

# AMENDED ANNUAL INFORMATION FORM (III)



This Amended Annual Information Form amends and replaces the Annual Information Form of Cardinal Resources Limited dated September 28, 2018, which has been amended to include current technical disclosure, as required by s. 5.4 of National Instrument 51-102F2, on the basis of the pre-feasibility study entitled “National Instrument 43-101 Namdini Gold Project Preliminary Feasibility Study Technical Report, Ghana, West Africa” dated October 25, 2018. The date of this Amended Annual Information Form is November 30, 2018. Except as otherwise indicated, the information contained herein is as at September 28, 2018.



# **ANNUAL INFORMATION FORM**

**For the year ended June 30, 2018**

**Dated November 30, 2018**

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## INTRODUCTORY NOTES

In this Annual Information Form (the “AIF”), Cardinal Resources Limited is referred to as “Cardinal” or the “Corporation”. Unless otherwise indicated, all information contained herein is as at September 28, 2018. Unless otherwise indicated, in this AIF all references to (i) “\$” or “AUD” are to Australian dollars; (ii) “US\$” and “USD” are to United States dollars; (iii) “C\$” or “CAD” are to Canadian dollars; and (iv) “GHS” are to Ghanaian cedi.

The Canadian dollar rates of exchange on September 28, 2018 were:

United States dollar <sup>(1)</sup>	Australian dollar <sup>(1)</sup>
C\$1.00=US\$0.76	C\$1.00=\$0.942

Note:

- (1) Bank of Canada average exchange rate for September 28, 2018 as reported on the Bank of Canada website.

### Financial Statements

This AIF should be read in conjunction with the Corporation’s consolidated financial statements and management’s discussion and analysis for the 12 months ended June 30, 2018. The consolidated financial statements and management’s discussion and analysis are available on the Corporation’s website at [www.cardinalresources.com.au](http://www.cardinalresources.com.au) and under the Corporation’s profile on the SEDAR website at [www.sedar.com](http://www.sedar.com). All financial statements are prepared in accordance with International Financial Reporting Standards and are reported in Australian dollars.

### Cautionary Statement Regarding Forward-Looking Information

Certain statements contained in this AIF constitute forward-looking information under applicable Canadian securities laws. These statements relate to future events or future performance. All statements other than statements of historical fact may be forward-looking statements. Forward-looking statements are often, but not always, identified by the use of words such as “seek”, “anticipate”, “plan”, “continue”, “objectives”, “strategies”, “estimate”, “expect”, “may”, “will”, “project”, “predict”, “potential”, “targeting”, “intend”, “could”, “might”, “should”, “believe” and similar expressions. These statements involve known and unknown risks, uncertainties and other factors that may cause actual results or events to differ materially from those anticipated in such forward-looking statements. The Corporation believes the expectations reflected in those forward-looking statements are reasonable but no assurance can be given that these expectations will prove to be correct and such forward-looking statements included in its AIF should not be unduly relied upon.

In particular, this AIF contains forward-looking statements pertaining to the following:

- Mineral Resource estimates;
- targeting additional Mineral Resources and expansion of deposits;
- the Corporation’s expectations, strategies and plans for the Ghanaian Projects, including the Corporation’s planned exploration activities;

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- the amount of funds required to fund the development of the mining licence in areas in respect of which Savannah had entered into agreements with holders of small scale mining licences;
  - the results of future exploration and drilling and estimated completion dates for certain milestones;
  - successfully adding or upgrading Mineral Resources and successfully developing new deposits;
  - the timing, receipt and maintenance of approvals, licences and permits from the Ghanaian government and from any other applicable government, regulator or administrative body;
  - future financial or operating performance and condition of the Corporation and its business, operations and properties; and
  - any other statement that may predict, forecast, indicate or imply future plans, intentions, levels of activity, results, performance or achievements.

The actual results could differ materially from those anticipated in these forward-looking statements or information as a result of the risk factors set forth below and elsewhere in this AIF:

- mineral exploration, development and operating risks;
- estimation of mineralization, resources and reserves;
- environmental, health and safety regulations of the resource industry;
- competitive conditions;
- operational risks;
- liquidity and financing risks;
- funding risk;
- exploration costs;
- uninsurable risks;
- environmental bonds;
- conflicts of interest;
- risks of operating in Ghana;
- government policy changes;
- ownership risks;
- permitting and licencing risks;
- artisanal miners;
- difficulty in enforcement of judgments;
- market conditions;
- stress in the global economy;
- current global financial condition;
- reliance on key personnel;
- dilution risk;
- exchange rate and currency risks;
- commodity prices;
- other factors discussed under “*Risk Factors*”; and
- other risks and uncertainties described elsewhere in this AIF.

Although the forward-looking statements contained in this AIF are based upon assumptions which the Corporation believes to be reasonable, there can be no assurance that actual results will be consistent with these forward-looking statements. With respect to forward-looking statements contained in this AIF, the Corporation has made assumptions regarding: future commodity prices and royalty regimes; availability of

skilled labour; timing and amount of capital expenditures; future currency exchange and interest rates; the impact of increasing competition; general conditions in economic and financial markets; availability of drilling and related equipment; effects of regulation by governmental agencies; royalty rates; future tax rates; future operating costs; availability of future sources of funding; ability to obtain financing and assumptions underlying estimates related to adjusted funds from operations. The Corporation has included the above summary of assumptions and risks related to forward-looking information provided in this AIF in order to provide readers with a more complete perspective on the Corporation's future operations and such information may not be appropriate for other purposes. The Corporation's actual results, performance or achievement could differ materially from those expressed in, or implied by, these forward-looking statements and, accordingly, no assurance can be given that any of the events anticipated by the forward-looking statements will transpire or occur, or if any of them do so, what benefits the Corporation will derive therefrom. These forward-looking statements are made as of the date of this AIF and the Corporation disclaims any intent or obligation to update publicly any forward-looking statements, whether as a result of new information, future events or results or otherwise, other than as required by applicable securities laws.

### Technical Information

Except where indicated, the disclosure contained in this AIF that is of an economic, scientific or technical nature has been summarized or extracted from the technical report titled "National Instrument 43-101 Namdini Gold Project Preliminary Feasibility Study Technical Report Ghana, West Africa", dated effective October 25, 2018 (the "**Technical Report**"). The Technical Report was prepared by (i) Mr. Glenn Turnbull, Principal Mining Engineer of Golder Associates Pty Ltd; (ii) Mr. Nicolas Johnson, Consulting Geologist with MPR Geological Consultants Pty Ltd; and (iii) Mr. Daryl Evans, Consulting Metallurgist with Independent Metallurgical Operations Pty Ltd. Each of Mr. Glenn Turnbull, Mr. Nicolas Johnson and Mr. Daryl Evans is an independent "qualified person" as such term is defined in NI 43-101 and has sufficient experience that is relevant to the style of mineralization and type of deposit under consideration and to the activity that he is undertaking to qualify as a "Competent Person" as such term is defined in the JORC Code. Each of Mr. Glenn Turnbull, Mr. Nicolas Johnson and Mr. Daryl Evans consents to the inclusion in this AIF of such scientific and technical information in the form and context in which it appears and confirms that such information is based on and fairly represents the Technical Report. Readers should consult the Technical Report to obtain further particulars regarding the Namdini Gold Project. The Technical Report, which constitutes the current technical report for the Namdini Gold Project, was filed on SEDAR on October 25, 2018 and, other than the extract of the Executive Summary thereof, which is included in this AIF, is incorporated by reference in its entirety in this AIF.

The Technical Report is subject to certain assumptions, qualifications and procedures described therein. Reference should be made to the full text of the Technical Report, which has been filed with Canadian securities regulatory authorities pursuant to NI 43-101 and is available for review under the Corporation's profile on SEDAR at [www.sedar.com](http://www.sedar.com).

The scientific and technical information in this AIF that relates to exploration results at the Bolgatanga Project and Subranum Project is based on information prepared by Mr. Paul Abbott, a full-time employee of Cardinal Resources Limited, who is a Member of the Geological Society of South Africa. Mr. Abbott has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person, as defined in the 2012 Edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves".

Where appropriate, certain information contained in this AIF that relates to exploration and drilling results, metallurgical testing, the Mineral Resource estimate and the Ore Reserve estimate, updates information derived from the Technical Report. Any updates to the scientific and technical information derived from the

Technical Report were prepared by or under the supervision of Mr. Glenn Turnbull, FIMM, MAusIMM, Eur. Ing. C. Eng, an employee of Golder (as defined below). Mr. Glenn Turnbull is a “qualified person” for the purposes of NI 43-101.

The scientific and technical information in this AIF that relates to the Namdini Gold Project has been reviewed and approved by Mr. Richard Bray, a Registered Professional Geologist with the Australian Institute of Geoscientists and Mr. Ekow Taylor, a Chartered Professional Geologist with the Australasian Institute of Mining and Metallurgy. Mr. Bray and Mr. Taylor have more than five years’ experience relevant to the styles of mineralisation and type of deposits under consideration and to the activity which is being undertaken to qualify as a Competent Person, as defined in the 2012 Edition of the “Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves” and as a Qualified Person for the purposes of NI43-101. Mr. Bray and Mr. Taylor are full-time employees of Cardinal and hold equity securities in the Corporation.

### **Mineral Resource Estimates**

The Ore Reserves and Mineral Resources for the Corporation’s properties have been estimated in accordance with the JORC Code and reconciled with the Canadian Institute of Mining, Metallurgy and Petroleum Definition Standards for Mineral Resources and Mineral Reserves adopted by the CIM Council on May 10, 2014 (the “**CIM Definition Standards**”).

### **JORC Code**

The following definitions are reproduced from the JORC Code:

“**Mineral Resource**” means a concentration or occurrence of solid material of economic interest in or on the Earth’s crust in such form, grade or quality and quantity that there are reasonable prospects for eventual economic extraction. The location, quantity, grade or quality, continuity and other geological characteristics of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge, including sampling.

“**Inferred Mineral Resource**” means that part of a Mineral Resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological and grade or quality continuity. An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource (as defined herein) and must not be converted to an Ore Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.

“**Indicated Mineral Resource**” means that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics are estimated with sufficient confidence to allow the application of Modifying Factors (as defined herein) as described below in sufficient detail to support mine planning and evaluation of the economic viability of the deposit. Geological evidence is derived from adequately detailed and reliable exploration, sampling and testing and is sufficient to assume geological and grade or quality continuity between points of observation. An Indicated Mineral Resource has a lower level of confidence than that applying to a Measured Mineral Resource (as defined herein) and may only be converted to a Probable Ore Reserve (as defined herein).

“**Measured Mineral Resource**” means that part of a Mineral Resource for which quantity, grade or quality, densities, shape, and physical characteristics are estimated with confidence sufficient to allow the application of Modifying Factors to support detailed mine planning and final evaluation of the economic viability of the deposit. Geological evidence is derived from detailed and reliable exploration, sampling and testing and is



sufficient to confirm geological and grade or quality continuity between points of observation. A Measured Mineral Resource has a higher level of confidence than that applying to either an Indicated Mineral Resource or an Inferred Mineral Resource. It may be converted to a Proved Ore Reserve (as defined herein) or to a Probable Ore Reserve.

**“Ore Reserve”** means the economically mineable part of a Measured and/or Indicated Mineral Resource. It includes diluting materials and allowances for losses, which may occur when the material is mined or extracted and is defined by studies at pre-feasibility or feasibility level as appropriate that include application of Modifying Factors. Such studies demonstrate that, at the time of reporting, extraction could reasonably be justified. The reference point at which Ore Reserves are defined, usually the point where the ore is delivered to the processing plant, must be stated. It is important that, in all situations where the reference point is different, such as for a saleable product, a clarifying statement is included to ensure that the reader is fully informed as to what is being reported.

**“Probable Ore Reserve”** means the economically mineable part of an Indicated, and in some circumstances, a Measured Mineral Resource. The confidence in the Modifying Factors applying to a Probable Ore Reserve is lower than that applying to a Proved Ore Reserve.

**“Proved Ore Reserve”** means the economically mineable part of a Measured Mineral Resource. A Proved Mineral Ore Reserve implies a high degree of confidence in the Modifying Factors.

For the purposes of the JORC Code and CIM Definition Standards, **“Modifying Factors”** are considerations used to convert Mineral Resources to Mineral Reserves. These include, but are not restricted to, mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social and governmental factors.

There can be no assurance that those portions of such Mineral Resources will ultimately be converted into Ore Reserves. Mineral Resources are not Ore Reserves and do not have demonstrated economic viability.

#### **Cautionary note to US Shareholders Concerning Estimates of Mineral Reserves and Mineral Resources**

This AIF uses the terms **“Probable Ore Reserve”**, **“Measured Mineral Resource”**, **“Indicated Mineral Resource”** and **“Inferred Mineral Resource”**. United States Shareholders are advised that while such terms are recognized and required by Canadian and Australian standards or regulations, the SEC does not recognize them. In particular, and without limiting the generality of this cautionary note, the term **“Mineral Resource”** does not equate to the term **“Ore Reserve”**. This AIF also uses the terms **“Probable Ore Reserves”** and **“Proved Ore Reserves”** as such terms are used under NI 43-101, CIM Definition Standards and the JORC Code, which standards differ from the standards that apply under SEC Industry Guide 7. Under United States standards, mineralization may not be classified as an **“Ore Reserve”** unless the determination has been made that the mineralization could be economically and legally produced or extracted at the time the reserve determination is made. As such, certain information contained in this AIF concerning descriptions of mineralization and resources and reserves under NI 43-101, CIM Definition Standards and the JORC Code are not comparable to disclosures made by United States reporting companies. **“Inferred Mineral Resources”** have a great amount of uncertainty as to their existence, and as to their economic and legal feasibility. It cannot be assumed that all or any part of a Probable Ore Reserve, Measured Mineral Resource, Indicated Mineral Resource or an Inferred Mineral Resource will ever be upgraded to a higher category. Under Canadian and Australian rules, estimates of Inferred Mineral Resources may not form the basis of feasibility or other economic studies. United States Shareholders are cautioned not to assume that all or any part of Measured, Indicated or Inferred Mineral Resources will ever be converted into Ore Reserves. United States Shareholders are also cautioned not to assume that all or any part of an Inferred Mineral Resource exists, or is economically or legally mineable.

## Glossary

In this AIF, unless otherwise indicated or the context otherwise requires, the following terms shall have the meaning set forth below:

“**2006 Mining Act**” means the Minerals and Mining Act 2006 (Act 703) (Ghana);

“**affiliate**” has the meaning ascribed thereto in National Instrument 62-104 — *Take-Over Bids and Issuer Bids*;

“**AIF**” means this Amended Annual Information Form;

“**Amended Proposal**” has the meaning ascribed thereto in the section “*Cease Trade Orders, Bankruptcies, Penalties or Sanctions*” of this AIF;

“**ASX**” means ASX Limited (ABN 98 008 624 691) or the Australian Securities Exchange operated by ASX Limited (as the context requires);

“**ASX Listing Rules**” means the official listing rules of the ASX, as amended from time to time;

“**Au**” means gold;

“**Audit and Risk Committee**” means the audit and risk committee of the Board;

“**Banro**” means Banro Corporation;

“**Besra**” means Besra Gold Inc.;

“**Besra Cease Trade Order**” has the meaning ascribed thereto in the section “*Cease Trade Orders, Bankruptcies, Penalties or Sanctions*” of this AIF;

“**BIA**” means the *Bankruptcy and Insolvency Act*, R.S.C. 1985, c. B-3;

“**Board**” means the board of directors of the Corporation;

“**Bolgatanga Project**” or “**Bolgatanga**” means, collectively, the Ndongo Licence Area, the Kungongo Licence Area and the Bongo Licence Area in the upper east region of Ghana;

“**Bongo Licence Area**” means the property located in the upper east region of the Town of Bolgatanga covered by reconnaissance licence number 2/2011 issued by the Government of Ghana through the Minister and of which an application for renewal has been granted and is pending the signature of the Minister. The Bongo licence covers an area of 453km<sup>2</sup>;

“**BQR**” means bulk quantity request;

“**Cardinal**” or the “**Corporation**” means Cardinal Resources Limited, a corporation incorporated under the laws of Australia, and unless otherwise stated or the context otherwise requires, references to the Corporation mean the Corporation and its current and proposed subsidiaries on a consolidated basis;

“**Cardinal Subranum**” means Cardinal Resources Subranum Limited, a subsidiary of the Corporation;

“**CCAA**” means the *Companies’ Creditors Arrangement Act*, R.S.C. 1985, c. C-36;

“**CCAA Plan**” has the meaning ascribed thereto in the section “*Cease Trade Orders, Bankruptcies, Penalties or Sanctions*” of this AIF;

“**Charter**” means the charter of the Audit and Risk Committee;

“**CIL**” means carbon-in-leach;

“**CIM Definition Standards**” means the 2014 CIM Definition Standards for Mineral Resources and Mineral Reserves;

“**Class A Performance Shares**” means the Class A performance shares of the Corporation, each of which is convertible into 100,000 Ordinary Shares;

“**Class B Performance Shares**” means the Class B performance shares of the Corporation;

“**Class C Performance Shares**” means the Class C performance shares of the Corporation, each of which is convertible into 100,000 Ordinary Shares;

“**cm**” means centimeter;

“**CMN**” means Cardinal Namdini Mining Limited, a subsidiary of the Corporation;

“**COG**” means cut-off grade (in g/t Au);

“**Computershare (Australia)**” means Computershare Investor Services Pty Ltd;

“**Computershare (Canada)**” means Computershare Investor Services Inc.;

“**Corporations Act**” means the *Corporations Act, 2001* (Commonwealth of Australia), as amended, including the regulations promulgated thereunder;

“**Credit Facility**” means the credit agreement entered into subsequent to the end of the financial year ended June 30, 2018, by the Corporation (together with its wholly owned subsidiaries) with Sprott Private Resource Lending (Collector), LP with respect to a US\$25 million senior secured credit facility in favour of the Corporation, as borrower;

“**Court**” means the Superior Court of the Province of Quebec;

“**Director**” means a director of the Corporation;

“**EIA**” means Environmental Impact Assessment;

“**EIS**” means Environmental Impact Statement;

“**EPA**” means the Ghana Environmental Protection Agency;

“**Exploration Tenements**” means the tenements forming part of the Bolgatanga Project and the Subranum Project. For the avoidance of doubt, the Exploration Tenements do not include the tenements forming the Namdini Gold Project;

“**g**” means grams;

“**g/t**” means grams per tonne;

“**Ghanaian Projects**” means the Namdini Gold Project, the Bolgatanga Project and the Subranum Project;

“**Ghanaian Subsidiaries**” means, collectively, Cardinal Subranum, Cardinal Mining Services Limited, Cardinal Resources Ghana Limited and Cardinal Namdini Mining Limited;

“**Golder**” means Golder Associates Pty Ltd;

“**GRIDCo**” means Ghana Grid Company Ltd;

“**IFRS**” means International Financial Reporting Standards as adopted by the International Accounting Standards Board;

“**Jaguar**” means Jaguar Mining Inc.;

“**JK Drop Weight Test**” means the Julius Kruttschnitt drop weight test;

“**JORC**” means the Australasian Joint Ore Reserves Committee;

“**JORC Code**” means the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves;

“**July 2016 Placement**” means the Corporation’s issuance on July 19, 2016, of 55,518,670 fully paid Ordinary Shares at a price of \$0.29 per Ordinary Share as the first part of a placement;

“**kg**” means kilogram;

“**km**” means kilometre;

“**km<sup>2</sup>**” means square kilometre;

“**Kungongo Licence Area**” means the property located in the upper east region of the Town of Bolgatanga covered by reconnaissance licence number 1/2011 issued by the Government of Ghana through the Minister. The Kungongo licence covers an area of 122km<sup>2</sup>;

“**kV**” means kilovolt;

“**Listed Option**” means a listed option (warrant) to purchase Ordinary Shares;

“**LOM**” means life of mine;

“**Lycopodium**” means Lycopodium Minerals Pty Ltd;

“**m**” means metre;

“**March 2016 Placement**” means the Corporation’s issuing of 47,333,310 fully paid Ordinary Shares at \$0.12 per Ordinary Share on March 8, 2016;

“**Maudore**” means Maudore Minerals Ltd.;

“**MIK**” means multiple indicator kriging;

“**Minerals Commission**” means the Minerals Commission of the Government of Ghana.

“**Minister**” means the Minister responsible for Lands and Natural Resources of Ghana;

“**mm**” means millimetre;

“**MOX**” means moderately oxidized weathered rock;

“**MPR Geological**” means MPR Geological Consultants Pty Ltd.;

“**Mt**” means million tonnes;

“**Mtpa**” means million tonnes a year;

“**NAG**” means net acid generating;

“**Namdini Gold Project**” or “**Namdini**” means the large-scale mining licence covering the Namdini mining lease. The large-scale mining licence covers 19.54km<sup>2</sup> in the Datoko area of the Talensi District Assembly in the upper east region of Ghana.

“**NAPP**” means net acid producing potential;

“**Ndongo Licence**” means the combined Ndongo prospecting licence number 17/2010 and the Nangodi and Yameriga prospecting licence number PL9/19 located in the upper east region of the town of Bolgatanga issued by the Government of Ghana through the Minister;

“**Ndongo Licence Area**” means the property covered by the combined Ndongo prospecting licence number 17/2010 and the Nangodi and Yameriga prospecting licence number PL9/19 located in the upper east region of the town of Bolgatanga issued by the Government of Ghana through the Minister. The Ndongo Licence covers an area of 295km<sup>2</sup>;

“**NEMAS**” means NEMAS Consult Ltd;

“**NI 43-101**” means National Instrument 43-101 – *Standards of Disclosure for Mineral Projects*, as amended from time to time;

“**NI 52-110**” means National Instrument 52-110 – *Audit Committees*, as amended from time to time;

“**Notice of Intention**” has the meaning ascribed thereto in the section “*Cease Trade Orders, Bankruptcies, Penalties or Sanctions*” of this AIF;

“**NYSE**” means the New York Stock Exchange;

“**October 2016 Order**” has the meaning ascribed thereto in the section “*Cease Trade Orders, Bankruptcies, Penalties or Sanctions*” of this AIF;

“**OMC**” means Orway Mineral Consultants;

“**Ordinary Shares**” means ordinary shares in the capital of the Corporation;

“**Orefind**” means Orefind Pty Ltd;

“**oz**” means Troy ounces (31.1035 g);

“**PEA**” means preliminary economic assessment;

“**Performance Shares**” means, the Class C Performance Shares;

“**PFS**” means preliminary feasibility study;

“**Properties**” means, collectively, the Bolgatanga Project, the Namdini Gold Project and the Subranum Project;

“**Proposal**” has the meaning ascribed thereto in the section “*Cease Trade Orders, Bankruptcies, Penalties or Sanctions*” of this AIF;

“**QAQC**” means quality control and quality assurance;

“**RC**” means reverse circulation;

“**Remuneration and Nomination Committee**” means the remuneration and nomination committee of the Board;

“**Ridge**” means Ridge Resources Limited;

“**SABC**” means SAG mill followed by closed circuit ball mill and recycle pebble crushing;

“**SAG**” means semi-autogenous grinding (mill);

“**Savannah**” means Savannah Mining Ghana Limited, of which Malik Easah is the sole shareholder;

“**SEC**” means the United States Securities and Exchange Commission;

“**September 2015 Placement**” means the Corporation’s issuance of 52,215,000 fully paid Ordinary Shares at \$0.10 per Ordinary Share, together with one free attaching Listed Option for every two Ordinary Shares subscribed for, on September 21, 2015.

“**Shareholders**” means the holders of Ordinary Shares;

“**SMC Variability Test**” means semi-autogenous mill comminution variability testwork;

“**SOX**” means sulfur oxides;

“**Subin Kasu Prospecting Licence**” means prospecting licence number PL6/309 issued by the Government of Ghana through the Minister;

“**Subranum Project**” or “**Subranum**” means the Subranum project, consisting of the Subin Kasu Prospecting Licence, in southwest Ghana;

“**t**” means metric tonne;

“**Technical Report**” means the technical report titled “National Instrument 43-101 Namdini Gold Project Preliminary Feasibility Study Technical Report Ghana, West Africa”, dated effective October 25, 2018;

“**TRANS**” means transition zone of partially weathered rock below MOX zone;

“**TSX**” means the Toronto Stock Exchange;

“**TSXV**” means the TSX Venture Exchange;

“**µm**” means micron (millionth of mm);

“**Unlisted Option**” means an unlisted option to purchase Ordinary Shares;

“**US**” means the United States of America; and

“**w/w**” means weight for weight (e.g. for slurry density).

