and technicians use a 'local'

database to enter the drill hole information during the logging process. At the end of each day, the information stored on the local database is uploaded to the remote server located at the LDI Mine, which then synchronizes to the central server located in the Thunder Bay Exploration office every night. While the core is being prepared, a geologist reviews it to check for: drilling quality, lithologies encountered, mineralized zones and major structures. This information is captured in a 'quick-log'. The purpose of the quick-log is to compare the observed lithologies, structures and mineralized zones with the drill hole's proposed objectives and expected lithologies, structures and mineralized zones. Once the quick-log is reviewed the geologist will then complete a detailed geological log of the drill hole. This includes identifying and recording lithology, alteration, mineralization and structure. Observations are recorded directly onto a laptop computer into the Fusion DH Logger software in a local database.

Sampling, Analysis and Data Verification

Sampling and Analysis

From 2014 through 2018, the Company used ALS Global ("ALS") which has sample preparation facilities in Thunder Bay, Ontario and analytical facilities in North Vancouver, British Columbia. The North American ALS analytical laboratories are accredited by the Standards Council of Canada ("SCC") for specific tests listed in the Scopes of Accreditation which conforms with CAN-P-1579: Requirements for the Accreditation of Mineral Analysis Testing Laboratories and CAN-P-4E ISO/IEC 17025: General Requirements for the Competence of Testing and Calibration Laboratories. All samples are submitted to ALS with unique barcode tags; ALS scans the barcodes, weighs samples and logs samples into laboratory information management system.

The sample preparation, analysis and security procedures used for drilling conducted from 2014 through 2018 were updated from previous periods and include the following steps and procedures: received samples are compared to a submittal list provided by the Company's exploration personnel; if samples are excessively wet they are dried at a maximum temperature of 120°C; samples are crushed to better than 70% passing <-2 mm; a sample is split using a riffle splitter with up to 250 g pulverized to better than 85% passing <75 microns (" μm "); any remainder of split is stored as reject for 45 days before return to client; analytical duplicates from pulps are taken within each analytical run at the end of the batch. The minimum number of duplicates required is based on the rack size specific to the method. For PGM-ICP methods, a minimum of 3 duplicates are taken and for ICP-AES methods a minimum of 1 duplicate is taken; for every 50 samples prepared, an additional split is taken from the crushed material to create a pulverizing duplicate. This additional split is processed and analyzed in a similar manner to other samples in the submission; crusher jaws and work stations are cleaned before the first sample of every new work order with barren material and compressed air; grinding bowls are cleaned before the first sample of every new work order with silica and compressed air and between each subsequent sample with compressed air; and a 100 -150 g split of each pulp sample is packaged and shipped to the analytical facilities in North Vancouver via courier. Pulps and coarse rejects are retained at the ALS Thunder Bay laboratory until requested for transfer to the Company's exploration personnel for long-term storage at the mine site.

All drill core samples are analyzed using the PGM-ICP23 (Pd, Pt, and Au) and ME-ICP61 (Cu, Ni, Co, Mg, Ag) procedures. Where necessary, over-limit procedures PGM-ICP27 and ME-OG62 are used. Sample decomposition is done by Fire Assay Fusion (FA-FUSPG1, FA-FUSPG2) and the analytical method used is ICP-AES. A prepared sample (30-50 g) is fused with a mixture of lead oxide, sodium carbonate, borax and silica, inquartered with 6 mg of gold-free silver and then cupelled to yield a precious metal bead. The bead is digested for 2 minutes at high power by microwave in dilute nitric acid. The solution is cooled and hydrochloric acid is added. The solution is digested for an additional 2 minutes at half power by microwave. The digested solution is then cooled, diluted to 4 millilitres with 2% hydrochloric acid, homogenized and then analyzed for gold, platinum and palladium by ICP-AES.

An approximately 60 g pulp split for requested samples is generated by ALS during the initial sample preparation. The Company's Exploration Department personnel retrieve the pulp splits from ALS, insert QC samples (blank and standard reference materials) at a rate of three per batch of 34 samples and then deliver to Activation Laboratories Ltd. ("**ActLabs**") in Thunder Bay for analysis. ActLabs is independent of LDI and is accredited to international quality standards through the International Organization for Standardization /International Electrotechnical Commission ("**ISO/IEC**") 17025 (ISO/IEC 17025 includes ISO 9001 and ISO 9002 specifications) with CAN-P-1578 (Forensics), CAN-P-1579 (Mineral Analysis) and CAN-P-1585 (Environmental) for specific registered tests by the SCC.

In the opinion of the authors of the LOM Technical Report, the quality assurance and quality control protocols in effect for the sample preparation, analyses and security meet or exceed what the authors consider to be industry standard and best practice.

Data Verification and Quality Control

The Company's exploration department utilizes an extensive data verification procedure for all diamond drilling programs. This procedure includes, but is not limited to, the verification of coordinate data, survey data, assay data, duplicate assay sampling, check assay sampling and overall data management. Data is verified at every collection or recording stage and again when it is entered into the central database. Frequent reviews of the data collection, process and recording of information are held throughout the year, by internal auditors as well as by third party consultants. All data is currently being managed by Datamine's SQL server-based Fusion software. This database is centrally managed and contains all aspects of a drilling program including logging, assay results and quality assurance. Only authorized personnel such as the database manager and Qualified Person (as defined in NI 43-101) have access to manipulate and input data into the centralized database. All other users have read-only access to this database.

Drill hole-related data undergoes various steps in the validation process prior to being imported into the central database. Coordinate and survey data collected are downloaded and reviewed immediately upon completion to ensure accuracy requirements have been met. A separate validation of the data is then completed to ensure there are no erroneous outlier stations and that the survey in its entirety as well as between stations shows no irregularity either with the positional survey tool or the actual performance of the survey. Once validated, the survey will be uploaded into the central database. Surveys completed in 2017 through 2018 were proven to be of a reliable quality, therefore, all holes completed during this period were included in the resource estimate. Logging, geotechnical and sampling data are recorded on laptops within a local database using the Fusion suite of software. Once all information is entered into the drill log, the geologist will complete a validation process run through Bezlio software as well as an end of hole checklist. The validation program was designed by the Company's database manager to highlight areas of missing or erroneous data. Once a drill hole has been validated and completed, the database manager will review the validation, checklist, and data log as a second check prior to uploading the hole into the central database.

Validation of analytical results is run by the Fusion software program with parameters pre-determined by the database manager and Qualified Person (as defined in NI 43-101). These parameters include tolerance limits for laboratory standards and LDI-inserted quality control materials as well as mathematical conversions for results lower than the detection limits for each element being analyzed.

Analytical results are received from each laboratory and imported directly into the central database via the Fusion software. During import the status of each sample being imported is recorded and time stamped, producing a detailed log. This log highlights any issues or failures associated with the import and is saved and reviewed by both the database manager and a Qualified Person. All values are converted by the software to a common unit of measure parts per million ("**ppm**") or weight percent), whilst any values that report less than detection are converted to half of the lower detection limit.

QA/QC measures for 2017 and 2018 included laboratory duplicate review, check sample analyses and the insertion of blank and standard reference material into the sampling series.

ALS Global regularly took duplicate samples both in the preparation stage (coarse reject) and in the primary laboratory stage (pulp split). ALS Global typically inserted one prep duplicate every 60-80 samples and one pulp split duplicate every 20 samples. Original assay results for palladium, platinum, gold, copper and nickel versus both the pulp and prep duplicates showed very little variation indicating the precision of the laboratory's performance and process to consistently replicate results.

Secondary laboratory checks of selected samples for the 2017 and 2018 program were conducted at ActLabs at its Thunder Bay, Ontario laboratory. Samples submitted for check sampling analyses were randomly selected at a margin of 5% of the sampled drill hole and consisting of 40% high grade material (greater than 2 g/t Pd), 40% mid-grade material (1 g/t Pd to 2 g/t Pd) and 20% low grade material (less than 1 g/t Pd). In 2018, 662 check analyses were completed. Of these samples, approximately 41% were from samples with greater than 1 g/t Pd and 34% from samples with greater than 2 g/t Pd. Results from the check laboratory confirm the performance of the primary laboratory's reporting of results with the majority of check samples in 2017 returning palladium values within 10% of the original assay result from the primary laboratory. 2018 checks are still in progress with initial results showing that the majority of check samples are returning palladium values within 10% of the original assay result.

In the opinion of the authors of the LOM Technical Report, the QA/QC protocols in effect for data verification meet or exceed what the authors consider to be industry standard and best practice.

Mineral Processing and Metallurgical Testing

The existing mill was built in 2000 and treats all the ore from surface and underground. In June 2017, LDI filed the 2017 Technical Report. The 2017 Technical Report summarizes the historical mineral processing and metallurgical testing at Lac des Iles. The LOM Technical Report references such findings and provides updates based on recent plant performance and additional test work completed. All supporting documents are referenced.

The mining plan described in the LOM Technical Report includes ore feed from both traditional and new mineral zones. The Company is confident that the majority of these ore sources are adequately characterized in terms of their physical properties, milling behaviour, mineralogy, and processing recoveries for the historical pay metals (Pd, Pt, Au, Cu, Ni) and principal deleterious elements (Mg, Al). As discussed in the "Geological Setting and Mineralization" section above, a geological equivalency has now been established between discrete mineral zones in the Lac des Iles deposits that includes strong similarities in their physical properties, metal grades, ore and gangue mineralogy, and geochemistry. Using this equivalency and historical mill records, the following statements are considered to be accurate and support a high level of confidence in the recovery equations described in the "Processing and Recovery Operations" section below:

- Roby Zone feed sources are adequately characterized by historical mineralogical and processing test studies and by the several years of processing recovery data from the current mill. This data relates to feed from the Roby pit that incorporated the Roby Northeast, Roby Central, Roby Southwest and Roby South domains.
- Offset Zone feed sources are similarly, adequately characterized from recent mill records and applied mineralogy and processing tests based on material from the Offset North, Offset Central and Offset Southwest (upper) zones and the B2 Zone (i.e., the Offset Southeast Zone).

- The Sheriff Pit ore (Sheriff North – Powerline Zone) is adequately characterized by bench-scale tests and, more importantly, recent milling records.
- The regular grade ore (“**RGO**”) stockpile is adequately characterized by milling data from the past three years and from historical ore characterization studies of low-grade samples from the west side of the Roby pit where most of the RGO stockpile was sourced.

The only future mill feed source that is considered by the Company to lack adequate characterization is the Sheriff South Zone. It is recommended that the Company prepare a representative composite sample from stored exploration core sample reject material from this zone to complete the required ore characterization work. In addition, a bulk sample should be collected from the development headings prior to full scale production and campaigned in the mill to ensure adequate pay metal recoveries and concentrate specifications. Mineralogically and geochemically, the Sheriff South Zone is most similar to the adjacent Sheriff North – Powerline Zone which is currently in production from the Sheriff pit.

The capacity of the concentrator’s milling circuit is determined by the ore hardness, grind target and installed power. Changes in the ore hardness impact the capacity of a milling circuit and, therefore, affect the annual tonnage that can be processed. Previous reports identified hardness testing completed on Breccia ore (Roby pit) and Roby and Offset Zone according to composite samples taken by SGS Mineral Services (“**SGS**”) in 2008 and 2011. During September 2017, a number of additional ore samples were collected for hardness testing of current mining areas:

- Mill metallurgist grab sample of RGO stockpile; and
- Mine geology department provided samples of the following mining zones: B2 Zone; Ore Blend – September 2017; Offset Zone SLS ore; and Roby Zone.

Hardness testing was also completed by SGS in 2017. The hardness of the ore samples was determined using two standard methods: (i) Semi-autogenous (“**SAG**”) Mill Circuit (“**SMC**”) and (ii) Bond Ball work index (“**BWi**”). The SMC tests are simplified drop weight tests used to generate parameters for use in JKSimMet® modelling programs. These tests are appropriate for determining energy requirements for circuits consisting of SAG mills and crushers. The parameters reported from the tests include A x b (unitless parameters derived from the JK Drop test), α (the percentage of material after breakage that is less than the ‘ α ’ percentage of original drop particle size, where α is commonly set to 10%) and SAG circuit specific energy. These are standard hardness parameters measured for ores to be processed in SAG circuits. The magnitude of the parameters determined can be compared to parameters determined on other ore samples providing an indication of the relative hardness. The LDI samples tested fell between the 80th and 90th percentile of hardest measured samples in the JK Drop test database and are classified as very hard. The Bond ball tests generates a BWi estimate for use in the sizing of ball mills. The tests were performed at a closing size of 75 μ m, which is appropriately sized to reflect the mill’s current grind target. The measured work index of between 17.3 kilowatt hours per tonne (“**kWh/t**”) and 19.2 kWh/t is also between the 80th and 90th percentiles of the hardest of all samples evaluated by SGS and is rated as very hard. Although the four recent samples tested were very hard, they produced similar results (within two standard deviations) as the two previous samples tested. The low variation in hardness test results from both recent and historic samples indicates that the mining zones are relatively consistent in hardness and should have minimal impact on the grinding capacity of the LDI plant.

Numerous applied mineralogical studies have been completed on ore samples capturing all known ore zones and commonly including whole-rock geochemical analyses of pay metals, sulphur and deleterious elements such as aluminum and magnesium. In addition, the Company’s Exploration Department maintains a comprehensive whole-rock geochemical database covering all known mineral zones on the LDI Mine property.

The applied mineralogy studies include academic theses, numerous research papers, and commercial and research laboratory reports. It is important to point out that there is no certainty of what constitutes ‘typical’ PGE and Au mineral assemblages, grain sizes and mineral associations for a specific ore zone.

In support of the ongoing operations, numerous studies on the characterization and flotation response of the LDI Mine’s mineral zones have been completed over the years. These studies include materials from the Roby, Offset and Sheriff Zones. The locked cycle test (“**LCT**”) results for the current mining zones provided confidence that the specified feed sources would generate acceptable recoveries in the LDI Mine mill but were not used in determining the recovery curves. The B2 Zone processing characteristics was evaluated by the Lac des Iles mill’s metallurgical laboratory prior to initial development in 2017. The Company’s Exploration Department provided a blended, composite sample and an analysis of B2 head grades was obtained on seven sub-samples. Open circuit flotation tests were performed on the sub-samples to simulate both rougher and cleaner performance. Results were presented in internal reports and are similar to those for other LDI Mine zones tested in other laboratories. The rougher Pd recovery of 90% to a rougher concentrate grade of 34 g/t Pd are consistent with current plant performance and it was concluded that B2 would produce similar performance to other zone ores. As the tonnage contribution of B2 Zone is small, the risk to overall economic calculations is deemed to be low.

The LCT studies are based on samples that are marginally higher in palladium grade than run of mine ore and are indicative of plant results of similar ore grade material. Projected recoveries from the resource are based on plant data. The plant recovery models were developed from demonstrated plant performance for ore over various feed grades and ore sources. The LCT results from metallurgical testing support the methodology used in developing the recovery models used for resource estimations. During 2017, an evaluation of opportunities to further improve Pd recovery was undertaken by Flowsheets Inc. under the direction of plant personnel. An evaluation of the potential impact of cleaner tails regrinding and mixed collectors was completed on a plant sample collected during the second week of June 2017. Based on laboratory tests performed at SGS, a potential of increasing Pd recovery with fine grinding of cleaner tails to 12 µm and the use of additional collectors was identified. Additional testing and economic evaluation was recommended to assess the impact of the testwork.

Test work completed by Xstrata Process Support (“**XPS**”) indicates that the metallurgical results from LDI Mine ore are driven by mineralogical and processing factors. The main mineralogical factor is the abundance of palladium relative to that of sulphide minerals, which ultimately affects the concentrate grade achievable from the ore. Test work on the Roby and Offset Zones indicated that ultimate recovery of palladium minerals is directly related to the fineness of grind down to 38 µm. Magnesium oxide (“**MgO**”) from magnesium silicate minerals was identified as a potential penalty element and diluent of the final concentrate. The reagent carboxymethyl cellulose was used in the laboratory tests and is used in the LDI Mine plant to reduce the recovery of magnesium silicate minerals (dominantly chlorite, orthopyroxene and amphibole). This approach has been proven effective in producing concentrate having MgO concentrations below the threshold amount above which smelters charge a penalty.

See also “– Processing and Recovery Operations”.

Mineral Resource and Mineral Reserve Estimates

Mineral Resource Estimates

In the 2018 Technical Report, the underground and near-surface resources were considered separately. In the LOM Technical Report, the discrete mineral zones are presented in terms of their position relative to the Offset Fault, that is, as being part of the Offset block (lower part of the mine) or the Roby block (upper part of the mine). In addition, the zones are presented as being part of the Roby-Offset palladium

deposit or separate, satellite palladium deposits. The new mine plan features a major change from open pit to underground bulk mining methods for most of the Roby Zone resources. Accordingly, the mineral resource estimates presented in the LOM Technical Report for the Roby block are subdivided into several discrete mineral zones based on both their geological characteristics and the proposed mining methods. In contrast to previous technical reports, the LOM Technical Report resource estimates are being presented on an inclusive basis (i.e., resources are inclusive of reserves). The reserves stated below have been depleted from mining activity that occurred between the last effective date (July 1, 2018) through December 31, 2018. The depletion from mining of the reserves has not yet been applied to the mineral resource estimates, which remain unchanged from those presented in the current Technical Report for the Property.

Offset Block

The Offset block contains four discrete mineral zones (the Offset, B2, Mystery and Sherriff South zones) and is subdivided into five grade domains (Upper Southwest, Upper Northeast, Central, Lower Southwest and Lower Southeast). The Qualified Persons responsible for the updated Offset block resources estimates, as well as the effective dates of such estimates, are provided in the following table:

Zone or Domain	QP Responsible for Resource	Title	Effective Date (day/month/year)
Upper Offset Southwest	Denis Decharte, P.Eng	Senior Resource Engineer for NAP	30/06/2018
Offset Central	Denis Decharte, P.Eng	Senior Resource Engineer for NAP	30/06/2018
Lower Offset Southwest	Denis Decharte, P.Eng	Senior Resource Engineer for NAP	30/06/2018
Upper Offset Northeast	Denis Decharte, P.Eng	Senior Resource Engineer for NAP	30/06/2018
Lower Offset Northeast	Denis Decharte, P.Eng	Senior Resource Engineer for NAP	30/06/2018
B2	Denis Decharte, P.Eng	Senior Resource Engineer for NAP	30/06/2018
Mystery	Chris T. Roney, P.Geo	Consulting Geologist for NAP	4/7/2018
Sheriff South	Chris T. Roney, P.Geo	Consulting Geologist for NAP	1/3/2017

The Offset Block mineral zones were interpolated using Ordinary Kriging (“OK”) and Anisotropic Inverse Distance (“ID2”) interpolation methods. For the five domains in the Offset Zone, the estimations were designed for three passes. In each pass, a minimum and maximum number of samples were required to satisfy the estimation criteria. In addition, a maximum number of samples from a single drill hole was established in order to optimize the number of holes considered for each block. For the Offset Zone domains, estimation runs were completed in two steps.

The first step involved the estimation for blocks inside the 1.0 g/t Pd shell folder. For this block folder, the composite points used are those that are inside the 1.0 g/t Pd to 2.25 g/t Pd shell domain (composites from the 2.25 g/t Pd shell were excluded). The second step involved the estimation of blocks inside the 2.0 g/t Pd shell folder. For this block folder, the composite points used are those that are inside the 1.75 g/t Pd, 2.00 g/t Pd, and 2.25 g/t Pd shells (composites from the 1.00 g/t Pd shell that were not inside another shell were excluded). For blocks that fall within both folders (that is, both grade domains), a percent attribute was included in each folder. The percent value represents the percentage of the block that is inside each grade domain. The two grade domains were consolidated into the ‘Standard’ folder, where the block grade is the average value for the grade in the 1.0 g/t Pd shell folder and the 2.0 g/t Pd shell folder based on their

respective percent attribute. This allows the higher-grade hangingwall zone domain to be preserved and reduces the potential for smearing grade along strike. The search ellipse orientations were defined for each of the domains of the mineralized wireframes. See the LOM Technical Report for further details.

The Offset Zone block model was validated by the following three methods: (i) visual comparison of colour-coded block model grades with composite grades on section and plan; (ii) comparison of the global mean block grades for OK, ID2, and one-meter composite; and (iii) swath plots of the block model. The Company also maintains short-term production block models for different mineral zones that include the compliant assays used for resource estimation and non-compliant information such as underground rock chip sample assays and definition drill core assays. Although not used for the current resource estimates, the non-compliant assay information was considered in refining specific 3D geological models and associated grade wireframes.

