

# Goldletter INTERNATIONAL

*the international independent information and advice bulletin for gold and related investments*

## Special Situation – November 2018 Update

[www.cardinalresources.com.au](http://www.cardinalresources.com.au)



### Cardinal Resources Ltd.(A\$ 0.45)

ASX : CDV

TSX : CDV

H + L prices (12 months) : C\$ 0.68 – 0.39

Net shares issued : 378.7 million

Fully diluted shares : 533.4 million

Market Capitalization : C\$ 170.4 million  
(US\$ 121.2 million)

**12 months price target: A\$ 0.90**

### Company profile

**Cardinal Resources'** ("Cardinal") principal activity and its subsidiaries is **gold exploration** in **Ghana**. The Company holds interests in 5 tenements prospective for gold mineralization in Ghana in two NE-SW trending Paleo-Proterozoic granite-greenstone belts.

**Cardinal's** Ndongo Prospect Licence covers an area of 298 km<sup>2</sup>, having been recently expanded by the purchase of two exploration licence areas from Kinross Gold in August 2017. The licence area is considered highly prospective for the discovery of economic gold mineralization associated with the prolific Nangodi Shear Zone located in northern Ghana, a splay fault off the main regional-scale Bole-Bolgatanga Shear.

Elsewhere, the Nangodi Shear Zone is spatially related to no fewer than four gold discoveries, including **Cardinal's** flagship **Namdini Gold Project**, the Shaanxi Mine, the historic Nangodi Gold Mine and the Youga Gold Mine in Burkina Faso, adjacent to the Ghana border.

In addition, there are numerous historic shallow artisanal workings along many arts of this shear zone approximately 15 kilometres north of the **Namdini Gold Project**.

**Cardinal's** main focus is the flagship **Namdini Gold Project**. On 18 September 2018, the Company announced the results of its Preliminary Feasibility Study (PFS) which delivered a **Maiden Probable Ore Reserve estimation of 4.76 million ounces gold** from 129.6 Mt @ 1.14 g/t gold at a 0.5 g/t cut-off.

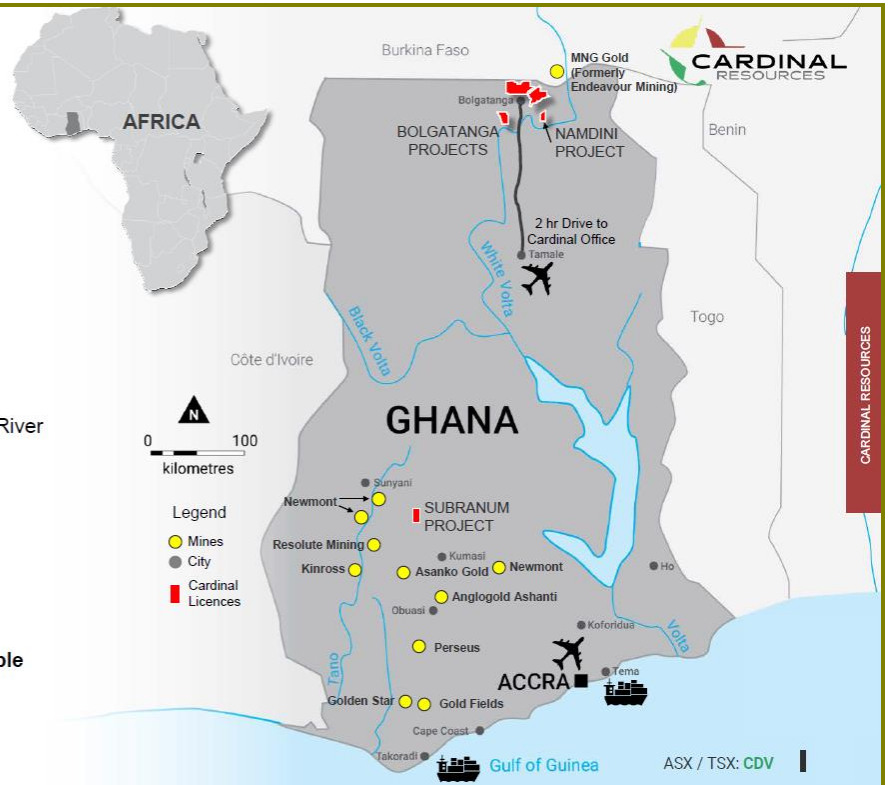
**The resource could generate US\$ 1.4 billion free cash flow (pre-tax) utilising a business case 9.5 million tonnes per annum throughput processing facility model.**