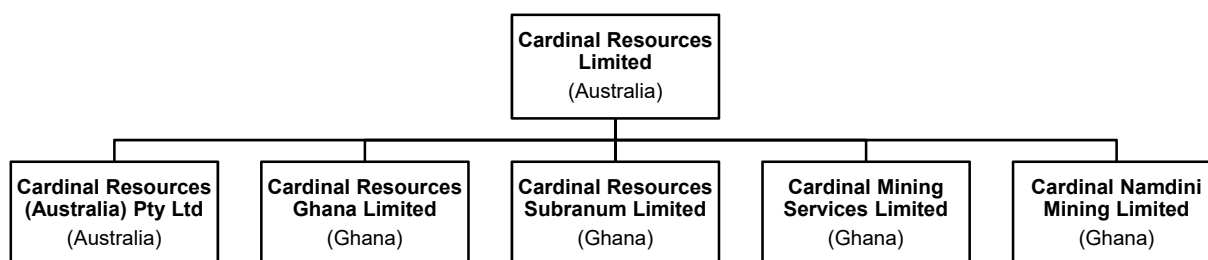
## CORPORATE STRUCTURE

Cardinal Resources Limited was incorporated as Heguy Resources Limited under the Corporations Act on November 11, 2010 and changed its name to Ridge Resources Limited (“**Ridge**”) on May 9, 2011 and then to Cardinal Resources Limited on December 27, 2012. The Corporation’s head and registered office is at Suite 1, 28 Ord Street, West Perth, Australia, 6005. The Corporation maintains offices outside of Australia.

On August 27, 2012, Ridge announced that it had entered into an implementation agreement with Cardinal Resources Limited, whereby Ridge would acquire 100% of the share capital of Cardinal. Ridge completed the acquisition of Cardinal on December 27, 2012 and subsequently changed its name to Cardinal Resources Limited.

The Corporation’s business under Ridge was operating as a Western Australian mineral exploration company. The Corporation’s business since December 27, 2012 has been to explore and develop its Ghanaian Projects, which consist of the Namdini Gold Project, the Bolgatanga Project and the Subranum Project.

The corporate structure is shown in the chart below. All of Cardinal’s subsidiaries are 100% owned.



The Corporation is a reporting issuer in the province of Ontario, Canada. The Corporation’s Ordinary Shares are listed and posted for trading on the Toronto Stock Exchange in Canada (the “**TSX**”) and on the Australian Securities Exchange (the “**ASX**”) in Australia, in each case under the symbol “**CDV**”.

## DESCRIPTION OF THE BUSINESS

### The Corporation

The principal activity of the Corporation (and its subsidiaries) is gold exploration in Ghana. The Corporation holds interests in seven prospective tenements for gold mineralization in Ghana in two NE-SW trending paleo-proterozoic granite-greenstone belts: the Bolgatanga Project and the Namdini Gold Project, which are, respectively, located within the Nangodi and Bole-Bolgatanga Greenstone Belts in northeast Ghana, and the Subranum Project, which is located within the Sefwi Greenstone Belt in southwest Ghana. The main focus of activity is the Namdini Gold Project. The maps that follow show the location of the Namdini Gold Project and the Corporation’s other properties in Ghana.



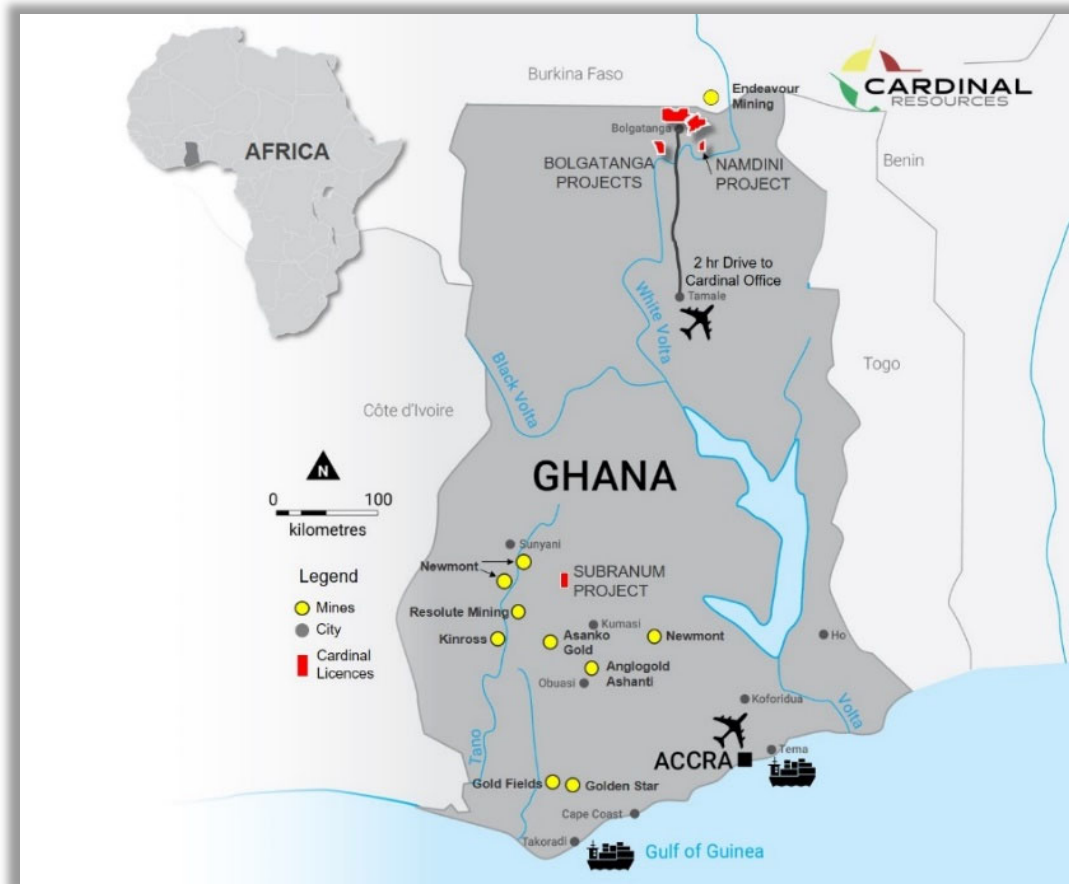


Figure 1 Cardinal Resource's Tenements in Ghana

### Employees

The Corporation employed 53 full-time employees as of June 30, 2018 and continued to employ 48 full-time employees as of the date of this AIF.

### Three Year History

The following summary sets out the notable events in the Corporation's history since the beginning of the financial year ended June 30, 2016:

On September 1, 2015, Cardinal announced that Mark Thomas and Simon Jackson had been appointed as non-executive Directors of the Corporation.

On September 21, 2015, the Corporation confirmed it had completed a capital raising thereby issuing 52,215,000 fully paid Ordinary Shares at \$0.10 per Ordinary Share, together with one free attaching Listed Option for every two Ordinary Shares subscribed for (the "**September 2015 Placement**"). The first tranche of such placement was completed on September 25, 2015, when 28,164,816 Ordinary Shares were issued to raise a total of \$2,816,481. On November 27, 2015, following the receipt of shareholder approval, the second tranche of Ordinary Shares and all the Listed Options that were part of the September 2015 Placement were issued. The second tranche included the issue of 10,000,000 Ordinary Shares and 5,000,000 Listed Options to

Macquarie Bank Limited. On November 27, 2015, the Directors of the Corporation (namely, Messrs. Alec Pismiris, Archie Koimtsidis, Malik Easah, Simon Jackson and Mark Thomas) purchased 8,117,116 Ordinary Shares and 4,058,558 Listed Options for proceeds to the Corporation of approximately \$812,000, on the same terms and conditions as the September 2015 Placement.

On November 19, 2015, the Corporation announced the appointment of Mr. Mark Connelly as the Non-Executive Chairman. Mr. Connelly replaced Mr. Alec Pismiris, who resigned from the Board.

On March 8, 2016, the Corporation confirmed it had completed a capital raising thereby issuing 47,333,310 fully paid Ordinary Shares at \$0.12 per Ordinary Share (the "**March 2016 Placement**"). 4,666,668 fully paid Ordinary Shares forming part of the March 2016 Placement were issued on May 9, 2016 after being approved at the Corporation's meeting of Shareholders held on April 27, 2016. On May 9, 2016, the Directors of the Corporation (namely, Messrs. Archie Koimtsidis, Malik Easah and Mark Thomas) purchased 1,750,002 fully paid Ordinary Shares for proceeds to the Corporation of approximately \$210,000, on the same terms and conditions as the March 2016 Placement.

On July 19, 2016, the Corporation announced that it had issued 55,518,670 fully paid Ordinary Shares at a price of \$0.29 per Ordinary Share as the first part of a placement (the "**July 2016 Placement**"). On August 26, 2016, the Corporation announced the completion of the second tranche of the July 2016 Placement and that, following shareholder approval at the general meeting of Shareholders, 19,481,330 fully paid Ordinary Shares had been issued at a price of \$0.29 per Ordinary Share.

On September 5, 2016, 50 Class B performance shares (the "**Class B Performance Shares**") were converted to 5,000,000 Ordinary Shares when the Corporation satisfied the vesting requirement of the Class B Performance Shares.

Between August 26, 2016 and October 28, 2016, 1,435,000 Listed Options were exercised.

On November 7, 2016, Cardinal reported an initial resource estimate for the Namdini Gold Project of 3.8 million ounces of inferred gold resources and 0.25 million ounces of indicated gold resources, calculated in accordance with the JORC Code.

On November 7, 2016, the Corporation announced that Mr. Kevin Tomlinson had been appointed to the Board and would serve as non-executive chairman, that Mr. Mark Connelly, who had previously served as non-executive chairman, would remain as a non-executive Director and that Mr. Mark Thomas, previously a non-executive Director, had retired as a Director.

On November 28, 2016, 476,247 Ordinary Shares were issued to Mr. Julian Barnes for services provided to the Corporation. The issue was approved at the Corporation's annual general meeting held on November 7, 2016.

On January 4, 2017, the Corporation announced that Mr. Bruce Lilford had been appointed Project Manager at the Namdini Gold Project, effective January 3, 2017.

On February 2, 2017, Cardinal reported an interim metallurgical update for the Namdini Gold Project identifying a number of conventional gold recovery techniques to enhance recoveries.

On February 6, 2017, the Corporation announced that Mr. Erik Palmbachs had been appointed as the Corporation's Chief Financial Officer, effective March 1, 2017. Mr. Palmbachs' appointment as Chief Financial Officer ended on May 24, 2017.

On February 7, 2017, Cardinal reporting drilling assay results at the Namdini Gold Project that demonstrated resource extensions to the east and south and at depth.

On February 28, 2017, the Corporation announced that BDO (WA) Pty Ltd. had been appointed as auditor for the Corporation.

On March 21, 2017, Cardinal reported that conventional gold recovery techniques for the Namdini Gold Project are showing overall gold recoveries of 84% are achievable and that crush-float-fine grind processing allows for a low mass flotation concentrate with superior operating costs due to low volumes of high grade concentrate to be processed.

On April 12, 2017, following the receipt of Shareholder approval, 26,000,000 Unlisted Options were issued to Directors and certain officers of the Corporation. Such Unlisted Options vest in three tranches upon the achievement of certain specified performance criteria, have an exercise price of \$0.50 and expire on April 12, 2022.

On April 21, 2017, the Corporation announced the completion of a share placement of 45,598,266 Ordinary Shares at an issue price of \$0.50 per Ordinary Share for aggregate gross proceeds of \$22,799,133.

On May 24, 2017, Sarah Shipway was appointed interim Chief Financial Officer of the Corporation.

On May 25, 2017, 476,247 Ordinary Shares were issued to Mr. Julian Barnes for services provided to the Corporation. The issue was approved at the Corporation's annual general meeting held on November 7, 2016.

On July 10, 2017, the Corporation's Ordinary Shares commenced trading on the TSX.

On July 10, 2017, Robert Schafer was appointed non-executive Director of the Corporation and Derrick Weyrauch was appointed as Chief Financial Officer of the Corporation.

On July 12, 2017, the Corporation announced that it had been granted a large-scale mining licence over an area of approximately 19.54 sq km covering the Corporation's Namdini Gold Project and that an initial Environmental Impact Statement ("EIS") was lodged with the EPA.

On July 26, 2017, the Corporation announced that interim results for phase two of its metallurgical test programme for the Namdini Gold Project had demonstrated an overall increased gold recovery rate of 86% utilizing standard gold recovery techniques.

On August 14, 2017, the Corporation announced two auger gold-in-soil anomalies (4.2 km long x 300 m wide and 800 m x 250 m) were discovered with +100ppb gold anomaly along the entire strike of both anomalies from exploration activities on its Kungongo prospect.

On August 15, 2017, the Corporation announced that it had entered into a definitive agreement with Red Back Mining Ghana Limited, a wholly-owned subsidiary of Kinross Gold Corp., to acquire two large-scale prospecting licences which encompass the Namdini regional shear and which contains the historic producing "Nangodi" gold mine and that combined with the Corporation's existing Ndongo holdings, increases the land area to 287.67 km<sup>2</sup>.

On September 18, 2017, the Corporation announced an updated Mineral Resource estimate for its Namdini Gold Project, including an Indicated Mineral Resource of 120 M tonnes grading 1.1 g/t Au for 4.3 Moz Au and an Inferred Mineral Resource of 84 M tonnes grading 1.2 g/t Au for 3.1 Moz Au at 0.5 g/t Au cut-off. The

effective date of the Mineral Resource Estimate is September 11, 2017.

On October 12, 2017, the Corporation announced the appointment of two new Non-Executive Directors, namely Jacques McMullen and Michele Muscillo. The Corporation also advised that Mark Connelly and Simon Jackson had resigned from the Board of Directors.

On October 20, 2017, the Corporation filed on SEDAR an updated technical report titled "Technical Report Mineral Resource Estimation for the Namdini Gold Project, Ghana", in respect of the Corporation's Namdini Gold Project in Ghana, West Africa.

On October 20, 2017, 1,000,000 fully paid ordinary shares were issued on exercise of Unlisted Options and 5,000,000 Unlisted Options expired, unexercised.

On October 23, 2017, the Corporation announced that it had entered into an agreement with Clarus Securities Inc., on behalf of a syndicate of underwriters, pursuant to which the underwriters have agreed to purchase, on a "brought deal" basis, 18,461,600 ordinary shares of the Corporation at a price of C\$0.65 per ordinary share for aggregate proceeds to the Corporation of C\$12,000,040. On November 22, 2017 the brought deal was closed.

On November 10, 2017, 1,000,000 Unlisted Options were exercised.

On November 22, 2017, 5,758,000 Unlisted Options exercisable at \$0.825 on or before 21 December 2022, 4,036,200 Unlisted Options exercisable at \$0.965 on or before 21 December 2022, 1,000,000 Unlisted Options exercisable at \$0.75 on or before 21 December 2022 and 379,390 fully paid ordinary shares were issued.

On December 21, 2017, the Corporation issued 379,390 shares for services, 190,000 at a deemed value of \$0.50 and 189,390 at a deemed value of \$0.58.

On January 3, 2018, 50 Class A Performance Shares expired.

On February 5, 2018, the Corporation released the results of its preliminary economic assessment/scoping study for the Namdini Gold Project in Ghana, West Africa.

On March 1, 2018, 160,500 fully paid ordinary shares were issued on exercise of Listed Options.

On March 5, 2018, the Corporation advised that it had completed an update to the Mineral Resource estimate for its Namdini Gold Project in Ghana, West Africa. As a result of an additional 15,684m of HQ diamond drilling within 35 holes since the last Mineral Resource estimate in September 2017, the infill drill program has been successful in delivering a substantial conversion of the inferred category ounces into the Indicated Mineral Resource category which is now at 6.5Moz of Indicated Mineral Resource and 0.5Moz of Inferred Mineral Resources.

On March 12, 2018, 189,500 fully paid ordinary shares were issued on exercise of Listed Options.

On March 14, 2018, the Corporation announced that it had filed a National Instrument 43-101 Technical Report in respect of the preliminary economic analysis announced on February 5, 2018.

On March 28, 2018, 403,500 fully paid ordinary shares were issued on exercise of Listed Options.

On April 10, 2018, 100,000 fully paid ordinary shares were issued on exercise of Listed Options.

On April 18, 2018, the Corporation announced that it had filed a National Instrument 43-101 Technical Report in respect of the Mineral Resource Estimation announced on March 5, 2018.

On April 19, 2018, 500,000 fully paid ordinary shares were issued on exercise of Listed Options.

On May 2, 2018, 150,000 fully paid ordinary shares were issued on exercise of Listed Options. 300,000 fully paid ordinary shares were issued for services rendered to the Corporation.

On May 29, 2018, 49,507 fully paid ordinary shares were issued on exercise of Listed Options.

On June 12, 2018, 24 ordinary fully paid shares were issued on exercise of Listed Options. 340,000 fully paid ordinary shares were issued for services rendered to the Corporation.

On July 16, 2018, the Corporation announced that it had intersected further gold at a new discovery named Ndongo East on its 100% owned Ndongo Licence, located approximately 15km north of the Corporation's flagship Namdini Gold Project which has a 6.5Moz indicated Mineral Resource.

On July 31, 2018, the Corporation announced that it had received investment committee approval from and executed a term sheet with Sprott Private Resource Lending (Collector), L.P. to be provided with a US\$25 million senior secured credit facility. The Corporation announced on August 22, 2018 that the facility had been finalised.

On July 31, 2018, 385,000 fully paid ordinary shares were issued on exercise of Listed Options.

On August 28, 2018, 4,250,000 fully paid ordinary shares were issued to Sprott Private Resource Lending (Collector), L.P. as part of the senior secured credit facility.

On September 18, 2018, the Corporation announced the results of its pre-feasibility study on the Namdini Gold Project, highlighted by a 4.76 Moz maiden probable ore reserve at a 1.14 g/t cut-off.

On September 19, 2018, 125,000 fully paid ordinary shares were issued on exercise of Listed Options.

On October 25 2018, subsequent to the currency date of this AIF, the Corporation filed a technical report titled "National Instrument 43-101 Preliminary Feasibility Study Technical Report Namdini Gold Project Ghana West Africa".

On October 31, 2018, subsequent to the currency date of this AIF, Derrick Weyrauch resigned from the Corporation. Mr. Weyrauch's position as an executive officer was concurrently filled by the appointment of Jon Grygorcewicz as CFO. Also on October 31, 2018, and subsequent to the currency date of this AIF, Jacques McMullen resigned as a director of the Corporation. Mr. McMullen's position on the Board was concurrently filled by the appointment of Kenneth G. Thomas as a director.

## **The Ghanaian Mining Industry**

### **Mining in Ghana**

#### ***Ghana***

Ghana is situated on the west coast of Africa, approximately 600 km north of the Equator on the Gulf of Guinea. Accra, the capital city of Ghana, is located almost exactly on the Prime Meridian. The former British colony changed its name from the Gold Coast to Ghana on achieving independence on March 6, 1957. Ghana is now

a republic with a population of approximately 25 million people and a democratically elected government. English remains the official and commercial language.

The total land area of the country is approximately 238,000 km<sup>2</sup> and the topography is relatively flat. Ghana has a tropical climate with two rainy seasons and two dry seasons in the southern sector each year. The climate condition in the upper east region of Ghana, where the Namdini Gold Project and the Bolgatanga Project are located, is tropical with a rainy season from May to October and a long dry season with virtually no rainfall from October to April. Temperatures range between a maximum of 40°C in March/April and a minimum of 12°C in December. The natural vegetation in the western region, where the Subranum Project is located, is moist tropical forest with a majority of the land converted to agricultural pursuits. The physiography of the Namdini Gold Project area is primarily savannah grassland characterized by short scattered drought-resistant trees, scattered scrub, and grass that gets burnt by bushfire or scorched by the sun during the long dry season. The climate is very dry. The most common trees are the Sheanut, Dawadawa, and Baobab.

The Ghanaian legal system is generally modelled after and based on British common law. The laws of Ghana include the Constitution, national laws passed by Parliament (or under authority granted by Parliament) and the common law of Ghana. The common law of Ghana includes customary rules which apply to particular communities in Ghana.

The Corporation has found Ghana to be stable (politically and economically) over the time in which it has engaged in operations in Ghana.

### ***Mining Rights***

The Constitution of Ghana vests title in every mineral in its natural state to the President of Ghana on behalf of, and in trust for, the people of Ghana. The exercise of any mineral right in the form of reconnaissance, exploration or exploitation of any mineral in Ghana requires an appropriate mineral right to be issued by the Government of Ghana acting through the Minister responsible for Lands and Natural Resources (the “**Minister**”). The Minister administers, promotes and regulates Ghana’s mineral wealth through the Minerals Commission, a governmental organization established in accordance with the Minerals Commission Act 1993 (Act 450) and the Minerals and Mining Act 2006 (Act 703) (the “**2006 Mining Act**”).

Pursuant to the 2006 Mining Act, a number of regulations were passed in 2012 to clarify and implement provisions of the 2006 Mining Act. These regulations relate to matters such as licensing, local content, technical issues, mineral right holding costs, mine support services and resettlement and payment of compensation to persons impacted by mining operations.

The 2006 Mining Act provides for a number of categories of licences.

A reconnaissance licence confers on the holder the right to search for a specific mineral or commodity within the licence area by geochemical and photo-geological surveys or other remote sensing techniques. Except as otherwise provided in the licence, it does not permit drilling, excavation or other sub-surface techniques. A reconnaissance licence is normally granted for up to one year and may be renewed by the Minister from time to time for periods up to one year at a time upon application by the holder. The size of the area over which a reconnaissance licence may be granted is limited to 5,000 contiguous blocks or 1,050 km<sup>2</sup>.

A corporate body duly registered in Ghana can apply to the Minerals Commission for a renewable exploration (prospecting) licence granting exclusive rights to explore for a particular mineral in a selected area for an initial period not exceeding three years. A prospecting licence may be renewed for a maximum of two further terms of up to three years each, subject to surrender of a portion of the area.

When exploration has successfully delineated a mineral reserve, an application may be made to the Minerals Commission for conversion to a mining lease, granting a company the right to produce a specific product from the concession area, normally for a period of 30 years or a lesser period that may be agreed upon with the applicant.

Once a mineral right is issued to an entity by the Government of Ghana, Ghanaian mining laws prevent that mineral right from being transferred, assigned or mortgaged by the licensee or mineral right holder without the prior written approval of the Minister. The Ghana Minerals Commission is also required to maintain a public register of all applications, grants, variations, transfers, suspensions and cancellations of such licences or mineral rights. Official searches may be conducted in the public register to obtain information regarding any mineral right granted by the Government of Ghana.

The 2006 Mining Act requires that any person who intends to acquire a controlling share of the equity of any mining company that has been granted a mineral right must first give notice of its intent to the Minister and also obtain the no objection of the Minister prior to acquiring a controlling share.

Under the 2006 Mining Act, the Government of Ghana is entitled to a 10% free carried interest in all companies that hold mining leases. The 10% free carried interest entitles the Government of Ghana to a pro-rata share of future dividends. The Government of Ghana has no obligation to contribute development capital or to operating expenses.

The Government of Ghana also has the right to acquire an additional interest in such companies for a price fixed by agreement.

Under the 2006 Mining Act, the Government of Ghana is empowered to acquire a special or “golden” share in any mining company. The special share would constitute a separate class of shares with such rights as the Government of Ghana and the mining company might agree. Though deemed a preference share, it could be redeemed without any consideration or for a consideration determined by the mining company and payable to the holder on behalf of the Government of Ghana.

In the absence of any such agreement, the special share would have the following rights:

- it would carry no voting rights but the holder would be entitled to receive notice of, and to attend and speak at, any general meeting of the members or any separate meeting of the holders of any class of shares;
- it could only be issued to, held by, or transferred to the Government of Ghana or a person acting on behalf of the Government of Ghana;
- the written consent of the holder would be required for all amendments to the organizational documents of the Corporation, the voluntary winding-up or liquidation of the Corporation, or the disposal of any mining lease, or the whole or any material part of the assets of the Corporation;
- it would not confer a right to participate in the dividends, profits or assets of the Corporation or a return of assets in a winding-up or liquidation of the Corporation; and
- the holder of a special share may require the Corporation to redeem the special share at any time for no consideration or for a consideration determined by the Corporation.

To the Corporation’s knowledge, for as long as it has been operating in Ghana, no mining company has been



requested to issue a special share.

The Government of Ghana has a pre-emptive right to purchase all gold and other minerals produced by mines in Ghana. The purchase price would be agreed by the Government of Ghana and the mining company, or the price established by any gold hedging arrangement between the Corporation and any third party approved by the Government of Ghana, or the publicly quoted market price prevailing for the minerals or products as delivered at the mine or plant where the right of pre-emption was exercised. The Corporation understands that the Government of Ghana has indicated it does not intend to take pre-emptive action pursuant to its right to purchase gold or other minerals so long as mining companies sell gold in accordance with certain procedures approved by the Bank of Ghana.