Several factors are considered in the classification of a mineral resource at the Offset block:

- CIM Definition Standards for Mineral Resources and Mineral Reserves;
- author's experience in resource modelling and LDIM Engineering's production experience for similar, Offset Zone mineralization;
- drill hole spacing and estimation runs required to estimate the grades in the block; and
- the number of samples and drill holes used in each block estimation.

For the Offset Zone, the resource classification is related to the interpolation passes. Blocks interpolated during the first pass are coded as 'Measured'; in the second pass as 'Indicated'; and in the third pass as 'Inferred'. No environmental, permitting, legal, title, taxation, socio-economic, marketing or other relevant issues are known to the author that may affect the estimate of mineral resources. As per NI 43-101 guidelines, mineral resources, which are not Mineral Reserves, do not have to demonstrate economic viability.

The following table summarizes the mineral resources for the Offset block:

Resource Name	Category	Cut-off Grade (g/t Pd)	Tonnes ('000s)	Pd (g/t)	Pt (g/t)	Au (g/t)	Cu (%)	Ni (%)	Contained Pd ('000 oz)
Offset Central (SLS)	Measured	1.2	4,437	2.72	0.236	0.214	0.08	0.09	388
	Indicated		11,214	2.89	0.237	0.237	0.09	0.10	1,041
Offset Central (OHS)	Measured	1.8	428	2.82	0.309	0.214	0.09	0.10	38
	Indicated		327	2.60	0.246	0.183	0.09	0.09	27
Offset Northeast	Measured	1.8	2,608	3.76	0.273	0.264	0.08	0.11	315
	Indicated		3,248	3.59	0.265	0.234	0.07	0.10	375
Offset Southwest	Measured	1.8	1,082	2.81	0.317	0.236	0.08	0.09	97
	Indicated		2,682	2.79	0.32	0.240	0.08	0.09	240
B2	Measured	1.8	0	-	-	-	-	-	-
	Indicated		1,040	2.77	0.289	0.221	0.1	0.11	92
Mystery	Measured	1.8	0	-	-	-	-	-	-
	Indicated		0	-	-	-	-	-	-
Sheriff South	Measured	1.2	1,011	1.62	0.174	0.109	0.05	0.06	52

	Indicated		245	1.50	0.162	0.087	0.04	0.05	11
Total Measured and Indicated			28,327	2.95	0.255	0.229	0.08	0.1	2,682
Offset Central (SLS)	Inferred	1.2	3,344	2.14	0.184	0.164	0.07	0.08	-
Offset Central (BH)	Inferred	1.8	171	2.69	0.191	0.148	0.06	0.07	-
Offset Northeast	Inferred	1.8	872	2.78	0.185	0.114	0.03	0.06	-
Offset Southwest	Inferred	1.8	1,093	2.88	0.344	0.253	0.09	0.1	-
B2	Inferred	1.8	50	2.61	0.289	0.247	0.10	0.11	-
Mystery	Inferred	1.8	297	3.14	0.260	0.196	0.06	0.06	-
Sheriff South	Inferred	1.2	513	1.65	0.173	0.109	0.05	0.05	-
Total Inferred		1.2-1.8	6,343	2.38	0.215	0.17	0.065	0.08	-
Notes: Tonnages are rounded down to the nearest '000 tonnes. Palladium, platinum and gold grades are limited to three decimal places and three significant figures. Nickel and copper grades are limited to two decimal places. All grades are rounded up or down to the nearest concentration unit. Contained palladium is rounded down to the nearest '000 ounces. Total tonnage, average grade and contained palladium calculated from unrounded numbers.									

Blocks that are inside the excavation solids for mined out material were not reported in the resource estimates. Mined-out stope shapes as well as underground development solids have been provided by LDMI and have been used to code blocks in the model in such a way that they are not reported in the mineral resource. A palladium resource cut-off grade has been applied to each zone. The mineral resources are inclusive of reserves. The depletion date is June 30, 2018. Tonnages are rounded down to the nearest '000 tonnes. Palladium, platinum, and gold grades are rounded to the nearest 0.01 g/t. Nickel and copper grades are rounded to the nearest 0.01%. Rounded numbers are used to calculate total tonnage and average grades. Row and column summation totals may not directly match due to rounding. The mineral resources are tabulated using various cut-off grades to demonstrate the nature of the resource.

The differences between the Offset Zone resource estimates in the LOM Technical Report and the 2017 Technical Report are attributed to the following factors:

- In the 2017 Technical Report, Offset Zone resources were reported exclusive of reserves;
- A single cut-off grade was used for resource reporting in the 2017 Technical Report; whereas in the LOM Technical Report, different cut-off grades were used to better reflect the different mining costs for different parts of the overall Offset Zone resource;
- New exploration drill holes completed in 2017 and the first half of 2018 led to a significant conversion of inferred mineral resources to indicated mineral resources; and
- Mining depletion has been applied with reference to the relevant, reporting effective dates.

Roby Block

The Roby block is comprised of ten discrete palladium mineral zones or zone domains. The Qualified Persons responsible for the Roby block resources estimates, as well as the effective dates of such estimates, are provided in the following table:

Zone or Domain	QP for Mineral Resource Estimate	Title	Effective Date (day/month/year)
North VT	Chris T. Roney, P.Geo	Consulting Geologist for NAP	1/6/2013

Roby Central	Denis Decharte, P.Eng	Senior Resource Geologist for NAP	26/03/2018
Roby Halo	Chris T. Roney, P.Geo	Consulting Geologist for NAP	13/04/2017
Roby NE	Denis Decharte, P.Eng	Senior Resource Geologist for NAP	27/03/2018
Roby NW	Denis Decharte, P.Eng	Senior Resource Geologist for NAP	31/10/2017
Roby South	Chris T. Roney, P.Geo	Consulting Geologist for NAP	1/6/2016
Roby SW Floor & Wall	Chris T. Roney, P.Geo	Consulting Geologist for NAP	29/04/2016
Sheriff North Powerline	Chris T. Roney, P.Geo	Consulting Geologist for NAP	30/06/2018
Sheriff North Twilight	Chris T. Roney, P.Geo	Consulting Geologist for NAP	30/06/2018

Block models were created for each zone for the purposes of resource estimation. All of the block models are percent models with different folders and are assigned: a code relating to the zone or domain that it belongs to; a percentage value representing the proportion of that block that falls inside the defining palladium grade wireframe; and search parameters. The coordinate system used is a local (mine) metric system and elevations used are real elevations such that a zero value represents mean sea level. See the LOM Technical Report for further particulars.

The Roby block resource models were validated by two methods: (i) visual comparison of colour-coded block model grades with composite point grades on section and plan; and (ii) swath plots. The Roby block resource models consider the same classification factors as those described above for the Offset block.

No environmental, permitting, legal, title, taxation, socio-economic, marketing or other relevant issues are known to the authors that may affect the estimation of the Roby block mineral resources. Mineral reserves can only be estimated on the basis of an economic evaluation that is used in a preliminary feasibility study or a feasibility study of a mineral project; thus, no reserves have been estimated. As per NI 43-101 guidelines, mineral resources, which are not mineral reserves, do not have to demonstrate economic viability. The mineral resource classification for the Roby Central and Roby Northeast domains applied the following criteria:

- Measured Resources– blocks interpolated during the 1st pass with a nearest composite situated less than 15 m (coded as 1);
- Indicated Resources– blocks interpolated during the 1st pass with a nearest composite situated at 15 m or more (coded as 2);
- Inferred Resources– blocks interpolated during the 2nd pass (coded as 3); and
- In areas where there is a lack of continuity or isolated blocks in some parts of the deposit, the Qualified Person has downgraded the classification of some of the Measured Resources to the Indicated Resource category.

The below table summarizes the mineral resources for the Roby block. Blocks that are inside the excavation solids for mined out material were not reported in the resource estimates. Mined-out stope shapes, underground development solids and the excavation shape for the Sheriff pit were provided by LDIM

Technical Services and were used to code block in the model in such a way that they are not reported into the mineral resource. A palladium cut-off grade has been applied to each zone and domain as shown in these tables. The mineral resources presented are inclusive of reserves. The resource estimates reflect mining depletion through June 30, 2018. The Roby block mineral resources are tabulated using various cut-off grades to demonstrate the nature of the resource.

Resource Name	Category	Cut-off Grade (g/t Pd)	Tonnes ('000s)	Pd (g/t)	Pt (g/t)	Au (g/t)	Cu (%)	Ni (%)	Contained Pd (oz)
North VT	Measured	0.8	603	1.72	0.113	0.028	0.004	0.03	33
	Indicated		37	1.20	0.099	0.019	0.004	0.03	1
Roby Central	Measured	1.2	5,561	2.45	0.218	0.207	0.06	0.07	438
	Indicated		3,267	2.42	0.215	0.199	0.06	0.06	253
Roby Halo	Measured	0.8	0	-	-	-	-	-	-
	Indicated		13,259	1.10	0.165	0.097	0.05	0.05	469
Roby Northeast	Measured	1.8	234	2.63	0.180	0.079	0.01	0.04	19
	Indicated		2,090	2.59	0.170	0.073	0.01	0.03	174
Roby Northwest	Measured	1.2	0	-	-	-	-	-	-
	Indicated		684	2.30	0.189	0.131	0.03	0.03	50
Roby South	Measured	1.2	3,031	1.86	0.201	0.138	0.06	0.05	180
	Indicated		738	1.75	0.196	0.134	0.05	0.05	41
Roby SW Floor	Measured	1.2	754	1.59	0.242	0.083	0.05	0.05	38
	Indicated		6,548	1.65	0.247	0.094	0.06	0.05	346
Roby SW Wall	Measured	0.8	7	0.852	0.117	0.070	0.08	0.06	0
	Indicated		1,555	1.22	0.155	0.106	0.07	0.07	61
Sheriff North Powerline	Measured	0.8	191	2.77	0.207	0.113	0.04	0.06	17
	Indicated		116	3.08	0.220	0.056	0.04	0.06	11
Sheriff North Twilight	Measured	0.8	2,371	1.18	0.133	0.078	0.06	0.05	83
	Indicated		200	1.09	0.126	0.072	0.05	0.05	6
Total Measured and Indicated			41,255	1.69	0.192	0.12	0.05	0.05	2,235
North VT	Inferred	0.8	0	-	-	-	-	-	-
Roby Central	Inferred	1.2	44	1.89	0.237	0.180	0.09	0.08	-
Roby Halo	Inferred	0.8	587	1.23	0.174	0.078	0.04	0.04	-
Roby Northeast	Inferred	1.8	80	2.3	0.164	0.065	0.01	0.03	-
Roby Northwest	Inferred	1.2	85	1.9	0.170	0.132	0.03	0.03	-
Roby South	Inferred	1.2	19	1.49	0.170	0.144	0.04	0.05	-
Roby SW Floor	Inferred	1.2	828	1.75	0.270	0.048	0.04	0.04	-
Roby SW Wall	Inferred	0.8	102	1.29	0.181	0.073	0.06	0.06	-
Sheriff North Powerline	Inferred	0.8	82	1.89	0.186	0.049	0.05	0.06	-
Sheriff North Twilight	Inferred	0.8	0	-	-	-	-	-	-
Total Inferred		-	1,831	1.59	0.219	0.068	0.04	0.04	

Notes: Tonnages are rounded down to the nearest '000 tonnes. Palladium, platinum and gold grades are limited to three decimal places and three significant figures. Nickel and copper grades are limited to two decimal places. All grades are rounded up or down to the nearest concentration unit. Contained palladium is rounded down to the nearest '000 ounces. Total tonnage, average grade and contained palladium calculated from unrounded numbers.

The differences between the Roby block resource estimates in the LOM Technical Report and the 2017 Technical Report are attributed to the following factors:

- New search parameters were developed for the three discrete domains of the Roby underground resources (i.e., Roby Northeast, Central and Northwest domains);
- Resources in this report are inclusive of reserves;
- Mining depletion has been applied based on the different effective dates; and
- Different palladium cut-off grades were selected for some of the zones and domains in order to reflect changes in the relevant, forecast mining methods and mining costs.

For the Roby Southwest Floor, Roby Southwest Wall and Roby South domains and the North VT Rim Zone, there are no changes to the LOM Technical Report's resource estimates compared to the previous 2017 Technical Report. The Sheriff North Powerline and Sheriff North Twilight zones and Roby Halo Domain also have no changes from the 2017 Technical Report, other than depletion from mining of the Sheriff pit. The Roby Central, Roby Northeast and Roby Northwest domains were previously amalgamated into the Roby Underground resources.

Low-Grade Stockpile

The Low-Grade Stockpile resource estimate captures the remaining recoverable material from this stockpile. The qualified responsible for estimating such mineral resources is Dr. Dave Peck, P.Geo., Vice President Exploration for the Company. Details on the history of the construction, mining and resource estimates of the RGO stockpile are provided in the 2017 Technical Report. The current resource estimate is based on depletion from mining activities to June 30, 2018.

The average grades for the RGO stockpile remain unchanged from the grade estimates stated in the 2018 Technical Report. In 2017, the LDI Mine implemented regular grade control sampling and analysis program for the RGO stockpile. The results of this program have been in good agreement with average grade estimate for the stockpile. The mineral resources for the RGO stockpile at a 0.68 g/t Pd cut-off grade are: Indicated Resources of 3.4 Mt at 0.97 g/t Pd and 0.12 g/t Pt. These mineral resources are stated inclusive of mineral reserves and reflect depletion from mining activities through December 31, 2018.

Summary of Mineral Resource Estimates

The following tables present a summary of the LDI Mine resource tonnage and grade, inclusive of all mineral reserves, which have been estimated according to CIM standards:

Summary of Mineral Resource Estimates Classified by Geological Association for the LDI Mine Property:

Resource Name	Category	Cut-off Grade (g/t Pd)	Tonnes('000s)	Pd (g/t)	Pt (g/t)	Au (g/t)	Cu (%)	Ni (%)	Contained Pd ('000 oz)
Offset Block	Mea&Ind	1.2-1.8	28,327	2.95	0.255	0.229	0.08	0.10	2,682

Roby Block	Mea&Ind	0.8-1.2	41,255	1.69	0.192	0.120	0.05	0.05	2,235
Stockpile	Mea&Ind	0.68	2,039	0.970	0.120	0.080	0.03	0.06	63
Total	Mea&Ind	0.68-1.8	72,982	2.14	0.213	0.160	0.06	0.07	5,024
	Inferred	0.8-1.8	8,235	2.22	0.216	0.146	0.06	0.07	-

Notes: MEA = Measured Resource. IND = Indicated Resource. The effective date of mineral resources is July 4, 2018. Mineral resources are inclusive of mineral reserve and reflect depletion from mining activities to July 1, 2018. The mineral resource estimates were made by Denis Decharte, P. Eng., Chris Roney, P.Geo., and Dave Peck, P.Geo., all of whom are Qualified Persons under NI 43-101.

Summary of Mineral Resource Estimates Classified by Position for the LDI Mine Property:

Resource Name	Category	Cut-off Grade (g/t Pd)	Tonnes ('000s)	Pd (g/t)	Pt (g/t)	Au (g/t)	Cu (%)	Ni (%)	Contained Pd ('000 oz)
Offset Underground	Measured	1.2-1.8	9,568	2.90	0.252	0.219	0.08	0.09	893
	Indicated		18,759	2.97	0.256	0.233	0.08	0.10	1,788
Roby Underground	Measured	1.2-1.8	9,581	2.20	0.214	0.172	0.06	0.06	677
	Indicated		26,589	1.56	0.193	0.109	0.05	0.05	1,336
Roby Surface Sheriff North	Measured	0.8	3,174	1.38	0.134	0.070	0.05	0.05	140
	Indicated		1,910	1.32	0.155	0.098	0.06	0.07	81
Stockpile	Indicated	0.68	3,399	0.970	0.120	0.080	0.03	0.06	106
Total	MEA&IND	0.8-1.8	72,982	2.14	0.213	0.160	0.06	0.07	5,024
	Inferred		8,235	2.22	0.216	0.146	0.06	0.07	-

Notes: MEA = Measured Resource. IND = Indicated Resource. The effective date of mineral resources is July 4, 2018. Mineral resources are inclusive of mineral reserve and reflect depletion from mining activities to July 1, 2018. The mineral resource estimates were made by Denis Decharte, P. Eng., Chris Roney, P.Geo., and Dave Peck, P.Geo., all of whom are Qualified Persons under NI 43-101.

Mineral Reserve Estimates

This section presents the estimated mineral reserves for the following deposits on the LDI property: B2, Offset, Roby, and Sheriff. It should be noted that the Mystery, North VT Rim, and Sheriff South deposits do not have proven or probable reserves as of the effective date of the LOM Technical Report. The Roby deposit is divided at elevation 235 meters above sea level ("265L") with surface mining above this elevation and underground mining below. The LOM Technical Report includes mineral reserves around the periphery of the open pit above the 265L for the first time.

The various zones within these mining blocks have been designed for extraction by underground mining methods. Mining shapes for reserve determination were designed using a NSR derived from cost estimates, dilution estimates, foreign exchange and metals prices that were determined in 2018 as discussed in the current Technical Report for the Property.

The following table presents a summary of the LDI Mine reserve tonnage and grades, which have been estimated according to CIM standards:

Mineral Reserve Statement:							Grades					Contained Metals				
Location	Zone or Domain	Method	Classification	Cut-off NSR or Cut-off Grade (Pd) (\$/t) or (g/t)	NSR (\$/t)	Tonnes ('000s)	Pd (g/t)	Pt (g/t)	Au (g/t)	Cu (%)	Ni (%)	Pd (Koz)	Pt (Koz)	Au (Koz)	Cu (Mlb)	Ni (Mlb)
Offset Block Underground	Northeast	OHS	Proven	\$ 77	\$ 96	950	3.12	0.225	0.205	0.05	0.08	95	6	6	1.0	1.7
	Central	SLS	Probable	\$ 77	\$ 101	1,046	3.30	0.250	0.201	0.05	0.08	110	8	6	1.0	1.7
			Proven	\$ 71		-	-	-	-	-	-	-	-	-	-	-
	Central	OHS	Probable	\$ 71	\$ 102	12,608	3.13	0.235	0.255	0.09	0.10	1,266	95	103	24.3	27.8
			Proven	\$ 66	\$ 71	68	1.08	0.155	0.117	0.04	0.07	2	-	-	-	0.1
	Southwest	OHS	Probable	\$ 66	\$ 65	50	2.27	0.167	0.093	0.03	0.05	3	-	-	-	-
			Proven	\$ 67	70	1,186	2.13	0.253	0.183	0.07	0.08	81	9	6	1.7	2.1
	B2	OHS	Probable	\$ 67	\$ 75	1,581	2.27	0.268	0.201	0.07	0.08	115	13	10	2.4	2.9
			Proven	\$ 50		-	-	-	-	-	-	-	-	-	-	-
	Sheriff South	OHS	Probable	\$ 50	\$ 72	1,211	2.20	0.226	0.178	0.08	0.08	85	8	6	2.0	2.2
			Proven	\$ 37	40	644	1.36	0.146	0.089	0.04	0.04	28	3	1	0.5	0.5
Roby Block Underground	Northwest	OHS	Proven	\$ 48		-	-	-	-	-	-	-	-	-	-	-
			Probable	\$ 48	\$ 54	1,156	1.98	0.134	0.065	0.01	0.02	73	4	2	0.2	0.5
	Northwest	OHS	Proven	\$ 37		-	-	-	-	-	-	-	-	-	-	-
			Probable	\$ 37	\$ 46	405	1.46	0.165	0.144	0.05	0.04	19	2	1	0.4	0.3
	Central	SLC	Proven	\$ 50		-	-	-	-	-	-	-	-	-	-	-
			Probable	\$ 50	\$ 71	7,399	2.27	0.188	0.181	0.06	0.06	539	44	42	9.3	9.7
	Central	OHS	Proven	\$ 38	69	268	2.35	0.147	0.105	0.03	0.05	20	1	-	0.1	0.2
			Probable	\$ 38	\$ 69	265	2.39	0.172	0.124	0.02	0.04	20	1	1	0.1	0.2
	SW Floor	Hybrid	Proven	\$ 34	45	486	1.42	0.229	0.081	0.04	0.05	22	3	1	0.4	0.5
			Probable	\$ 34	\$ 42	4,986	1.35	0.215	0.077	0.04	0.04	217	34	12	4.8	4.5
South	OHS		Proven	\$ 32	53	1,374	1.70	0.193	0.129	0.05	0.04	74	8	5	1.4	1.3
			Probable	\$ 32	\$ 45	356	1.47	0.171	0.111	0.04	0.04	16	1	1	0.3	0.2
Subtotal Underground			Proven Probable			4,979 31,069	2.03 2.47	0.208 0.216	0.145 0.189	0.05 0.07	0.06 0.07	324 2,469	33 216	23 189	5.6 45.3	6.6 50.5
Total Underground			Proven and Probable			36,048	2.41	0.215	0.183	0.06	0.07	2,793	249	212	50.9	57.2
Surface Stockpiles	Low Grade Stockpile	Load & Haul	Proven	0.68	\$ 28	-	-	-	-	-	-	-	-	-	-	-
			Probable	0.68	\$ 28	2,830	0.97	0.120	0.080	0.03	0.06	88	10	7	1.8	3.7
Total Surface			Proven and Probable			2,830	0.97	0.120	0.080	0.03	0.06	88	10	7	1.8	3.6
Underground + Surface			Proven			4,979	2.03	0.208	0.145	0.05	0.06	324	33	23	5.6	6.6
			Probable			33,899	2.35	0.208	0.180	0.06	0.07	2,557	227	196	47.1	54.2
Grand Total			Proven and Probable			38,879	2.31	0.208	0.176	0.06	0.07	2,882	260	219	52.7	60.9

Notes:

- Abbreviations: NSR = net smelter return value; SLS = sub-level shrinkage; OHS = open hole stoping; SLS = sub-level caving; Koz = thousands of troy ounces; Mlb = million pounds
- The effective date of the mineral resource and mineral reserve estimates is July 4, 2018.

3. The current estimates of mineral resources and mineral reserves on the LDI Mine property reflect depletion from mining activities to December 31, 2018.
4. All mineral resource and mineral reserve estimates were prepared in accordance with the CIM Definition Standards (2014).
5. Mineral resources, which are not mineral reserves, do not have demonstrated economic viability.
6. Mineral resources are inclusive of mineral reserves.
7. Tonnages are rounded down to the nearest '000 tonnes. Row and column totals may not match due to rounding.
8. Palladium, platinum and gold grades are rounded and limited to three decimal places and three significant figures.
9. Copper and nickel grades are rounded and limited to two decimal places.
10. Average grades are calculated from unrounded numbers, all grades are rounded to the appropriate decimal place or significant digit.
11. Contained palladium, platinum and gold are rounded down to the nearest '000 ounces.
12. Contained copper and nickel are rounded down to the nearest tenth of a Mlb.
13. The underground Mineral Reserves for the Sheriff South, Roby Northeast, Roby Northwest, Roby SW Floor and Roby South zones were estimated by Stephen Taylor, P. Eng., an employee of SRK Consulting and a qualified person under NI 43-101.
14. The underground Mineral Reserves for the Offset Northeast, Offset Central, Offset Southwest, B2 and Roby Central zones were estimated by Steven Olson, P. Eng., an employee of the Company and a qualified person under NI 43-101.
15. The Low-grade Stockpile Mineral Reserves were estimated by Steve Olson, P. Eng., an employee of the Company and a qualified person under N.I. 43-101.
16. The Roby and Offset Block Mineral Resources were estimated by Denis Decharte, P. Eng., an employee of the Company, and Chris Roney, P. Geo., a consultant to the Company, both of whom are qualified persons under NI 43-101.
17. The low-grade Stockpile Mineral Resources were estimated by Dave Peck, P. Geo., an employee of the Company and a qualified person under N.I. 43-101.
18. The following long-term analyst consensus metal price and foreign exchange assumptions were used for Mineral Reserves estimation: US\$940/oz palladium, US\$1,025/oz platinum, US\$1,300/oz gold, US\$3.00/lb copper and \$CAD:\$US = 1.21.

Mining Methods and Operations

Background and Overview

The LOM Technical Report describes the current and future mining methods used to define the feasibility production plan and outlines the replacement of the Roby open pit pushback, as described in the 2017 Technical Report, with a number of near surface underground mining zones. The near-surface zones (“**NSZ**”) consist of the following mining areas:

- Roby Northeast (“**NE**”) Zone – a series of narrower open stopes along the north east extension of the main Roby Central Domain.
- Roby Northwest (“**NW**”) Zone – a single large open stope located in the low-grade disseminated halo on the footwall side of the main Roby Zone.
- Roby Central Zone – the remaining pillars and lower grade footwall material from the historical mining activities in the Roby Pit and Roby Underground hangingwall mining.
- Roby South West (“**SW**”) Floor Zone – a large disseminated zone located under the SW corner of the Roby open pit.
- Roby South Zone – a smaller disseminated zone located south of the Roby open pit.
- Sheriff South Zone – a mineralized pipe located south of the Offset Fault and the Sheriff pit.

The NSZs tend to be lower-grade disseminated zones around the periphery of the Roby Central Domain’s high grade hangingwall. The other major zones included in this plan are:

- Offset Zone – mining the high-grade core and lower-grade areas at depth, the highest margin ore available.
- B2 Zone – a mineralize pipe located below the Offset Fault and to the south of the main Offset Zone.

Together, these zones constitute what is referred to as the “lower” mine.

Mining Methods

Lac des Iles historically used open pit and a top down open hole stoping (“**OHS**”) mining methods to mine the Roby block and also began mining the Upper Offset using OHS. Lac des Iles transitioned to a SLS mining method for the Lower Offset Central zone in 2016 and will continue to use this method for the bulk of the Lower Offset Central zone. Lac des Iles continues to use the OHS method around the periphery of the SLS, for pillar recovery and otherwise as appropriate. Two additional mining methods have been introduced as part of this study:

- A sub-level cave (“**SLC**”) mining method is proposed in order to recover the lower-grade material left behind on the footwall side of the historic Roby stopes of the Roby Central Zone.
- A hybrid blasthole/caving method is proposed to recover a lower grade area located under the south west wall and floor of the existing Roby open pit. This area was previously included as part of the open pit pushback reported in the 2017 Technical Report.

Planned Mining Methods by Zone

The Lac des Iles deposit is broken into four mining blocks: Roby, Sheriff South, Offset, B2. These blocks are further broken down into mining zones, with eight underground mining zones and one open pit mining zone currently in operation or planned. All ore from the Roby mining block and the Sheriff South Zone will be trucked to surface via the ramp system. All other ore will be hoisted to surface through the shaft.

(a) Upper Offset Zone

The Upper Offset Zone is located to the south and under the Roby underground mine workings. It consists of all stopes in the Offset Zone above the 905L. This area has been combined to consolidate a number of OHS variant mining methods that are accessed by historical OHS levels with little to no additional development required. Ore will be extracted by transverse and longitudinal OHS with the exception being a cluster of stopes accessed from the B2 development which require controlled mucking to maintain confinement of the stope walls to reduce the risk of failure. Production planning for this zone is based on the following:

- Development in the south will commence in 2019 on levels 645 and 600 and continue as needed until 2024. Production in the zone is currently ongoing and will continue to 2027.
- A maximum mucking productivity of 1,000 tpd per stope is planned for a 14 tonne (“t”) class load-haul-dump (“LHD”). Pillar and footwall retreat stopes are limited to 500 tpd to allow for proper assay turnaround times for effective grade control monitoring. Several stopes will be mined concurrently and a 1000 tpd average production rate from 2019 to 2024 will be achieved. Total production rates will increase to 1200 tpd in 2025 and to a maximum of 1600 tpd in 2027.
- All production ore excluding ore from the south 645L to 510L will be loaded into trucks and hauled to the rockbreakers where it will be hoisted to surface through the shaft.
- No backfill is planned for the Upper Offset OHS except to allow for development waste storage if needed. Footwall retreat and pillar recovery stopes will become connected to the SLS backfill zone, filling the voids with unconsolidated rockfill.

(b) Lower Offset Central Zone

As discussed above, in 2016, the LDI Mine transitioned the Lower Offset zone from a long hole to SLS to benefit from the increased production flexibility from having more drawpoints and reduced seismicity by eliminating the needs for pillars. The Offset SLS zone is located under and to the south of the Roby Zone. It consists of all SLS areas from 930L to the lowest planned SLS elevation, 1305L. SLS production is currently underway on 980L, 1005L and 1030L while SLS mining on 930 and 955 levels is complete.

Mucking will be by 14t class LHDs and based on daily bucket counts per drawpoint controlled by engineering and based on a strict draw strategy. LHDs have remote capabilities and portable remote stands will be setup as required. Mucking from a draw point is limited to a maximum of 600 tpd in order to effectively manage the ore blanket. Mining of the Offset SLS zone will continue between 4,300 tpd and 4,500 tpd from 2019 to 2021 and gradually decline to 3,500 tpd in 2027 as the haul distance increases.

(c) Lower Offset Zones

The Lower Offset Zone (OHS) consists of all OHS stopes below 905L. These stopes are on the periphery of the Offset SLS, to the north and south, and will be mined using longitudinal retreat OHS. Production planning for this zone is based on the following:

- Development in the area is currently ongoing and will continue until 2024. All drilling will be up-holes from the lower access level with a total of 324,000m of drilling.
- Mucking of stopes is limited to a maximum of 800 tpd with a 14-t class LHD due to tramming distances often exceeding 300 m. Development in 2019 will establish access to the first stopes on the 1030L and 980L followed by first production in the latter half of 2019 at a maximum production rate of 600 tpd.
- All production ore is extracted by LHD and dumped at the level ore pass. Ore is then loaded on trucks and hauled to the rockbreakers where it is skipped to surface.
- No backfill is required for the OHS stopes which are isolated on the fringes of the ore body.

(d) B2 Zone

The B2 Zone is located to the south of the Roby Zone and southeast of the Upper Offset area. It is situated between 440L and 645L and to the northeast of the shaft. The upper B2 (above 440L) is a standalone stope that was mined out in 2018 and currently remains unfilled. The lower B2 will be mined by OHS with a bottom-up shrinkage approach, controlling mucking to maintain confinement of the stope walls with the broken ore. Production planning for this zone is based on the following:

- Development on 645L is complete and production (up hole and down hole) drilling began in January 2019 with 76,000 m of drilling planned. Development on 510L and 460L will continue in 2019 to provide future drilling horizons.
- Mucking on 625L can reach a maximum of 1000 tpd with an 14 t class LHD. B2 mucking is utilized to maintain stable levels in the shaft ore pass during times of variable haulage availability. Development ore will be mined in 2019, and stope mining begins in 2019 and continues to 2027. The approximate production rate for OHS mining is 400 tpd.
- Ore will be trammed with an LHD at 645L to the rockbreakers, from where it will be hoisted to surface via the shaft.
- No backfilling is planned for the Lower B2 zone. Signs and barricades will be placed to limit access and control ventilation.

(e) Roby SW Floor Zone

The Roby SW Floor Zone is located directly under the western half of the south wall of the Roby open pit. This zone is a massive disseminated zone with two major lobes striking 45 degrees to the pit wall with a waste pillar in between. Overall, the irregularly shaped zone is up to 250 m long east to west, 60-120 m wide in plan view and is 120 m high. The design consists of a primary drilling level (145L), a slot drilling level (165L), a primary extraction level (205L) and a SLC-style secondary extraction level (235L). Production planning for this zone is based on the following:

- Production is scheduled to begin in January 2020 and will continue until the end of mine life using a draw control plan to muck the bed of material down in such a manner as to minimize dilution. As the caved material from benches above is drawn into the trenches, drawpoints will be closed based on shut-off grades, which generally represent the grade that pays for the direct mining costs.
- After all the drawpoints on an extraction drift have been shut down, secondary recovery will begin by mining the extraction drifts using SLC methods. Following the secondary recovery, the protection pillar around the 205L footwall drift will be recovered.
- The successful management of dilution will depend on the planning and timing of mass blasting, where excessive time between blasts may increase the risk of premature open pit wall failure dilution. In addition, adherence to a strict draw control plan will maximize ore recovery and minimize the amount of dilution. The location does have a major advantage over typical caving operations in that the full length of the zone is visible along the south wall of the Roby open pit, thereby enabling easier monitoring of the mining progression and the effectiveness of the draw control plan by physically observing sources of external dilution.
- A maximum productivity of 1,200 tpd could be achieved with one 14 t LHD on the 205L and 235L mucking horizons. The average scheduled production is 940 tpd in 2020 & 2021, 1680 tpd in 2022 and peaks in 2023 at 2,200 tpd. Therefore, one production LHD will be required for the first 2 years of production, increasing to two until the end of mine life.
- All production ore from the 205L and 235L will be dumped onto a grizzly and stored in the ore pass to be hauled to surface using 60 t class trucks. Oversize will either be blasted at the drawpoint using a blockholer or be stored in the remuck beside the grizzly until it can be side loaded into 60 t class trucks and hauled directly to the surface ore pad or gyratory crusher.
- No backfill is planned, though some caving of the open pit benches above is expected. As mining this zone could potentially influence the stability of the shaft and backfill raise, monitoring systems will be installed at those locations to determine whether the extent of instability warrants modifications to the mining plan in this zone.

(f) Roby South Zone

The Roby South Zone is located directly under the south lobe of the Roby open pit. This zone is an irregular 100 m wide by 60-100m long ore body in plan view and is 100 m high. The zone also overlays the Offset Fault which dips at approximately 45 degrees towards the north. A minimum 5 m pillar has been left between the footwall of the stope and the top of the fault. The zone consists of four stopes that will be mined using transverse OHS. Production planning for this zone is based on the following:

- Development to access the 205L is planned for 2020 with production in 2023 from 205L only. Development to access the 235L and 280L is planned to start in 2022 with production on these levels scheduled to start in early 2024. Final pillar extraction is scheduled at the end of mine life.
- Drilling will be a combination of up-holes and down-holes, with a total of 161,000 m of drilling.
- A maximum productivity of 800 tpd could be achieved with one 14t LHD on the 205L given the long tram to the ore pass. The average scheduled production is 470 tpd. A maximum productivity of 1,100 tpd could be achieved with one 14 t LHD on the 280L, average scheduled production is 1,000 tpd in

2024 through 2027. Peak production in 2024 and 2025 is scheduled at 1,400 tpd, which at times will require a second LHD.

- All production ore from the 280L will be side loaded into 60 t class trucks and hauled directly to the surface ore pad or gyratory crusher. On the 205L, the LHD will tram to the Roby SW Floor ore pass.
- No backfill is planned, though some caving is expected to start before the last stope is recovered. This is scheduled at the end of mine life as severe caving of this zone could potentially influence the stability of the shaft and backfill raises.

(g) Roby Central Zone

The Roby Central Zone mining primarily focuses on the low-grade halo to the west of the historical mining stopes. This halo is called the Footwall and varies in thickness but can be up to approximately 50 m wide. SLC crosscuts rings will be excavated starting from east to west followed by production rings from the extents of the footwall drives in towards the access. Mining will progress generally in a top-down fashion ensuring that the level above is not undercut. Other mining in the Roby Central Zone includes the historical rib and sill pillars as well as a few stopes around the periphery which are mined by OHS. Production planning for these zones is based on the following:

- Development on 240L is complete and development on 290L is ongoing with initial production from the zone planned for 2019. Development continues down-dip to establish the new exhaust raises, crosscuts and spill raises prior to production.
- All SLC drilling will be up-holes.
- Mucking will be by 14 t class LHDs and based on daily bucket counts per drawpoint controlled by Technical Services and based on a strict draw strategy. LHDs have remote capabilities and portable remote stands will be setup as required. Production of the Roby Central SLS Zone will ramp up starting in 2019 to a steady state average of approximately 3,700 tpd for the 4 years at full production from 2020 to 2023. The mucking rates will naturally slow from 2024 to 2025 as the footwall drive rings are retreated towards the accesses, resulting in a reduction in the number of available headings.
- Sequencing for the SLC zone is generally top-down with the exception being that the dip of the Roby Central allows for some areas to be deferred while still not undercut by levels below.
- Ore will be loaded and hauled from the draw point to a loadout or spill pass on the level. Trucks will be loaded in the truck loadouts by LHDs before hauling to the Lower Portal until the South Portal is completed in 2020.
- As the mining progresses deeper, the excavation will be automatically filled by rockfill from the historical mining stopes and material sloughing off of the east wall of the Roby pit.

(h) Roby NW Zone

The Roby NW Zone consists of a steeply dipping pipe that is roughly 40 m by 50 m in plan and has a 100 m vertical height. It is located on the footwall side of the Roby Central Zone, some 20 m from the main ramp. This zone will be mined as a single stope using transverse OHS, retreating east to west. This zone is scheduled at the end of mine life as mining of this zone puts the vehicle access to the main ventilation fans for the Offset Zone at risk. Production planning for this zone was based on the following:

- Development to access this zone is planned to start in mid-2025 with production coming on line in late 2026.
- Drilling will be a combination of up-holes and down-holes, with a total of 38,000 m of drilling.
- A maximum productivity of 1,600 tpd could be achieved with one 14t LHD, average scheduled production is 330 tpd in 2027.
- All production ore will be side loaded into 60 t class trucks on the 290L and hauled directly to the surface ore pad or gyratory crusher.
- No backfill is planned, though a 5 m “failing crown pillar” is expected to fail to surface after mucking is completed, which would allow the stope to be filled if required.

(i) Roby NE Zone

The Roby NE Zone consists of a steeply dipping extension of the Roby Central Zone that extends to the north east. This zone averages 11 m in width and is 300 m long by 225 m high. Individual stopes are a maximum of 60m long and nominally 100 m high, separated by 20m rib pillars. Seven stopes in this zone will be excavated using both longitudinal retreat and transverse OHS, retreating the stopes toward the access. The three stopes above the 180L are offset from the stopes below. A 15 m crown pillar has been left below a section of the zone previously mined from the Roby open pit. The production plan for this zone is based on the following:

- Development to access this zone is planned to start in 2022 to allow for a 2-year definition drilling program. Production starts coming on line in late 2024.
- Drilling will be a combination of up-holes and down-holes, with a total of 106,000m of drilling.
- A maximum production rate of 800 tpd could be achieved with one 14 t class LHD. The average scheduled production rate is 630 tpd from 2023 to 2027.
- All production ore will be side loaded into 60t class trucks and hauled directly to the surface ore pad or gyratory crusher.
- No backfill is planned.

(j) Sheriff South Zone

The Sheriff South Zone consists of a near-vertical pipe that is roughly 50 m by 50 m in plan and has a 95 m vertical height, located to the south-east of the Roby Open Pit and south of the Sheriff Pit. The stope will be excavated as a transverse OHS, retreating east to west. Production planning for this zone is based on the following:

- Development to access this zone is planned to start in late 2023 with production coming on line in late 2025.
- Drilling will be up-holes from 170L and up and down-holes from 95L, with a total of 60,000 m of drilling.

- A maximum productivity of 1,300 tpd could be achieved with one 14 t LHD, average scheduled production is 860 tpd in 2025 and 2026.
- All production ore will be side loaded into 60 t class trucks and hauled directly to the surface ore pad or gyratory crusher.
- No backfill is planned, though a drop raise from surface could be completed so that unconsolidated rockfill could be introduced if required.

(k) Sheriff Pit

Mining operations in the Sheriff Pit began in the fall of 2017 and was completed in Q4 2018. In 2018, a total of 696,333 tonnes were mined at an average grade of 1.6 g/t Pd. Investigations into the potential for deepening the Sheriff Pit are currently ongoing.

(l) RGO Stockpile

The RGO (low-grade) stockpile continues to be mined with conventional load (wheel loader) and haul methods.

Life Of Mine Production Schedule

As part of the Company's plans to increase underground production from 6,000 tpd to 12,000 tpd, the company contracted the services of Redpath Canada Limited of North Bay, Ontario, to assist in the underground mine development of its major mine expansion. The Redpath development contract consists of approximately 6,550 meters of lateral development and 560 meters of vertical development, occurring over a period of approximately 2 years. Crews and equipment mobilized in late January to begin development.

Total lateral meters for the mine site will be a maximum of 880 m/month in 2019 and 2020 as production ramps up. The priorities for development in this period will be:

1. Sustaining development for Offset SLS to maintain 6,000 tpd.
2. Ventilation system upgrades to support production ramp up in Roby block.
3. Development of the South Ramp to support production ramp up in Roby block.
4. Pre-production development for Roby Central SLC Zone.
5. Pre-production development for the Roby SW Floor Zone.