### ***Ghanaian Royalties and Taxes***

Ghanaian law sets mineral royalties at a flat rate of 5% of mineral revenues. The corporate income tax rate is 35% of taxable income for mining companies. Capital expenditures (tax depreciation) are deductible at a flat rate of 20% per year over a five-year period.

The tax regulations disallow expenditures from one mining area as a deduction from revenues in a separate mining area belonging to the same company in determining the Corporation's taxable income for tax purposes.

Under the 2006 Mining Act, the Government of Ghana may enter into a stability agreement with the holder of a mining lease, to ensure that the holder of the mining lease will not, for a period not exceeding 15 years from the date of the agreement,

1. be adversely affected by a new enactment, order, instrument or other action made under a new enactment or changes to an enactment, order, instrument that existed at the time of the stability agreement, or other action taken under these that have the effect or purport to have the effect of imposing obligations upon the holder or applicant of the mining lease, and
2. be adversely affected by subsequent changes to:
  - (a) the level of and payment of customs or other duties relating to the entry of materials, goods, equipment and any other inputs necessary to the mining operations or project,
  - (b) the level of and payment of royalties, taxes, fees and other fiscal imports, and
  - (c) laws relating to exchange control, transfer of capital and dividend remittance.

A stability agreement entered into is subject to ratification by the Parliament of Ghana.

In 2011, the Government of Ghana established a tax stability renegotiation team to review the existing tax stability agreements of some major mining companies operating in Ghana.

### ***Environmental and Other Laws and Regulations***

All phases of mineral exploration, project development, and operations are subject to environmental laws and regulations. These laws and regulations may define, among other things, air and water quality standards, waste management requirements, and closure and rehabilitation obligations. In general, environmental legislation is evolving to require stricter operating standards, more detailed socio-economic and environmental impact assessments for proposed projects, and a heightened degree of accountability of companies and their officers, directors, and employees for corporate social responsibility, and health and safety. Changes in environmental



regulations, and the way they are interpreted by the regulatory authorities, could affect the way the Corporation operates, resulting in higher environmental and social operating costs that may affect the viability of operations.

Environmental matters in Ghana, including those related to mining, fall primarily under the oversight of the EPA, as well as the Minerals Commission and the Inspectorate Division of the Minerals Commission. The EPA has laws and regulations that govern, among other things, environmental and socio-economic impact assessments and statements, environmental management plans, emissions into the environment, environmental auditing and review, and mine closure and reclamation, to which the Corporation's operations are subject. Additional provisions governing mine environmental management are provided in the 2006 Mining Act and the various Minerals and Mining Regulations which came into force in 2012.

The Corporation notes a continuing trend toward substantially increased environmental requirements and evolving corporate social responsibility expectations in Ghana, including the requirement for more permits, analysis, data gathering, community hearings, and negotiations than have been required in the past for both routine operational needs and for new development projects. There has been a trend to longer lead times in obtaining environmental permits.

The Corporation's mineral exploration activities and anticipated development, mining and processing operations will also be subject to various laws governing prospecting, development, production, taxes, labor standards, occupational health and safety, land rights of local people and other matters. New rules and regulations may be enacted or existing rules and regulations may be modified and applied in a manner that could have an adverse effect on the Corporation's financial position and results of operations.

The Corporation established objectives to achieve regulatory requirements in its exploration, development, operation, closure, and post-closure activities so that its employees, the local environment, and its stakeholder communities are protected and that the next land use contributes to the sustainability of the local economy. In order to meet its objectives, the Corporation:

- educates its managers so that they are committed to creating a culture that makes social and environmental matters an integral part of short-term and long-term operations and performance management systems;
- works with its employees so they understand and accept environmental and social policies and procedures as a fundamental part of the business;
- established, and continues to improve, operating standards and procedures that aim to meet or exceed requirements in relevant laws and regulations, the commitments made in its environmental impact statements, environmental and socio-economic management plans, rehabilitation and closure plans, and any international protocols to which the Corporation is a signatory;
- incorporated environmental and human rights performance requirements into relevant contracts;
- provides training to employees and contractors in environmental matters;
- regularly prepares, reviews, updates, and implements site-specific environmental management and rehabilitation and closure plans;
- works to progressively rehabilitate disturbed areas in conformance with site-specific environmental plans;

- consults with local communities and regulators to communicate its environmental management policies and procedures;
- regularly reviews its environmental performance;
- intends to complete resettlement projects in accordance with the International Finance Corporation Performance Standard 5 on land acquisition and involuntary resettlement when required; and
- publicly reports social, health, safety and environmental performance.

### NAMDINI PROJECT TECHNICAL REPORT SUMMARY

The following is an extract of Section 1 – Summary of the Technical Report prepared by Golder. See also “Technical Information”. The balance of the Technical Report is incorporated herein by reference.

#### Introduction

The principal activity of the Corporation is gold exploration and development in Ghana. The Corporation holds interests in five tenements prospective for gold mineralization in Ghana in two NE-SW trending paleo-proterozoic granite-greenstone belts: the Bolgatanga Project and the Namdini Gold Project, which are, respectively, located within the Nangodi and Bole-Bolgatanga Greenstone Belts in northeast Ghana, and the Subranum Project, which is located within the Sefwi Greenstone Belt in southwest Ghana.

The main focus of activity is the Namdini Gold Project where a Mineral Resource at a 0.5 g/t Au cut-off grade has been established comprising: an Indicated Mineral Resource of 180 Mt grading 1.1 g/t Au for 6.5 Moz Au, and an Inferred Mineral Resource of 13 Mt grading 1.2 g/t Au for 0.5 Moz Au. Figure 1 of the Technical Report shows the location of the Namdini Gold Project and the Corporation’s other properties in Ghana.

The Technical Report presents the result of the preliminary feasibility study (“PFS”) carried out by Cardinal on the Namdini Gold Project.

#### PFS parameters and material assumptions

The PFS capital cost estimates were completed to an accuracy of +30/-20% for the 9.5 Mtpa option and undertaken based on open pit mining from the existing March 2018 Mineral Resources.

Metallurgical testwork carried out to date indicates that gold can be satisfactorily recovered from Namdini ore using conventional flotation, regrind and carbon-in-leach (“CIL”) of the flotation concentrate. The testwork is considered sufficient to determine that the Namdini Gold Project Mineral Resource represents a deposit with potential economic extraction. Estimation of capital costs was prepared by Lycopodium Minerals Pty Ltd (“Lycopodium”) for the process plant and associated infrastructure.

The proposed plant incorporates primary crushing, grinding and re-crush (SABC), gravity, flotation, concentrate regrind and CIL gold extraction. Three production throughputs were assessed by Cardinal, namely 9.5, 7.0 and 4.5 Mtpa. The 9.5 and 4.5 Mtpa throughput options were factored from the 7.0 Mtpa option (+20/-15% accuracy) and are therefore lower in accuracy at +30/-20%. A contingency factor of 5% was added to the 9.5 and 4.5 Mtpa options over and above the project contingency.

Golder provided open pit mine engineering services. The work comprised collation of input parameters, open pit optimization studies, pit designs and detailed NPV optimized mine schedules. A series of shells from the

open pit optimizations was selected and used to generate engineering pit designs that included starter pit and life of mine (“**LOM**”) stages for the LOM production schedule.

Golder estimated the Ore Reserve in accordance with the JORC Code. The term ‘Ore Reserve’ is synonymous with the term ‘Mineral Reserve’ as used by Canadian NI 43-101 and conforms with the CIM Definition Standards. The JORC Code is defined as an ‘acceptable foreign code’ under NI 43-101. For the purposes of reporting under NI 43-101 a JORC Table 1 is not required, but it was provided as Appendix 1 to the Technical Report.

The Ore Reserve estimate is based on the revised Mineral Resource model referred to in the press release by Cardinal Resources Limited to the ASX and TSX, dated March 5, 2018 titled ‘Cardinal Upgrades Indicated Mineral Resource to 6.5 Moz’. Golder provided an estimate of mining costs, including drill and blast, haulage, rehabilitation and administration costs. Lycopodium provided processing cost estimates.

The Ore Reserve was estimated from the Mineral Resource after consideration of the level of confidence in the Mineral Resource and considering material and relevant modifying factors including mining, processing, infrastructure, environmental, legal, social and commercial factors. The Probable Ore Reserve estimate is based on Indicated Mineral Resources. No Inferred Mineral Resource was included in the Ore Reserve. The Ore Reserve represents the economically mineable part of the Indicated Mineral Resources. There is no Proved Ore Reserve since no Measured Mineral Resource has yet been defined. Mineral Resource estimates are reported inclusive of those Mineral Resources converted to Ore Reserves.

The proposed mine plan is technically achievable. All technical proposals made for the operational phase involve the application of conventional technology that is widely utilized in the gold industry. Financial modelling completed as part of the PFS show that the Namdini Gold Project is economically viable under current assumptions. Modifying Factors (mining, processing, infrastructure, environmental, legal, social and commercial) were considered during the Ore Reserve estimation process. The PFS incorporates a number of factors and assumptions as outlined in the sections within the report.

The financial model was completed as a real discounted model. A LOM financial analysis was performed using the discounted cash flow method and varying real discount rates. The financial analysis was used to determine the potential economic return of the project over the LOM.

The preliminary schedule is shown in Section 26.4 (Table 154) of the Technical Report and is subject to available funding, positive outcomes for the PFS and the feasibility study and favorable timelines for permitting.

The gold price assumptions used for the purposes of the PFS and the project gold price for the financial analysis are presented in Table 144 of the Technical Report.

### **Mining Licence**

During the quarter ended 31 December 2017, a large-scale mining licence covering the Namdini mining lease was assigned to CMN, a wholly owned subsidiary of Cardinal, by the Minister of Lands and Natural Resources under the Ghanaian Minerals and Mining Act 2006 (Act 703). The large-scale mining licence, which covers 19.54 km<sup>2</sup> in the Dakoto area of the Talensi District Assembly in upper east region of Ghana evidenced by a mining lease, is for an initial period of fifteen (15) years and is renewable for up to a further thirty (30) years.

Savannah has completed an EIS scoping report for Namdini and has filed the EIS with the EPA. In accordance with EPA Regulations 15(1b) and (1c) of the Environmental Assessment Regulations, 1999 (LI 1652) and Ghana’s Environmental Impact Assessment (EIA) Procedures, the EPA issued a public notification on the proposed

Namdini Gold Project. Cardinal will submit to the EPA and Minerals Commission an updated EIS for the selected project scale option envisioned for the feasibility study prior to commencement thereof.

### **Namdini Mineral Resources**

Independent mining industry consultant, MPR Geological was commissioned by Cardinal to estimate the Mineral Resources of the Namdini deposit. The Mineral Resource estimate was reported in accordance with the JORC Code. The JORC Table 1 was provided as Appendix 1 of the Technical Summary provided to the ASX and TSX in the press release by Cardinal, dated March 5, 2018 titled 'Cardinal Upgrades Indicated Mineral Resource to 6.5 Moz.'

The Mineral Resource estimate, summarized in Table 81 and Table 82 of the Technical Report, reports the Mineral Resources by category and material type (weathering) above a 0.5 g/t gold cut-off grade. The classification categories of Inferred and Indicated Mineral Resources under the JORC Code are equivalent to the CIM Definition Standards categories of the same name.

### **Geology**

The Namdini gold deposit is a large, structurally controlled, orogenic gold deposit within the Nangodi Greenstone Belt, with numerous features similar to deposits found elsewhere in late Proterozoic Birimian terranes of West Africa. To date the Namdini gold deposit has been delineated over a strike length of 1.15 km, up to 300 m wide and 700 m deep.

In 2016, geological consultants from Orefind Pty Ltd ("**Orefind**") conducted an on-site study and developed a structural framework of the controls and geometry of gold mineralization comprising the Namdini deposit.

Orefind concluded that the rock types comprising the Namdini Gold Project included a steeply west dipping Birimian sequence of interbedded, foliated, metasedimentary and metavolcanic units which have been intruded by a medium-grained granitoid and diorite. The southern part of the Namdini Gold Project is covered by flat-lying Voltaian Basin clastic sedimentary rocks that have been deposited unconformably on the Birimian sequence and postdate mineralization and the host sequence.

Underneath the weathering profile, the Birimian units include metasedimentary, metavolcanic, granitoid (tonalite) and diorite. The metasedimentary and volcanoclastic lithologies have been intensely altered with a resulting pyrite-carbonate-muscovite-chlorite-quartz assemblage. Alteration is most prevalent in the volcanoclastic units. Similarly, the tonalite is extensively altered and has been overprinted by silica-sericite-carbonate assemblages.

In all rock types, the mineralization is accompanied by visible disseminated sulfides of pyrite and very minor arsenopyrite in both the veins and wall rocks. In diamond drill core, the mineralized zones are visually distinctive due to the presence of millimetre to centimetre wide quartz-carbonate veins that are commonly folded and possess yellow-brown sericite-carbonate selvages. Rare visible gold occurs in strongly altered granite and is associated with sub-millimetre wide silica-sericite shears.

### ***Drilling techniques***

The input dataset used for the Namdini Mineral Resource estimate comprises a total of 167 HQ diamond core holes and 144 RC drill holes totalling 82,870 m.

Reverse circulation drilling of 140 (nominally 5¼ inch) or 125 mm diameter was usually 200 m or less in depth.

All reverse circulation holes were downhole surveyed at 30 m intervals.

Diamond drilling was HQ in both weathered and fresh rock. All diamond holes were downhole surveyed at 30 m intervals. All HQ core was orientated.

### ***Sampling***

All reverse circulation samples were collected at the drill site over 1 m intervals and split using a multi-stage riffle splitter.

Diamond core was generally sawn in half; with half sent for assaying, and half retained in core trays for future reference. One metre samples were taken and submitted to an independent laboratory for assaying. At the laboratory, both core and reverse circulation samples followed a standard procedure of drying, crushing and grinding. The pulverized samples were thoroughly mixed on a rolling mat ('carpet rolled') and then 200 g of sub-sample was collected. Internal laboratory checks required at least 90% of the pulp passing 75 microns. A 50 g charge was produced for subsequent fire assay analysis.

Very good recovery of both core and reverse circulation samples were recorded and considered to be representative of the mineralization defined by the drilling.

### ***Sample analytical methods***

Cardinal used two laboratories for its geological sample submissions: SGS Ouagadougou Laboratory in Burkina Faso, and SGS Tarkwa Laboratory in Ghana. The independent SGS commercial geochemical analytical laboratories are officially recognized by the South African National Accreditation System for meeting the requirements of the ISO/IEC 17025 standard for specific registered tests for the Minerals Industry.

As part of the Cardinal QAQC, a suite of internationally accredited and certified reference material (standards) and locally sourced blanks were included in the sample submission sequence. The standards cover gold grade ranges expected at Namdini. Interlaboratory umpire analyses were also conducted.

Certified reference material (blanks and standards) were submitted into the sample stream at a rate of 1 in 22 samples. Duplicate samples of reverse circulation chips were taken at a rate of 1 in 22.

No employee, officer, director, or associate of Cardinal carried out any sample preparation on samples from the Namdini Gold Project exploration programme.

Drill core was transported from the drill site by a Cardinal vehicle to the secure core yard facility at the Bolgatanga field exploration office only.

All samples collected for assaying are retained in a locked, secure storage facility until they are collected and transported by the SGS laboratory personnel. Retained drill core is securely stored in the core storage facility and pulps and coarse rejects returned from the laboratories are securely stored in the exploration core logging area and at a nearby secure location in Bolgatanga, Ghana.

### ***Estimation methodology***

MPR Geological estimated recoverable resources for Namdini using multiple indicator kriging ("MIK") with block support adjustment, a method that has been demonstrated to provide reliable estimates of recoverable open pit resources in gold deposits of diverse geological styles. The Mineral Resource was estimated by MIK using GS3M resource modelling software developed by FSSI Consultants (Australia) Pty Ltd.

Estimation was constrained within a mineralization envelope (wireframe) based on geological logging and grade thresholds. The three-main host lithologies are granite, metavolcanics and diorite. Where geological contacts were not clearly controlling the distribution of mineralization, a grade cut-off of approximately 0.1 g/t Au was used to construct Mineral Resource boundaries.

The domain trends north-northeast over 1.3 km and dips approximately 60° to the west with an average horizontal width of approximately 350 m. The Mineral Resource can reasonably be expected to provide appropriately reliable estimates of potential mining outcomes at the assumed selectivity, without application of additional mining dilution or mining recovery factors. Validation of the MIK model was undertaken visually and statistically and reviewed independently.

Parent block dimensions of 12.5 mE by 25 mN by 5 m RL were used for estimation. All sample assays were composited to 2 m prior to estimation.

### **Classification**

The Namdini Mineral Resource has been classified into the Indicated and Inferred categories, in accordance with the JORC Code and the CIM Definition Standards. A range of criteria were considered in determining this classification including geological and grade continuity, data quality and drill hole spacing.

Resource model blocks have been classified as Indicated or Inferred on the basis of search passes and a wire-frame outlining more closely drilled portions of the mineralization. Blocks within the classification wire-frame informed by all search passes were classified as Indicated. Blocks outside the classification wire-frame and estimated by iteration 1 are classified as Indicated. All remaining blocks estimated by iterations 2 and 3 were assigned to the Inferred category.

The three progressively more relaxed search criteria used for MIK estimation are presented in Table 68 of the Technical Report. The search ellipsoids were aligned with the general mineralization orientation.

MPR Geological considers the estimation technique and parameters appropriate for this style of mineralization.

Based on the information presented in the PFS, the Ore Reserve estimation process has converted 73% of the Indicated Mineral Resources to Probable Ore Reserves.

### **Mining**

The mine design and Ore Reserve estimate is based on the revised Mineral Resource model referred to in the press release by Cardinal Resources Limited to the ASX and TSX, dated 5 March 2018.

Trial open pit optimizations were run in Whittle 4X at a US\$1,300/oz gold price (which was the appropriate gold price at the time of the optimization runs) to define the base of potentially economic material. Four cut back pits were then selected and full mine designs applied.

The Ore Reserve reported in the PFS is a sub-set of the Indicated Mineral Resource which can be extracted from the mine and processed with an economically acceptable outcome.

Mining of the Namdini Gold Project has been assumed to be medium-scale using conventional open pit mining equipment. The mining process will include drill and blast as well as conventional load and haul operations. There is expected to be a very limited amount of free-dig material with the majority of material assumed to require drilling and blasting.

Mining will be carried out using staged cut backs with four identified stages incorporated within the LOM final pit. The mining schedule incorporates movement of ore and waste on 10 m mining benches, by year for each of the four mining stages.

Except for the initial plant commissioning, oxide ore will be stockpiled temporarily and batch-fed into the process plant when suitable volumes are available, ensuring that no more than 10% of the plant available time is used to process oxide in any one year. Waste rock will be stockpiled separately on the western side of the pit.

Metallurgical work carried out to date indicates that gold can be satisfactorily recovered from Namdini ore using conventional flotation, regrind and CIL cyanidation techniques. The work is considered sufficient to determine that the Namdini Gold Project Mineral Resource represents a deposit with potential for economic extraction.

### ***Mining factors***

The *in situ* deposit Mineral Resource model is the basis for the mining model used for the starter pit and LOM pit planning and assessment reporting. The resource model has cell dimensions of 12.5 m (east) by 25 m (north) by 5 m (elevation). The MIK adjustment assumes a moderately selective mining unit of 10 m × 5 m × 2.5 m, which has been applied to Namdini's relatively low-grade, large-tonnage, disseminated deposit.

Mining will consist of a conventional hydraulic shovel operation typically using 400 t class excavators in a face-shovel configuration and 150 t class (Cat 785 or similar) rigid body dump trucks hauling on designed access roads. An auxiliary mining fleet of dozers, graders, water carts and utility vehicles will support the mining operation. The appropriately-sized equipment is of medium scale and is less amenable to selective mining. With 60 m minimum mining width as noted, selective mining practices are limited for development of this orebody.

Mining is proposed on 5 m flitches in the ore, within 10 m benches. The base case optimization was determined as part of the PFS and was run using Indicated Mineral Resources only. There is currently no Measured Mineral Resource within the Namdini resource model.

A gold cut-off grade of 0.5 g/t Au was applied to the mineralized material. Process costs and mining costs were supplied by independent consultants and compared with similar gold projects. Gold grades were supplied with the model as estimated proportional grades using the MIK recoverable resource estimation technique.

For purposes of selecting the optimum Whittle pit for mine design purposes, Golder estimated a mining cost of US\$3.50 per tonne of rock mined (see Section 16.14 of the Technical Report) based on experience with similar mining operations in the region, which includes grade control sampling, laboratory assay, analysis and supervision costs. The input process and general and administration cost for the baseline 7.0 Mtpa option was estimated at US\$14.50/t milled plus an additional US\$1.50/t allowance for stockpile reclaim. All tonnes were assumed to be on a dry basis.

Once the optimum selected Whittle pit was selected and mine design completed, a detailed mining movement schedule was supplied to two prospective mining contract companies to assist with the provision of a detailed mining cost estimate. Quotations were provided by both companies which supported an all-in contract mining cost used in the PFS. Further discussions and negotiations will continue with suitable mining contractors prior to any award of the mining contract.

Metallurgical test work was used to estimate the recoverable fraction from the oxide, transition and fresh ore



components, with gold grade and proportion of the block at varying MIK cut-off points coded in the block model.

Using the identified marginal cut-off grade, the proportion of ore per parcel and gold grade above the cut-off grade were included within the mining model to allow export of the parcelled (ore + waste) blocks to the pit optimiser for open pit optimization.

No consideration has been made for underground extensions of the operation in the PFS. A minimum mining width of 60 m was assumed. Mining dilution and recovery are addressed in the modelling method (MIK with variance adjustment) and the utilization of flitch mining. No Inferred Mineral Resources have been included for the PFS within the LOM planning. Mining infrastructure requirements were assumed to be provided by the selected mining contractor with the mining performed on an outsourced basis.

Grade control will be based on sampling from RC drilling spaced at approximately 10 mE by 15 mN with samples taken at 1.5 m intervals downhole. All grade control sampling assays are assumed to be determined by fire assay on the mine site. Standard QAQC protocols will be applied comprising 1 in every 10 samples.

### ***Geotechnical parameters***

In support of the mine design, Golder carried out a study of existing geotechnical information, reviewed information on mineral resource estimates, conducted a detailed pit geotechnical drilling campaign supervised by a site visit by a senior Golder engineer and gathered detailed rotary core logging data from selected drill locations within the Namdini Gold Project area.

The LOM pit design considers slope performance based on models developed from laboratory results of sampled drill core. The results present feasibility-level slope designs based on data collected in the field, plus data and reports made available by Cardinal.

Based on geotechnical and hydrogeological considerations from site investigations at the project area, the design sectors were designated around Namdini Gold Project pit.

Inter-ramps (bench stacks) in slightly weathered to fresh rock should consist of four benches. These are to be separated by 25 m ramps or geotechnical berms (this means that a 25 m geotechnical berm should be included after every 80 m of fresh rock benches). The design table includes an alternative berm width of 5 m, along with the corresponding inter-ramp angle.

Golder recommended that at the beginning of excavation the narrower width be used for benches in SOX, MOX and TRANS materials in temporary walls. Should this geometry perform well then it could be applied to the final walls as well. Should it prove inadequate or problematic, the wider 6-m berms could be used for the final walls in SOX, MOX and TRANS materials.

### ***Pit optimizations***

Pit optimizations were completed using the Lerchs-Grossman algorithm in Whittle 4X to calculate the optimal pit at specified input parameters that were determined prior to the study. A wireframe pit shell for each gold price considered was the resultant output. One of these was selected as the base for the final LOM pit design. A smaller pit approximately 1 Moz was chosen for the starter pit to maximize discounted cash flow and minimize time for capital payback.



### ***Mine scheduling***

Mine scheduling was used to maximize value through deferring of larger strip ratio cut-backs until later in the mine life. The maximum value pit was selected using a discounted average net present value and determined to align with a revenue factor shell of approximately \$1,105/oz using estimated LOM input prices and costs. Pit shells were converted into engineering designs prior to export of the contained resource model for scheduling purposes.

Minemax Scheduler, a commercial linear programming software package was used to model the mining sequence, the processing plant and different ore feeds to maximize net present value for the nominated parameters and constraints. Major constraints included mill throughput, mining limits and oxide feed proportion. The material selection to satisfy processing requirements was based on cut-off grade, mineable ore, processing and selling costs.

The mine scheduling programme includes revenue and cost information. The scheduling software assesses the value generated by each block to determine whether the block is fed directly to the plant, stockpiled or treated as waste. Further financial analysis to determine more realistic absolute financial indicators and sensitivity analysis are performed separately, using the tonnes and grades extracted from the schedule.