From 2021 to 2027, development decreases as the major production areas reach their sustainable production rates. All development in the last 2 years of mine life is categorized as operating development due to the short remaining life span. Additionally, a design growth allowance has been added to the designed capital lateral development in order to account for infrastructure excavations that have not been included in the design such as safety bays, electrical cut-outs and backslashes for truck loading at the ramp intersection. The amount of design growth included is based on the level of detail available for each zone. As the most mature design, the design growth allowance is 5% for the Lower Offset zones, 7% for the NSZ, B2 and the Upper Offset and 2% for the South Ramp.

Processing and Recovery Operations

Process Description

The LDI mill has a capacity to process 4,470,000 tonnes per annum of ore to a final particle size of 55µm. The plant operates at 555 tonnes per hour at a 92% availability. The run-of-mine (ROM) ore feed is crushed prior to reporting to the milling circuit. The crushing circuit begins with all the ore being crushed through a primary 54" x 75" gyratory crusher driven by a 447kW (600 hp) motor. The gyratory discharge is conveyed to a live stockpile. Apron pan feeders feed the conveyor between the stockpile and the main grinding circuit, with the capability of diverting a variable proportion of the coarse ore to the secondary crusher. The proportion fed to the secondary crushing circuit is regulated a supervisory system to maximize throughput in the grinding circuit. Secondary crushing is accomplished with a cone crusher (standard HP800), which discharges back on the mill feed conveyor producing a finer feed for the grinding circuit.

The grinding circuit consists of a SAG mill, two ball mills and pebble crusher. The SAG mill has dimensions of 9.14 m in diameter by 4.27 m equivalent grinding length (EGL), and is driven by a 6,400 kW (8,500 hp) motor. The mill output is passed over a vibrating screen where oversized particles are directed by conveyor to the pebble crusher (short head cone HP800). The pebble crusher product is then returned to the grinding mill. The pebble circuit is configured to allow oversized particles to bypass the pebble crusher and return directly to the SAG mill feed. Undersized particles from the SAG mill output are directed by the vibrating screen to the ball mill diverter box, which splits the stream to feed between two ball mills. The two ball mills each have dimensions of 6.10 m in diameter by 10.36 m EGL and are also each fitted with 6,400 kW (8,500 hp) motors. Each ball mill is in closed circuit with a hydrocyclone cluster. The underflows from the hydrocyclones report back to the ball mills and the overflows report to a collection tank. The primary hydrocyclones were upgraded to GMAX 20" and the ball mill media was reduced to 1" high chrome balls in order to produce the current P₈₀ of 55 µm.

The rougher conditioning tank receives feed from the primary hydrocyclone overflow. The conditioner is configured to feed two flotation lines, each with a rougher flotation cell having a capacity of 50 m³. The concentrate from the rougher flotation cells (cell 1 in line 1 and cell 2 in line 2), report to the 1.7 m rougher column cleaner cell (column cell C). The tailings from rougher flotation move forward to a series of scavenger flotation cells having a capacity of 130 m³ each (cells 1B to 1G on line 1 and 2B to 2G on line 2). Tailings from scavenger flotation are final tailings and are pumped to the tailings management facility (TMF) for impoundment. Scavenger concentrates from cells 1A, 2A, 1B, 2B, 1C, and 2C are combined and pumped to the cleaner A feed bank of flotation cells. The scavenger concentrates from 1D, 2D, 1E, 2E, 1F, 2F, 1G, and 2G are combined and pumped to the cleaner B feed bank of flotation cells. The cleaner circuit consists of two main divisions, one for rougher cleaning (column cell C) and the other for scavenger cleaning (4 conventional banks of cells called Cleaners A, B, C. Cleaners B and C concentrates feed Cleaner A which in turn feeds the Denvers.

Rougher concentrate reporting to the 1.7 m column C is cleaned once to produce final concentrate. The tailings from this column are split and fed into the two 1.3 m columns (columns A & B) which operate in parallel. The concentrate from these columns are sent to the Denver cells while the tailings from the two columns enter the cleaner circuit. The scavenger cleaner circuit is comprised of 4 banks of conventional cleaners. Cleaners A, B, and C each employ 3 x 38 m³ cells, while the Denvers consist of 8 x 2.8 m³ cells. Cells are operated in counter current mode with the concentrate from each bank being pumped to the next higher cleaner and the tailings flowing by gravity through each successively lower cleaner (Cleaner C to Cleaner B to Cleaner A to Denvers). Entry points to the circuit are at the Denvers, Cleaner A (from the 3 scavengers A, B and C on each line) and Cleaner B (from the scavengers D, E, F and G on each line). The outputs of the Scavenger Cleaner circuit are Final Concentrate from the Denvers and Cleaner C tailings which are circulated back to the main circuit and split between Scavenger cells 1A and 1B.

Final concentrate streams are combined and pumped to the 17 m high-rate concentrate thickener. The thickener underflow is pumped into a 4.3 m by 7 m storage tank prior to filtration. Two pressure filters (PF-19) are operated to reduce concentrate moisture to 10%. The concentrate is shipped via trucks to the smelter.

Plant Capacity

The plant capacity is calculated to be 4,470,000 tonnes per annum. This capacity is based on the grinding rates demonstrated to achieve the target flotation feed grind size at normal industry utilization. The plant targets a flotation feed grind size of $P_{80}=55\text{ }\mu\text{m}$. This target is based on test work by XPS which showed an improvement in Pd recovery was possible by reducing the P_{80} to as low as $38\text{ }\mu\text{m}$. At that time, the plant was operating with a feed grind size $P_{80}=75\text{ }\mu\text{m}$ and SGS simulated a number of alternative options to achieve a finer grind. The selected option increased the grinding efficiency and decreased the grinding rates to reach the selected size target of $P_{80}=55\text{ }\mu\text{m}$. The improvement in efficiency was achieved by reducing the transfer size at the SAG mill discharge screen and replacing the cyclones with a more efficient model producing the finer cut size. The ball mill charge was changed to 2.5cm high-chrome grinding media and the load of balls in the mills was increased to the limit of the motors. To achieve the new grind size the throughput was reduced to 555 tph. Since 2014, the plant has produced a significantly finer grind of P_{80} of $55\text{ }\mu\text{m}$ which has resulted in an increase in Pd recovery.

As the flotation feed grind size is an important parameter in achieving expected Pd recovery, the grind is measured each day of operation and maintained in a database by the LDIM metallurgist. This daily measured value was averaged for each month. The plant objective of $<55\text{ }\mu\text{m}$ was achieved during in 2016 and 2017. In early 2018, the target was not achieved during a test of a larger grinding media in the ball mills impacted grind. The test was ended in April with the return of the addition of 2.5 cm high-chrome grinding media after which the flotation feed grind size returned to target. The plant throughput at the $55\text{ }\mu\text{m}$ flotation feed size is governed primarily by the capacity of the SAG, ball mill, pebble crusher circuit. The throughput rate is a measure of the tonnes per operating hour and is determined from the metallurgical reports of total tonnage milled and SAG operating hours.

Also affecting the overall mill capacity is the plant utilization. The utilization is defined as the SAG mill operating hours per month as a percentage of total hours in the month. From January 2011 to the end of 2017, the plant throughput was adjusted by limiting operating days to process the available ore. During 2016 and 2017, a schedule of 14 days on and 14 days off was employed resulting in utilizations of under 50%. The plant began a ramp-up to continuously operating 24/7 schedule late in 2017. During the first 6 months of 2018, the plant has progressed along a path of improved utilization.

As the plant had been operated on a reduced schedule over the past 8 years an estimate of the potential maximum utilization was produced based on previous plant performance combined with industry norms. A continuous operation of 365 operating days per year requires scheduled downtime for the replacement of SAG mill liners and for routine maintenance and inspections. The SAG liners require changing every nine months and require the most significant downtime. Coordinating maintenance of the ball mills, cone crushers, and major flotation overhauls with the major SAG liner changes can minimize total downtime. With this coordination of scheduled maintenance, 18 days of planned downtime would be required annually. Additionally, the plant is shut down for 2.5 days of downtime for peak power management annually. Based on previous operating data, the plant operates at a 97.5% reliability when scheduled maintenance was performed on the non-operating days of the 14 off days of the schedule. An overall mill availability of 92% is therefore projected based on 365 days available, less 18 days of planned maintenance, less 2.5 days of peak power management and 97.5% reliability. At a throughput rate of 554.5 tph and a 92% utilization, the plant capacity is 4,470,000 tpa.

Water Management and Tailings Impoundment Process

The final plant tailings containing Rougher Scavenger tails and Cleaner 1 Scavenger tails are currently pumped to the TMF for permanent impoundment. The solids content in the tailings slurry is approximately 30%. Tailings are spigoted into various containment cells within the TMF, where solids are allowed to settle out and the water reports to a central water management facility (“**WMF**”) before being recycled back to the concentrator for use in the process. Any surplus water accumulated in the WMF due to precipitation is clarified at the concentrator to meet discharge limits and then released to the environment. Currently under construction is a 33.5 m tailings thickener designed by Westpro. Once completed the thickener is designed to produce an underflow containing the solids at above 50% solids to be pumped to tailings and an overflow containing less than 400 NTU solids which will be recirculated directly back to the concentrator. Proactive management of the TMF facility, the WMF levels, and clarifier are important to ensure adequate tailing capacity and recycle water for the continuous operation of the mill and the 4,470,000 tpa plant capacity. The installation of the thickener will result in less water to manage in both the TMF and Water Management Facility 1 (“**WMF1**”) improving the reliability of these processes.

Infrastructure, Permitting and Compliance Activities

Site Infrastructure

The LDI Mine has been in operation for many years and has well established permanent infrastructure. With the exception of the ventilation and underground dewatering systems, the existing infrastructure is capable of supporting the activities proposed in the LOM Technical Report. Due to its distance from the nearest city, Thunder Bay, Ontario, the mine is operated on a “remote mine” basis in which most of the employees work on a “14 day in/14 day out” basis.

The existing infrastructure at the site consists of the following: A gravel access road to site from Provincial Highway 527 which is maintained year-round by LDIM; a gated access to site and security building, operated year-round (security is provided on a contract basis by a security firm and includes site patrols); main camp accommodations for 559 people, includes dining and recreation (check-in and -out service, housekeeping and kitchen facilities are provided on a contract basis); a separate construction camp with accommodations for an additional 50 people; a potable water treatment plant which is located near the camp facility and is operated by LDIM employees; an exploration office building and core storage area; an open pit maintenance facility and warehouse; a fuel farm, two major propane tank stations and miscellaneous propane facilities throughout the site; a no.1 shaft, headframe, truck load out, fresh air fans with heaters, a hoist house and compressor building; the underground ore handling system which consists of two ore passes, grizzlies, rock breakers, a crusher and a loading pocket; the Mine Dry building which houses operation and maintenance offices, line up rooms, lamp man room and the industrial nurse’s station; the Administration Building which is located near the no. 1 shaft and houses the administration, technical services, health and safety, training and the environmental groups; the old administration building and mine dry (this facility is currently occupied by the site services department, maintenance planning department, contractors and a mine rescue station); the mill complex; the TMF and the water treatment plant; the upper and lower portals, the second fresh air fan with heater and the two exhaust raise fans which are all located within the Roby pit; west fresh air intake fan and heater house; surface explosive storage buildings which are managed by Dyno Nobel who also transport the explosives underground; the pump house which draws fresh water from Lac Des Isle Lake as required within permitted volumes; electric power to site; the East waste rock pile which contains an estimated 7.6 Mt; the low-grade stockpile which is used as supplemental mill feed; the South Fill Raise and Dump.

Permitting and Compliance Activities

Environmental Matters

There are no known environmental issues identified that would materially affect the ability of LDI to extract the mineral resources or mineral reserves at Lac des Iles Mine. LDI has developed management plans to comply with the requirements for environmental impact monitoring during operations. The ongoing operational monitoring, reporting, and regulatory filings related to the environment will be continued at the Company after the mine has closed as outlined in the Mine Closure Plan.

The Company carries out a comprehensive environmental monitoring program in accordance with federal and provincial regulatory requirements and in accordance with the relevant permits described in the LOM Technical Report. Environmental monitoring at the LDI Mine includes surface water and groundwater quality, sediment quality, benthic invertebrate community monitoring, fish population studies and air quality monitoring. The following summarizes the environmental effects monitoring at the LDI Mine.

Surface water quality is monitored in accordance with the industrial sewage works Environmental Compliance Approval (ECA) 8775- A86LLL dated October 19, 2016, and the Metal Mining Effluent Regulation (“**MMER**”) of the Fisheries Act (Canada). The abovementioned ECA approves the treatment and discharge of mine water from the LDI Mine into the environment, with conditions for the monitoring of effluent and receiver water quality. Effluent is treated by a clarifier and discharged from the Final Discharge Point to a small headwater stream that drains through South Starter Pond and Second Pond before entering Hasson Lake located south of the mine. Surface water quality in the receiving environment is monitored up to four times a year in accordance with the industrial sewage ECA and the Environmental Effects Monitoring requirements of the MMER. In compliance with the industrial sewage ECA, a network of 28 groundwater monitoring wells surrounding the mine site are sampled three times annually: during spring freshet, summer, and fall with a minimum of sixty days between sampling events, as outlined in Section 8 of the ECA. LDI monitors groundwater quality and complies with all monitoring measures outlined in the ECA.

Biological monitoring at the LDI Mine is undertaken in accordance with the MMER and the Ministry of the Environment and Climate (“**MOECC**”) amended ECA.

Waste Rock and Tailings Disposal, Site Monitoring and Water Management

There are three TMFs present on the property: the West TMF, the East TMF and the South TMF. The TMFs are located adjacent to one another, occupying a footprint of approximately 350 ha southwest of the Roby Pit. The TMFs are located over low-lying areas, bounded by engineered retaining structures and natural heights of land. Perimeter dams of the TMFs and WMF 1 are zoned rockfill structures and are lined with high density polyethylene (HDPE) liners for impermeability. Tailings are discharged as a slurry from the crest of perimeter dams to create a sloped tailings beach and direct contact water into the WMF 1, where it is recycled back to the mill for use in the process. A tailings thickener is set to be commissioned by the end of 2018, which will allow for the recovery and recycling of more process water at the mill, further decreasing the volume of water requiring management within the TMFs. The thickener will also improve the beaching of tailings around the dam perimeters during tailings deposition.

The Company has updated its short and long term plans for tailings management to more efficiently increase tailings storage capacity, to ensure safe operations, and to minimize additional environmental impacts. The updated tailings management plan is designed to accommodate thickened tailings. The updated tailings management plan is based on the self-execution of all future dam raises, but differs from the 2017 plan in that it replaces the long-term reliance on upstream raises by a medium term deposition strategy based on hybrid upstream/downstream raises. It also adds a new TMF located on a near-mine greenfield site to

accommodate tailings from the latter years of the production schedule and from any extension of the mine life. The greenfield TMF replaces the footprint of the West TMF, which will not be used for future tailings storage. The resulting three-phased plan is defined as follows:

- Phase 1: Short-Term Plan (2018-2019) remains unchanged from the previous plan and involves raising the South TMF and East Reclaim Pond dams by the downstream method (“**Phase 1**”).
- Phase 2: South TMF and East TMF (2019-2025) updated to replace upstream dam raises with hybrid upstream/downstream raise methodology (“**Phase 2**”).
- Phase 3: Greenfield (2025 – end of life-of-mine) (“**Phase 3**”).

During Phase 1 of the updated plan, tailings deposition into the TMF cells will be controlled from the TMF perimeters such that a coarse tailings beach is deposited adjacent to the dams, with supernatant ponds forming in the center of the TMF. Water from the ponds will be pumped to the WMF1, where it will be returned to the mill for use in the metallurgical process. During Phase 2 and Phase 3, tailings will be deposited from the crest of upstream lifts constructed over half the impoundment perimeter, to form a one way fall beach and a decant pond on the opposite side of the impoundment. Water will be transferred to the WMF1 either through a regulated overflow spillways. Based on the ultimate TMF configuration, the remaining capacity of the South and East TMFs is estimated to be 24 million tonnes (accumulative from June 2017 and beyond). The proposed greenfield TMF will be progressively expanded to hold the balance of tailings production, equivalent to approximately 20 million tonnes.

Based on the ultimate TMF configuration, the remaining capacity of the TMFs is estimated to be adequate for the production plan presented in the report. Dam safety inspections are completed on an annual basis. The 2017 dam safety inspection was completed by Hatch in October 2017 in accordance with MOECC direction in the industrial sewage ECA. The inspection was based on visual observations of dam crests, slopes, toes and tailings beaches (where applicable), spillways, review of pond levels and available monitoring data, as well as discussions/interviews with NAP’s personnel regarding historical performance of the TMF. The dam safety inspection concluded that in general, the dams at the mine site are considered to be in a stable condition.

Permitting Matters

The Company ensures that all necessary approvals and licenses for operations at LDI Mine have been obtained and remain current. The Company asserts that its operations and facilities comply in all material respects with current legislation, and it holds all necessary approvals and licenses for its operations at the mine and for all ongoing expansion projects. The Qualified Person is satisfied that the Company has all permits and approvals to continue its mining operations at LDI Mine.

Social and Community Initiatives

The Company is committed to ensuring appropriate consultation with potentially affected indigenous communities with respect to the Company’s mining and exploration activities. The goal of aboriginal consultation is to provide indigenous communities with information and gather feedback about: potential impacts from mining and exploration activities and means to mitigate such impacts; corporate information about the Company and the LDI Mine; opportunities for economic benefits, including service contracts, employment, etc.; the status of operations and development; applicable regulations, permits, and potential environmental impacts; and updates to the LDI Mine closure plan. The Company regularly interacts with these groups in a number of ways ranging from face-to face meetings, phone calls, e-mail, information sessions, presentations focused on specific activities (for example amendments to the current closure plan or permit

applications), communications and updates regarding ongoing environmental monitoring, discussions around potential business opportunities, and the regular dissemination of information relating to employment and training opportunities at the site.

With respect to the Company's mine closure plan amendment process, the Company has an Aboriginal Consultation Plan filed with the Ministry of Energy, Northern Development and Mines ("**MENDM**"). The Company carries out consultation with the First Nations and Metis Nations in accordance with the consultation plan, and submits consultation reports to the MENDM prior to filing a closure plan amendment. The Company also has committed a number of resources to community liaison/relations activities. The goal is to ensure all required engagements are addressed and that communities of interest have a point of contact to ensure open and frequent communication, and that any concerns be addressed in a timely fashion.

Currently, the Company has a letter of mutual respect and understanding signed with Gull Bay First Nation as well as a statement of intent from which a fuller participation agreement will be negotiated. The Company is growing its relationships with other indigenous communities, holding early memorandum of understanding discussions with Fort William First Nation and Whitesand First Nation, and has already achieved signed agreements with Métis Nation of Ontario and Red Sky Métis Independent Nation. The purpose of these agreements is to formalize the Company's commitment to building relationships between the parties and to providing opportunities for employment, training and business development, as well as ensuring environmental monitoring and protection. LDI has established and maintained cooperative relationships with its local indigenous communities to ensure that meaningful consultation is carried out in a transparent and timely fashion.

Mine Closure

Closure of the LDI Mine at the end of operations will be carried out in accordance with O. Reg. 240/00 of the *Mining Act* (Ontario), as described in the mine closure plan. The most recent changes to the closure plan were approved by the MENDM in June 2017. The 2017 closure plan amendment supplements a comprehensive closure plan filed in November 2015 to constitute the complete LDI Mine closure plan under Part VII of the *Mining Act* (Ontario). The closure cost for the LDI Mine was estimated in 2017 at \$20,794,140.12. In late 2017, the Company subsequently obtained approval to construct a tailings thickener with an added closure cost estimate of \$339,600.00. The closure cost estimate includes a contingency of 20% on the base values, which is a requirement of the MENDM.

NAP is responsible for providing the full amount of the financial assurance to be held by the MENDM, subject to any required or approved changes to the closure cost estimate. As of June 2018, the MENDM held \$21,174,000 in financial assurance, largely in the form of a letter of credit. A comprehensive closure plan amendment is scheduled to be filed with the MENDM in late 2018 incorporating updates to the mine plan as described in this document. The updated closure cost for the LDI Mine has been estimated to be \$22,169,356. Future amendments to the closure plan arising from changes to the operations and/or infrastructure at the LDI Mine will be undertaken as required by the MENDM. Progressive rehabilitation of disturbed areas where no further activity is planned will be implemented as appropriate to reduce eventual closure costs.

Capital and Operating Costs

Capital Costs

The total capital cost is estimated at \$425 million for the LDI Mine life of mine plan as described in this study. Of this, \$22 million is the forecasted capital spending for H2 2018 as presented in the most recent cost forecast. Of the total \$425 million, \$143 million is project capital required to double the mines underground

capacity. The following table summarizes the capital costs for the life of mine plan described in the LOM Technical Report by category and by year:

Summary of Capital Costs – LDI Mine – Life of Mine:

	2018 H2	2019	2020	2021	2022	2023	2024	2025	2026	Total
H2 2018 Forecast	22,164	-	-	-	-	-	-	-	-	22,164
Project Capital	-	40,456	45,455	16,782	4,830	5,533	14,956	10,325	3,410	142,578
Sustaining Capital	-	36,181	38,820	32,769	42,785	25,465	44,724	35,436	5,040	282,553
Total	22,164	76,637	84,275	49,551	47,615	30,997	59,681	45,761	8,450	425,131

Operating Costs

The operating cost is based primarily on owner owned and operated mining and service fleets. The mine carries out its daily routine with the minimal use of permanent contractors except where value is provided through expertise and/or packaged efficiencies and skills. Nearly all of the estimate inputs are derived from actual data from 2017 and from the 2018 budget. Cost estimates reflect the changing state of the mine over time in terms of the distribution and location of the individual mining areas.

The following table summarizes the operating costs for the life of mine plan described in the LOM Technical Report by category and by year:

Total Average Operating Cost by Categories (\$ 000's):

Production Costs	2019	2020	2021	2022	2023	2024	2025	2026	2027	Total
Development	21,223	28,888	11,852	13,856	11,612	7,953	7,393	5,324	41	116,804
Stoping	15,611	19,922	23,250	21,121	22,408	18,145	19,097	19,974	9,417	177,322
Hauling	26,913	33,289	31,355	32,061	32,147	32,088	32,151	31,619	19,980	284,456
Backfilling	1,643	1,748	1,759	1,760	1,877	1,864	1,980	2,121	1,943	17,276
Dia. Drilling	2,808	2,144	2,328	2,723	2,430	2,416	1,423	-	-	19,085
Power & Propane	-	1,250	1,687	1,804	1,659	1,764	1,521	1,483	594	11,761
Shaft Services	10,708	10,891	10,897	10,851	11,070	10,923	11,081	10,845	7,344	99,712
Underground Services	20,763	24,059	24,912	25,317	25,037	23,637	22,797	22,972	13,922	213,171
Surface Services	18,553	18,790	19,027	19,027	19,027	19,027	18,553	17,656	11,080	168,747
Milling	47,312	47,312	47,312	47,312	47,312	47,312	47,312	47,312	31,520	433,412
SG&A	26,565	27,301	27,574	27,408	27,105	26,318	24,722	22,066	17,361	238,478
Total Production Cost	192,100	215,595	201,953	203,241	201,684	191,446	188,030	179,372	113,202	1,780,224
Production Cost/ tonne milled	42.98	48.23	45.18	45.47	45.12	42.83	42.06	40.13	39.52	43.55

Economic Analysis

The economic model calculates key production and economic metrics including production (tonnes and grades), recovered and payable metals, revenue, operating expenses and total cash flows, margins, and unit cost calculations. A suite of sensitivities were calculated to determine the main drivers of economic performance including: grade, operating and capital costs, metal prices and foreign exchange rates. Cash flows are presented as undiscounted and discounted at 8%.

With the exception of overhead costs incurred by NAP that are directly related to LDI Mine operations, allowances for assets or cash flows from NAP are excluded from this evaluation. Regional exploration costs were also excluded from the evaluation. The economic model is static and accrual based; revenues and costs were assumed to be realized in the month or year in which they occurred. The model does not include debt financing costs other than interest on equipment leases currently in place. The start date for financial valuation is July 1, 2018. The cash flow model was reviewed and validated by independent third parties specializing in valuation and business modelling.

The market for concentrate products from the LDI Mine is mature and multiple smelting and refining options exist. Metal prices and foreign exchange rates for the economic analysis were developed through market analyst consensus and are shown in the following tables:

Metal Prices Used for Economic Analysis:

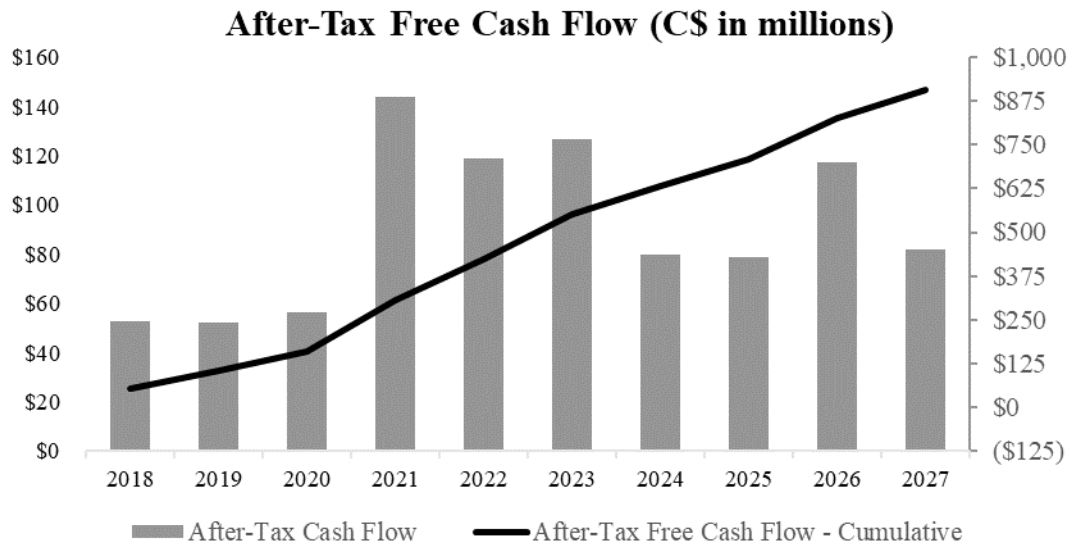
Metal	Units	2018	2019	2020	2021	2022 onward
Pd	(\$US/oz)	975.88	1,040.20	1,040.20	1,040.20	1,040.20
Pt	(\$US/oz)	903.5	955	955	955	955
Au	(\$US/oz)	1,290.00	1,276.00	1,275.00	1,305.00	1,290.00
Cu	(\$US/oz)	3.08	3.19	3.24	3.29	3.27

Foreign Exchange Used for Economic Analysis:

Units	2018	2019	2020	2021	2022 onward
(\$US/\$CAD)	1.3	1.24	1.26	1.25	1.25

The total revenue generated by the life of mine plan is \$3,641 million. A cash flow analysis was conducted which resulted in a net pre-tax cash flow of \$1,063 million and a post-tax cash flow of \$ 909 million. The following table summarizes yearly after-tax cash flows in the LOM Technical Report:

After-Tax Cash Flow:



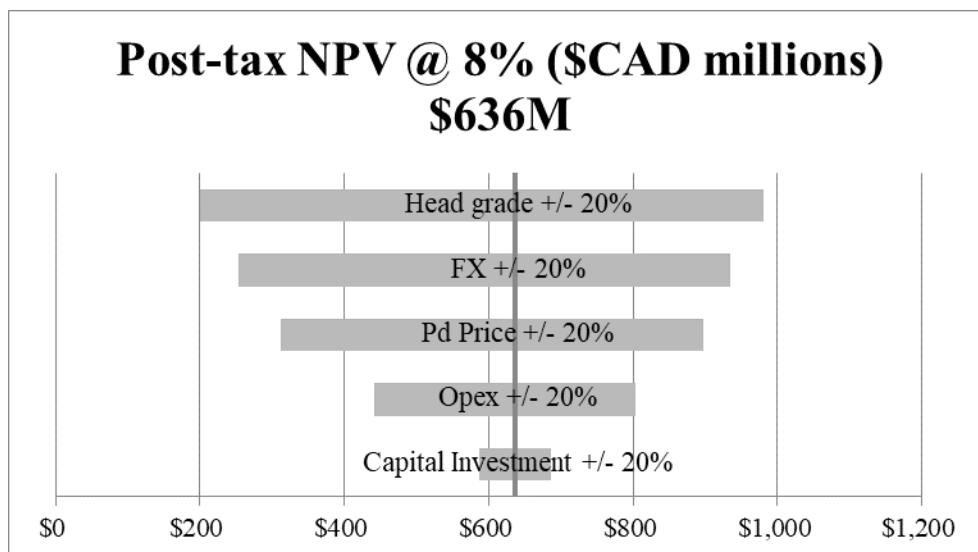
The cash flows for LDIM were converted to NPV at a discount rate of 8%. Since cash flows remain positive throughout the life of mine, the internal rate of return is undefined and there is no defined payback period. The undiscounted cash flows and NPV for the LDI Mine life of mine plan is summarized in the following table:

NPV Analysis:

Evaluation Scenario	Pre-Tax (\$M)	Post Tax (\$M)
Undiscounted Cash Flow	1,063	909
Discounted Cash Flow @ 8%	731	637

The NPV of the LDI Mine LOM plan described in the LOM Technical Report is most sensitive to: (i) metal price; (ii) foreign exchange (USD/CAD); (iii) mill head grade; (iv) operating costs; (v) capital costs; (vi) processing costs. Efforts to preserve and/or improve head grade while controlling or reducing the operating costs at the mine will yield the best possible economic opportunities to improve on the valuation of the LDI Mine.

Sensitivities of LOM Financial Results:



Exploration, Development and Production

Exploration and Development

The following is a brief summary of the Company's recent surface exploration activities carried out at the LDI Mine:

Summary of Recent Exploration Activities on the LDI Mine Property

Year	Description
2014-2015	- Ground magnetic field surveys, total 275.95 line km. - High resolution magnetic field survey, total 15.6 line km. - High resolution magnetic field survey, total 265.35 line km.
2015	Overburden stripping and trenching in the Roby Zone area, 362 samples collected for analysis.
2016	No surface exploration at LDI Mine.
2017	8 surface exploration diamond drill holes (4,356 m) completed. 110 surface samples collected. 2,915 m of trenching in the eastern and southern parts of the property. - Trench and outcrop mapping focused on the southern part of the property.
2018	31 surface exploration diamond drill holes (11,850m) completed. - XX surface samples collected. - YY meters of trenching completed in the eastern part of the property.

For additional information regarding the Company's exploration and development activities, please refer to the LOM Technical Report incorporated by reference herein under the heading "Description of the Business and General Developments".

Production

The following is the Company's key production data from 1992 to present:

Year	Mine Totals*	2018	2017	2016	2015	2014	2013
Recovered Pd (oz)	3,929,148	242,686	208,923	158,481	181,951	192,040	148,789
Payable Pd (oz)	-	237,461	201,592	149,563	166,785	174,194	135,158
Pt (oz)	293,708	16,368	12,267	10,230	12,295	13,072	10,222
Au (oz)	268,568	15,816	13,295	9,671	10,484	11,607	10,423
Cu (lb)	75,372,307	4,546,499	3,123,144	2,234,976	2,519,100	3,029,525	2,828,271
Ni (lb)	37,419,461	0	70,517	810,111	1,297,664	1,677,820	1,437,311
Pd Head Grade (g/t)	2.5	2.2	2.9	3	3.2	2.7	2.8
Pd Recovery (%)	76.3	80.1	80.6	82.3	82.8	82.4	80.7
Tonnes Milled	61,075,877	4,237,734	2,780,119	1,996,484	2,135,915	2,684,782	2,048,082
Tonnes of Ore Mined	67,745,993	4,342,335	2,859,174	2,098,204	2,311,987	2,637,023	2,093,669
Underground Tonnes Mined	13,636,953	2,285,821	1,897,114	1,367,458	1,532,050	1,225,547	816,705
Surface Tonnes Mined	54,109,040	2,056,514	962,060	730,746	779,937	1,411,476	1,276,964
Year	2012	2011	2010	2009	2008	2007	2006
Recovered Pd (oz)	176,823	157,393	102,946	-	212,046	286,334	237,338
Payable Pd (oz)	163,980	146,624	95,057	-	195,083	263,046	217,022
Pt (oz)	11,187	9,143	4,894	-	16,311	24,442	22,308
Au (oz)	11,106	7,267	4,023	-	15,921	20,092	17,237
Cu (lb)	2,592,748	1,596,185	658,013	-	4,623,278	5,536,044	5,155,588
Ni (lb)	1,348,179	816,037	395,622	-	2,503,902	3,066,973	2,721,042
Pd Head Grade (g/t)	3.4	3.7	6.1	-	2.3	2.4	2.2
Pd Recovery (%)	78.4	78.3	80.8	-	75.3	74.7	74
Tonnes Milled	2,063,260	1,689,781	649,649	-	3,722,732	5,006,383	4,570,926
Tonnes of Ore Mined	2,051,563	1,830,234	693,078	-	3,676,418	5,143,066	4,648,090
Underground Tonnes Mined	802,180	988,502	615,926	-	615,630	768,841	721,179
Surface Tonnes Mined	1,249,383	841,732	77,152	-	3,060,788	4,374,225	3,926,911
Year	2005	2004	2003	2002	2001	2000	1999
Recovered Pd (oz)	177,167	308,931	288,703	219,325	123,281	95,116	64,441
Payable Pd (oz)	161,469	281,743	nr	nr	nr	nr	nr
Pt (oz)	18,833	25,128	23,742	19,180	10,073	6,074	4,744
Au (oz)	14,308	25,679	23,536	16,030	9,603	6,035	4,888
Cu (lb)	5,514,670	7,836,183	7,142,674	5,295,486	3,123,763	1,362,266	1,377,464
Ni (lb)	2,353,227	4,320,970	4,070,785	2,763,654	1,595,179	1,035,485	973,817
Pd Head Grade (g/t)	1.7	2.4	2.3	1.9	2.1	3.0	2.7
Pd Recovery (%)	69.6	75.2	75.5	73.8	67.4	74	nr
Tonnes Milled	4,780,599	5,298,544	5,159,730	4,851,621	2,662,240	893,017	894,168
Tonnes of Ore Mined	3,705,555	4,574,134	4,396,847	7,250,963	5,768,157	2,689,634	1,271,816
Underground Tonnes Mined	0	0	0	0	0	0	0
Surface Tonnes Mined	3,705,555	4,574,134	4,396,847	7,250,963	5,768,157	2,689,634	1,271,816

Year	1998	1997	1996	1995	1994		
Recovered Pd (oz)	84,228	66,086	60,426	76,668	59,026	-	-
Payable Pd (oz)	nr	nr	nr	nr	nr	-	-
Pt (oz)	5,535	4,588	4,285	5,013	3,774	-	-
Au (oz)	5,079	4,324	3,811	4,870	3,463	-	-
Cu (lb)	1,229,309	1,133,565	941,105	1,162,677	809,774	-	-
Ni (lb)	914,030	864,093	740,689	978,857	663,497	-	-
Pd Head Grade (g/t)	3.9	nr	nr	nr	nr	-	-
Pd Recovery (%)	nr	nr	nr	nr	nr	-	-
Tonnes Milled	859,942	728,641	686,964	674,564	nr	-	-
Tonnes of Ore Mined	873,920	827,875	765,350	716,648	520,253	-	-
Underground Tonnes Mined	0	0	0	0	0	-	-
Surface Tonnes Mined	873,920	827,875	765,350	716,648	520,253	-	-

*Mine totals include weighted average Pd grades and Pd mill recoveries

Abbreviations: nr = not reported; na = not available

Notes:

1. Metal production for the period 1994 - 2008 is reported as contained metal in concentrate except for 2004 to 2008 where payable Pd is also reported
2. Metal production for the period 2010 to 2018 is reported as payable production
3. No production in 2009 (mine on care and maintenance)
4. Pd grades where reported are mill head grades excluding 1998-2000 where production grades are cited
5. Data cited is sourced from the Company's annual reports, as filed on www.sedar.com

For additional information regarding the Company's production results from the LDI Mine property and related analysis, please refer to the Annual Management's Discussion and Analysis incorporated by reference herein.

ENVIRONMENT

The Company's mining, exploration, and development activities are subject to various levels of federal, provincial and municipal laws and regulations relating to protection of the environment, including requirements for closure and reclamation of mining properties. In all jurisdictions in which the Company operates, environmental licenses, permits and other regulatory approvals are required in order to engage in exploration, mining and processing and mine closure activities.

The Company's operating facilities have environmental monitoring processes and procedures in place to identify and eliminate or mitigate environmental risks. These processes are designed to identify risks early on and allow the Company to respond to risks as they arise. Monitoring processes include environmental effects monitoring studies, toxic substance reduction plans, greenhouse gas emissions monitoring and reporting, national pollutant release inventory monitoring and reporting, quarterly sampling and other regulatory compliance monitoring in order to protect water quality and reduce the potential for contamination of surface or groundwater. The Company also has various programs to reuse and conserve water at its operations. In order to mitigate the impact of dust produced by its operations the Company uses dust suppression techniques.

The Company also has a practice of participating in external and internal environmental compliance audits of its business activities on a regular and scheduled basis in order to evaluate its operations. External environmental compliance assessment audits were performed on the LDI Mine by DMCL Consulting Inc. in 2014 and 2017, and by AECOM in 2010. In addition, the Ministry of Environment performed numerous audits on site in 2012, 2013, 2014, 2015, 2016, 2017 and 2018. The audits assess compliance with applicable laws and

regulations, permit and license requirements, company policies and management standards including guidelines and procedures and identify areas where improvements are needed so that any issues can be addressed proactively.

As part of the Company's goal to minimize the impact on the environment from its projects and operations, the Company has developed comprehensive closure and reclamation plans during the initial project planning and design. The Company periodically reviews and updates closure plans and submitted a closure plan amendment in April 2017 which was approved in July 2017. The Company's rehabilitation and remediation plans include re-vegetation and dust suppression measures. The Company's rehabilitation program on its deactivated tailings management areas at the LDI Mine includes several trial based treatments in an effort to successfully re-vegetate and mitigate dusting events on these areas, in addition to continual monitoring. The Company will continue to implement innovative rehabilitation treatments on its tailings management areas through research and monitoring initiatives including the Scientific Research & Experimental Design tax credit program. These efforts have received international peer recognition and are consistent with the Company's corporate direction to meet and surpass environmental standards.

The LDI Mine closure plan currently provides for approximately \$22.4 million of future closure and restoration costs. This obligation of the Company is secured by a letter of credit in the amount of \$22.4 million.

The Company has developed environmental policies, which are communicated to employees through monthly safety training. The Board reviews the Company's environmental policies and programs periodically and oversees the Company's environmental performance.

In May 2015, the LDI Mine addressed water balance issues within its TMF and received approval to commence a controlled release of water in order to restore the water balance. Extensive downstream monitoring and testing during 2015 of the treated and untreated water released in downstream discharge areas revealed no long-term negative impacts on fish, plankton, chlorophyll, benthic invertebrates or vegetation. A reduced monitoring and sampling program continued during 2016, 2017 and 2018, and again no long-term negative impacts were observed. A further reduced downstream monitoring and sampling plan is expected to continue during the 2019 year.

DIVIDENDS

On February 14, 2019, the Company announced that the Board declared a quarterly dividend of \$0.03 on each Common Share outstanding (the "**Dividend**"). The Dividend is payable on March 15, 2019 to shareholders of record at the close of business of March 1, 2019. The Dividend was designated as an eligible dividend for the purposes of the *Income Tax Act* (Canada).

The Company has not approved a formal dividend policy. The actual timing, payment and amount of any dividends will be determined by the Board from time to time based upon, among other things, cash flow, results of operations, financial condition, the need for funds to finance ongoing operations and such other business considerations as the Board may consider relevant.

CAPITAL STRUCTURE

Common Shares

The authorized share capital of the Company consists of an unlimited number of Common Shares. As of March 20, 2019, there were 58,840,783 Common Shares issued and outstanding.

Holders of Common Shares are entitled to receive notice of, attend and vote at meetings of the shareholders (other than meetings at which only holders of another class or series of shares are entitled to vote separately as a class or series). Each Common Share carries the right to one (1) vote. The holders of Common Shares are entitled to receive any dividends declared by the Company in respect of the Common Shares, subject to the rights, privileges, restrictions and conditions attaching to any other class or series of shares ranking in priority to the Common Shares with respect of the payment of dividends. In the event of the liquidation, dissolution or winding-up of the Company, whether voluntary or involuntary, holders of Common Shares are also entitled to receive, on a pro rata basis, the remaining property and assets of the Company available for distribution after payment of all of its liabilities and subject to the rights of the holders of any other class of shares ranking in priority to the Common Shares.