The mine design of the Namdini Gold Project consists of a series of nested conventional pit layouts with orebody access provided by a series of ramps. The orebody can be considered a layered sequence consisting of strongly oxidized, moderately oxidized, transition, and fresh mineralized zones.

High level mine production schedules were evaluated for the three scenarios considered (9.5, 7.0 and 4.5 Mtpa mill throughputs) using a starter pit with subsequent pushbacks to the final LOM pit extent.

The schedules allowed an initial ramp up for the process plant in each case before full process plant production was assumed. In order to gain maximum value from the 9.5 Mtpa option, an estimated total peak rock movement of some 30 Mtpa is required in year 7 of the schedule, whereas the 7.0 Mtpa option indicated a total peak required movement of some 17 Mtpa. The 4.5 Mtpa option saw a peak total required rock movement of some 15 Mtpa.

### ***Mine design criteria***

The mine design criteria were developed to allow for development and assessment of designs to provide plant feed rates of 9.5, 7.0 and 4.5 Mtpa.

For the mining study, the maximum mining movement has allowed for a strip ratio of up to 2:1 in order that the initial optimizations are not 'mining-limited'.

For the conceptual pit design, two geotechnical domains namely Zone 1 – Slightly and Moderately Oxidized Weathering Domain and Zone 2 – Transitional and Fresh Weathering Domain, were used to define pit bench heights, berm widths and slope angles.

Pit design criteria were based on Golder's geotechnical recommendations with the deposit broadly broken up into weathered (oxide), partially weathered (transition) and fresh domains, with two distinct domains on the hangingwall and footwall sides of the ore zone (bearing 295°). Refer to Table 96 of the Technical Report for the geotechnical configurations used for the mine pit design criteria.

For practical pit design purposes, the berm widths were rationalized to an 8 m wide berm to avoid having

multiple berm widths required on the same mining bench. Analysis of the block model indicated that the semi-weathered (transition) material reaches a maximum depth of 160 m RL. Thus, it was deemed prudent to maintain single benches with 6 m berm widths above this level and adopt double-benching (20 m) with 8 m berms below it. Adoption of the 6 m berm in both the oxide and transition zones adds a level of increased safety and ease of management in the weathered part of the deposit. Detailed geotechnical zones were then flagged into the mining resource model with which to guide the pit design angles.

The pit was designed with four stages. The initial stage (starter pit) provides early access to the higher-grade ore near the surface. The second stage is largely an expansion of the initial stage targeting the ore to a greater depth. The stage designs were created for optimal ore delivery from the first two stages, due to their low strip ratio and waste rock movement. The third and fourth stages contain a greater proportion of waste rock. A minimum mining width of 60 m was established between the stages.

The pit designs have targeted the maximum discounted value pit shell at a US\$1,300/oz gold price (note that the US\$1,300/oz gold price was applicable at the time of the Whittle optimizations performed in Q2 2018). Pit optimization using Whittle software was used to identify the optimum pit shell with the Inferred Resource material considered as waste rock. The identified pit was then considered for practical staging to minimize waste movement and improve the cashflow for the project. The analysis allowed the selection of four stages with the initial stage targeting a relatively higher-grade area of ore near surface. Access was allowed to the first three stages by a ramp from the northern edge of the pit as the volume of waste rock in the first three stages is considered modest. The final fourth stage has a main access ramp on the western side of the pit to provide a shorter haul to the waste rock dump, given that the final stage has a higher strip ratio than the preceding three stages. Having the primary access on the western side of the pit reduces waste rock haulage costs and thus improves the overall value.

Given limited opportunity outside the starter pit to target higher grade zones, stage design was largely focused on targeting maximum value change points within practical mining constraint limits, such as the minimum mining width for the pushbacks. The first stage is a relatively small 'mini-pit' on the northeast side of the deposit. The first stage contains an estimated 19.9 Mt of fresh ore with an additional 4.0 Mt of oxide and transition ore. This will be stockpiled and processed in campaigns such that a maximum of 10% of available processing time is used for treating the oxide and transition ore in any annual period. The remaining three pit stages follow a traditional pit expansion with the pits pushing out towards the dip of the ore and the pit deepening with each stage.

The indicative production schedules are outlined in Table 152 of the Technical Report.

### ***Mining cost***

The PFS assumes the mining contractor will bear the total mining capital cost under an outsourced mining arrangement with the costs recovered by the mining contractor on a cost per tonne mined basis.

Mining costs were solicited from two of the largest in-country mining contractors. The estimated base mining cost has an applied incremental cost with depth, to account for increased haulage costs and the depth of mining increases in line with standard mining cost principles.

All costs in the Technical Report have been determined on a US dollar basis.

### ***Cut-off grade***

An estimated marginal cut-off grade was established at 0.5 g/t using an assumed long-term gold price of US\$1,300/ounce. The provided Mineral Resource model was validated and used to develop a mining model, as the basis for the LOM plan and economic assessment.

Gold royalties were assumed at 5% of gold price, with payable gold estimated at 99.8% of doré exported. The net gold price was thus \$39.63/g. The input processing cost provided in May 2018 was \$14.49/t plus an additional \$1.50/t allowed for stockpile reclaim giving a total of \$15.99/t of mill feed (as dry tonnes). Thus, the marginal cut-off grade ("**COG**") was estimated as: process cost/(net gold price \* process recovery) giving 0.5 g/t (to one significant figure).

Using this marginal COG, the proportion of ore and the gold grade above the COG, were defined in the mining model and the parcelled proportions of ore, above cut-off within the blocks were exported for open pit optimization.

The 0.5 g/t Au cut-off approximates an operational parameter that the Corporation believes to be applicable. This is in accordance with the guidelines of Reasonable Prospects for Eventual Economic Extraction in the CIM Definition Standards and the JORC Code.

### ***Ore Reserve***

Ore Reserves were estimated for the Namdini Gold Project as part of the PFS by Golder. The total Probable Ore Reserve is estimated at 129.6 Mt at 1.14 g/t Au with a contained gold content of 4,760 koz.

The Ore Reserve for the Namdini Gold Project is reported according to the JORC Code and CIM Definition Standards. The Mineral Resource was converted by applying Modifying Factors. The Probable Ore Reserve estimate is based on the Mineral Resource classified as Indicated. Table 83 of the Technical Report presents a summary of the Ore Reserves on a 100% project basis at a US\$1,300/oz gold price.

## **Mineral processing and metallurgical testing**

### ***Introduction***

The PFS phase of metallurgical testwork focused on development of the flowsheet as presented in Cardinal's preliminary economic assessment ("**PEA**"). The flowsheet is described as a conventional primary crush, SAG/ball mill and re-crush, gravity, flotation, regrind and carbon-in-leach process. Metallurgical results proved to be consistent and strongly supported the flowsheet as described above.

All fresh rock metallurgical testwork for the PFS was carried out by ALS Laboratory in Perth, Australia. This work followed on from the PEA metallurgical testwork completed by Suntech Geomet Laboratories in Johannesburg, South Africa.

Further oxide (weathered rock) metallurgical testwork was not necessary. The oxide PEA results were carried into the PFS.

The PFS fresh rock was metallurgically tested in four parts:

- Starter pit and flotation specific testwork (to test for initial ore metallurgical response):
  - Mineralogy and gold department

- Gravity recoverable gold
- Flotation
- Cyanide leach testwork of bulk rougher flotation concentrate at various regrind sizes.
  
- LOM testwork (to test for ore metallurgical response for the entire mine life):
  - Mineralogy and gold deportment
  - Gravity recoverable gold
  - Flotation
  - Cyanide leach testwork of bulk rougher flotation concentrate at various regrind sizes.
  
- Variability testwork (to test for combinations of gold and varying sulfur grades):
  - Mineralogy and gold deportment
  - Gravity recoverable gold
  - Flotation
  - Cyanide leach testwork of bulk rougher flotation concentrate at various regrind sizes.
  
- Comminution testwork:
  - Semi-autogenous mill comminution variability testwork using HQ core samples
  - Julius Kruttschnitt Drop Weight Test testwork using PQ core samples.

The ALS Laboratory test scope focused on optimization of the flotation and cyanide leach response across a range of representative master and variability composites formed from selected drill core samples.

Metallurgical flowsheet development testwork has been supported based on a wide range of testwork, including:

- Comprehensive master and variability composite head assay analysis, XRD and QEMSCAN mineralogy, and diagnostic leach characterisation.
- Coupled gravity recovery and flotation optimization across a range of primary grind sizes and including assessment of alternative reagent regimes and conditions.
- Flotation variability testing based on the optimal regime derived from the master composite tests.
- Comparative whole ore leach testing over a range of grind sizes, including: direct cyanidation, CIL, lead nitrate dosing, air and oxygen sparging.
- Flotation concentrate leaching based on bulk flotation concentrates formed from master composites, LOM and variability composites. The test scope covered a wide range of regrind sizes and leach methodologies including lead nitrate assisted leaching.
- Comminution characterisation, including: Julius Kruttschnitt drop weight test (“**JK Drop Weight Test**”), uniaxial compressive strength, bond suite and semi-autogenous mill comminution style testwork (“**SMC Variability Test**”) applied to HQ drill core variability lithological composites and PQ drill core lithological composites.

## Results

Key findings from the testwork were:

### Comminution:

- The JK Drop Weight Test showed A\*b values ranged between 30 and 42 for the PQ samples.
- The SMC Variability Test showed derived A\*b values between 30 and 47 for the HQ samples.
- The bond ball mix work index test indicated a range between 14.7 and 19.7 with an average of 16.9 kwh/t.
- Bond abrasion index ranged between 0.03 and 0.29, with the granite ore type having the highest values.

### Mineralogy:

- Native gold is the predominant gold bearing mineral with very low silver content (<2 ppm Ag average).
- Pyrite is the dominant sulfide mineral in the composites where the majority of the gold is associated.
- P80 of the pyrite ranged from 82  $\mu\text{m}$  to 93  $\mu\text{m}$ .
- Pyrite is classified as 'well-liberated' from the host rock minerals with close to 85% liberation.
- Free gold particles were detected during a thorough optical search (using a binocular stereo-microscope) of the unmounted gravity concentrates. These gold grains are approximately 200  $\mu\text{m}$  in diameter and rounded in appearance.
- Separate testing of the mineralization confirms that it is not preg-robbing.

### Flotation:

- High gold recoveries averaging 95% to concentrate for the majority of composites.
- Fast flotation kinetics observed with majority of the gold recovered in less than 5 minutes.
- Addition of a co-collector blended with base case (potassium amyl xanthate) collector did not show a definite benefit to gold recovery.
- Upfront gravity gold recovery improved total gold recovery and mostly eliminated variability in the flotation tails grade.
- Gravity and flotation resulted in average tail grades ranging from of 0.05 to 0.14 g/t.
- Flotation mass recovery to concentrate averaged 7% w/w; concentrate grade based on the starter pit composite averaged approximately 30 g/t without gravity recovery and approximately 20 g/t with prior gravity recovery.
- All gravity gold, flotation, regrind and leach results were analysed to produce regression recovery curves for the starter pit and for the LOM samples. These curves were then applied to the varying head grades of the mine schedule to yield an overall recovery result which for the starter pit was 86% and LOM (including the starter pit) was 84%. These overall recoveries include oxide ore, which were applied at an average of 90% based on previous testwork. These were achieved at a grind P98 of 15  $\mu\text{m}$ .

*Leach:*

- Concentrate leach feed grades based on starter pit and separate LOM lithology composites ranged between 10 g/t and 27.5 g/t, ranging between 15 and 17 g/t on average.
- Leach residues ranged from 1.94 g/t for the starter pit composite to 2.28 g/t for the separate LOM lithology composites at a grind P98 of 15 µm. This range in leach residue grade is equivalent to 0.14-0.16 g/t on a whole ore basis, assuming an average flotation concentrate mass recovery of 7%.

Comminution and metallurgical testwork has provided preliminary information about the physical characteristics and metallurgical response of the three Namdini lithologies.

The processing route for the Namdini ores would be a conventional: crush, primary grind, sulfide flotation followed by regrind and CIL cyanidation of the flotation concentrate.

Orway Mineral Consultants has utilized the comminution results for comminution circuit selection and mill sizing. A primary crushing and SABC comminution circuit (open circuit SAG mill with recycle pebble crushing followed by closed circuit ball mill/hydrocyclones) was selected by Orway Mineral Consultants based on the available comminution parameters.

***Metallurgical testing conclusion***

Key results supporting selection of the process flowsheet from the metallurgical testing are as follows:

*Comminution:*

- From uniaxial compressive strength testing, the Namdini ore is amenable to conventional jaw or gyratory crushing.
- SAG mill comminution testing supports configuration of the comminution circuit based on the proposed SABC flowsheet, incorporating SAG milling and recycle crushing of SAG mill scats, coupled with ball milling to a finished primary grind (P80) size of 106 µm.

*Gravity:*

- Gravity testwork proved the requirement of an upfront gravity recovery process. Prior gravity treatment lifted base-line recovery, mitigating lower flotation recovery of free gold. The inclusion of a gravity circuit is justified based on recoveries achieved for the starter pit composite.

*Flotation:*

- Metallurgical response was very consistent for all lithologies.
- Gold and sulfur flotation kinetics were rapid with high recovery (> 90%) achieved after five minutes with an industry standard reagent regime.
- Variable grind and flotation testing confirmed a primary grind and flotation P80 of 106 µm suitable for on-going development. However, scope for increasing the primary grind to P80 of 150 µm without compromising flotation recovery is a possibility.
- Site water analysis indicated low concentrations of sulfate and multi-valent cations, also indicating little impact on flotation. Subsequent testing in site water confirmed no measurable impact on flotation kinetics or recovery.

*Leach:*

- Leach kinetics were rapid with extraction plateauing after 24-36 hours retention. Consistent with the current flowsheet, CIL leaching and recovery are supported. However, an opportunity exists to reduce the process design leach residence time allowed which is currently 72 hours.
- Leach residue grade is predicated primarily on grind size and leach feed grade; separate lithology residues tended toward a relatively constant (terminal) grade at low leach feed grade.
- Leach residue grade reduces with decreasing regrind size.
- Starter pit composite reported 87.9% extraction at a calculated head of 1.96 g/t and a regrind P98 of 15 µm. Gold recovery based on the average starter pit head grade of 1.31 g/t is calculated at 85.1% based on a concentrate regrind P98 of 15 µm. A combination of oxide and fresh material yields an overall recovery of for the starter pit of 86%.
- Gold recovery based on LOM blend proportions: 60% metavolcanics, 30% granite and 10% diorite and LOM head grading 1.15 g/t is calculated at 84% based on a fine concentrate regrind P98 of 15 µm.

*Flowsheet development:*

- Metallurgical testwork carried out to date indicates that the Namdini Gold Project can utilise a standard gold recovery process plant design with no innovative technology required.
- The metallurgical process uses well-tested technology for all unit operations.
- No deleterious elements were identified in the testwork that could affect the saleability or price of the gold doré produced.
- Namdini will produce readily saleable gold doré which will be exported for refining.
- Gold is recovered using primary crushing, SAG and ball mill grinding with re-crush, gravity recovery (Knelson Concentrator), flotation, concentrate regrind circuit and a CIL circuit.
- A grind P80 of 106 µm was utilized for the primary grind design of the PFS assessment.
- Gravity recovery has been incorporated given the presence of gravity recoverable gold.
- Laboratory flotation testwork indicated fast sulfide flotation kinetics; the circuit comprises six stages of rougher flotation.
- The flotation concentrate is reground and subjected to pre-aeration before CIL.
- Gold recovery will be by a conventional CIL with elution circuit, electrowinning and gold smelting to recover gold from the loaded carbon to produce doré.
- Industry typical design parameters were assumed for the study where testwork was not completed.
- Detailed metallurgical testwork is continuing for the Namdini Gold Project under the direction of Cardinal to support completion of the feasibility study.

**Process Plant**

Annual nominal throughput processing options of 9.5, 7.0 and 4.5 Mtpa were investigated as part of the PFS. Note that all options were designed to meet the International Cyanide Management Code for the manufacture, transport, and use of cyanide in the production of gold.

Assessment of the comminution circuit identified upper and lower throughput limits as follows:

- 9.5 Mtpa as the largest throughput that could be achieved with dual pinion mill drives.
- 7.0 Mtpa throughput that could be accommodated with dual pinion mill drives.
- 4.5 Mtpa as the largest throughput that could be accommodated by a jaw crusher.

### **Flowsheet**

The process plant design incorporates the following unit process operations:

- Single stage primary crushing with a gyratory crusher to produce a P80 of 150 mm.
- Crushed ore feeding a coarse ore stockpile (12 hours live) with ore reclaim via two apron feeders.
- Two stage SAG/ball mill grinding in closed circuit with cyclones to produce a grind P80 of 106 µm. This includes recrushing of pebbles from the SAG mill.
- Gravity recovery including a scalping screen, a single 70-inch centrifugal concentrator and a CS4000 intensive leach reactor.
- Rougher flotation to produce a gold-rich sulfide concentrate.
- High intensity regrind of the flotation concentrate followed by thickening to minimize CIL tankage and reduce overall reagent consumption.
- Commercially recognised high intensity grinding mill technology is utilized to regrind flotation concentrate.
- Thickening of the flotation tails for water recovery prior to disposal in a separate non-cyanide tailings storage facility.
- A concentrate CIL circuit incorporating one pre-leach tank and seven CIL tanks for gold and silver adsorption.
- A 3.5 tonne split AngloAmerican Research Laboratory elution circuit, electrowinning and smelting to recover gold and silver and produce doré.
- CIL tailings treatment incorporating cyanide destruction by sulfur dioxide and oxygen.
- Concentrate CIL tailings disposal in a lined tailings storage facility.
- Figure 130 indicates the selected PFS flowsheet for the Namdini Gold Project.

### **Infrastructure**

#### **Roads and power**

Lycopodium has completed PFS level analysis covering all related aspects of the infrastructure requirement including power, water, road access and waste management.

The site will be accessed by road from the west with a new, approximately 25 km, gravel road linking the site to the existing national road N10 between Pwalagu and Winkogo. The N10 provides good access to the major cities and ports in southern Ghana and no upgrades of the N10 will be required. The site access road will follow a similar route to the proposed new power line for the existing substation north of Pwalagu.

Infrastructure will include the following dedicated elements:

- Unsealed road;
- HV power line;
- Water supply line from the White Volta River.



The site is located approximately 20 km outside Bolgatanga and 180 km from Tamale. Serviced camp style accommodation will also be integrated in the proximity of the operation. A shuttle bus service will operate from Bolgatanga to and from site as required.

Cardinal has sufficient area on its leases to cater for its planned land requirements.

The study assumed that a new, approximately 30 km dual high voltage transmission power line will be constructed.

Power supply to the process plant includes the modifications necessary in the electricity grid connection, and associated Ghana Grid Company Ltd (“**GRIDCo**”) substations as well as the 161 kV high voltage power line to the process plant.

GRIDCo currently supplies a 161 kV high voltage power line from Tamale substation to the Bolgatanga substation. The connection point for the Namdini Gold Project will be near Pwalagu and will traverse a corridor to a new GRIDCo substation close to the Namdini mine.

The GRIDCo substation will transform power at 11 kV to a plant feeder circuit breaker terminal in the Namdini mine substation at the plant site which will then be distributed mine-wide, including the accommodation and other site infrastructure facilities.

#### ***Site facilities and layout***

The location of the plant, pit and waste dump is shown in Figure 132 of the Technical Report.

#### ***Hydrogeology and hydrology***

A hydrogeological fieldwork programme was undertaken comprising a hydro-census of surrounding properties to identify groundwater users. Groundwater exploration drilling of five pairs of boreholes converted to deep and shallow monitoring wells was completed. Characterization of groundwater quality by sampling and laboratory analysis, groundwater monitoring and hydraulic testing was completed. Development of a conceptual model for assessment of pit inflows, potential impacts on mine dewatering on local, plus regional groundwater and surface water systems, has been completed in support of the mine design.

A hydrology programme including the development of a stormwater plan and overall site water balance was also completed. Hydrological design criteria are being developed, largely based on International Finance Corporation requirements.

#### ***Geotechnical investigation***

A geotechnical investigation of the proposed site facilities is summarized in Section 18.4 of the Technical Report.

#### ***Water supply***

A river abstraction system will be installed to provide any shortfall in process water requirements during the operation. An abstraction tower will be constructed on the northern bank of the White Volta River approximately 8.5 km to the west of the process plant. This will comprise submersible pumps situated within an intake tower located within a trench excavated into the northern bank of the White Volta River. A water storage facility will store 30 days’ supply of process water to account for periods during which pumping from the river is not permitted. The facility will comprise a lined ‘turkey’s nest’ pond located directly to the north of

the process plant.

A pipe branch from the main raw water pipeline will supply the potable water treatment plant located at the camp that will purify the water after which it will be reticulated across the site.

A vendor packaged modular potable water treatment plant including filtration, ultraviolet sterilization and chlorination will be installed at the accommodation camp with the treated water reticulated to the site buildings, ablutions, safety showers and other potable water outlets.

### ***Tailings Storage Facilities***

#### *Tailings testing*

Tailings were subject to physical testing. Results indicate that flotation tails will have a rapid rate of supernatant release of 46% of contained water excluding rainfall. CIL tails would be similar but at a slower rate. Ultimate settled density (air dried) was 1.47 t/m<sup>3</sup> for CIL tails and 1.67 t/m<sup>3</sup> for flotation tails.

Geochemical testing indicated the following:

The flotation tailings samples recorded negative net acid producing potential (“**NAPP**”) values and weakly alkaline net acid generating (“**NAG**”) pH values. Therefore, the diorite and metavolcanic flotation tailings are classified as acid consuming and the granite rougher tailings as non-acid forming.

The CIL tailings sample recorded a positive NAPP and a low NAG pH, resulting in a classification of potentially acid forming.

On the basis of the multi-element results, both the flotation and CIL tailings storage facilities will be designed to prevent the loss of solids. The flotation tailings storage facility will require a basic cover system on closure. The cover system for the CIL tailings storage facility will be driven by the need to control potential acid generation by precluding oxygen and water ingress to limit on-going oxidation of the tailings and seepage.

Based on supernatant analysis, the flotation tailings facility will require a compacted soil liner to limit seepage. In addition, the facility will have an under-drainage system to limit the hydraulic head acting on the soil liner. The CIL tailings facility will require a robust engineered liner system, likely comprising of a compacted soil liner with overlying high-density polyethylene liner and underdrainage system.

### ***Tailings Storage Facility design***

#### *Flotation Tailings Storage Facility*

The flotation tailings storage facility will be constructed as a side valley-type storage facility to the southwest of the open pit. The facility will be constructed as two cells with zoned earth fill perimeter embankments and will be lined with a low permeability compacted soil liner. The total basin area will be 311 Ha and is designed to accommodate 120 Mt of tailings. The tailings storage facility embankments will be constructed in stages to suit storage requirements with stage 1 constructed initially to provide capacity for the first 12 months of operation and subsequent stages constructed using downstream, modified centerline and upstream raise construction methods.

The tailings storage facility basin area will be cleared, grubbed and stripped of topsoil. A 300 mm depth compacted soil liner will be constructed over the entire tailings storage facility basin area as either reworked in situ material (assumed 70%) or imported Zone A (30%) material.

The tailings storage facility design incorporates an underdrainage system comprising a network of branch and collector drains in each cell. The underdrainage system drains by gravity to a collection sump located at the lowest point in each cell.

Supernatant water will be removed from the tailings storage facility via a submersible pump (designed by others) mounted in a decant tower. Temporary decants will be provided to suit the tailings deposition schedule in each cell. The final decants will be located along the divider embankment between the two cells.

#### *CIL Tailings Storage Facility*

The CIL tailings storage facility will be constructed as a paddock-type storage facility to the south of the open pit. The facility will be constructed as a single cell with zoned earthfill perimeter embankments and will be lined with compacted soil liner overlain by a synthetic high-density polyethylene geomembrane. The total basin area will be approximately 45 Ha and is designed to accommodate 9.6 Mt of tailings. The tailings storage facility embankments will be constructed in stages to suit storage requirements with stage 1 constructed initially to provide capacity for the first 12 months of operation and subsequent stages constructed using downstream raise construction methods to a final elevation of RL266.0 m (all throughput options). Staged embankment crest elevations will vary between throughput options.

The tailings storage facility basin area will be cleared, grubbed and topsoil stripped, and a 200 mm depth compacted soil liner will be constructed over the entire tailings storage facility basin area as either re-worked in situ material (assumed 30%) or imported Zone A (70%) material. This will be overlain by a 1.5 mm thick smooth high-density polyethylene geomembrane liner.