The Company's by-laws provide for certain rights of its shareholders in accordance with the provisions of the CBCA. Such by-laws may be amended either by a majority vote of the shareholders or by a majority vote of the Board. Any amendment of the by-laws by action of the Board must be submitted to the next meeting of the shareholders whereupon the by-law amendment must be confirmed as amended by a majority vote of the shareholders voting on such matter. If the by-law amendment is rejected by the shareholders, the by-law ceases to be effective and no subsequent resolution of the Board to amend a by-law having substantially the same purpose or effect shall be effective until it is confirmed or confirmed as amended by the shareholders.

The foregoing description may not be complete and is subject to, and qualified in its entirety by reference to, the terms and provisions of the Company's constating documents, as amended.

MARKET FOR SECURITIES

The Common Shares of the Company are listed for trading on the TSX under the trading symbol “PDL”. The following table sets out the reported high and low closing prices and trading volumes of the Common Shares on the TSX for the periods indicated.

	TSX ⁽¹⁾			
	Low (CAD\$)	High (CAD\$)	Aggregate Volume	Average Volume
2019				
March (1 st – 20 th)	14.22	26.30	2,388,580	170,613
February	13.03	23.75	1,248,803	65,726
January	10.93	13.36	255,570	11,617
2018				
December	9.12	12.23	112,180	5,904
November	10.10	13.35	191,980	8,726
October	9.40	11.10	120,860	5,493
September	8.62	10.05	78,350	4,123
August	9.20	10.20	85,190	3,871
July	9.26	9.98	89,910	4,281
June	9.33	11.44	122,530	5,834
May	10.60	11.98	429,470	19,521
April	9.80	11.16	212,430	10,116
March	8.74	10.70	113,220	6,343
February	10.97	8.18	198,444	10,444
January	11.60	7.33	465,832	21,174

Note: (1) Numbers shown above adjusted to reflect 400-1 share consolidation completed effective August 6, 2015 in connection with the Recapitalization.

DIRECTORS AND EXECUTIVE OFFICERS

The following table sets forth information about the directors and executive officers of the Company as of the date hereof. Each director's term of office expires at the next annual general meeting of shareholders, or when he or she resigns or ceases to be a director by operation of law.

Directors of the Company

J. Peter Gordon Toronto, Ontario, Canada Chairman	Mr. Gordon is a Managing Partner at Brookfield Asset Management Inc. and has responsibility for the industrial portfolio of assets within Brookfield Asset Management's private equity group. Mr. Gordon has 35 years of industry experience in operations and finance with Brookfield companies. He currently serves on the board of directors for Norbord Inc. He holds an engineering degree from Queen's University and an MBA from the University of British Columbia.
Director since	2015
Committees	Technical, Environmental, Health and Safety Committee Governance, Nominating and Compensation Committee
Principal Occupation	Managing Partner, Brookfield Asset Management Inc.

David Nowak Toronto, Ontario, Canada Director	Mr. Nowak is a Managing Partner at Brookfield Asset Management Inc. and has responsibility for transaction origination and execution for Brookfield Asset Management's private equity group. Prior to joining Brookfield Asset Management in 2011, he was a principal at a Toronto-based private equity firm. He holds a Bachelor of Laws from the University of Western Ontario and an MBA from Duke University where he graduated as a Fuqua Scholar.
Director since	2015
Committees	Technical, Environmental, Health and Safety Committee Governance, Nominating and Compensation Committee
Principal Occupation	Managing Partner, Brookfield Asset Management Inc.

John W. Jentz Toronto, Ontario, Canada Director	Mr. Jentz is currently Vice President, Corporate Development and Investor Relations at SEMAFO. He has over 20 years' experience in corporate finance and mergers and acquisitions, mostly within the mining sector. Previously, Mr. Jentz served as a senior member of the mining teams at both regional and global investment banking firms. A chartered accountant, he holds a B.Sc. degree in actuarial science from University of Western Ontario and an MBA from McMaster University.
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Director since	2015
Committees	Governance, Nominating and Compensation Committee (Chair) Audit Committee Technical, Environmental, Health and Safety Committee
Principal Occupation	Vice President, Corporate Development and Investor Relations, SEMAFO, Inc.

Dean Chambers Toronto, Ontario, Canada Director	Mr. Chambers is a professional engineer and financial executive with over 35 years of business, technical and financial experience. In 2017, Mr. Chambers retired as Executive Vice President and Chief Financial Officer at Sherritt International Corporation, a major international resource company. Mr. Chambers continues to consult in the materials sector. Mr. Chambers' career as a senior executive in the mining and chemical industries includes positions with Dynatec Corporation, Falconbridge Limited and the Dow Chemical Company. Mr. Chambers holds a Bachelor of Engineering and Management from McMaster University and is a charter member of the Institute of Corporate Directors.
Director since	2015
Committees	Audit Committee (Chair) Governance, Nominating and Compensation Committee Technical, Environmental, Health and Safety Committee
Principal Occupation	Corporate Director and Consultant

Greg Fauquier Vancouver, British Columbia, Canada Director	Mr. Fauquier is a mining engineer with a broad range of management skills covering mining, process operations and development undertaken in both open pit and underground operations. Retired in 2017, Mr. Fauquier's career in mining spans 44 years, where he recently held the position of Global Managing Director for Hatch Ltd. a consulting engineering firm where he was responsible for mining and mineral processing, as well as the operational services. Prior to joining Hatch Ltd in 2003, Mr. Fauquier was the Senior Vice President of Barrick Gold Corporation where he was responsible for the U.S. and Peruvian operations. Mr. Fauquier holds a B.Sc. Mining from Queen's University.
Director since	2015
Committees	Technical, Environmental, Health and Safety Committee (Chair) Audit Committee Governance, Nominating and Compensation Committee

Principal Occupation	Retired
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Executive Officers of the Company

James E. Gallagher Oakville, Ontario, Canada President and Chief Executive Officer	Jim Gallagher is a Professional Mining Engineer with over 34 years of experience in the mining industry which includes progressive roles in operations management, technical services, consulting and projects. During a 24 year career at Falconbridge Limited and 8 years as Global Director of Mining for Hatch Limited, Mr. Gallagher has had the opportunity to work for or benchmark some of the largest and most complex mines and mining projects around the world. Mr. Gallagher joined NAP in October of 2013 as Chief Operating Officer. He was appointed President and Chief Executive Officer in August of 2015. Mr. Gallagher holds a Bachelor of Engineering degree from Laurentian University in Sudbury, Canada.
Principal Occupation	President and Chief Executive Officer, North American Palladium Ltd.

Timothy J. Hill Maple, Ontario, Canada Vice President, Finance and Chief Financial Officer	Timothy Hill is a Chartered Public Accountant and a Certified Management Accountant with 19 years of experience in the mining sector, including 10 years in mining operations. Mr. Hill is responsible for the Company's financial reporting and disclosure practices, corporate treasury, financial planning and information technology. Prior to joining the Company, Mr. Hill held a series of progressively senior positions at Vale Canada Ltd. in operations, finance and business planning for the North Atlantic base metals business. Mr. Hill holds a MSc. (Finance) from Queen's University Belfast and a BSc. (Economics) from the University of Victoria.
Principal Occupation	Vice President, Finance and Chief Financial Officer, North American Palladium Ltd.

David Peck Brandon, Manitoba, Canada Vice President, Exploration	Dr. Peck is a Professional Geoscientist with over 30 years of exploration and applied research experience specializing in magmatic Ni-Cu-PGE ore deposits. Prior to joining NAP, Dr. Peck operated an independent geoscience consulting business, was President and co-founder of Revelation Geoscience Ltd., spent several years as Global Nickel Commodity Leader at Anglo American plc and worked as a mineral deposits geologist in both the government and academic sectors. He received a Ph.D. degree in Geology from Melbourne University and holds a M.Sc. degree in Geology from the University of Windsor.
Principal Occupation	Vice President, Exploration, North American Palladium Ltd.

Cease Trade Orders, Bankruptcies, Penalties or Sanctions

J. Peter Gordon served as a director of Fraser Papers Inc. ("**Fraser**") from 2007 to February 2011. In June 2009, Fraser initiated a court-supervised restructuring under the *Companies' Creditors Arrangement Act* (Canada) and also filed for protection pursuant to Chapter 15 of the U.S. Bankruptcy Code. As part of its restructuring, Fraser sold all of its operating assets and distributed the proceeds from the sale. Fraser's Common Shares were suspended from trading on the TSX on June 23, 2009 and delisted on July 22, 2009. On March 10, 2011, the Ontario Securities Commission issued a cease trade order against Fraser, and on June 23, 2011, Fraser was dissolved.

Mr. Jentz was a director of the Company prior to the completion of the Recapitalization. The Recapitalization was accomplished by way of a plan of arrangement and resulted in the issuance of shares in exchange for debt, among other things.

Conflicts of Interest

There may be potential conflicts to which the directors of the Company are subject in connection with the business and operations of the Company. The individuals concerned are governed in any conflicts or potential conflicts by applicable law. As of the date hereof, no directors and officers of the Company hold positions with other companies that explore for or produce PGEs or have other business interests which may potentially conflict with the interests of the Company.

LEGAL PROCEEDINGS

From time to time, the Company is involved in other litigation, investigations or proceedings related to claims arising out of its operations in the ordinary course of business. In the opinion of the Company's management, these other claims and lawsuits individually and in the aggregate, even if adversely settled, would not be expected to have a material effect on the results of operations or financial condition of the Company and would not exceed ten percent of the current assets of the Company.

INTERESTS OF MANAGEMENT AND OTHERS IN MATERIAL TRANSACTIONS

Except as set out below or as otherwise set out in this AIF, no director, executive officer, shareholder owning, directly or indirectly, or exercising control or direction over, 10% or more of the voting securities of the Company or any associate or affiliate of any of the foregoing has or had a material interest, direct or indirect in any transaction since January 1, 2012 that has materially affected or will materially affect the Company.

As a result of the Recapitalization, Brookfield holds approximately 91% of the Common Shares of the Company issued and outstanding.

PRINCIPAL HOLDERS OF VOTING SECURITIES

To the best of the Company's knowledge, as at March 20, 2019:

- (a) the only persons who beneficially own, or control or direct, directly or indirectly, Common Shares carrying 10% or more of the voting rights attached to all outstanding Common Shares of the Company, and the approximate number of Common Shares so owned, controlled or directed, and the percentage of the voting shares of the Company represented by such shares; and

- (b) the aggregate share ownership by the current directors and officers of the Company as a group,

are as follows:

Name and Address of Beneficial Owner	Number of Voting Shares Beneficially Owned	Percentage of Voting Shares Outstanding
Brookfield Capital Partners Ltd. Brookfield Place, Suite 300 181 Bay Street Toronto, ON M5J 2T3	53,459,128	91%
Directors and Executive Officers as a group	2,302	0.004%

TRANSFER AGENT AND REGISTRAR

Computershare Investor Services Inc. is the registrar and transfer agent of the Common Shares of the Company in Canada.

MATERIAL CONTRACTS

Except for the agreement listed below, the Company has not entered into any material contracts, other than in the ordinary course of business:

- (a) Credit Agreement between the Company, BMO Capital Markets and BNP Paribas dated December 17, 2018 governing the US\$125 million revolving term credit facility in replacement of the Company's prior credit facilities, including the Scotia Credit Facility.

INTERESTS OF EXPERTS

Some of the information relating to the Company's LDI Mine property in this AIF has been derived from the LOM Technical Report prepared by the following Qualified Persons: Denis Decharte, P.Eng., Toby Hofton, P.Eng., Gord Marrs, P.Eng., Steve Olson, P.Eng., Dave Peck, P.Geo., Chris Perusse, P.Eng., Chris Roney, P.Geo., Stephen Taylor, P.Eng., Denis Thibodeau, P.Eng. and Brian Young, P.Eng., and has been included in reliance on such persons' expertise. Each of these individuals is a "Qualified Person" as such term is defined in NI 43-101 and is independent from the Company.

None of the Consultants, Denis Decharte, P.Eng., Toby Hofton, P.Eng., Gord Marrs, P.Eng., Steve Olson, P.Eng., Dave Peck, P.Geo., Chris Perusse, P.Eng., Chris Roney, P.Geo., Stephen Taylor, P.Eng., Denis Thibodeau, P.Eng. and Brian Young, P.Eng., each being persons who have prepared or supervised the preparation of reports relating to the Company's mineral properties, or any director, officer, employee or partner thereof, as applicable, received or has received a direct or indirect interest in the property of the Company or of any associate or affiliate of the Company. To the knowledge of the Company, as at the date hereof, the aforementioned persons and persons at the companies specified above who participated in the preparation of such reports, as a group, beneficially own, directly or indirectly, less than one percent of the outstanding securities of the Company.

Other than as indicated above, neither the aforementioned persons, nor any director, officer, employee or partner, as applicable, of the aforementioned companies or partnerships, is currently expected to be elected, appointed or employed as a director, officer or employee of the Company or of any associate or affiliate of the Company.

KPMG LLP are the auditors of the Company and have confirmed that they are independent with respect to the Company within the meaning of the relevant rules and related interpretations prescribed by the relevant professional bodies in Canada and any applicable legislation or regulation.

RISK FACTORS

NAP's business is exploration, development and operation of mining properties. The risk factors below could materially affect the Company's business, operating results and financial condition, or the trading price of the Company's securities. The risk factors described below are not the only risks and uncertainties that the Company faces. Additional risks and uncertainties not presently known to the Company or that the Company considers immaterial may also materially and adversely affect its business operations.

Commodity price fluctuations.

The Company's financial results are directly related to commodity prices as its revenues are derived from sales of palladium, and to a lesser extent, platinum, gold, nickel and copper produced from the LDI Mine. Commodity prices can fluctuate widely and are affected by numerous factors beyond the Company's control, including production at other mines, supply from recycling, producer hedging activities, the state of the automotive industry, other production and investor demands and overall political and economic conditions. The price of palladium is affected by global supply and demand for the commodity, and the availability and cost of substitutes for palladium, such as platinum, and supply from Russia and South Africa, the two major PGE producing countries. An increased supply of palladium from Russia or South Africa could have a negative impact on the price of palladium. Further, the prices of palladium and platinum have on occasion been subject to very rapid short-term changes because of the smaller size of the market relative to other metals. The aggregate effect of these factors is impossible to predict.

If the price of palladium drops, this will adversely affect the Company's financial performance and results of operations. Historically, changes in the market price of palladium have significantly impacted the Company's profitability and the trading price of its Common Shares.

Fluctuations in foreign currency exchange rates in relation to the U.S. dollar.

Changes in the CAD/US exchange rate significantly affect the Company's financial and operating results and cash flows, as the Company's revenues and debt are denominated in US dollars but most of its operating and capital costs are incurred in Canadian dollars. As a result, a strengthening Canadian dollar relative to the US dollar will result in reduced profit or increased losses for the Company. The CAD/US exchange rate has varied significantly over the past year. From time to time, the Company may engage in hedging activities to manage its exposure related to changes in exchange rates, interest rates and commodity prices, but those hedging activities may not be successful in mitigating the Company's exposure to those changes. There can be no assurance that future foreign exchange fluctuations will not materially adversely affect the Company's financial performance and results of operations.

In addition, changes in currency exchange rates, and particularly a significant weakening of the South African rand or the Russian ruble relative to the US dollar, could reduce relative costs of production and improve the competitive cost position of South African or Russian PGE producers.

The Company may require additional financing to fund long-term investment capital requirements.

The Company currently has one available source of financing, the Credit Facility, a US\$125 million revolving term credit facility, between the Company, BMO Capital Markets and BNP Paribas, dated December 17, 2018 and which matures on December 17, 2023. The Credit Facility replaces the Company's previous term and revolving credit facilities, including the Scotia Credit Facility. A portion of the proceeds of the initial drawdown under the Credit Facility was used to repay in full the outstanding senior secured term loan with an affiliate of Brookfield. As at December 31, 2018 the Credit Facility had available credit of US\$80 million.

The Company utilizes the Credit Facility as needed to both supplement working capital and to fund certain capital expenditures. The Credit Facility contains several financial covenants, which, if not met could result in an event of default. Certain events of default entitle the lender to demand immediate repayment.

The Company's cash and liquidity position and covenant compliance is sensitive to a number of variables which cannot be predicted with certainty, including, but not limited to, meeting production targets, metal prices, foreign exchange rates, operational costs and capital expenditures. Even though the Company has the financing noted above in place, in the event that management's assumptions are not realized, the Company believes that additional financing may be required.

Management has estimated that the Company's existing cash is sufficient to fund forecasted operating and investing cash requirements in the year ending December 31, 2019. However, there can be no assurance that additional financing will be available to the Company when needed or on terms acceptable to the Company. Failure to obtain necessary financing at the time required may result in the delay or indefinite postponement of exploration, development or production on any or all of the Company's properties, or the loss of one or more of its property interests, and could ultimately cause the Company to cease operations.

The Company may not be able to generate sufficient cash to service all of its indebtedness and may be forced to take other actions to satisfy its obligations under its indebtedness.

The Company's ability to make scheduled payments of interest and principal on its outstanding indebtedness or to refinance its debt obligations depends on its financial and operating performance, which is subject to prevailing economic and competitive conditions and to certain financial, business and other factors beyond its control. There can be no assurance that the Company will generate sufficient cash flow from operating activities to make its scheduled repayments of principal, interest, and any applicable premiums.

The Company may be forced to pursue strategic alternatives such as reduce or delay capital expenditures, sell assets or operations, seek additional capital or restructure or refinance its indebtedness. No assurances can be made that the Company would be able to take any of these actions, that these actions would be successful, or that these actions would be permitted under the terms of existing or future debt agreements. Such indebtedness restricts the Company's ability to dispose of assets and use the proceeds from such dispositions and, accordingly, the Company may not be able to dispose of assets or to obtain or use the proceeds of dispositions.

If the Company cannot make scheduled payments on its debt, or comply with its covenants, it will be in default of such indebtedness and, as a result:

- holders of such debt could declare all outstanding principal and interest to be due and payable;
- the lenders could terminate their commitments to lend the Company money;
- the holders of the Company's secured debt could realize upon the assets securing their borrowings;

- the Company could become the subject of restructuring, insolvency, bankruptcy or liquidation proceedings; and
- the value of the Company's securities could decline.

Inherent risks and hazards associated with exploration, mining and processing pose operational and environmental risks.

Exploration, mining and processing operations involve many risks and hazards, including, among others:

- metallurgical and other processing problems;
- geotechnical problems;
- unusual and unexpected rock formations;
- ground or slope failures or underground cave-ins;
- environmental contamination;
- industrial accidents;
- fires;
- flooding and periodic interruptions due to inclement or hazardous weather conditions or other acts of nature;
- organized labour disputes or work slow-downs;
- mechanical equipment failure and facility performance problems; and
- the availability of critical materials, equipment and skilled labour.

These risks could result in: damage to, or destruction of, the Company's properties or production facilities; personal injury or death; environmental damage; delays in mining or processing; increased production costs; asset write downs; monetary losses; and legal liability.

In previous years, the Company has experienced significant water flows onto its properties as a result of weather conditions in northern Ontario. The Company may be required to store water in underground areas, limiting its ability to operate in those areas. Production and capital development could be delayed if the Company cannot operate in necessary areas as a result of such flooding, which could cause the Company to miss production targets and to lose revenue. The Company may also incur additional costs as a result of such flooding, both in dealing with excess water and in remediating any damage resulting from flooding.

The Company cannot be certain that its insurance will cover all of the risks associated with mining and processing or that it will be able to maintain insurance to cover these risks at economically feasible rates. The Company may also become subject to liability for hazards against which it cannot insure or against which the Company has elected not to insure because of high premium costs, commercial impracticality or other reasons. Such events could result in a prolonged interruption in operations that would have a negative effect on the Company's ability to generate revenues, profits and cash flow. Losses from such events may increase costs and decrease profitability.

Failure to effectively manage the Company's tailings facilities could have a material adverse effect on the Company.

Managing the tailings produced by the LDI Mine is integral to production. The Company is in the second phase of an expansion of the long-term tailings and water management facility that will provide sufficient storage capacity to support operations at the full production rate. Given recent experiences with

water balance issues in the tailings management facilities, if the Company does not expand the tailings facilities on a timely basis, palladium production could be constrained or suspended.

The Company is required to obtain and renew licensing and permits, which is often a costly and time-consuming process.

Throughout the normal course of business, the Company is required to obtain and renew permits (including environmental permits) for exploration, operations and expansion of existing operations or for the development of new projects. Obtaining or renewing governmental permits is a complex and time-consuming process. The duration and success of permitting efforts are contingent upon many variables not within the Company's control, including the interpretation of requirements implemented by the applicable permitting authority.

The Company may not be able to obtain or renew permits that are necessary for existing operations, additional permits for possible future changes or additional permits associated with new legislation. The cost to obtain or renew permits may exceed the Company's expectations. Any unexpected delays or costs associated with the permitting process could delay the development or impede the operation of a mine, which could materially adversely affect the Company's revenues and future growth.

Additionally, it is possible that previously issued permits may become suspended for a variety of reasons, including through government or court action. There can be no assurance that the Company will continue to hold or obtain, if required to, all permits necessary to develop or continue operating the property.

There can be no assurance that delays or objections will not occur in connection with obtaining any necessary renewals of permits for the existing operations or additional permits or authorizations for any possible future changes to operations at LDI.

Title to the Company's mineral properties cannot be guaranteed.

The Company cannot guarantee that title to its properties will not be challenged. The Company's ability to ensure that it has obtained secure claim to individual mineral properties or mining concessions may be severely constrained. The Company's mineral properties may be subject to prior recorded and unrecorded agreements, transfers or claims, and title may be affected by, among other things, undetected defects. Additionally, there can be no guarantee that potential First Nations claims to the Company's mineral properties will not create delays in project approval, unexpected interruptions in project progress or production, or result in additional costs to advance the project. A successful challenge to the area and location of these claims could result in the Company being unable to operate on its properties as permitted or being unable to enforce its rights with respect to its properties.

Uncertainty related to First Nations rights and title in Ontario may create delays or interruptions.

The nature and extent of First Nations rights and title remains the subject of active debate, claims, and litigation in Ontario. The Supreme Court of Canada has held that aboriginal groups may have a spectrum of aboriginal rights in lands that have been traditionally used or occupied by their ancestors. Such aboriginal rights and title are not absolute and may be infringed by government in furtherance of a legislative objective, subject to meeting a justification test. The effect of such claims on any particular area of land will not be determinable until the exact nature of historical use, occupancy and rights to such property have been clarified by a decision of the Courts or definition in a treaty. First Nations in Canada are seeking settlements including compensation from governments with respect to these claims, and the effect of these claims cannot be estimated at this time. The federal and provincial governments have been seeking to negotiate settlements

with aboriginal groups throughout Ontario in order to resolve many of these claims. Any settlements that may result from these negotiations may involve a combination of cash, resources, grants of conditional rights to undertake traditional pursuits (like hunting, gathering, trapping and fishing) on public lands, and some rights of self- government. The issues surrounding aboriginal title and rights are not likely to be resolved in the near future.

There can be no guarantee that the unsettled nature of First Nations rights and title in Ontario will not create delays in permit approval, unexpected interruptions in operations or development projects, or result in additional costs. In many cases mine construction and mining activities are only possible with consultation with local First Nations groups.

As a participant in the resource extraction industry, the Company may face opposition from local and international groups.

There is an increasing level of public concern relating to the effects of mining production on its surroundings, communities and environment. Certain non-governmental organizations, public interest groups and reporting organizations (“NGOs”), who oppose globalization and resource development and who may not be bound to codes of ethical reporting, can be vocal critics of the mining industry. In addition, there have been many instances in which local community groups have opposed resource extraction activities, which have resulted in disruption and delays to the relevant operation. While the Company seeks to operate in a socially responsible manner, NGOs or local community organizations could direct adverse publicity and/or disrupt the operations of the Company in respect of one or more of its properties, regardless of its successful compliance with social and environmental best practices, due to political factors, activities of unrelated third parties on lands in which the Company has an interest or the Company’s operations specifically. Any such actions and the resulting media coverage could have an adverse effect on the reputation and financial condition of the Company or its relationships with the communities in which it operates, which could have a material adverse effect on the Company’s business, financial condition, results of operations or prospects.

Deterioration of economic conditions will adversely impact the Company’s revenues.

The deterioration of economic conditions generally could negatively impact the Company’s business in several ways. For instance, market volatility, tight credit markets and reduced consumer confidence and business activity can negatively impact the Company’s revenues and the market price of its Common Shares.

In addition, a prolonged or significant global economic contraction could put downward pressure on market prices of PGEs, particularly if demand for PGEs decline in connection with consumer demand, since PGEs are used in the production of items such as automobiles, electronics and jewellery.

In addition, some purchasers of PGEs, such as automobile manufacturers, could experience serious cash flow problems due to deteriorating global capital markets. Approximately 85% of global demand of palladium is for the manufacture of automotive catalytic converters. Auto companies and other PGE purchasers may be forced to reduce their product lines or production, shut down their operations or file for bankruptcy protection, which would have a material adverse effect on the Company’s business.

Inability to meet production level and operating cost estimates.

Planned production levels, capital expenditures and operating costs are estimates, which are based on technical studies as well as the Company’s experience in operating the LDI Mine. All of the Company’s estimates are subject to numerous uncertainties, many of which are beyond the Company’s control. The Company’s ability to achieve or maintain projected production at the LDI Mine is uncertain due to the fact that

the Company's production decisions are not based on feasibility studies of mineral reserves demonstrating economic viability. In addition, the Company may have difficulties attracting and maintaining a sufficient number of qualified workers to meet projected production levels. The Company cannot give assurances that its actual production levels will not be substantially lower than its estimates or that its capital expenditures and operating costs will not be materially higher than anticipated. Failure to meet production levels and operating costs estimates could adversely affect the Company's financial performance and results of operations.

Concentrate marketing and transportation risk.

Concentrates produced at the LDI Mine are loaded onto highway road vehicles for transport to smelters in Canada. The Company could be subject to potential increases in road transportation charges and treatment and refining charges. Transportation of such concentrate is also subject to numerous risks including, but not limited to, delays in delivery of shipments, road blocks, weather conditions and environmental liabilities in the event of an accident or spill. There is no assurance that transportation contracts for the concentrates will be entered into on acceptable terms or at all.

NAP could also be subject to limited smelter availability and capacity and could face the risk of a potential interruption of business from a third party beyond its control, which could have a material adverse effect on the Company's operations and revenues.

Expansion of the LDI Mine involves significant risks.

There is significant risk involved in all expansion projects. Project delays may adversely affect expected revenues and cost overruns may adversely affect project economics. In addition, completed expansion projects may not operate as expected by the Company, or result in the achievement of targeted operational results. The Company's ability to execute on its development projects on time and on budget depends on many factors beyond the Company's control, including the availability of equipment and personnel, access, weather, accidents, equipment breakdown, the need for government and regulatory approvals and unexpected or uncontrollable increases in the costs or availability of materials. Other risks include, but are not limited to, delays in obtaining sufficient financing, as well as unforeseen difficulties encountered during the expansion process including labour disputes or opposition by First Nations to the expansion and other risks that generally apply to the Company.

Calculation of mineral reserves, mineral resources and metal recovery are only estimates, and there can be no assurance about the quantity and grade of minerals until the metals are actually mined.

The calculation of mineral reserves, mineral resources and grades are merely estimates and depend on geological interpretation and statistical inferences or assumptions drawn from drilling and sampling analysis, which might prove to be inaccurate. Mineral resources that are not mineral reserves do not have demonstrated economic viability and mineral reserve estimates are based on certain assumptions, including metal prices. Until mineral reserves or mineral resources are actually mined and processed, the quantity of reserves or resources and their respective grades must be considered as estimates only. Any material change in the quantity of mineral reserves, mineral resources, grade or stripping ratio may affect the economic viability of the Company's operations.

The Company cannot guarantee that it will recover the indicated quantities of metals. Future production could differ dramatically from such estimates for the following reasons:

- actual mineralization or ore grade could be different from those predicted by drilling, sampling, technical studies or technical reports;
- resources may not be successfully converted to reserves;
- changes in the life-of-mine plan; or
- the grade of ore may vary over the life of the mine and the Company cannot give any assurances that any particular mineral reserve estimate will ultimately be recovered.

The occurrence of any of these events may cause the Company to adjust its mineral resource and reserve estimates or change its mining plans, which could negatively affect the Company's financial condition and results of operations. Moreover, short-term factors, such as the need for additional development of the orebody or the processing of new or different grades may adversely affect the Company's operations and results.

Decreases in the market price of palladium or other metals or changes to foreign currency exchange rates may render the mining of reserves uneconomic.

The mineral resource and reserve figures presented in this AIF are estimates, which are, in part, based on forward-looking information, and no assurance can be given that the indicated level of palladium, platinum, gold, nickel and copper will be produced. Factors such as metal price fluctuations, changes in the CAD/US exchange rate, increased production costs and reduced recovery rates may render the present proven and probable reserves unprofitable to develop at a particular site or sites for periods of time.

Mineral reserve and resource estimates would be lower than estimated to the extent that actual metal prices are lower than assumed or the Canadian dollar is stronger than assumed.

The Company's operations may be affected by increased demand for, and cost of, exploration, development and construction services and equipment.

Strength of the metal market can result in an increase in exploration, development and construction activities around the world, resulting in increased demand for, and cost of, exploration, development and construction services and equipment. The costs of such services and equipment could increase in the future, which could result in delays or materially increased costs if services or equipment cannot be obtained in a timely manner or at acceptable prices.

Future exploration at the LDI property or at the Company's other exploration properties may not result in increased mineral reserves or mineral resources.

As mines have a depleting asset base, the Company actively seeks to replace and expand its mineral reserves and mineral resources through exploration and development, strategic acquisitions and joint ventures. The Company has conducted exploration programs on the LDI property and elsewhere with the objective of increasing total mineral reserves and mineral resources. Exploration for minerals involves many risks and uncertainties and is frequently unsuccessful. Among the many uncertainties inherent in any exploration and development program are the location of mineralized zones, the development of appropriate metallurgical processes, the receipt of necessary governmental permits to mine a deposit and the construction of mining and processing facilities. Assuming discovery of an economic mineralized zone, several years may elapse from the completion of the exploration phase until commercial production commences and during such time the economic feasibility of production may change. There can be no assurance that the Company's current exploration and development programs will result in economically viable mining operations or yield new mineral reserves and mineral resources to replace current mineral reserves and mineral resources. This

could prevent the Company from sustaining its targeted production levels over the long term, which could impact its ability to generate sufficient cash flows to fund its operations.

The Company's future prospects will be negatively affected if the LDI Mine fails to achieve or maintain projected production levels.

The Company's future prospects will be negatively affected if the LDI Mine fails to achieve or maintain projected production levels. Unforeseen conditions or developments could arise during the ongoing development and operation of the LDI Mine or other properties, which could increase costs and adversely affect the Company's ability to generate revenue and profits. These conditions may include, among others:

- shortages or unanticipated increases in the cost of equipment, materials or skilled labour;
- delays in delivery of equipment or materials;
- labour disruptions;
- adverse weather conditions or natural disasters;
- accidents;
- unforeseen engineering, design, environmental or geotechnical problems; and
- unanticipated changes in the life-of-mine plan or the ultimate mine design.

The Company is subject to extensive environmental and other regulatory requirements.

Environmental laws and regulations affect the exploration, development, mining and processing operations of the Company. These laws and regulations set various standards regulating the environment and require the Company to obtain various operating approvals and licenses. Environmental legislation generally provides for restrictions and prohibitions on emissions of various substances produced in association with mining operations, such as seepage from tailings containment facilities, which could result in environmental pollution.

In addition, amendments to current laws or regulations governing mining companies, or more stringent implementation thereof, could have a material adverse impact on the Company and cause increases in costs, reductions in levels of production or delays in the development of new mining properties. In addition to existing requirements, new environmental legislation may be implemented in the future with the objective of further protecting human health, the environment and climate change. New environmental legislation or changes in existing environmental legislation could have a negative effect on production levels, product demand, and methods of production and distribution. The complexity and breadth of these issues make it difficult for the Company to predict their impact.

A breach of such legislation could result in the issuance of governmental orders, imposition of fines and penalties and, in certain circumstances, could result in the loss of operating licenses or approvals, or the suspension of the Company's operations. Significant liabilities could be imposed for damages or clean-up costs in the event of damage to the environment or non-compliance with environmental laws or regulations, which may have a material adverse impact on the Company's operations or financial results. If the Company fails to obtain or maintain the necessary operating approvals or licenses it may not be able to continue its operations in its usual manner or at all.

The Company cannot give assurances that it will at all future times be in compliance with all federal and provincial environmental legislation or that steps to bring the Company into compliance would not have a negative effect on its financial condition and results of operations.

The cost of complying with environmental legislation may be significant.

The Company's operations are subject to extensive environmental legislation. This legislation requires the Company to obtain various operating approvals and licenses and also imposes standards and controls on activities relating to exploration, development and production. The cost to the Company of obtaining such approvals and licenses and abiding by environmental legislation, standards and controls may be significant.

The Company will be responsible for all costs of closure and reclamation at the LDI property. In addition, to the extent that the Company's exploration activities at other projects disturb the land or some other environmental attribute, the Company may incur clean-up and other reclamation costs at such projects. The LDI Mine closure plan provides for approximately \$22.4 million of closure and restoration costs plus \$1.6 million for an electricity supply contract commitment. This obligation of the Company is secured by a letter of credit in the amount of \$22.4 million. Including the Shebandowan West project, the Company's obligations with respect to the eventual clean-up and restoration of these sites is secured by total letters of credit in the amount of \$22.7 million. There can be no assurance that the closure and reclamation costs for these sites will not substantially exceed the Company's estimates, or that letters of credit will cover these costs.

Changes in environmental legislation or in its enforcement, new information on existing environmental conditions or other events, including changes in environmental controls or standards or in their enforcement, may increase future environmental expenditures or otherwise have a negative effect on the Company's financial condition and results of operations.

Compliance with current and future government regulations may cause the Company to incur significant costs.

The Company's activities are subject to extensive Canadian federal and provincial legislation governing matters such as mine safety, occupational health, labour standards, prospecting, exploration, production, exports, explosives, management of natural resources, price controls, land use, water use, and taxes. Compliance with applicable legislation could require the Company to make significant capital outlays. The enactment of new legislation or more stringent enforcement of current legislation may increase costs, which could have a negative effect on the Company's financial position. The Company cannot make assurances that it will be able to adapt to these regulatory developments on a timely or cost-effective basis. Violations of these laws, regulations and other regulatory requirements could lead to substantial fines, penalties or other sanctions, including possible shut-downs of the LDI property and future operations, as applicable.

Significant Ownership by Brookfield

Brookfield holds an approximately 91% voting interest in the Company (on a non-diluted basis). For so long as Brookfield, either directly or indirectly, maintains a significant voting interest in the Company, Brookfield will have the ability to exercise substantial influence with respect to the Company's affairs and significantly affect the outcome of shareholder votes, and may have the ability to prevent certain fundamental transactions. The Company's Common Shares may be less liquid and trade at a discount relative to the trading that could occur in circumstances where Brookfield did not have the ability to significantly influence or determine matters affecting the Company. Additionally, Brookfield's significant voting interest in the Company may discourage transactions involving a change of control of the Company, including transactions in which an investor, as a holder of Common Shares, might otherwise receive a premium for its Common Shares over the then-current market price.

Future Sales of Shares by Brookfield

No prediction can be made as to the effect, if any, of future sales of Common Shares by Brookfield on the market price of the Common Shares. However, the future sale of a substantial number of shares by Brookfield, or the perception that such sales could occur, could adversely affect prevailing market prices for the Common Shares.

If the Company loses key personnel or is unable to attract and retain personnel, the Company's mining operations and prospects could be significantly harmed.

The Company is dependent upon the services of a small number of members of senior management. The Company's current operations and its future prospects depend on the experience and knowledge of these individuals. The Company does not maintain any "key person" insurance. The loss of one or more of these individuals could have a material adverse effect on the Company's mining operations and results of operations.

The Company faces competition from other, larger suppliers of PGEs and from potential new sources of PGEs.

The Company competes globally with other PGE producers and suppliers, some of which are significantly larger and have access to greater mineral reserves and financial resources. In addition, recycling and new mines could increase the global supply of palladium. The Company may not be successful in competing with these existing and emerging PGE producers and suppliers.

Current and future litigation and regulatory proceedings may impact the revenue and profits of the Company.

The Company may be subject to civil claims (including class action claims) based on allegations of negligence, breach of statutory duty, public nuisance or private nuisance or otherwise in connection with its operations or investigations relating thereto. Potential liability may be covered in whole or in part by insurance; however such liability may be material to the Company and may materially adversely affect its ability to continue operations.

In addition, the Company may be subject to actions or related investigations by governmental or regulatory authorities in connection with its activities at the LDI property or its other properties. Such actions may include prosecution for breach of relevant legislation or failure to comply with the terms of the Company's licenses and permits and may result in liability for pollution, other fines or penalties, revocations of consents, permits, approvals or licenses or similar actions, which could be material and may impact the results of operations of the Company. The Company's current insurance coverage may not be adequate to cover any or all of the potential losses, liabilities and damages that could result from the civil and/or regulatory actions referred to above, or the Company may elect not to insure against such risks.

The development of new technology or new alloys could reduce the demand for palladium and platinum.

Demand for palladium and platinum may be reduced if manufacturers in the automotive, electronics and dental industries find substitutes for palladium or platinum. The development of a substitute alloy or synthetic material which has catalytic characteristics similar to PGEs could result in a decrease in demand for palladium and platinum. Furthermore, if the automotive industry were to develop automobiles that do not require catalytic converters, such as pure electric vehicles, it could significantly reduce the demand for palladium and platinum. High prices for palladium or platinum would create an incentive for the development

of substitutes. Any such developments could have a material adverse effect on the Company's financial condition and results of operations.

The Company's hedging activities could expose it to losses.

From time to time, the Company may engage in hedging activities to manage its exposure related to currencies, interest rates and commodity prices. While hedging related to realized metal prices may protect the Company against low metal prices, it may also limit the price the Company can receive on hedged products. As a result, the Company may be prevented from realizing possible revenues in the event that the market price of a metal or currency exceeds the price stated in a forward sale or call option contract. In addition, the Company may experience losses if a counterparty fails to purchase under a contract when the contract price exceeds the spot price of a commodity.

Lack of infrastructure could impact operations, or delay or prevent the Company from developing its projects.

Operations and the completion of development projects is subject to various requirements, including the availability and timing of acceptable arrangements for electricity or other sources of power, water and transportation facilities. The lack of availability on acceptable terms or the delay in the availability of any one or more of these items could impact operations or prevent or delay development projects. If adequate infrastructure is not available in a timely manner, there can be no assurance that:

- operations will achieve the anticipated costs or production volumes;
- development projects will be completed on a timely basis, if at all; or
- the ongoing costs associated with development of the Company's advanced projects will not be higher than anticipated.

The Company may fail to achieve and maintain adequate internal control over financial reporting pursuant to the requirements of legislation in Canada (NI 43-109) and the Sarbanes-Oxley Act.

The Company documented and tested, during its fiscal year ended December 31, 2018, its internal control procedures in order to satisfy the requirements of Section 404 of the Sarbanes-Oxley Act ("**SOX**") and equivalent Canadian legislation. Both SOX and Canadian legislation require management to assess annually the effectiveness of the Company's internal control over financial reporting ("**ICFR**").

The Company may fail to maintain the adequacy of its ICFR as such standards are modified, supplemented or amended from time to time, and the Company may not be able to ensure that it can conclude, on an ongoing basis, that it has effective ICFR in accordance with Section 404 of SOX and equivalent Canadian legislation. The Company's failure to satisfy the requirements of Section 404 of SOX and equivalent Canadian legislation on an ongoing, timely basis could result in the loss of investor confidence in the reliability of its financial statements, which in turn could harm the Company's business and negatively impact the trading price of its Common Shares or the market value of its other securities. In addition, any failure to implement required new or improved controls, or difficulties encountered in their implementation, could harm the Company's operating results or cause it to fail to meet its reporting obligations. Future acquisitions of companies, if any, may provide the Company with challenges in implementing the required processes, procedures and controls in its acquired operations. No evaluation can provide complete assurance that the Company's ICFR will detect or uncover all failures of persons within the Company to disclose material information otherwise required to be reported. The effectiveness of the Company's processes, procedures and controls could also be limited by simple errors or faulty judgments. In addition, if the Company expands, the

challenges involved in implementing appropriate ICFR will increase and will require that the Company continue to improve its ICFR.

AUDIT COMMITTEE INFORMATION

Audit Committee Mandate

The Company's audit committee (the "**Audit Committee**") is responsible for assessing the performance of the Company's auditors and for reviewing the Company's financial reporting and internal controls. The Audit Committee has adopted a mandate, ratified by the Board, which describes roles and responsibilities of the members of the Audit Committee.