The tailings storage facility design incorporates an underdrainage system comprising a network of branch and collector drains. The underdrainage system drains by gravity to two collection sumps located at the lowest points in the cell at the southeast and southwest corners.

Supernatant water will be removed from the tailings storage facility via a submersible pump (designed by others) mounted in a decant tower located along the western embankment of the facility.

In order to mitigate seepage losses through the basin area, minimize the phreatic surface in the embankments, and increase the settled density of the deposited tailings, a number of seepage control and underdrainage collection features have been integrated into the design of each facility. The seepage control and underdrainage collection systems will consist of the following components:

- Cut-off trench.
- Low permeability soil liner.
- Synthetic high-density polyethylene geomembrane.
- Basin underdrainage collection system.
- Underdrainage collection sump.
- Leak collection system.
- Upstream toe drain.

Each cell of the flotation tailings storage facility will operate with a series of three decant towers which will be constructed, operated and subsequently decommissioned to suit the staged development of the facility and of the tailings beaches in each cell. The CIL tailings storage facility will operate with a single decant tower throughout the life of the facility.

The decant towers will be raised as required with each embankment lift and will consist of the following components:

- An access causeway constructed of local coarse gravel material.
- A slotted concrete decant tower consisting of 1.8 m square slotted precast concrete sections surrounded by clean waste rock with a minimum size of 100 mm.
- A submersible pump with float control switches mounted on a lifting hoist.
- The decant pump in each tower will be raised on a regular basis to ensure that no tailings enters the pump intake.
- The tailings storage facilities have been designed to completely contain storm events during operation up to and including an annual exceedance probability of 1 in 1,000 (flotation tailings storage facility cell 2) or 1 in 10,000 (flotation tailings storage facility cell 1 and CIL tailings storage facility) on top of the predicted maximum pond level under average climatic conditions, without the emergency spillways operating. Consequently, exceeding the storm storage capacity of the facilities at any stage of operation is unlikely. Regardless, in the event that the storage capacity of a facility is exceeded, water which cannot be stored within the facility will discharge via an engineered spillway.

### **Operating costs**

The purpose of this operating cost estimate is to provide substantiated costs which can be utilized for a preliminary assessment of the viability of the Namdini Gold Project. The operating costs have been developed by:

- Lycopodium – processing and general and administration costs.
- Golder – mining costs.
- Cardinal – owners costs.

Operating costs have been determined for a mine that operates 24 hours per day, 365 days per year. The operating estimate is considered to have an accuracy of  $\pm 25\%$ , is presented in United States dollars (US\$) and is based on prices obtained during the first quarter of 2018 (1Q18). Study currency exchange rates were confirmed by Cardinal.

The 9.5 Mtpa and 4.5 Mtpa options were factored from the 7.0 Mtpa option.

The operating costs have been compiled from a variety of sources, including the following:

- The LOM design mass recovery to flotation concentrate of 7.5% (this is based on recent testwork showing good gold recovery to concentrate at this mass pull).
- Flotation reagent consumption based on recent prefeasibility optimization testwork.
- Leaching reagent consumption based on industry norms in anticipation of final testwork results.
- Calculated reagent usage regimes for cyanide detoxification prior to testwork.
- Modelling by OMC for crushing and grinding energy and consumables based on the final comminution testwork.
- Typical industry data from equipment vendors.
- Budget pricing or Lycopodium's database of prices for consumables.
- Lycopodium's database of costs for similar sized operations.

- Additional operating costs added by Cardinal to allow for the finer grind results.
- Mining costs solicited from two of the largest in-country mining contractors. The estimated base mining cost has an applied incremental cost with depth, to account for increased haulage costs and the depth of mining increases in line with standard mining cost principles.

Operating costs per tonne of ore processed (129.6 Mt of ore) are tabulated in (Table 141 of the Technical Report). Owners costs are tabulated in (Table 142 of the Technical Report).

Sustaining capital costs provided by consultants and Cardinal were compiled from a variety of sources and compared against existing and planned operations elsewhere in Ghana.

Sustaining capital costs which include rehabilitation and mine closure are tabulated in (Table 143 of the Technical Report).

### Capital costs

The mining establishment cost was provided by in-country mining contractors. The process plant and infrastructure costs were estimated by Lycopodium. The costs for the tailings storage facility were provided by Knight Piésold. The capital costs include owner's project cost and contingency as calculated by Lycopodium.

The PFS capital cost estimate was completed to an accuracy of +30 %/-20 % for the 9.5 Mtpa option and was undertaken based on open pit mining from the existing March 2018 Mineral Resource. The proposed plant comprises primary crushing, SABC, gravity recovery, flotation, concentrate regrind and CIL recovery. Three production throughputs were assessed by Cardinal, namely 9.5, 7.0 and 4.5 Mtpa. The 9.5 and 4.5 Mtpa throughput options were factored from the 7.0 Mtpa option (+20/-15% accuracy) and are therefore lower in accuracy at +30/-20%. A contingency factor of 5% was added to the 9.5 and 4.5 Mtpa options over and above the project contingency.

The factored estimates were established by assessing the correlation between cost and the process design criteria with factors being determined by discipline for all areas of the estimate.

Capital costs are summarized below from Table 150 of the Technical Report.

Unit	9.5 Mtpa	7.0 Mtpa	4.5 Mtpa
US\$ (M)	414	348	300

The capital cost in all three throughput scenarios reduced compared to those in the PEA. The main contributors to the reduction were:

- Flotation recovery mass pull was reduced from 15% to 7.5%, based on flotation testwork optimization. This reduction effectively reduced this section of the processing plant by 50% in terms of duty.
- Optimized plant layout, which reduced the plant footprint.
- Optimized steel structures, which ensured that all structures are fit for purpose.
- More accurately designed plant based off engineered quantities, which allowed a reduction in the growth allowance and contingency.

Overall plant layout and equipment sizing was prepared with sufficient detail to permit an assessment of the

engineering quantities for the majority of the facilities for earthworks, concrete, steelwork and mechanical items. The layouts enabled preliminary estimates of quantities to be taken for all areas and for interconnecting items such as pipe racks.

Unit rates for labour and materials were derived from responses to BQRs sent to fabricators and contractors experienced in the scale and type of work in the region.

Budget pricing for equipment was obtained from reputable suppliers with the exception of low value items which were costed from Lycopodium's database of recent project costs.

For the accommodation camp, offices, workshops and similar items, appropriate budget pricing was obtained from reputable suppliers of similar prefabricated designs.

Knight Piésold provided the design and quantities of the following infrastructure items that were subsequently costed by Lycopodium.

The capital cost estimate includes:

- Direct costs of the project development.
- Indirect costs associated with the design, construction and commissioning of the new facilities.
- Owner's cost associated with the management of the project from design, engineering and construction up to the handover to operations and project close-out.
- Insurance and operating spares, first fills.
- Costs associated with operational readiness and pre-production operations.
- Growth allowance on quantity, pricing and unit rates variance.
- Contingency on project scope definition and risks.

The material quantities and unit cost estimates were developed from engineering drawings, estimates and calculations at the level required for PFS and validated against estimates from similar sized projects.

Cardinal allowed for additional capital costs for a finer grind. These were factored costs obtained from Lycopodium.

## **Environmental**

NEMAS Consult Ltd ("**NEMAS**") has undertaken a site reconnaissance visit and completed the scoping stage of the process in accordance with the Ghanaian Environmental Protection Agency procedures for the Environmental Impact Assessment ("**EIA**"). The NEMAS scoping study included preliminary field surveys, literature reviews and examination of appropriate legal and regulatory frameworks.

In compliance with the above regulations, the Namdini Gold Project was registered with the Ghana EPA for environmental permitting. The EPA in response to the registration application by the proponent in a letter dated 23 November 2016, indicated that the project which falls under Schedule 2 makes mandatory a full-scale EIA study and submission of EIS to the EPA.

In compliance with directives by the EPA, a scoping report was prepared and submitted to the agency on 22 June 2017, which also set out the Terms of Reference for the EIA and EIS study. The scoping study report highlighted the following issues among others: project description, environmental and social baseline conditions (mostly from secondary sources) and key environmental and social issues of impact and some

preliminary proposed mitigation measures. The scoping study report also captured the various national and internal laws, policies and guidelines that shall be triggered. Additionally, the concerns of some key stakeholders consulted were captured in the report as consulted. Other key stakeholders that need to be consulted were also identified.

On receiving the scoping report the EPA posted a scoping report notification on page 24 of the August 18, 2017 edition of the Ghanaian Times (a government-owned daily newspaper with a wide national circulation) requesting persons who have an interest, concern or special knowledge relating to the potential environmental effect of the proposed undertaking to contact or submit such concerns, etc., before the EIS notification, to the Executive Director at its national office in Accra and/or the Regional Director at its regional office in Bolgatanga or the Managing Director of the proponent's company in Bolgatanga. The EPA also provided copies of the Scoping Report to the Talensi District Assembly in Tongo and to its Regional Office in Bolgatanga.

NEMAS are in the process of a detailed EIS which will be submitted to the Ghanaian EPA for approval.

### **Social**

The PFS environmental study was progressed by NEMAS, including active engagement of local and state regulatory bodies.

Cardinal has an excellent relationship with neighbouring stakeholders, including engagement with the local stakeholders. Granted mining leases cover all of the proposed mining and processing assets. There are no title claims pending.

Expatriate and skilled Ghanaians from outside the local community will be accommodated in a single status camp on site. An allowance for an accommodation camp to house up to 200 people has been made in the capital cost estimate.

The local workforce will be bussed from the neighbouring population centers. Compensation agreements are being negotiated for the proposed mining operation.

### **Economic evaluation**

Key economic statistics for the comparison of the 9.5 Mtpa, 7.0 Mtpa and 4.5 Mtpa option are included in Table 150 of the Technical Report.

The starter pit key estimated production comparison results are presented in Table 151 of the Technical Report. The starter pit includes the first 2.5 years of operation (24 Mt at 1.31 g/t for 1.06 Moz at 0.5 g/t cut off).

The LOM key estimated production comparison results for the 3 throughput options are presented in Table 152 of the Technical Report.

Figure 137 of the Technical Report to Figure 140 of the Technical Report illustrate the 9.5 Mtpa option pre-tax and post-tax sensitivities at a gold price of US\$1,250/oz.

Based upon LOM production and cost parameters, the post-tax net present value sensitivities are shown in Table 149 of the Technical Report for the 9.5 Mtpa option.

The results of a study on higher throughput options is provided in Section 24.1 of the Technical Report.

A staged funding approach for the on-going development of the Namdini Gold Project is discussed in Section

22.6 of the Technical Report.

### **Next stages**

Based on the positive PFS outcome, the Board has approved the immediate progression to a feasibility study of the Namdini Gold Project to further define and support the case for full project funding and development.

The feasibility study budget for the Namdini Gold Project is summarised below, from Table 153 of the Technical Report.

<b>Item</b>	<b>Cost (US\$<i>k</i>)</b>
Feasibility Study Value Engineering	<b>101</b>
Feasibility Study	<b>1,408</b>
Detailed design and long lead equipment procurement	<b>5,732</b>
Namdini drilling	<b>1,121</b>
Namdini geophysics	<b>13</b>
<b>Total</b>	<b>8,375</b>

### **OTHER PROPERTIES AND ASSETS**

In addition to the Namdini Gold Project, the Corporation is carrying out exploration activities on its other licences, although its main focus is on the Namdini Gold Project. Cardinal during the year has also focused its attention at the Ndongo Licence, with an exploration program being completed at Ndongo during the year.

Cardinal does not consider the other properties to be material. No resources have as yet been established on the Corporation's other properties.

#### **Bolgatanga Project**

The Bolgatanga Project consists of the Ndongo Licence Area, the Kungongo Licence Area and the Bongo Licence Area.

#### ***Ndongo Licence Area***

The Ndongo Licence comprises the combined, Ndongo prospecting licence, Nangodi prospecting licence and Yameriga prospecting licence granted to Cardinal to prospect for and prove gold in the Bolgatanga and Telensi Nabdram district in the upper east region in the Republic of Ghana.

The Ndongo prospecting licence number 17/2010 covering a land size of 173.36 km<sup>2</sup> was granted to Cardinal Resources Ghana Limited on July 7, 2014 for a period of two years ending July 6, 2016. On October 31, 2016, the Minerals Commission extended the Ndongo prospecting licence until October 31, 2017. On February 27, 2017, the Minerals Commission confirmed that Cardinal Resources Ghana Limited is the holder and owner of the Ndongo prospecting licence.



In August 2017, Cardinal entered into a definitive agreement with Red Back Mining Ghana Limited to acquire 100% ownership of Nangodi and Yameriga prospecting licences PL9/19, located adjacent to the Ndongo prospect which expanded the combined Ndongo Licence Area to 286.67km<sup>2</sup>.

### ***Kungongo Licence Area***

The Kungongo prospecting licence was originally granted to Cardinal Resources Ghana Limited on January 21, 2011 as a reconnaissance licence for one year ending January 20, 2012. After the expiration of the reconnaissance licence, the Minerals Commission on its own upgraded the Kungongo reconnaissance licence to a prospecting licence. On October 13, 2015, the Minerals Commission wrote to Cardinal Resources Ghana Limited requesting it to pay for the extension of the Kungongo prospecting licence for a period of 12 months. Cardinal Resources Ghana Limited made the payment for the extension of the Kungongo prospecting licence on June 17, 2016. On July 26, 2016, the Minerals Commission extended the Kungongo prospecting licence to July 25, 2017. On February 27, 2017, the Minerals Commission confirmed that Cardinal Resources Ghana Limited is the holder and owner of the Kungongo prospecting licence.

The Kungongo prospecting licence covers a total land size of 120.12 km<sup>2</sup> and is eligible for renewal.

### ***Bongo Licence Area***

The Bongo reconnaissance licence was granted to Cardinal Resources Ghana Limited on January 21, 2011 for a period of one year ending January 20, 2012. Cardinal Resources Ghana Limited has applied for a renewal of the Bongo reconnaissance licence and the Minerals Commission has recommended that the Minister renew the Bongo reconnaissance licence in the name of Cardinal Resources Ghana Limited. The Minister is yet to sign the renewal letter. However, on February 27, 2017, the Minerals Commission confirmed that Cardinal Resources Ghana Limited is the holder and owner of the Bongo reconnaissance licence.

### ***Subranum Project***

Cardinal Resources Subranum Limited ("**Cardinal Subranum**") is the beneficial and title holder of the Subin-Kasu prospecting licence, which comprises the Subranum Project.

The Subin-Kasu prospecting licence was originally granted to Newmont Ghana Gold Limited. On April 6, 2012, Newmont Ghana Gold Limited entered into a Purchase and Sale Agreement with Cardinal Subranum and assigned the Subin-Kasu prospecting licence to Cardinal Subranum, in consideration for certain cash payments and Cardinal's agreement to incur certain exploration expenses.

Under the Purchase and Sale Agreement, Cardinal Subranum shall pay a two percent net smelter returns royalty on all minerals mined, removed and sold in respect of the Subin-Kasu prospecting licence.

On November 24, 2015, the Minister approved the Purchase and Sale Agreement and Cardinal Subranum became the title holder of Subin-Kasu prospecting licence until September 15, 2016. On November 18, 2016, the Minerals Commission wrote to Cardinal Subranum requesting it to make payment for the extension of the Subin-Kasu prospecting licence for a period of 12 months. Cardinal Subranum made the payment for the extension of the Subin-Kasu prospecting licence on December 14, 2016. On February 27, 2017, the Minerals Commission confirmed that Cardinal Resources Ghana Limited is the holder and owner of the Subin-Kasu prospecting licence.

The Subin-Kasu prospecting licence covers a total land size of 68.70 km<sup>2</sup> located in the Offinso and Ahafo-Ano south district of the Ashanti region in the Republic of Ghana, expires on September 15, 2017, and is eligible for

renewal.

### **Cardinal's Operations in Ghana**

The Corporation holds its material assets and carries on its business in Ghana largely through separate, wholly-owned, operating subsidiaries. As discussed above, Cardinal Subranum, Cardinal Mining Services Limited, Cardinal Resources Ghana Limited and Cardinal Namdini Mining Limited (collectively, the “**Ghanaian Subsidiaries**”) are incorporated under the laws of the Republic of Ghana. The Ghanaian Subsidiaries are indirectly wholly owned by the Corporation.

The Corporation has established systems of corporate governance, internal controls over financial reporting and disclosure controls and procedures that apply at all levels of the Corporation's corporate structure. Such systems are overseen by the Board and implemented by senior management of the Corporation. Certain significant features of these systems are described below:

*Control over Subsidiaries* – The Corporation's corporate structure has been designed to ensure that the Corporation is able to direct the operations of its subsidiaries. All of the Corporation's subsidiaries, including the Ghanaian Subsidiaries, are wholly-owned. Accordingly, the Corporation controls the appointments of the directors of the Corporation's subsidiaries and the directors of such subsidiaries are ultimately accountable to the Board and senior management. Mr. Koimtsidis and Mr. Easah, both of whom are directors of the Corporation, are the only directors of the Ghanaian Subsidiaries. The corporate records, including minute books, of the Ghanaian Subsidiaries are kept at the Corporation's head office.

Under Ghanaian law, the shareholders of a corporation are entitled to remove directors at a duly convened general meeting of a corporation. In the event that the Corporation wished to remove a director of a Ghanaian Subsidiary, the Corporation would cause the shares in such Ghanaian Subsidiary to be voted for the removal of such director. Removal would take place at a meeting duly convened for the purpose of such removal and held at least 35 days after the notice of the meeting has been served on such director and any other directors of such Ghanaian Subsidiary who are entitled to attend the general meeting.

As noted above, the only directors of Ghanaian Subsidiaries also serve as directors of the Corporation. In the event that the Corporation wished to remove an officer of a Ghanaian Subsidiary, the directors of such Ghanaian Subsidiary would take the requisite corporate action to remove such officer.

*Risk Assessment* – The Board is responsible for the management of the Corporation and, as such, supervises the management of the business and affairs of the Corporation. The Board is responsible for approving any capital expenditures and other transactions and matters that are considered material to the Corporation, including matters of the Corporation's subsidiaries that are considered material to the Corporation. In addition, the Board has delegated certain risk-management functions to the Audit and Risk Committee. The Audit and Risk Committee is responsible for overseeing the Corporation's risk management systems, practices and procedures, for identifying and managing business, economic, environmental and social sustainability risks and for reviewing the Corporation's risk management framework at least annually.

*Internal Control over Financial Reporting* – The Corporation prepares its consolidated financial statements and MD&A on a quarterly and annual basis, using International Financial Reporting Standards (IFRS), which require financial information and disclosures from the Corporation's subsidiaries. The Corporation implements internal controls over the preparation of its financial statements and other financial disclosures to provide reasonable assurance that its financial reporting is reliable and that the quarterly and annual financial statements and MD&A are being prepared in accordance with IFRS. These internal controls include the following:

- Management of the Corporation has direct access to relevant financial management of the Corporation's subsidiaries in order to verify and clarify all information required.
- All public documents and statements relating to the Corporation and its subsidiaries containing material information (including financial information) are reviewed by senior management (including the Chief Executive Officer and Managing Director) before such material information is disclosed, to make sure that all material information has been considered by management of the Corporation and properly disclosed.
- The Audit and Risk Committee will review and approve the Corporation's quarterly financial statements and MD&A and will recommend to the Board for the Board's approval the Corporation's annual financial statements and MD&A, and any other financial information requiring Board approval, prior to their publication or release.
- The Audit and Risk Committee assesses and evaluates the adequacy of the procedures in place for the review of the Corporation's public disclosure of financial information extracted or derived from the Corporation's financial statements, other than annual and quarterly financial disclosure.

In addition, the Corporation engages its external auditor to perform an audit of the annual consolidated financial statements in accordance with IFRS.

*Disclosure Controls and Procedures* – The responsibilities of the Audit and Risk Committee include oversight of the Corporation's internal control systems including identifying, monitoring and mitigating business risks as well as compliance with legal, ethical and regulatory requirements.

*CEO and CFO Certifications* – In order for the Corporation's Managing Director and Chief Executive Officer and its Chief Financial Officer to be in a position to attest to the matters addressed in the quarterly and annual certifications required by National Instrument 52-109 – *Certification of Disclosure in Issuers' Annual and Interim Filings*, the Corporation has developed internal procedures and responsibilities throughout the organization for its regular periodic and special situation reporting, in order to provide assurances that information that may constitute material information will reach the appropriate individuals who review public documents and statements relating to the Corporation and its subsidiaries containing material information, is prepared with input from the responsible officers and employees, and is available for review by the Managing Director and Chief Executive Officer and the Chief Financial Officer in a timely manner.

These systems of corporate governance, internal control over financial reporting and disclosure controls and procedures are designed to ensure that, among other things, the Corporation has access to all material information about its subsidiaries, including the books and records of its subsidiaries.

The Corporation provides funds to the Ghanaian Subsidiaries for exploration activities. As part of its corporate governance practices, Cardinal has developed a Delegation of Authority Manual. The Delegation of Authority Manual contains guidelines for delegated authorities that help in maintaining adequate controls within the organization, including the flow of funds between Australia and Ghana.

## RISK FACTORS

Prospective investors should carefully consider the following risk factors in addition to the other information contained in this AIF. The risks and uncertainties described below are not the only ones facing the Corporation. Additional risks and uncertainties not presently known to the Corporation or that the Corporation currently considers immaterial may also impair the business and operations of the Corporation and cause the price of the Ordinary Shares to decline. If any of the following risks actually occur, the Corporation's business may be

harmed and the financial condition and results of operations may suffer significantly. In that event, the trading price of the Ordinary Shares could decline and holders of the Ordinary Shares may lose all or part of their investment.

## **Risks Related to the Industry**

### ***Mineral Exploration, Development and Operating Risks***

Mineral exploration is highly speculative in nature, generally involves a high degree of risk and frequently is non-productive. The mineral tenements of the Corporation are at various stages of exploration, and potential investors should understand that mineral exploration and development are high-risk undertakings. There can be no assurance that exploration of these tenements, or any other tenements that may be acquired in the future, will result in the discovery of an economic ore deposit. Even if an apparently viable deposit is identified, there is no guarantee that it can be economically exploited or will result in a profitable commercial mining operation.

Resource acquisition, exploration, development and operation involve significant financial and other risks over an extended period of time, which even a combination of careful evaluation, experience and knowledge may not eliminate. Significant expenses are required to locate and establish economically viable mineral deposits, to acquire equipment, and to fund construction, exploration and related operations, and few mining properties that are explored are ultimately developed into producing mines.

Success in establishing an economically viable project is the result of a number of factors, including the quantity and quality of minerals discovered, proximity to infrastructure, metal and mineral prices which are highly cyclical, costs and efficiencies of the recovery methods that can be employed, the quality of management, available technical expertise, taxes, royalties, environmental matters, government regulation (including land tenure, land use and import/export regulations) and other factors. Even in the event that mineralization is discovered on a given property, it may take several years in the initial phases of drilling until production is possible, during which time the economic feasibility of production may change as a result of such factors. The effect of these factors cannot be accurately predicted, but the combination of these factors may result in the Corporation not receiving an adequate return on its invested capital, and no assurance can be given that any exploration program of the Corporation will result in the establishment or expansion of resources or reserves.

The Corporation's operations are subject to all the hazards and risks normally encountered in the exploration, development and production of gold and other minerals, including hazards relating to the discharge of pollutants or hazardous chemicals, changes in anticipated grade and tonnage of ore, unusual or unexpected adverse geological or geotechnical formations, unusual or unexpected adverse operating conditions, slope failures, rock bursts, cave-ins, seismic activity, the failure of pit walls, pillars or dams, fire, explosions, and natural phenomena and 'acts of God' such as inclement weather conditions, floods, earthquakes or other conditions, any of which could result in damage to, or destruction of, mineral properties or production facilities, personal injury or death, damage to property, environmental damage, unexpected delays, monetary payments and possible legal liability, which could have a material adverse impact upon the Corporation. In addition, any future mining operations will be subject to the risks inherent in mining, including adverse fluctuations in fuel prices, commodity prices, exchange rates and metal prices, increases in the costs of constructing and operating mining and processing facilities, availability of energy and water supplies, access and transportation costs, delays and repair costs resulting from equipment failure, changes in the regulatory environment, and industrial accidents and labour actions or unrest. The occurrence of any of these risks could materially and adversely affect the development of a project or the operations of a facility, which could have a material adverse impact upon the Corporation.