The mandate of the Audit Committee is set out in full beginning on page 69.

Composition of the Audit Committee

The Audit Committee comprises of Messrs. Chambers (Chair), Jentz and Fauquier, each of whom has been determined by the Board to be "independent" and "financially literate", as such terms have been defined in National Instrument 52-110 – *Audit Committees*. The Board has selected each of the above individuals based upon their education and experience, as same is relevant to his responsibilities as a member of the Audit Committee.

Relevant Education and Experience

Mr. Chambers is a professional engineer and financial executive with over 35 years of business, technical and financial experience. In 2017, Mr. Chambers retired as Executive Vice President and Chief Financial Officer at Sherritt International Corporation, a major international resource company. Mr. Chambers continues to consult in the materials sector. Mr. Chambers' career as a senior executive in the mining and chemical industries includes positions with Dynatec Corporation, Falconbridge Limited and the Dow Chemical Company. Mr. Chambers holds a Bachelor of Engineering and Management from McMaster University and is a charter member of the Institute of Corporate Directors.

Mr. Jentz is currently Vice President, Corporate Development and Investor Relations at SEMAFO. He has over 20 years' experience in corporate finance and mergers and acquisitions, mostly within the mining sector. Previously, Mr. Jentz served as a senior member of the mining teams at both regional and global investment banking firms. A chartered accountant, he holds a B.Sc. degree in actuarial science from University of Western Ontario and an MBA from McMaster University.

Mr. Fauquier is a mining engineer with a broad range of management skills covering mining, process operations and development undertaken in both open pit and underground operations. Retired in 2017, Mr. Fauquier's career in mining spans 43 years, where he recently held the position of Global Managing Director for Hatch Ltd. a consulting engineering firm where he was responsible for mining and mineral processing, as well as the operational services. Prior to joining Hatch Ltd in 2003, Mr. Fauquier was the Senior Vice President of Barrick Gold Corporation where he was responsible for the U.S. and Peruvian operations. Mr. Fauquier holds a B.Sc. Mining from Queen's University.

Audit Committee Pre-Approval Policies and Procedures

All audit and non-audit services performed by the Company's external auditors are pre-approved by the Audit Committee.

External Auditor Service Fees

Audit Fees

The aggregate fees billed by KPMG LLP, the Company's external auditors for the fiscal years ended December 31, 2018 and 2017, for audit fees, including professional services that are normally provided by the external auditors in connection with statutory and regulatory filings or engagements for such years were \$330,000 and \$335,000, respectively.

Tax Fees

The aggregate fees billed by KPMG LLP for the fiscal years ended December 31, 2018 and 2017 for professional services rendered by it for tax compliance, tax advice, tax planning and other services were \$100,000 and \$100,000, respectively. In 2018, such fees were paid for the preparation of federal/provincial tax returns and other tax advisory services. In 2017, such fees were paid for the preparation of federal/provincial tax returns and tax advisory services.

ADDITIONAL INFORMATION

Additional information, including directors' and officers' remuneration and indebtedness, principal holders of the Company's securities and securities authorized for issuance under equity compensation plans, is contained in the Company's management information circular for its most recent annual meeting of security-holders that involved the election of directors and can be found on the Company's SEDAR profile at www.sedar.com. As well, additional financial information is provided in the Company's annual financial statements for the year ended December 31, 2018 and management's discussion and analysis of operations and financial results.

MANDATE OF THE AUDIT COMMITTEE

Purpose

The Audit Committee (the “Committee”) is a committee of the Board of directors (the “Board”) of North American Palladium Ltd. (the “Company”). Its primary function shall be to assist the Board in fulfilling its oversight responsibilities with respect to:

1. The financial reporting process and the quality, transparency and integrity of the Company’s consolidated financial statements and other related public disclosures;
2. The Company’s internal controls over financial reporting;
3. The Company’s compliance with legal and regulatory requirements relevant to its consolidated financial statements and financial reporting;
4. Ensuring that there is an appropriate standard of corporate conduct for senior financial personnel and employees;
5. The external auditor’s (as defined below) qualifications and independence; and
6. The performance of the internal audit function and the external auditor engaged for the purpose of preparing or issuing an auditor’s report or performing other audit, review or attest services for the Company (the “external auditor”).

The function of the Committee is oversight. The members of the Committee are independent of the Company. The Company’s management is responsible for the preparation of the Company’s consolidated financial statements in accordance with applicable accounting standards and applicable laws and regulations. The Company’s external auditor is responsible for the audit or review, as applicable, of the Company’s consolidated financial statements in accordance with applicable auditing standards and laws and regulations. Accordingly, in carrying out its oversight responsibilities, the Committee does not provide any expert or special assurance as to the Company’s financial statements or internal controls or any professional certification as to the auditor’s work.

Responsibilities

The Committee shall:

1. Review and assess the adequacy of this Mandate on an annual basis and submit it to the Governance, Nominating and Compensation Committee together with any proposed amendments for review and comment before it is submitted to the Board for approval;
2. Meet with the Company’s external auditor as necessary and before the submission of the audited annual financial statements to the Board and communicate to external auditors that they are ultimately accountable to the shareholders of the Company;
3. Require the external auditor to report directly to the Committee;
4. Review the annual financial statements of the Company and “management’s discussion and analysis” and, where appropriate, recommend the financial statements for approval to the Board;
5. Review and where appropriate, recommend for approval to the Board the interim financial statements of the Company and “management’s discussion and analysis”;
6. Review reconciliations of the annual or interim financial statements, and all other audited or unaudited financial information contained in public disclosure documents, including without

limitation, any prospectus, or other offering or public disclosure documents and financial statements required by regulatory authorities.

7. Review and discuss with management prior to dissemination earnings press releases and other press releases containing financial information (to ensure consistency of the disclosure to the financial statements), as well as financial information and earnings guidance provided to analysts including the use of “pro forma” or “adjusted” non-IFRS information in such press releases and financial information. Such review may consist of a general discussion of the types of information to be disclosed or the types of presentations to be made;
8. Obtain explanations from management on all the significant variances between comparative reporting periods and, in respect the annual financial statements, question management and the external auditor regarding the significant financial reporting issues discussed during the fiscal period and the method of resolution;
9. Be responsible for:
 - a. Ensuring that a written statement is obtained from the external auditor describing all relationships between the external auditor and the Company;
 - b. Discussing with the external auditor any disclosed relationships or services that may impact the objectivity and independence of the external auditor; and
 - c. Determining that the external auditor have a process in place to address the rotation of the lead partner and other audit partners serving the account as required under Canadian independence standards;
 - d. Reviewing and evaluating the external auditor’s independence, experience, qualifications and performance (including the performance of the lead audit partner) and determine whether the external auditor should be appointed or re-appointed and nominate the external auditor for appointment or re-appointment by the shareholders.
10. Assess the performance of the external auditor and recommend to the Board at least annually a duly qualified external auditor to be nominated (for appointment or retention) for the purpose of preparing or issuing an audit report or performing other audit, review or attest services for the Company;
11. Review the plan and scope of the audit to be conducted by the internal and external auditor of the Company;
12. Recommend to the Board for approval, the compensation of the external auditor;
13. Directly oversee the work of the external auditor;
14. Resolve any disagreements between management and the external auditor regarding financial reporting;
15. Pre-approve all audit and permitted non-audit services to be provided to the Company or its subsidiary entities by the external auditor, in accordance with Applicable Laws;
16. Review all post-audit or management letters containing the recommendations of the external auditor and management’s response or follow-up of any identified weakness;
17. Meet separately, periodically, with management, with internal auditors (or other personnel responsible for the internal audit function) and with external auditor;

18. Determine that adequate procedures are in place for the review of the Company's public disclosure of financial information extracted or derived from the Company's financial statements and periodically assess the adequacy of these procedures;
19. Establish procedures for:
 - a. The receipt, retention and treatment of complaints received by the Company regarding accounting, internal accounting controls, or auditing matters; and
 - b. The confidential, anonymous submission by employees of the Company of concerns regarding questionable accounting or auditing matters;
20. Enquire as to the adequacy of the Company's system of internal controls and review periodic reports from management about internal controls, including an assessment of risk with respect to financial reporting;
21. Review and approve all related party transactions;
22. Review and approve the Company's hiring policies regarding employees and former employees of the present and former external auditors of the Company;
23. Have such other duties, powers and authorities, consistent with Applicable Laws (as defined below), as the Board may, by resolution, delegate to the Audit Committee from time to time.

Composition

The Committee shall consist of a minimum of two directors of the Company.

1. The Committee shall be comprised entirely of independent directors, as such term is defined by applicable laws and related rules and regulations, and rules of relevant stock exchanges (collectively referred to as "Applicable Laws").
2. A member is only exempt from the independence requirements if permitted by Applicable Laws. The appointment of a non-independent director shall be disclosed in the next proxy circular mailed to shareholders. If there is reliance on curing provisions, notice shall be given to the stock exchanges immediately upon learning of the circumstances that resulted in the non-compliance.
3. The Board shall appoint one Member as the chair of the Committee (the "Chair"). If the Chair is absent from a meeting, the Members shall select an Acting Chair from among those Members in attendance at the meeting.
4. A quorum for the transaction of business at all meetings of the Committee shall be a majority of members.

Qualifications and Experience

At the time of appointment or within a reasonable period of time following appointment, each member of the Committee must be financially literate, meaning the member has the ability to read and understand a set of financial statements that present the breadth and level of complexity or accounting issues that are generally comparable to the breadth and complexity of the issues that can be reasonably be expected to be raised by the Company's financial statements.

1. At least one member (the “financial expert”) of the Committee must have:
 - a) An understanding of financial statements and accounting principles used by the Company to prepare its financial statements;
 - b) The ability to assess the general application of such accounting principles in connection with the accounting for estimates, accruals and reserves;
 - c) Experience preparing, auditing, analyzing or evaluating financial statements that present a breadth and level of complexity of accounting issues that are generally comparable to the breadth and complexity of issues that can reasonably be expected to be raised by the Company’s financial statements, or experience actively supervising one or more persons engaged in such activities;
 - d) An understanding of internal controls and procedures for financial reporting; and
 - e) An understanding of Committee functions.
2. The financial expert must have acquired the foregoing attributes through one or more of the following:
3. Education and experience as a principal financial officer, principal accounting officer, controller, public accountant or auditor or experience in one or more positions that involve the performance of similar functions;
4. Experience actively supervising a principal financial officer, principal accounting officer, controller, public accountant, auditor or person performing similar functions;
5. Experience overseeing or assessing the performance of companies or public accountants with respect to the preparation, auditing or evaluation of financial statements; or
6. Other relevant experience.

Meetings

Meetings of the Committee may be called by any member, the Chairman of the Board, the President and Chief Executive Officer (“CEO”) or Chief Financial Officer (“CFO”) of the Company, internal auditors or the external auditor.

The following shall apply to the meetings of the Committee:

1. The business of the Committee shall be transacted in person, by conference call or by resolution in writing. All questions at a meeting shall be decided by majority vote of those present and the Chair of the meeting shall not have a second or casting vote.
2. A resolution in writing signed by all members of the Committee shall be as valid as if it had been passed at a duly called and constituted meeting. Such resolutions may be signed in one or more counterparts.
3. The Committee Chair shall periodically report to the Board on the activities of the Committee.
4. The Committee may invite from time to time such person as it may see fit to attend its meetings and to take part in discussion and consideration of the affairs of the Committee, including,

without limitation, management and/or the external auditor, whose attendance shall be at the expense of the Company.

5. The minutes of the proceedings of the Committee and any resolutions in writing shall be kept in a book provided for that purpose which shall always be open for inspection by any director of the Company.

Members of the Committee will meet privately with senior management as frequently as they feel is appropriate to fulfill the Committee's responsibilities, but not less than annually.

Authority

The Committee shall have the authority:

1. For the purpose of performing their duties, to inspect all of the books and records of the Company and its affiliates and to discuss such accounts and records and any matters relating to the financial position or condition of the Company with the officers and internal auditors of the Company and its affiliates and the external auditor;
2. To engage independent counsel and other advisors as it determines necessary to carry out its duties;
3. To set and pay the compensation for any advisors employed by the Committee, including without limitation, compensation to any public accounting firm engaged for the purpose of preparing or issuing an audit report or performing other audit, review or attest services for the Company;
4. To set and pay the ordinary administrative expenses of the Committee that are necessary or appropriate in carrying out its duties; and
5. To communicate directly with the internal auditors and the external auditor.

Duties of the Committee Chair

The fundamental responsibility of the Committee Chair is to be responsible for the management and effective performance of the Committee and provide leadership to the Committee in fulfilling its mandate and any other matters delegated to it by the Board. To that end, the Committee Chair's responsibilities shall include:

1. Working with the Chairman of the Board and the CEO to establish the frequency of Committee meetings and the agendas for meetings;
2. Providing leadership to the Committee and presiding over Committee meetings;
3. Facilitating the flow of information to and from the Committee and fostering an environment in which Committee members may ask questions, receive answers, and express their viewpoints;
4. Reporting to the Board with respect to the significant activities of the Committee and any recommendations of the Committee;
5. Meet regularly with the CFO of the Company and other members of management to review material issues relating to matters under discussion, review and consideration by the Committee and to provide the Committee and the Board, in a timely manner, all information necessary to permit the Board to fulfill its statutory obligations;

6. Leading the Committee in annually reviewing and assessing the adequacy of this Mandate and evaluating its effectiveness in fulfilling its mandate; and
7. Taking such other steps as are reasonably required to ensure that the Committee carries out its mandate.

IMPERIAL-METRIC CONVERSION TABLE

Imperial	Metric
1 troy ounce	31.10 grams
1 ton, short	0.907 tonnes
1 troy ounce per ton	34.286 grams per tonne
1 foot	0.305 meters
1 mile	1.609 Kms
1 acre	0.405 hectares

GLOSSARY OF TERMS

The following is a glossary of certain terms used in this document:

“°C” means degrees Celsius.

“Au” means gold.

“B2 Zone” means a mineral resource located approximately 200 meters east of the Upper Offset Zone and comprising a cylindrical-shaped, subvertical zone of palladium mineralization.

“Breccia” means a rock composed of rock fragments or clasts of intrusive igneous or basement gneissic rocks set in an igneous matrix.

“concentrate” means a product containing the valuable metal and from which most of the waste material in the ore has been removed.

“Cu” means copper.

“cut-off grade” is determined by the following formula parameters: estimates over the relevant period of mining costs, ore treatment costs, general and administrative costs, refining costs, royalty expenses, process and refining recovery rates and PGE prices.

“diamond drilling” means rotary drilling using diamond impregnated bits to produce a solid continuous core sample of the underlying rock.

“EM” means electromagnetic.

“feasibility study” means a comprehensive technical and economic study of the selected development option for a mineral project that includes detailed assessments of the factors and detailed financial

analysis that are necessary to demonstrate that extraction is reasonably justified (economically mineable).

“Flow-Through Shares” means flow-through shares in the capital of the company, within the meaning of the *Income Tax Act* (Canada).

“g” means gram.

“g/t” means grams per tonne.

“gabbro” means an intrusive igneous rock containing 10 to 90% clinopyroxene and 10 to 90% plagioclase. On the Lac des Iles mine property, the term gabbro is commonly substituted for the term norite.

“grade” means a particular quantity of ore or mineral relative to other constituents, in a specified quantity of rock.

“head grade” means the quantity of valuable mineral or metal contained in each tonne of ore delivered to the concentrator.

“indicated resource” means that part of a mineral resource for which quantity, grade or quality, densities, shape and physical characteristics, can be estimated with a level of confidence sufficient to allow the appropriate application of technical and economic parameters, to support mine planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough for geological and grade continuity to be reasonably assumed.

“inferred resource” means that part of a mineral resource for which quantity and grade or quality can be estimated on the basis of geological evidence and limited sampling and reasonably assumed, but not verified, geological and grade continuity. The estimate is based on limited information and sampling gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes.

“intrusion/intrusive” means a mass of igneous rock that was injected and solidified within the earth’s crust.

“iridium” means hard, brittle, silver-white platinum group metal used for pen tips, jewellery, resistance wiring, electronic contacts and electrodes.

“km²” means square Km.

“L/min” means litres per minute.

“lb” means pound.

“LDI” means Lac des Iles Mines Ltd.

“mafic rocks” means rocks composed of 10 to 90% mafic minerals.

“measured resource” means that part of a mineral resource for which quantity, grade or quality, densities, shape and physical characteristics are so well established that they can be estimated with confidence sufficient to allow the appropriate application of technical and economic parameters to support production planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough to confirm both geological and grade continuity.

“mineral reserve” means the economically mineable part of a measured or indicated resource demonstrated by at least a preliminary feasibility study. This study must include adequate information on mining, processing, metallurgical, economic and other relevant factors that demonstrate, at the time of reporting, that economic extraction can be justified. A mineral reserve includes diluting materials and allowances for losses that may occur when the material is mined.

“mineral resource” means a concentration or occurrence of natural, solid, inorganic or fossilized organic material in or on the Earth’s crust in such form and quantity and of such a grade or quality that it has reasonable prospects for economic extraction. The location, quantity, grade, geological characteristics and continuity of a mineral resource are known, estimated or interpreted from specific geological evidence and knowledge.

“mineralization” means the concentration of metals and their chemical compounds within a body of rock.

“mm” means millimeter.

“Mt” means million tonnes.

“Ni” means nickel.

“NI 43-101” means National Instrument 43-101 – *Standards of Disclosure for Mineral Projects*.

“North VT Rim” means mineralization of possible economic significance located about one Km along strike to the east of the Roby Zone which may be contiguous to an extension of the Roby Zone.

“NSR” means net smelter return, being the gross proceeds received from the sale of minerals less the cost of smelting, refining, freight and other related costs.

“NSR royalty” means net smelter return royalty, being a royalty based on the gross proceeds received from the sale of minerals less the cost of smelting, refining, freight and other related costs.

“Offset South Zone” or **“Offset South”** means the south region of the mineralized zone referred to as Offset.

“Offset Zone” or **“Offset”** means the mineralized zone located below and approximately 250 meters to the west of the Lac des Iles underground mine orebody.

“OK” means ordinary kriging.

“ore” means a mixture of valuable and worthless minerals from which at least one of the minerals can be mined and processed at an economic profit.

“osmium” means a rare, hard white metal.

“ounce” or **“oz.”** means a troy ounce. A troy ounce is equal to one-twelfth part of a pound or 31.103 grams.

“palladium” means a white, ductile, malleable precious metal that does not tarnish at normal temperatures. Palladium is used in a wide range of applications including automotive catalytic converters, electronics, dentistry, jewellery and chemical applications.

“Pd” means palladium.

“PGEs” means platinum group elements. PGEs include platinum, palladium, rhodium, ruthenium, osmium and iridium. All PGEs have catalytic qualities and resist corrosion and are chemically inert over a wide range of temperatures.

“Powerline Zone” means a mine zone of high grade mineralization exposed at the surface, adjacent to the Roby Zone open pit.

“Pt” means platinum.

“pyroxenite” means an ultramafic rock containing >90% of the pyroxene mineral group.

“QA” means quality assurance.

“QC” means quality control.

“Qualified Person” means an individual who is an engineer or geoscientist with at least five years of experience in mineral exploration, mine development or operation or mineral project assessment, or any combination of these; has experience relevant to the subject matter of the mineral project and the technical report; and is a member in good standing of a professional association.

“Recapitalization” means the 400-1 consolidation of the Common Shares completed in 2015.

“RGO” means low-grade stockpile.

“rhodium” means a silver-white metal of the platinum family resistant to tarnishing and used as an electrode posit, or alloyed with platinum to manufacture thermocouples.

“Roby Zone” means the previously operated open pit and the underground mine which is currently in production on the LDI property.

“Shebandowan West” means the nickel sulfide mineralization located west of the west shoreline of Shebandowan Lake and co-owned by NAP and Vale Canada Ltd.

“Sheriff Zone” means a PGE zone delineated in 2013 at the LDI property, located approximately 100 meters southeast of the Offset Zone.

“t/a” means tonnes per year.

“tailings” means that portion of the ore which remains after the valuable minerals have been extracted.

“Tetra Tech” means Tetra Tech WEI Inc.

“TMF” means tailings management facility.

“tonne” means a metric measure consisting of 2,204.6 pounds or 1,000 kilograms.

“ultramafic” means rocks composed of greater than 90% mafic minerals.

“waste” means barren rock in a mine, or mineralized material that is too low in grade to be mined and milled at a profit.

“wt%” means weight percent.