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***Estimation of Mineralization, Resources and Reserves***

There is a degree of uncertainty attributable to the calculation of mineralization, resources and reserves and corresponding grades being mined or dedicated to future production. Until reserves or mineralization are actually mined and processed, the quantity of mineralization and reserve grades must be considered estimates only. These estimates depend upon geological interpretation and statistical inference drawn from drilling and sampling analysis, which may prove unreliable. There can be no assurance such estimates will be accurate. In addition, the quantity of reserves and mineralization may vary depending on commodity prices. Any material change in quantity of reserves, mineralization, grade or stripping ratio may affect the economic viability of a mine. In addition, there can be no assurance that recoveries from laboratory tests will be duplicated in tests under on-site conditions or during production. The inclusion of mineral resource estimates should not be regarded as a representation that these amounts can be economically exploited and no assurances can be given that such resources estimates will be converted into reserves. Different experts may provide different interpretations of resource estimates.

***Environmental, Health and Safety Regulations of the Resource Industry***

Environmental matters in Ghana, including those related to mining, fall primarily under the oversight of the EPA, as well as the Minerals Commission and the Mines Inspectorate Division of the Minerals Commission. The Environmental Protection Agency Act, 1994 (Act 490), and the Environmental Assessment Regulations, 1999 (L.I. 1652) govern, among other things, environmental and socio-economic impact assessments and statements, environmental management plans, emissions into the environment, environmental auditing and review, and mine closure and reclamation, to which the Corporation's operations are subject.

Additional provisions governing mine environmental management are provided in the Minerals and Mining Act, 2006 (Act 703), and Minerals and Mining Regulations (Health, Safety and Technical) 2012 (L.I. 2182). The Corporation believes it is in substantial compliance with these laws and regulations; however, the Corporation notes a continuing trend toward substantially increased environmental requirements and evolving corporate social responsibility expectations in Ghana, including the requirement for more permits, analysis, data gathering, community hearings, and negotiations than have been required in the past for both routine operational needs and for new development projects.

Due to bureaucratic delays, there can be no assurance that all permits which the Corporation may require for construction of mining facilities and conduct of mining operations, particularly environmental permits, will be obtainable on reasonable terms or timeframes or that compliance with such laws and regulations would not have an adverse effect on the profitability of any mining project that the Corporation might undertake.

All phases of the Corporation's operations are subject to environmental regulations in various jurisdictions. If the Corporation's properties are proven to host economic reserves of metals, mining operations will be subject to national and local laws relating to the protection of the environment, including laws regulating removal of natural resources from the ground and the discharge of materials into the environment.

Mining operations will be subject to national and local laws and regulations which seek to maintain health and safety standards by regulating the design and use of mining methods and equipment. Various permits from government bodies are required for mining operations to be conducted; no assurance can be given that such permits will be received.

No assurance can be given that environmental standards imposed by national or local authorities will not be changed or that any such changes would not have material adverse effects on the Corporation's activities. Moreover, compliance with such laws may cause substantial delays or require capital outlays in excess of those

anticipated, thus causing an adverse effect on the Corporation. Additionally, the Corporation may be subject to liability for pollution or other environmental damage, which it may not be able to insure against.

Failure to comply with applicable laws, regulations and permitting requirements may result in enforcement actions thereunder, including orders issued by regulatory or judicial authorities causing operations to cease or be curtailed, and may include corrective measures requiring capital expenditures, installation of additional equipment or remedial actions. Parties engaged in mining operations may be required to compensate those suffering loss or damage by reason of the mining activities and may have civil or criminal fines or penalties imposed for violations of applicable laws or regulation and, in particular, environmental laws.

Amendments to current laws, regulations and permits governing operations and activities of mining companies, or more stringent implementation thereof, could have a material adverse impact on the Corporation and cause increases in capital expenditures or production costs or reduction in levels of production at producing properties or require abandonment or delays in development of new mining properties.

### ***Competitive Conditions***

There is aggressive competition within the mineral exploration and mining industry for the discovery and acquisition of properties considered to have commercial potential, and for management and technical personnel. The Corporation's ability to acquire projects in the future is highly dependent on its ability to operate and develop its current assets and its ability to obtain or generate the necessary financial resources. The Corporation will compete with other parties in each of these respects, many of which have greater financial resources than the Corporation. Accordingly, there can be no assurance that any of the Corporation's future acquisition efforts will be successful, or that it will be able to attract and retain required personnel. Any such failure could have a material adverse impact upon the Corporation.

### **Risks Related to the Business**

#### ***Operational Risks***

The Corporation has not previously generated revenues from operations and its mineral projects are at an exploration stage. Therefore, it is subject to many risks common to comparable companies, including under-capitalization, cash shortages and limitations with respect to personnel, financial and other resources as well as a lack of revenues. The Corporation has historically incurred significant losses as it has no sources of revenue (other than interest income), and has significant cash requirements to meet its exploration commitments, administrative overhead and maintain its mineral interests. The Corporation expects to continue to incur net losses unless or until one or more of its properties enters into commercial production and generates sufficient revenue to fund continuing operations. There can be no assurance that current exploration or development programs will result in the discovery of commercial deposits or, ultimately, in profitable mining operations. See also "Liquidity and Financing Risk" and "Funding Risk" below.

#### ***Liquidity and Financing Risk***

The Corporation has no source of operating cash flow and may need to raise additional funding in the future through the sale of equity or debt securities or by optioning or selling its properties. Any additional equity financing will dilute shareholdings, and debt financing, if available, may involve restrictions on financing and operating activities. No assurance can be given that additional funding will be available for further exploration and development of the Corporation's properties when required, upon terms acceptable to the Corporation or at all. Failure to obtain such additional financing could result in the delay or indefinite postponement of further exploration and development of its properties, or even a loss of property interest, which would have a

material adverse impact upon the Corporation.

### ***Funding Risk***

At the date of this AIF, the Corporation has no income producing assets and will generate losses for the foreseeable future. Until it is able to develop a project and generate appropriate cash flow, it is dependent upon being able to obtain future equity or debt funding to support long term exploration. Neither the Corporation nor any of the Directors nor any other party can provide any guarantee or assurance that if further funding is required, such funding can be raised on terms favourable to the Corporation (or at all). Any additional equity funding will dilute existing shareholders. Also, no guarantee or assurance can be given as to when a project can be developed to the stage where it will generate cash flow. As such, a project would be dependent on many factors, for example exploration success, subsequent development, commissioning and operational performance.

### ***Exploration Costs***

The exploration costs of the Corporation are based on certain assumptions with respect to the method and timing of exploration. By their nature, these estimates and assumptions are subject to significant uncertainties and, accordingly, the actual costs may materially differ from these estimates and assumptions. Accordingly, no assurance can be given that the cost estimates and the underlying assumptions will be realized in practice, which may materially and adversely affect the Corporation's viability.

### ***Uninsurable Risks***

In the course of exploration, development and production of mineral properties, risks, including, but not limited to, unexpected or unusual geological or operating conditions, natural disasters, inclement weather conditions, pollution, rock bursts, cave-ins, fires, flooding, earthquakes, civil unrest, terrorism and political violence may occur. It is not always possible to fully insure against all risks associated with Cardinal's operations and Cardinal may decide not to take out insurance against certain risks as a result of high premiums or other reasons. Should such liabilities arise, they could reduce or eliminate any future profitability and result in increasing costs and a decline in the value of the securities of Cardinal.

### ***Conflicts of Interest***

Certain directors of the Corporation are, and may continue to be, involved in the mining and mineral exploration industry through their direct and indirect participation in corporations, partnerships or joint ventures which are potential competitors of the Corporation. Situations may arise in connection with potential acquisitions in investments where the other interests of these directors may conflict with the interests of the Corporation. Any Directors with conflicts of interest will be subject to and will follow the procedures set out in applicable corporate and securities legislation, regulations, rules and policies.

### **Risks Related to Operating in Ghana**

#### ***Environmental Bonds***

The EPA from time to time reviews the reclamation bonds that are placed on the Corporation's projects in Ghana. As part of its periodic assessment of mine reclamation and closure costs, the EPA reviews the adequacy of reclamation bonds and guarantees.

In certain cases, the EPA has requested higher levels of bonding based on its findings. If the EPA were to require



additional bonding at the Corporation's properties, it may be difficult, if not impossible, to provide sufficient bonding. If the Corporation is unable to meet any such increased bonding requirements or negotiate an acceptable solution with the Government of Ghana, its operations and exploration and development activities in Ghana may be materially adversely affected.

The Corporation is not in a position to state whether a review in respect of any of the Corporation's projects in Ghana is imminent or whether the outcome of such a review would be detrimental to the funding needs of the Corporation.

### ***Risks of Operating in Ghana***

The Corporation's projects in Ghana are subject to the risks of operating in foreign countries, including political and economic considerations such as civil and tribal unrest, war (including in neighbouring countries), terrorist actions, criminal activity, nationalization, invalidation of governmental orders, failure to enforce existing laws, labour disputes, corruption, sovereign risk, political instability, the failure of foreign parties, courts or governments to honour or enforce contractual relations or uphold property rights, changing government regulations with respect to mining (including royalties, environmental requirements, labour, taxation, land tenure, foreign investments, income repatriation and capital recovery), fluctuations in currency exchange and inflation rates, import and export restrictions, challenges to the title to properties or mineral rights in which the Corporation has interests, problems or delays renewing licences and permits, opposition to mining from local, environmental or other non-governmental organizations, increased financing costs, instability due to economic under-development, inadequate infrastructure, and the expropriation of property interests, as well as by laws and policies of Canada affecting foreign trade, investment and taxation. As African governments continue to struggle with deficits and depressed economies, the strength of commodity prices has resulted in the gold mining sector being targeted as a source of revenue. Governments are continually assessing the terms for a mining company to exploit resources in their country.

Furthermore, the Corporation requires consultants and employees to work in Ghana to carry out its planned exploration and development programs. It may be difficult from time to time to find or hire qualified people in the mineral exploration industry who are situated in Ghana, or to obtain all of the necessary services or expertise in Ghana, or to conduct operations on its projects at reasonable rates. If qualified people and services or expertise cannot be obtained in Ghana, the Corporation may need to seek and obtain those services from service providers located outside of Ghana which could result in delays and higher costs to the Corporation.

Mineral resource companies face increasing public scrutiny of their activities, and are under pressure to demonstrate that their operations have potential to generate satisfactory returns not only to their shareholders, but also to benefit local governments and the communities surrounding its properties where it operates. The potential consequences of these pressures include reputational damage, lawsuits, increasing social investment obligations and pressure to increase taxes and future royalties payable to local governments and surrounding communities. As a result of these considerations, the Corporation may incur increased costs and delays in permitting and other operational matters with respect to its property interests in Ghana.

Any of the above events could delay or prevent the Corporation from exploring or developing its properties even if economic quantities of minerals are found, and could have a material adverse impact upon the Corporation's foreign operations.

### ***Government Policy Changes***

The mineral exploration activities undertaken by the Corporation are subject to laws and regulations governing health and worker safety, employment standards, exports, taxation, waste disposal, management and use of



toxic substances and explosives, protection of the environment, mine development and production, protection of endangered and protected species, reclamation, historic and cultural preservation and other matters. Exploration activities may also be affected in varying degrees by government regulations with respect to, but not limited to, restrictions on future exploration and production, price controls, royalties, export controls, currency availability, foreign exchange controls, income taxes, delays in obtaining or the inability to obtain necessary permits, opposition to mining from environmental and other non-governmental organizations, limitations on foreign ownership, expropriation of property, ownership of assets, environmental legislation, labour relations, limitations on repatriation of income and return of capital, limitations on mineral exports, high rates of inflation, increased financing costs, and site safety.

The Corporation's exploration programs with respect to the Corporation's projects in Ghana will, in general, be subject to approval by the Minerals Commission and other governmental agencies. Development of any of the Corporation's properties will be dependent on the Namdini Gold Project meeting environmental guidelines set by EPA and, where required, being approved by governmental authorities such as the Minerals Commission.

Failure to comply with applicable laws, regulations and permits, even if inadvertent, may result in enforcement actions thereunder, including the forfeiture of claims, orders by regulatory or judicial authorities requiring operations to cease or be curtailed, and may include corrective measures requiring capital expenditures, installation of additional equipment or costly remedial actions, which could have a material adverse impact upon the Corporation. The Corporation may be required to compensate those claiming to suffer loss or damage by reason of its activities and may have civil or criminal fines or penalties imposed for violations of such laws, regulations and permits, which could have a material adverse impact upon the Corporation.

In addition, no assurance can be given that new rules and regulations will not be enacted or that existing rules and regulations will not be applied in a manner which could limit or curtail development or future potential production. Adverse changes in government policies or legislation may affect ownership of mineral interests, taxation, royalties, land access, labour relations, and mining and exploration activities of the Corporation. It is possible that the current system of exploration and mine permitting in Ghana may change, resulting in impairment of rights and possibly expropriation of the Corporation's properties without adequate compensation.

### **Ownership Risks**

The Corporation holds its interests in the Namdini Gold Project through a large-scale mining licence. For more information, please see "*Namdini Gold Project*".

The Constitution of Ghana vests title in every mineral in its natural state to the Government of Ghana. The exercise of any mineral right in the form of reconnaissance, exploration or exploitation of any mineral in Ghana requires an appropriate licence or mineral right to be issued by the Government of Ghana acting through the Minister. There is no assurance that title to the properties in which the Corporation has interests will not be challenged. The acquisition of title to mineral exploration properties is a very detailed and time-consuming process. Title to and the area of mineral properties may be disputed. While the Corporation has diligently investigated title to the properties in which it has an interest, it may be subject to prior unregistered agreements or transfers or indigenous land claims and title may be affected by undetected defects. Consequently, the boundaries may be disputed.

There can be no assurance that there are no prior unregistered agreements, claims or defects that may result in the title to the properties in which the Corporation has an interest being challenged. Further, the Corporation's interests in the properties are subject to the risks that counterparties will fail to honour their contractual commitments, that courts will not enforce such contractual obligations and that required

governmental approvals will not be obtained. A successful challenge to the precise area and location of these claims, or the failure of counterparties to honour or of courts to enforce such contractual obligations could result in the Corporation being unable to operate on its properties as anticipated or being unable to enforce its rights with respect to its properties which could have a material adverse impact upon the Corporation.

### ***Permitting and Licensing Risks***

In addition to mineral rights, the Corporation will require some or all of the following permits, licences or other regulatory approvals to be able to carry out business operations in Ghana as it advances its projects: (i) environmental permits; (ii) approved environmental management plans and environmental certificates; (iii) reclamation bonds and approved reclamation plans; (iv) water usage permits; (v) business operating permits; (vi) licences to export, sell or dispose of minerals; (vii) permits/licences to retain a specified percentage of mineral export proceeds for purposes of debt servicing, dividend payment to foreign shareholders and acquisition of plant and machinery for the mining project; (viii) permits to operate foreign exchange retention accounts with a trustee bank; and (ix) immigration quotas to employ a specified number of non-Ghanaians to work on mining projects. The Corporation believes that it will be able to obtain and maintain in the future all such necessary licences and permits to carry on the activities which it intends to conduct, and intends to comply in all material respects with the terms of such licences and permits.

There can be no guarantee, however, that the Corporation will be able to obtain and maintain, at all times, all the necessary licences and permits required to undertake the proposed exploration and development or to place its properties into commercial production and to operate mining facilities thereon. In the event of commercial production, the cost of compliance with changes in governmental regulations has the potential to reduce the profitability of operations or preclude the economic development of a particular property.

### ***Artisanal Miners***

The Corporation's property interests are held in areas of Ghana that have historically been mined by artisanal miners. As the Corporation further explores and advances its projects, it may be required to require the removal of any artisanal miners operating on its properties. There is a risk that such artisanal miners may oppose the Corporation's operations, which may result in a disruption to any planned development and/or mining and processing operations. In addition, artisanal miners have historically used chemicals that are harmful to the environment to separate the precious metals from the ore. There can be no assurance that the Corporation will not be subject to environmental liabilities resulting from such operations in the future, which could have a material adverse impact on the Corporation. In addition, artisanal work practices are often unsafe and accidents and/or incidents may occur on the Corporation's property, and there is an added reputational risk that third parties may wish to link the activities of the artisanal miners to that of the Corporation in the event of accidents or incidents, which could have a material adverse impact on the Corporation.

### ***Difficulty in Enforcement of Judgements***

All of the subsidiaries of the Corporation and the majority of its assets are located outside of Canada. Accordingly, it may be difficult for investors to enforce within Canada any judgments obtained against the Corporation, including judgments predicated upon the civil liability provisions of applicable Canadian securities laws. Consequently, investors may be effectively prevented from pursuing remedies against the Corporation under Canadian securities laws or otherwise.

The Corporation has subsidiaries incorporated in Australia and Ghana. Many of the directors and officers of the Corporation reside outside of Canada, and substantially all of the assets of these persons are located outside of Canada. It may not be possible for shareholders to effect service of process against the Corporation's

directors and officers who are not resident in Canada. In the event a judgment is obtained in a Canadian court against one or more of the Corporation's directors or officers for violations of Canadian securities laws, it may not be possible to enforce such judgment against those directors and officers. Additionally, it may be difficult for an investor, or any other person or entity, to assert Canadian securities law claims in original actions instituted in Australia or Ghana. Courts in these jurisdictions may refuse to hear a claim based on a violation of Canadian securities laws on the grounds that such jurisdiction is not the most appropriate forum to bring such a claim. Even if a foreign court agrees to hear a claim, it may determine that the local law, and not Canadian law, is applicable to the claim. If Canadian law is found to be applicable, the content of applicable Canadian law must be proven as a fact, which can be a time-consuming and costly process. Certain matters of procedure will also be governed by foreign law.

## **General Risks**

### ***Market Conditions***

Share market conditions may affect the value of the Corporation's quoted securities regardless of the Corporation's operating performance. Share market conditions are affected by many factors such as: general economic outlook; introduction of tax reform or other new legislation; interest rates and inflation rates; changes in investor sentiment toward particular market sectors; the demand for, and supply of, capital; and terrorism or other hostilities. The market price of securities can fall as well as rise and may be subject to varied and unpredictable influences on the market for equities in general and resource exploration stocks in particular. The Corporation does not warrant the future performance of the Corporation or any return on an investment in the Corporation.

### ***Stress in the Global Economy***

Reduction in credit, combined with reduced economic activity and the fluctuations in the Australian dollar may adversely affect businesses and industries that purchase commodities, affecting commodity prices in more significant and unpredictable ways than the normal risks associated with commodity prices. The availability of services such as drilling contractors and geological service companies and/or the terms on which these services are provided may be adversely affected by the economic impact on the service providers. The adverse effects on the capital markets generally make the raising of capital by equity or debt financing much more difficult and the Corporation is dependent upon the capital markets to raise financing. Any of these events, or any other events causing turmoil in world financial markets, may have a material adverse effect on the Corporation's business, operating results and financial condition.

### ***Current Global Financial Condition***

Current global financial conditions have been subject to increased volatility. As such, the Corporation is subject to counterparty risk and liquidity. The Corporation is exposed to various counterparty risks including, but not limited to, financial institutions that hold the Corporation's cash, and through companies that have payables to the Corporation. The Corporation is also exposed to liquidity risks in meeting its operating expenditure requirements in instances where cash positions are unable to be maintained or appropriate financing is unavailable. These factors may impact the ability of the Corporation to obtain loans and other credit facilities in the future and, if obtained, on terms favourable to the Corporation. If these increased levels of volatility and market turmoil continue, the Corporation's operations could be adversely impacted and the trading price of the shares could be adversely affected.

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***Exchange Rate and Currency Risks***

The Corporation undertakes certain transactions denominated in foreign currencies, hence exposures to exchange rate fluctuations arise. The Corporation does not hedge this exposure. The Corporation manages its foreign exchange risk by constantly reviewing its exposure and ensuring that there are appropriate cash balances in order to meet its commitments.

Currency fluctuations may affect the cash flow which the Corporation may realize from its operations, since most mineral commodities are sold in a world market in USD. The Corporation's costs are incurred in AUD, GHS, USD and CAD.

***Commodity Prices***

The price of the Ordinary Shares, and the Corporation's profitability, financial results and exploration activities may in the future be significantly adversely affected by declines in the price of precious metals. Precious metal prices fluctuate on a daily basis and are affected by a number of factors beyond the control of the Corporation, including the US dollar and other foreign currency exchange rates, central bank and financial institution lending and sales, producer hedging activities, global and regional supply and demand, production costs, confidence in the global monetary system, expectations of the future rate of inflation, the availability and attractiveness of alternative investment vehicles, interest rates, terrorism and war, and other global or regional political or economic events or conditions.

The price of gold has fluctuated widely in recent years, and future trends cannot be predicted with any degree of certainty. In addition to adversely affecting the Corporation's financial condition and exploration and development activities, declining commodity prices can impact operations by requiring a reassessment of the feasibility of a particular project, as well as have an impact on the perceptions of investors with respect to gold equities, and therefore, the ability of the Corporation to raise capital. A sustained, significant decline in the price of gold could also cause development of any properties in which the Corporation may hold an interest from time to time to be impracticable. Future production from the Corporation's future properties, if any, will be dependent upon, among other things, the price of gold being adequate to make these properties economic. There can be no assurance that the market price of gold will remain at current levels, that such price will increase or that market prices will not fall.

***Reliance on Key Personnel***

The responsibility of overseeing the day-to-day operations and the strategic management of the Corporation depends substantially on its senior management and its key personnel. There can be no assurance that there will be no detrimental impact on the Corporation if one or more of these employees cease their employment.

***Dilution Risk***

Cardinal has outstanding options and Performance Shares, as detailed in the most recent financial statements for the year ended June 30, 2018 and elsewhere in this AIF. Should these securities be exercised or converted (as applicable), the holders have the right to acquire additional Ordinary Shares, in accordance with the terms of such securities. During the life of these securities, the holders have the opportunity to profit from a rise in the market price of the Cardinal shares, possibly resulting in the dilution of existing securities.

**DIVIDENDS**

To date, the Corporation has not paid any dividends on its Ordinary Shares and anticipates that it will retain all

future earnings and other cash resources for the future operation and development of its business. The Corporation does not intend to declare or pay any cash dividends in the foreseeable future. Payment of any future dividends will be at the discretion of the Board after taking into account many factors, including the Corporation's operating results, financial condition and current and anticipated cash needs.

## DESCRIPTION OF CAPITAL STRUCTURE

### Ordinary Shares

The Corporation's authorized capital stock consists of an unlimited number of Ordinary Shares, of which 378,823,580 Ordinary Shares are issued and outstanding as of the date of this AIF.

All Ordinary Shares rank equally as to dividends, voting powers and participation in the distribution of assets. All holders of Ordinary Shares are entitled to receive notice of any meetings of Shareholders of the Corporation, and to attend and cast one vote per Ordinary Share at all such meetings. Holders of Ordinary Shares do not have cumulative voting rights with respect to the election of directors. Holders of Ordinary Shares are entitled to receive on a pro rata basis such dividends, if any, as and when declared by the Board at its discretion from funds legally available therefor, and upon the liquidation, dissolution or winding up of the Corporation are entitled to receive on a pro rata basis the net assets of the Corporation after payment of liabilities, in each case subject to the rights, privileges, restrictions and conditions attaching to any other series or class of shares ranking senior in priority to or on a pro rata basis with the holders of Ordinary Shares with respect to dividends or liquidation. The Ordinary Shares do not carry any pre-emptive, subscription, redemption or conversion rights, nor do they contain any sinking or purchase fund provisions.

The Corporation is authorized to issue an unlimited number of Ordinary Shares, subject to certain restrictions prescribed in the ASX Listing Rules, the Corporations Act and the Corporation's constitution. Under the ASX Listing Rules, subject to certain exceptions and without the approval of Shareholders, the Corporation may not issue or agree to issue during any 12-month period equity securities (including options and other securities convertible into equity) if the number of securities issued or agreed to be issued would exceed 15% of the total equity securities on issue at the commencement of the 12-month period. At the Corporation's annual general meeting held on November 22, 2017, Shareholders approved the issue of an additional 10% of the Corporation's issued capital, subject to satisfaction of certain criteria prescribed in the ASX Listing Rules and the Corporation's notice of annual general meeting dated October 18, 2017.

### Listed Options (Warrants)

As of the date of this AIF, the Corporation has 113,619,906 Listed Options outstanding. Each Listed Option is exercisable until September 30, 2019 and, upon payment of \$0.15, a holder of such Listed Option is entitled to receive one Ordinary Share. The Listed Options are listed and posted for trading on the ASX under the symbol "CDVOA".

### Unlisted Options

The Corporation's share option plan permits the Board to grant to directors, officers, consultants and employees of the Corporation Unlisted Options to purchase Ordinary Shares from the Corporation. As at the date of this AIF, the Corporation has issued 7,000,000 Unlisted Options under the share option plan.

As at the date of this AIF, there were 35,294,200 Unlisted Options to acquire Ordinary Shares outstanding.

## Performance Shares

The Corporation is authorized to grant an unlimited number of Class C Performance Shares. As at the date of this AIF, there was 60 Class C Performance Shares issued and outstanding. Holders of Performance Shares are entitled to conversion of each Performance Share into 100,000 Ordinary Shares upon the achievement of certain milestones or events as outlined below. The total number of Ordinary Shares that would be issuable upon the conversion of all Class C Performance Shares pursuant to the milestones and events having been achieved would be 6 million Ordinary Shares.

The conversion of Class C Performance Shares will occur upon satisfaction of achieving a minimum inferred resource (JORC compliant) of gold within the Ndongo prospect by February 18, 2020, being no later than five years after the date on which the Class C Performance Shares were issued. The table below sets out the conversion of the Class C Performance Shares based on the achievement of performance hurdles.

Performance Shares	Performance Hurdles (JORC Inferred Au Resource)	Conversion to Ordinary Shares
10	500,000 ounces	1,000,000
5	750,000 ounces	500,000
5	1,000,000 ounces	500,000
5	1,250,000 ounces	500,000
5	1,500,000 ounces	500,000
5	1,750,000 ounces	500,000
5	2,000,000 ounces	500,000
5	2,250,000 ounces	500,000
5	2,500,000 ounces	500,000
5	2,750,000 ounces	500,000
5	3,000,000 ounces	500,000
<b>60</b>		<b>6,000,000</b>

General terms attaching to the Performance Shares are set out below.

### Class C Performance Shares

- (a) Each Class C Performance Share is a share in the capital of the Corporation.
- (b) Class C Performance Shares shall confer on the holder the right to receive notices of general meetings and financial reports and accounts of the Corporation that are circulated to shareholders. Holders have the right to attend general meetings of shareholders of the Corporation.
- (c) The Class C Performance Shares do not entitle the holder to vote on any resolutions proposed at a general meeting of shareholders of the Corporation.
- (d) The Class C Performance Shares do not entitle the holder to any dividends.
- (e) The Class C Performance Shares are not transferable.
- (f) If at any time the issued capital of the Corporation is reorganized, all rights of a holder will be changed to the extent necessary to comply with the applicable listing rules at the time of reorganisation.

- (g) The Class C Performance Shares will not be quoted on ASX. However, upon conversion of the Class C Performance Shares into Ordinary Shares, the Corporation must, within seven (7) days after the conversion, apply for the official quotation of the Ordinary Shares arising from the conversion on ASX.
- (h) The Class C Performance Shares give the holders no rights other than those expressly provided by these terms and those provided at law where such rights at law cannot be required by ASX.
- (i) The Ordinary Shares into which the Class C Performance Shares will convert will rank pari passu in all respects with the other Ordinary Shares on issue.

## MARKET FOR SECURITIES

### Trading Price and Volume

#### Ordinary Shares

The Ordinary Shares are listed on the ASX and TSX and trade under the symbol "CDV". The following table sets forth the price range and trading volume of the Ordinary Shares on the ASX for each month during the most recently completed financial year. The Ordinary Shares commenced trading on the TSX on July 10, 2017.

Month	ASX Trading			TSX Trading		
	Price Per Ordinary Share		Trading Volume	Price Per Ordinary Share		Trading Volume
	High (\$)	Low (\$)		High (CA\$)	Low (CA\$)	
<b>2017</b>						
July	0.68	0.47	6,825,701	0.80	0.54	3,748,401
August	0.70	0.57	9,621,051	0.72	0.60	6,024,025
September	0.71	0.57	7,802,169	0.70	0.55	597,065
October	0.74	0.56	7,418,662	1.05	0.59	3,462,057
November	0.63	0.55	4,719,659	0.65	0.54	4,951,514
December	0.61	0.44	7,105,203	0.60	0.42	2,325,750
<b>2018</b>						
January	0.56	0.45	8,662,499	0.55	0.45	2,109,290
February	0.56	0.45	10,937,688	0.55	0.44	4,042,818
March	0.59	0.51	5,363,175	0.60	0.51	3,403,600
April	0.56	0.46	5,493,014	0.63	0.48	1,029,217
May	0.52	0.44	2,365,339	0.48	0.44	1,984,947

Month	ASX Trading			TSX Trading		
	Price Per Ordinary Share		Trading Volume	Price Per Ordinary Share		Trading Volume
	High (\$)	Low (\$)		High (CA\$)	Low (CA\$)	
June	0.49	0.40	2,463,020	0.48	0.38	1,777,900

Source: Bloomberg

### Prior Sales of Unlisted Securities

The only securities of the Corporation that are outstanding but not listed or quoted on a marketplace are the Unlisted Options granted under the Corporation's stock option plan which total 35,294,200 and 60 Class C Performance Shares, as of the date of this AIF, the Class C Performance Shares were issued in 2015. The following table sets forth information with respect to the Unlisted Options and Performance Shares issued during the most recently completed financial year.

#### Unlisted Options

During the financial year ended June 30, 2018, the Corporation issued the following Unlisted Options to acquire Ordinary Shares.

Date of Issuance	Number of Securities Issued	Exercise Price per Ordinary Share	Expiry Date
December 21, 2017	5,758,000 <sup>(1)</sup>	\$0.825	December 21, 2022
December 21, 2017	4,036,200 <sup>(2)</sup>	\$0.965	December 21, 2022
December 21, 2017	1,000,000	\$0.750	December 21, 2022

Notes:

(1) The vesting provisions of the 5,758,000 Unlisted Options are as follows:

- 1,727,400 options vest on the earlier of (a) the completion of a scoping study and (b) the completion of a preliminary economic assessment of the Ghanaian assets;
- 1,727,400 options vest on the beginning of earthworks for gold production at the Ghanaian assets; and
- 2,303,200 options vest on the first pouring of gold at the Ghanaian assets.

(2) The vesting provisions of the 4,036,200 Unlisted Options are as follows:

- 1,729,800 options vest on the beginning of earthworks for gold production at the Ghanaian assets; and
- 2,306,400 options vest on the first pouring of gold at the Ghanaian assets.

### DIRECTORS AND OFFICERS

The following table sets forth the name and residence of each director and executive officer of the Corporation as well as such individual's positions and offices held with the Corporation, period of service as a Director (if applicable), and principal occupation(s) during the five preceding years. The term of office of each of the Directors (other than the Corporation's Managing Director) expires at the end of the third annual general



meeting of Shareholders of the Corporation after such Director's last election or appointment, provided that one-third of the Directors (other than the Managing Director) must retire at each annual general meeting. Retiring Directors are eligible for re-election. The term of office of the Corporation's Managing Director expires at the discretion of the Corporation's directors, in accordance with his employment contract. When required, the Corporation intends to apply for exemptions from the TSX requirements relating to director elections.

<b>Name, Province or State, and Country of Residence</b>	<b>Positions and Offices Held and Date of Appointment</b>	<b>Number and Class of Securities Beneficially Owned or Controlled</b>	<b>Principal Occupation(s) During Past Five Years</b>
Kevin Tomlinson London, United Kingdom	Director, Non-Executive Chairman  November 7, 2016	Ordinary Shares: 0 Listed Options: 400,000 Unlisted Options: 5,000,000 Class C Performance Shares: 0	Non-executive Chairman of the Corporation since November 2016; Director, Samco Gold Limited since January 2012; former Director, Centamin Plc (2012 to 2016) and Besra Gold Inc. (2012 to 2015); former Chairman, Maudore Minerals Ltd. (2014 to 2014).
Arthur (Archie) Koimtsidis Western Australia, Australia	Managing Director  December 27, 2012	Ordinary Shares: 8,117,565 Listed Options: 4,191,731 Unlisted Options: 7,500,000 Class C Performance Shares: 0	Co-founder and Managing Director of the Corporation since December 2012.
Malik Easah, Accra, Ghana	Executive Director  December 27, 2012	Ordinary Shares: 7,681,815 Listed Options: 6,560,423 Unlisted Options: 6,000,000 Class C Performance Shares: 60 <sup>(2)</sup>	Co-founder and Executive Director of the Corporation since December 2012.
Robert Schafer Utah, US <sup>(1) (3)</sup>	Non-Executive Director  July 10, 2017	Ordinary Shares: 10,000 Listed Options: 0 Unlisted Options: 2,897,000 Class C Performance Shares: 0	Current Director, Volcanic Gold Mines Inc. since March 2017 and Trigon Metals Inc. since April 2017; former director Martina Minerals Corp. (2005 to 2015); Curtis Resources Ltd. (2011 to 2014), Rathdowney Resources Ltd. (2011 to 2015), Galway Metals Inc. (2012 to 2014), Minera IRL Limited (2016) and Orex Exploration Inc. (2016 to 2017).
Jacques McMullen <sup>(1) (3)(4)</sup> Canada	Non-Executive Director  October 11, 2017	Ordinary Shares: 0 Listed Options: 0 Unlisted Options: 2,018,100 Class C Performance Shares: 0	Director, Equinox Gold Ltd. since December 2017, Excellon Resources since November 2017, NewCastle Gold Ltd. March 2017 to December 2017; Advisor, Detour Gold Corp. since 2016; Director and Principal,

Name, Province or State, and Country of Residence	Positions and Offices Held and Date of Appointment	Number and Class of Securities Beneficially Owned or Controlled	Principal Occupation(s) During Past Five Years
			Mines & Metals, BBA (2012 to 2015); Chairman, Orvana Minerals Corp. (2014 to 2016); Director, Fire River Gold Corp. (2012 to 2013); Executive, Barrick Gold Corporation (1994 to 2011).
Michele Muscillo <sup>(1) (3)</sup>  Queensland, Australia	Non-Executive Director  October 11, 2017	Ordinary Shares: 0 Listed Options: 0 Unlisted Options: 2,018,100 Class C Performance Shares: 0	Mr Muscillo is currently a Non-Executive Director with Aeris Resources Limited (ASX:AIS), Xanadu Mines Ltd. (ASX: XAM) and Mako Gold Limited (ASX:MKG). Formerly, Michele was also Non-Executive Director of Orbis Gold Limited which is currently owned by TSX-Listed SEMAFO Inc. (TSX:SMF).
Sarah Shipway  Western Australia, Australia	Company Secretary	Ordinary Shares: 175,000 Listed Options: 0 Unlisted Options: 0 Class C Performance Shares: 0	Company Secretary of the Corporation since December 2012; current Director, Beacon Minerals Limited since 2015 and St. George Mining Limited since 2015.
Derrick Weyrauch <sup>(5)</sup>  Ontario, Canada	Chief Financial Officer	Ordinary Shares: 80,000 Listed Options: 0 Unlisted Options: 2,897,000 Class C Performance Shares: 0	Chief Financial Officer to the Corporation since July 2017; former Director of Banro Corporation (2013 to 2018); Jaguar Mining Inc. (2014 to 2016), Minera IRL Limited (2016), Eco Oro Minerals Corp. (2016 to 2017); and former Chief Financial Officer, Jaguar Mining Inc. (2014-2016), Andina Minerals Inc. (2010 to 2013) and Temex Resources Corp. (2014).

## Notes:

- (1) Member of the Audit and Risk Committee.
- (2) Mr. Easah is the sole shareholder of Savannah Mining Ghana Limited, which holds the 60 outstanding Class C Performance Shares. For a description of the conversion conditions for the Class C Performance Shares, see "Description of Capital Structure" above.
- (3) Member of the Remuneration and Nomination Committee.
- (4) On October 31, 2018, subsequent to the currency date of this AIF, Mr. McMullen resigned as a director of the Corporation. Mr. McMullen's position on the Board was filled by the appointment of Kenneth G. Thomas as a director.
- (5) On October 31, 2018, subsequent to the currency date of this AIF, Mr. Weyrauch resigned from the

Corporation. Mr. Weyrauch's position as an executive officer was concurrently filled by the appointment of Jon Grygorcewicz as CFO.

Based on the disclosure available on the System for Electronic Disclosure by Insiders, as of the date of this AIF, the directors and executive officers of the Corporation, as a group, beneficially owned, or controlled or directed, directly or indirectly, a total of 15,709,380 Ordinary Shares, representing approximately 4.2% of the total number of Ordinary Shares outstanding.

Set forth below is a brief description of the background of the directors and executive officers of the Corporation, including a description of each individual's principal occupation(s) during the past five years.

***Kevin Tomlinson – Director, Non-Executive Chairman***

Kevin Tomlinson possesses over 30 years' experience in Geology and Finance with enormous experience within the Toronto, Australian and London Stock Exchanges.

Mr. Tomlinson holds a MSc in Structural Geology and a Grad Dip in Finance. From 1998 Mr. Tomlinson has worked in the finance sector raising over US\$2 billion in equity.

Mr. Tomlinson was previously Managing Director of Investment Banking at Westwind Partners/Stifel Nicolaus where he advised a number of resource companies including Centamin Plc, Platinum Group Metals, Trelawney Resources and Allied Gold. He was also an integral part of the team raising finance for Osisko Mining and Semafo Inc.

Mr. Tomlinson was Director of Natural Resources at Williams de Broë and Head of Research for Hartleys Ltd in Australia. Recent Directorships include Centamin Plc (producer), Orbis Gold Limited (developer) and Medusa Mining (producer) where he chaired the company through growth from \$30m to over \$700m market capitalisation in less than four years.

Mr. Tomlinson is a Fellow of the Institute of Directors, a Fellow of the Chartered Institute for Securities & Investment and a Liveryman of the Worshipful Company of International Bankers.

***Arthur (Archie) Koimtsidis – Co-founder, Managing Director***

Archie Koimtsidis has 27 years' experience in business in Ghana and has for the last 23 years been involved in all facets of gold exploration, discovery, production and refining in West Africa and South America. His most recent appointment prior to joining Cardinal was as the Deputy Country Manager of Ghana for PMI Gold Limited, a joint TSXV- and ASX-listed company. During this time, he was responsible for all field operational matters including coordination of exploration, drilling programs and human resource management in relation to the Corporation's projects in Ghana.

Mr. Koimtsidis has been instrumental in acquiring the Ghanaian Projects on behalf of Cardinal and has a unique knowledge and understanding of geopolitical and operational matters relating to resource projects in West Africa.

***Malik Easah – Co-founder, Executive Director***

Malik Easah is the principal of successful alluvial mining operations in the North West Adansi Gold Obotan concession and is currently developing additional payable gold permits within the Ashanti and Nangodi Gold belts of Ghana.

Mr. Easah specializes in the manufacture of alluvial gold wash plants and recovery equipment and is regarded as an authority in the development of alluvial mining operations in Ghana. Mr. Easah has worked in the mining industry in Ghana for 12 years.

***Robert Schafer – Non-Executive Director***

Robert Schafer has over 30 years of international experience as a geologist exploring for mineral deposits in more than 70 countries. As an executive, manager and field geologist with companies including Billiton, BHP, Kinross and Hunter Dickinson, Mr. Schafer led teams to the discovery of several deposits in the western US (Briggs and Griffon gold mines), as well as developing strategies that led to brownfields discoveries in western Canada, southern Africa and far east Russia (Birkachan gold mine).

Mr. Schafer is the immediate Past President of the Prospectors and Developers Association of Canada (PDAC) as well as Past President of both the Canadian Institute for Mining, Metallurgy and Petroleum (CIM) and the Mining and Metallurgical Society of America (MMSA). He is a Certified Corporate Director (ICD.D), a RGeo and is also an active member of the Society for Mining, Metallurgy and Exploration (SME) in the US, where he served on its Board for more than a decade.

Mr. Schafer serves as a member of the Board of Directors for both the Canadian Mining Hall of Fame and National Mining Hall of Fame in the US. He is the recipient of the William Lawrence Saunders Gold Medal from the American Institute of Mining, Metallurgical and Petroleum Engineers (AIME) and the Daniel C. Jackling Award from SME for career achievements, two of the highest mining recognitions in the US.

***Jacques McMullen – Non-Executive Director***

Jacques McMullen retired in 2012 after a distinguished 35-year career in the mining industry of which the last 17 years were with Barrick Gold Corporation where he held the positions of Senior VP Special Projects and Technical Services. In his role as Senior VP of Barrick, Mr McMullen was instrumental in the development of many mines including Goldstrike, Veladero, Lagunas Norte, Cowal and Bulyanhulu. His experience includes all phases of development including feasibility, construction, commissioning, ramp-up and operation's optimization.

Following his retirement, Mr. McMullen joined BBA as Principal, Mines & Metals and Director. BBA is a Canadian based, global engineering firm. At BBA, Mr McMullen focused on the Borden Lake development project which was purchased by Goldcorp. Additionally, Jacques was Chairman of Orvana Minerals Corp. (TSX: ORV) and is currently a Director at Equinox Gold Ltd. (TSX-V: EQX), Excellon Resources (TSX:EXN) and a corporate advisor to Detour Gold Corporation (Detour Gold: TSX: DGC).

On October 31, 2018, subsequent to the currency date of this AIF, Mr. McMullen resigned as a director of the Corporation. Mr. McMullen's position on the Board was concurrently filled by the appointment of Kenneth G. Thomas as a director.

***Michele Muscillo – Non-Executive Director***

Michele Muscillo is a Partner with HopgoodGanim Lawyers in Australia. Mr Muscillo has practised exclusively in corporate law for over 15 years and has extensive experience in capital markets transactions, including the negotiation of significant commercial contracts and agreements. As part of this role, Mr Muscillo has acted on numerous IPOs and debt and equity raisings, and advised both bidders and targets on public market control transactions. His key areas of practice include Corporate Advisory and Governance, Capital Markets, Resources and Energy.

Mr Muscillo is currently a Non-Executive Director with Aeris Resources Limited (ASX:AIS), Xanadu Mines Limited (ASX: XAM) and Mako Gold Limited (ASX:MKG). Formerly, Michele was also Non-Executive Director of Orbis Gold Limited which is currently owned by TSX-Listed SEMAFO Inc. (TSX:SMF).

***Sarah Shipway – Company Secretary***

Sarah Shipway has been involved with the Corporation since inception. Prior to joining Cardinal, Ms. Shipway was an accountant. Ms. Shipway holds a Bachelor of Commerce from Murdoch University and is a member of the Institute of Chartered Accountants. Ms. Shipway is also non-executive director for Beacon Minerals Limited and St. George Mining Limited.

***Derrick Weyrauch – Chief Financial Officer***

Derrick Weyrauch is a Chartered Professional Accountant (CPA/CA) with over 25 years of experience that includes board and executive management roles at a number of publicly listed mining companies.

As the Chairman of the Special Committee for Restructuring and Recapitalization and then Chief Financial Officer, Mr. Weyrauch was instrumental in the recent successful turnaround and financial restructuring of Jaguar Mining Inc., a gold producer with three operating underground mines and a 3.5 million ounce gold development project in Brazil.

Previously, Mr. Weyrauch was the Chief Financial Officer of Andina Minerals Inc., a development stage gold company advancing 6.6 million ounces of proven and probable gold reserves towards development in the high Andes of Chile where he led a US\$800+ million project finance initiative.

Mr. Weyrauch previously served as the Lead Independent Director and Audit Committee Chairman at Banro Corporation and currently serves at the audit committee chairman at Cabral Dordinal and Magna Mining Corp.

On October 31, 2018, subsequent to the currency date of this AIF, Mr. Weyrauch resigned from the Corporation. Mr. Weyrauch's position as an executive officer was concurrently filled by the appointment of Jon Grygorcewicz as CFO.

**Cease Trade Orders, Bankruptcies, Penalties or Sanctions**

No director or executive officer of the Corporation, nor any personal holding company of any director or executive officer of the Corporation, is, as at the date hereof, or was, within 10 years before the date hereof, a director, chief executive officer or chief financial officer of any company (including the Corporation) that:

- (a) was subject to a cease trade order, an order similar to a cease trade order, or an order that denied the relevant company access to any exemption under securities legislation, that was in effect for a period of more than 30 consecutive days, that was issued while the director or executive officer was acting in the capacity as director, chief executive officer or chief financial officer; or
- (b) was subject to a cease trade order, an order similar to a cease trade order or an order that denied the relevant company access to any exemption under securities legislation, that was in effect for a period of more than 30 consecutive days, that was issued after the director or executive officer ceased to be a director, chief executive officer or chief financial officer, and which resulted from an event that occurred while that person was acting in the capacity as director, chief executive officer or chief financial officer.

Other than as set out below, no director or executive officer of the Corporation or shareholder holding a sufficient number of securities of the Corporation to affect materially the control of the Corporation, nor any personal holding company of any such individual:

- (i) is, as at of the date hereof, or has been within 10 years before the date hereof, a director or executive officer of any company (including the Corporation) that, while that person was acting in that capacity, or within a year of such individual ceasing to act in that capacity, became bankrupt, made a proposal under any legislation relating to bankruptcy or insolvency or was subject to or instituted any proceedings, arrangement or compromise with creditors or had a receiver, receiver manager or trustee appointed to hold its assets; or
- (ii) has, within the 10 years before the date hereof, become bankrupt, made a proposal under any legislation relating to bankruptcy or insolvency, become subject to or instituted any proceedings, arrangement or compromise with creditors, or had a receiver, receiver manager or trustee appointed to hold the assets of such individual; or
- (iii) has been subject to (i) any penalties or sanctions imposed by a court relating to securities legislation or by a securities regulatory authority, or has entered into a settlement agreement with a securities regulatory authority, or (ii) any other penalties or sanctions imposed by a court or regulatory body that would likely be considered important to a reasonable investor in making an investment decision.

Kevin Tomlinson served as a director of Maudore Minerals Ltd. (“**Maudore**”) until May 22, 2014, and of Besra Gold Inc. (“**Besra**”) until April 10, 2015. On September 8, 2014, Maudore announced that it had filed a notice of intention to make a proposal under the *Bankruptcy and Insolvency Act* (the “**BIA**”). On March 2, 2015, Maudore announced that the Superior Court of the Province of Quebec (the “**Court**”) had granted an order whereby Maudore’s proposal to creditors, which had initially been filed under the BIA, had been continued under the CCAA and that the Court had granted an initial stay of proceedings under the CCAA. Maudore made further announcements on March 27, 2015, June 19, 2015, September 22, 2015 and February 29, 2016 that the Court had granted extensions of the stay of proceedings under the CCAA. On May 16, 2016, Maudore announced that Maudore had, under the BIA, made an assignment of its property to a trustee for the benefit of its creditors generally. On October 19, 2015, Besra announced that its board of directors had decided to file a notice of intention to make a proposal (the “**Notice of Intention**”) under the BIA. On January 29, 2016, Besra announced that, through its appointed proposal trustee, it had submitted a proposal (the “**Proposal**”) to its creditors in accordance with the Notice of Intention to make a proposal. The Proposal was subsequently amended on March 13, 2016 (the “**Amended Proposal**”). A meeting of creditors (the “**Meeting**”) was initially called for March 17, 2016 and was adjourned until April 7, 2016 in order to permit creditors to consider the Amended Proposal. On April 7, 2016, Besra announced that at the Meeting, the Amended Proposal had been approved by a majority of unsecured creditors holding in excess of two-thirds of the value of proven unsecured creditor claims. The Amended Proposal was approved by the Ontario Superior Court of Justice (Commercial List) on May 17, 2016. On December 17, 2014, the OSC issued a temporary cease trade order for the securities of Besra, and on December 29, 2014, the OSC issued a further cease trade order directing that trading in the securities of Besra cease until further order by the Director (together, the “**Besra Cease Trade Order**”). The British Columbia Securities Commission issued a cease trade order on December 17, 2014; the Autorité des marchés financiers issued a cease trade order on January 5, 2015; and the Alberta Securities Commission issued a cease trade order on March 30, 2015. The OSC partially revoked the Besra Cease Trade Order on March 4, 2015 to permit trades and acts in furtherance of trades in connection with a proposed private placement financing by Besra for proceeds of up to C\$15 million. On April 7, 2015, the first tranche of such financing, with gross proceeds of C\$2 million, was completed. Besra received no further proceeds from such financing. On October 14, 2016, the OSC issued an order (the “**October 2016 Order**”) partially revoking the Besra Cease Trade Order to permit trades and acts in furtherance of trades that are necessary for and are in connection with the



Amended Proposal and a \$10 million tranche of an exit financing. The October 2016 Order was subsequently varied by the OSC on November 18, 2016, and Besra announced on November 18, 2016 that it had closed a C\$10 million “exit financing” and intended to deliver to the Proposal trustee the consideration necessary to satisfy the elections made by creditors under the Proposal. Besra expects that once all requirements of the Proposal have been satisfied, the Proposal trustee will issue a certificate of full performance. In October 2014 trading in the common shares of Besra on the ASX was suspended and Besra’s common shares were delisted from the TSX because of Besra’s failure to file its financial statements for the year ended June 30, 2014.

Derrick H. Weyrauch was elected to the board of directors of Jaguar Mining Inc. (“**Jaguar**”) in June 2013. As part of a corporate turnaround and restructuring process, Jaguar declared insolvency and commenced a voluntary proceeding under the CCAA on December 23, 2013 in the Ontario Superior Court of Justice. This proceeding was commenced to implement a debt restructuring and financing transaction (“**CCAA Plan**”) that was negotiated prior to the commencement of the CCAA proceeding. On April 22, 2014, Jaguar implemented the CCAA Plan and emerged from court protection under the CCAA. On May 2, 2014, the shares of Jaguar began trading on the TSX Venture Exchange. Following the voluntary proceeding under the CCAA, the Toronto Stock Exchange advised that it is reviewing the common shares of Jaguar with respect to meeting the requirements for continued listing pursuant to the Expedited Review Process. The common shares were subsequently suspended from trading on the Toronto Stock Exchange. In 2013, NYSE Regulation Inc. reached a decision to delist Jaguar’s common shares in view of the fact that Jaguar’s common shares had fallen below the NYSE’s continued listing standard for an average closing price of less than US\$1.00 over a consecutive 30 trading day period. As a result, on June 3, 2013, NYSE Regulations, Inc. commenced proceedings to delist the common shares of Jaguar from the New York Stock Exchange and trading in Jaguar’s common shares was suspended prior to the opening on June 7, 2013.

Mr. Weyrauch was a director of Banro Corporation (“**Banro**”). On November 20, 2017 Banro became subject to a general cease trade order issued by the Ontario Securities Commission for failure to file its interim financial statements and management’s discussion and analysis for the period ended September 30, 2017, and the certifications of such filings as required by National Instrument 52-109. The filings were not made due to significant uncertainty concerning Banro’s ability to continue as a going concern. As part of a corporate turnaround and restructuring process, Banro declared insolvency and commenced a voluntary proceeding under the CCAA on December 22, 2017 in the Ontario Superior Court of Justice. This proceeding was commenced to implement a debt restructuring and sale and investment solicitation process. On May 3, 2018 Banro implemented the CCAA Plan and emerged from court protection under the CCAA.

On October 31, 2018, subsequent to the currency date of this AIF, Mr. Weyrauch resigned from the Corporation.

### **Conflicts of Interest**

To the best of the Corporation’s knowledge, and other than as disclosed in this AIF, there are no known existing or potential material conflicts of interest between the Corporation or a subsidiary of the Corporation and any director or officer of the Corporation or a subsidiary of the Corporation, except that certain of the directors and officers serve as directors and officers of other public companies, and therefore it is possible that a conflict may arise between their duties as a director or officer of the Corporation and their duties as a director or officer of such other companies. See “*Description of the Business – Risk Factors – Risks Associated with Conflicts of Interest*”.

### **LEGAL PROCEEDINGS AND REGULATORY ACTIONS**

The Corporation is not a party to, and its property is not the subject of, any material legal proceedings, and the

Corporation was not a party to, and its property was not the subject of, any material legal proceedings during the Corporation's most recently completed financial year. The Corporation is not aware of any contemplated legal proceedings.

During the most recently completed financial year, no penalties or sanctions were imposed against the Corporation by a court relating to securities legislation or by a securities regulatory authority, no penalties or sanctions were imposed by a court or regulatory body against the Corporation that would likely be considered important to a reasonable investor in making an investment decision, and no settlement agreements were entered into by the Corporation before a court relating to securities legislation or with a securities regulatory authority.

#### **INTEREST OF MANAGEMENT AND OTHERS IN MATERIAL TRANSACTIONS**

Other than as disclosed in this AIF, the Corporation is not aware of any material interest, direct or indirect, of any director or officer of the Corporation, any person or company that beneficially owns, or controls or directs, directly or indirectly, more than 10% of the Corporation's voting securities, or any associate or affiliate of any such persons or companies in any transaction within the three most recently completed financial years or during the current financial year that has materially affected or is reasonably expected to materially affect the Corporation.

#### **TRANSFER AGENT AND REGISTRAR**

The transfer agent and registrar for the Ordinary Shares and the Listed Options of the Corporation in Australia is Computershare Investor Services Pty Ltd ("**Computershare (Australia)**"), and the Ordinary Shares and Listed Options are transferable at the offices of Computershare (Australia) in Perth.

The transfer agent and registrar for the Ordinary Shares of the Corporation in Canada is Computershare Investor Services Inc. ("**Computershare (Canada)**"), and the Ordinary Shares are transferable at the offices of Computershare (Canada) in Toronto.

#### **AUDIT COMMITTEE AND RELATED INFORMATION**

##### **The Audit and Risk Committee's Charter**

The responsibilities and duties of the audit and risk committee (the "**Audit and Risk Committee**") of the Board are set out in the Audit and Risk Committee's Charter (the "**Charter**"), the text of which is set forth in Appendix A to this AIF.

##### **Composition of the Audit and Risk Committee**

The Audit and Risk Committee is comprised of Michele Muscillo (Chair), Jacques McMullen and Robert Schafer. The following chart sets out the Corporation's assessment of the independence, financial literacy and relevant educational background and experience supporting such financial literacy of each member of the Audit and Risk Committee. Additional information about relevant experience of each member of the Audit and Risk Committee can be found in such member's biography under the heading "*Directors and Executive Officers*" above.



Name	Independent <sup>(1)</sup>	Financially Literate <sup>(2)</sup>	Relevant Education and Experience
Michele Muscillo	Yes	Yes	Bachelor of Laws Chair of audit committee of Aeris Resources Limited and Xanadu Mines Limited.
Jacques McMullen	Yes	Yes	BScA, MScA, PEng, ICD.D
Robert Schafer	Yes	Yes	Graduate Diploma Finance

## Notes:

- (1) To be considered independent, a member of the Audit and Risk Committee must not have any direct or indirect “material relationship” with the Corporation. A “material relationship” is a relationship which could, in the view of the Board, be reasonably expected to interfere with the exercise of a member’s independent judgment.
- (2) To be considered financially literate, a member of the Audit and Risk Committee must have the ability to read and understand a set of 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 Corporation’s financial statements.

### Reliance on Certain Exemptions

At no time since the commencement of the Corporation’s most recently completed financial year, has the Corporation relied on the exemption in section 2.4 of NI 52-110 (*De Minimis Non-audit Services*), the exemption in section 3.2 of NI 52-110 (*Initial Public Offerings*), the exemption in subsection 3.3(2) of NI 52-110 (*Controlled Companies*), the exemption in section 3.4 of NI 52-110 (*Events Outside Control of Member*), the exemption in section 3.5 of NI 52-110 (*Death, Disability or Resignation of Audit Committee Member*), the exemption in section 3.6 of NI 52-110 (*Temporary Exemption for Limited and Exceptional Circumstances*) or an exemption from NI 52-110, in whole or in part, granted under Part 8 of NI 52-110 (Exemptions).

### Audit Committee Oversight

At no time since the commencement of the Corporation’s most recently completed financial year has a recommendation of the Audit and Risk Committee to nominate or compensate an external auditor not been adopted by the Board.

### Pre-Approval Policies and Procedures

The Corporation has adopted policies and procedures with respect to the pre-approval of audit and permitted non-audit services to be provided by its external auditor as set forth in the Charter. It is expected that the Audit and Risk Committee will approve the provision of a specified list of audit and permitted non-audit services that the Audit and Risk Committee believes to be typical, reoccurring or otherwise likely to be provided by the Corporation’s external auditor during the current fiscal year.

### External Auditor Service Fees

The following table provides detail in respect of audit, audit related, tax and other fees paid by the Corporation

to the external auditors for professional services:

Reporting Period	Audit Fees <sup>(1)</sup>	Audited-Related Fees <sup>(2)</sup>	Tax Fees <sup>(3)</sup>	All Other Fees <sup>(4)</sup>
June 30, 2018	\$67,143	Nil	\$4,400	\$35,295
June 30, 2017	\$54,605	Nil	Nil	\$6,250

Notes:

- (1) "Audit Fees" include the aggregate fees billed by the Corporation's external auditor for the audit of the annual financial statements and other regulatory audits and filings.
- (2) "Audit-Related Fees" include the aggregate fees billed for assurance and related services by the Corporation's external auditor that are reasonably related to the performance of the audit or review of the Corporation's financial statements but not included in "Audit Fees".
- (3) "Tax Fees" include the aggregate fees billed for professional services rendered by the Corporation's external auditor for tax compliance, tax advice and tax planning.
- (4) "All Other Fees" include the aggregate fees billed for products and services provided by the Corporation's external auditor, other than as set out under the headings "Audit Fees", "Audit Related Fees" and "Tax Fees".

#### MATERIAL CONTRACTS

The Corporation is not party to any material contracts entered into by or on behalf of the Corporation or any of its subsidiaries within the financial year ended June 30, 2018, or before the financial year ended June 30, 2018 if still in effect. Subsequent to the end of the financial year ended June 30, 2018, the Corporation (together with its wholly owned subsidiaries) entered into a credit agreement with Sprott Private Resource Lending (Collector), LP with respect to a US\$25 million senior secured credit facility in favour of the Corporation, as borrower (the "**Credit Facility**"). The Credit Facility was entered into to provide the Corporation with working capitals to advance the Namdini Gold Project. Amounts drawn by the Corporation under the Credit Facility bear interest at a floating rate equal to 7.75% per annum plus the greater of (i) LIBOR and (ii) 1.00%, per annum, calculated and compounded monthly on the last day of every month, and be payable on the last business Day of each month. The Credit Facility matures on February 28, 2021. The Credit Facility is secured by: (i) a first priority encumbrance granted by the Corporation and each of its wholly-owned subsidiaries, being Cardinal Mining Services Limited, Cardinal Namdini Mining Limited, Cardinal Resources Ghana Limited and Cardinal Resources Subranum Limited (the "**Subsidiaries**") in favour of Sprott; (ii) a guarantee of the obligations of the Corporation as borrower by each of the Subsidiaries; and (iii) a pledge by the Corporation of the shares of each of the Subsidiaries via a share charge agreement under the laws of Ghana to Sprott. In connection with the completion of the Credit Facility, the Corporation agreed to issue to Sprott and its affiliates 4,250,000 ordinary shares of the Corporation on a private placement as a work fee.

#### INTERESTS OF EXPERTS

The following persons or companies are named as having prepared or certified a report, valuation, statement or opinion described or included in a filing, or referred to in a filing, made by the Corporation under National Instrument 51-102 – *Continuous Disclosure Obligations* of the Canadian Securities Administrators during, or relating to, the financial year ended June 30, 2018, and whose profession or business gives authority to the

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report, valuation, statement or opinion made by the person or company:

- Glenn Turnbull, MAusIMM (CP) of Golder Associates Pty Ltd.;
- Marc LeVier, MMSA (QP) of K. Marc LeVier & Associates, Inc.;
- Nicolas Johnson, MAIG of MPR Geological Consultants Pty Ltd.; and
- BDO (WA) Pty Ltd.

To the best knowledge of the Corporation, the persons and companies referenced above each hold less than 1% of any outstanding securities of the Corporation, or of any associate or affiliate of the Corporation.

None of the persons referenced above or directors, officers or employees of a person or company referenced above is or is expected to be elected, appointed or employed as a director, officer or employee of the Corporation or of any associate or affiliate of the Corporation.

#### **ADDITIONAL INFORMATION**

Additional information relating to the Corporation can be found under the Corporation's profile on the SEDAR website at [www.sedar.com](http://www.sedar.com). Additional information, including directors' and officers' remuneration and indebtedness, principal holders of the Corporation's securities and securities authorized for issuance under equity compensation plans, if applicable, is contained in the Corporation's information circular for its most recent annual meeting of shareholders. Additional financial information is provided in the Corporation's audited consolidated financial statements and management's discussion and analysis for its most recently completed financial year.

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## APPENDIX A - AUDIT AND RISK COMMITTEE CHARTER

### 1. ROLE

The role of the Audit and Risk Committee is to assist the Board in monitoring and reviewing any matters of significance affecting financial reporting and compliance. This Charter defines the Audit and Risk Committee's function, composition, mode of operation, authority and responsibilities.

### 2. COMPOSITION

The Board will adhere to the following composition requirements for the Committee.

- (a) The Committee must comprise at least three members.
- (b) All members of the Committee must be non-executive Directors.
- (c) Except as permitted by NI 52-110, all members of the Committee must be independent in accordance with the criteria set out in Annexure A.
- (d) The Board will appoint members of the Committee. The Board may remove and replace members of the Committee by resolution.
- (e) All members of the Committee must be able to read and understand financial statements that present a breadth and level of complexity of accounting issues that are generally comparable to the breadth and level of complexity of the issues reasonably expected to be raised by the Corporation's financial statements.
- (f) The Chairman of the Committee shall have leadership experience and a strong finance, accounting or business background and will not be the Chair of the Board.
- (g) The external auditors, the other Directors, the Managing Director, Chief Financial Officer, Company Secretary and other senior executives may be invited to Committee meetings at the discretion of the Committee.

### 3. PURPOSE

The primary purpose of the Committee is to assist the Board in fulfilling its statutory and fiduciary responsibilities relating to:

- (a) the quality and integrity of the Corporation's financial statements, accounting policies and financial reporting and public disclosure practices;
- (b) compliance with all applicable laws, regulations and company policy;
- (c) the effectiveness and adequacy of internal control processes;
- (d) the performance of the Corporation's external auditors and their appointment and removal;

- (e) the independence of the external auditor and the rotation of the lead engagement partner;
- (f) the scope and adequacy of the external audit;
- (g) any proposal for the external auditor to provide non-audit services and whether it might compromise the independence of the external auditor;
- (h) the identification and management of business, economic, environmental and social sustainability risks; and
- (i) the review of the Corporation's risk management framework at least annually to satisfy itself that it continues to be sound and to determine whether there have been any changes in the material business risks the Corporation faces and to ensure that they remain within the risk appetite set by the Board.

A secondary function of the Committee is to perform such special reviews or investigations as the Board may consider necessary.

#### **4. DUTIES AND RESPONSIBILITIES OF THE COMMITTEE**

##### **4.1 Review of Financial Reports**

- (a) Review the appropriateness of the accounting principles adopted by management in the financial reports and the integrity of the Corporation's financial reporting.
- (b) Directly oversee the work of the external auditor engaged to prepare or issue an auditor's report and the results of the external audits of those reports.
- (c) Assess whether external reporting is adequate for shareholder needs.
- (d) Assess management processes supporting external reporting.
- (e) Establish procedures for receipt, retention and treatment of accounting complaints and confidential, anonymous submission by employees of the Corporation of complaints regarding questionable accounting or auditing matters.
- (f) Directly oversee the resolution of disagreements between management and the external auditor regarding financial reporting.
- (g) Review the impact of any proposed changes in accounting policies on the financial statements.
- (h) Review the financial statements, MD&A and annual and interim profit or loss press releases before the Corporation publicly discloses the information.
- (i) Ensure that, before the Board approves the Corporation's financial statements for a financial period, the Chief Executive Officer and Chief Financial Officer (or, if none, the person(s) fulfilling those functions) have declared that, in their opinion, the financial records of the Corporation have been properly maintained and that the financial statements comply with

the appropriate accounting standards and give true and fair view of the financial position and performance of the Corporation and that the opinion has been formed on the basis of a sound system of risk management and internal control which is operating effectively.

- (j) Ensure that adequate procedures are in place for the review of the Corporation's public disclosure of financial information extracted or derived from its financial statements and periodically assess the adequacy of those procedures.

#### **4.2 Relationship with External Auditors**

- (a) Recommend to the Board (i) the external auditor to be nominated for the purpose of preparing or issuing an auditor's report or performing another audit, review or attestation services for the Corporation and (ii) the compensation of the external auditor.
- (b) Review performance, succession plans and rotation of lead engagement partner.
- (c) Approve the external audit plan and fees proposed for audit work to be performed.
- (d) Discuss any necessary recommendations to the Board for the approval of quarterly, half yearly or annual reports.
- (e) Review the adequacy of accounting and financial controls together with the implementation of any recommendations of the external auditor in relation thereto.
- (f) Meet with the external auditors at least twice in each financial year and at any other time the Committee considers appropriate.
- (g) Provide pre-approval of audit and non-audit services that are to be undertaken by the external auditor.
- (h) Ensure adequate disclosure as may be required by law of the Committee's approval of all non-audit services provided by the external auditor.
- (i) Review the Corporation's public disclosure required by applicable securities laws concerning the audit committee and its members to ensure it is accurate and complete.
- (j) Ensure that the external auditor prepares and delivers an annual statement as to their independence which includes details of all relationships with the Corporation.
- (k) Receive from the external auditor their report on, among other things, critical accounting policies and alternative accounting treatment, prior to the filing of their audit report in compliance with applicable securities law requirements and/or the Corporations Act.
- (l) Ensure that the external auditor attends the Corporation's Annual General Meeting and is available to answer questions from security holders relevant to the audit.

### 4.3 Internal Audit Function

- (a) Monitor the need for a formal internal audit function and its scope.
- (b) Review and monitor the appointment or removal of the head of internal audit.
- (c) Assess the performance and objectivity of any internal audit procedures that may be in place.
- (d) Review risk management and internal compliance procedures.
- (e) Monitor the quality of the accounting function.
- (f) Review the internal controls of the Corporation via consideration of any comments from the Corporation's internal and/or external auditors and/or commissioning an independent report on the Corporation's internal controls.

### 4.4 Risk Management

- (a) Oversee the Corporation's risk management systems, practices and procedures to ensure effective risk identification and management and compliance with the Corporation's Risk Management Policy, internal guidelines and external requirements.
- (b) Assist in identifying and managing potential or apparent business, economic, environmental and social sustainability risks (if appropriate) that could adversely affect the Corporation's prospects currently and for future financial years.
- (c) Review the Corporation's Risk Management Policy at least annually to satisfy itself that it continues to be sound.
- (d) Review reports by management on the efficiency and effectiveness of the Corporation's Risk Management Policy and associated internal compliance and control procedures.

### 4.5 Other

- (a) The Committee will oversee the Corporation's environmental risk management, insurance and occupational health and safety processes.
- (b) The Committee will oversee procedures for whistleblower protection.
- (c) As contemplated by the ASX Corporate Governance Council's *Corporate Governance Principles and Recommendations*, and to the extent that such deviation or waiver does not result in any breach of the law, the Committee may approve any deviation or waiver from the "*Corporate code of conduct*". Any such waiver or deviation will be promptly disclosed where required by applicable law.
- (d) The Committee will monitor related party transactions.
- (e) The Committee will review and approve the Corporation's hiring policy regarding partners,

employees and former partners and employees of the present and former external auditor of the Corporation.

## **5. MEETINGS**

- (a) The Committee will meet at least twice in each financial year and additionally as circumstances may require for it to undertake its role effectively.
- (b) Meetings are called by the Secretary as directed by the Board or at the request of the Chairman of the Committee.
- (c) Where deemed appropriate by the Chairman of the Committee, meetings and subsequent approvals and recommendations can be implemented by a circular written resolution or conference call.
- (d) A quorum shall consist of two members of the Committee. In the absence of the Chairman of the Committee or their nominees, the members shall elect one of their members as Chairman of that meeting.
- (e) Decisions will be based on a majority of votes with the Chairman having a casting vote.
- (f) The Committee Chairman, through the Secretary, will prepare a report of the actions of the Committee to be included in the Board papers for the next Board meeting.
- (g) Minutes of each meeting are included in the papers for the next full Board meeting after each Committee meeting.

## **6. SECRETARY**

- (a) The Company Secretary or their nominee shall be the Secretary of the Committee and shall attend meetings of the Committee as required.
- (b) The Secretary will be responsible for keeping the minutes of meetings of the Committee and circulating them to Committee members and to the other members of the Board.
- (c) The Secretary shall distribute supporting papers for each meeting of the Committee as far in advance as possible.

## **7. RELIANCE ON INFORMATION OR PROFESSIONAL OR EXPERT ADVICE**

Each member of the Committee is entitled to rely on information, or professional or expert advice, to the extent permitted by law, given or prepared by:

- (a) an employee of the Group whom the member believes on reasonable grounds to be reliable and competent in relation to the matters concerned;
- (b) a professional adviser or expert in relation to matters that the member believes on reasonable grounds to be within the person's professional or expert competence; or



- (c) another Director or officer of the Group in relation to matters within the Director's or officer's authority.

#### **8. ACCESS TO ADVICE**

- (a) Members of the Committee have rights of access to management and to the books and records of the Corporation to enable them to discharge their duties as Committee members, except where the Board determines that such access would be adverse to the Corporation's interests.
- (b) Members of the Committee may meet with the auditors, both internal and external, without management being present.
- (c) Members of the Committee may engage independent legal counsel or other advisers they consider necessary to assist them in carrying out their duties and responsibilities and set and pay the compensation for any advisors employed by the Committee. Any costs incurred as a result of the Committee consulting an independent expert will be borne by the Corporation.

#### **9. REVIEW OF CHARTER**

- (a) The Board will conduct an annual review of the membership to ensure that the Committee has carried out its functions in an effective manner, and will update the Charter and Risk Management Policy as required or as a result of new laws or regulations.
- (b) The Charter and Risk Management Policy shall be made available to members on request, to senior management, to the external auditor and to other parties as deemed appropriate, will be posted to the Corporation's website and will be included, where required, in the Corporation's public disclosure documents.

#### **10. REPORT TO THE BOARD**

- (a) The Committee must report to the Board formally at the next Board meeting following from the last Committee meeting on matters relevant to the Committee's role and responsibilities.
- (b) The Committee must brief the Board promptly on all urgent and significant matters.

### **ANNEXURE A – DEFINITION OF INDEPENDENCE**

An audit committee member is independent if he or she:

- (a) has no direct or indirect material relationship with the Corporation, being a relationship which could, in the view of the Corporation's board of directors, be reasonably expected to interfere with the exercise of a member's independent judgement; and
- (b) is free of any interest, position, association or relationship that might influence, or reasonably be perceived to influence, in a material respect his or her capacity to bring an independent judgement to bear on issues before the board and to act in the best interests of the entity and its security holders

generally.

### **Material relationships**

Subject to certain exemptions and further clarification set out in Canadian securities laws applicable to the Corporation, the following individuals are considered to have a material relationship with the Corporation:

- (a) an individual who (i) accepts, directly or indirectly, any consulting, advisory or other compensatory fee from the Corporation or any subsidiary entity of the Corporation, other than as remuneration for acting in his or her capacity as a member of the board of directors or any board committee, or as a part-time chair or vice-chair of the board or any board committee; or (ii) is an affiliated entity of the Corporation or any of its subsidiary entities,
- (b) an individual who is, or has been within the last three years, an employee or executive officer of the Corporation;
- (c) an individual whose immediate family member is, or has been within the last three years, an executive officer of the Corporation;
- (d) an individual who:
  - i. is a partner of a firm that is the Corporation's internal or external auditor,
  - ii. is an employee of that firm, or
  - iii. was within the last three years a partner or employee of that firm and personally worked on the Corporation's audit within that time;
- (e) an individual whose spouse, minor child or stepchild, or child or stepchild who shares a home with the individual:
  - i. is a partner of a firm that is the Corporation's internal or external auditor,
  - ii. is an employee of that firm and participates in its audit, assurance or tax compliance (but not tax planning) practice, or
  - iii. was within the last three years a partner or employee of that firm and personally worked on the Corporation's audit within that time;
- (f) an individual who, or whose immediate family member, is or has been within the last three years, an executive officer of an entity if any of the Corporation's current executive officers serves or served at that same time on the entity's compensation committee; and
- (g) an individual who received, or whose immediate family member who is employed as an executive officer of the Corporation received, more than \$75,000 in direct compensation from the Corporation during any 12 month period within the last three years.

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**Examples of interests, positions, associations or relationships affecting independence**

Examples of interests, positions, associations and relationships that might cause doubts about the independence of a director include if the director:

- (a) is, or has been, employed in an executive capacity by the Corporation or any of its child entities and there has not been a period of at least three years between ceasing such employment and serving on the board;
- (b) is, or has within the last three years been, a partner, director or senior employee of a provider of material professional services or a material consultant to the Corporation or any of its child entities;
- (c) is, or has been within the last three years, in a material business relationship (e.g. as a supplier or customer) with the Corporation or any of its child entities, or an officer of, or otherwise associated with, someone with such a relationship;
- (d) is a substantial security holder of the Corporation or an officer of, or otherwise associated with, a substantial security holder of the Corporation;
- (e) has a material contractual relationship with the Corporation or its child entities other than as a director;
- (f) has close family ties with any person who falls within any of the categories described above; or
- (g) has been a director of the Corporation for such a period that his or her independence may have been compromised.

In each case, the materiality of the interest, position, association or relationship needs to be assessed to determine whether it might interfere, or might reasonably be seen to interfere, with the director's capacity to bring an independent judgment to bear on issues before the Board and to act in the best interests of the Corporation and its security holders generally.