The **Feasibility Study (FS)** is fully funded by a recently finalised secured credit facility of US\$ 25 million with Sprott Private Resource. **Completion is anticipated in Q3 2019.**

## Overview of Projects

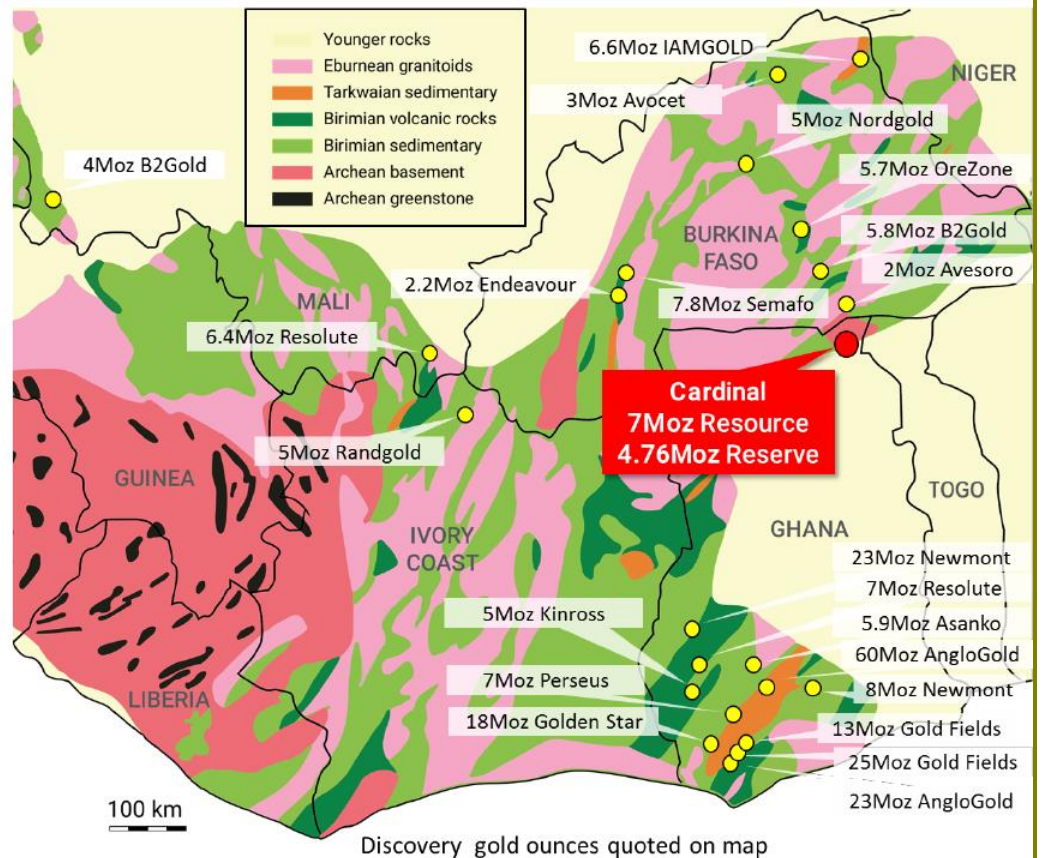
### NEW FRONTIER: NORTHERN GHANA

- **Paleoproterozoic Granite-Greenstone Belt**
  - Underexplored compared to Southern Ghana
- **Well-Established Local Infrastructure**
  - 30km – National HV hydro grid power
  - 7km – Continuous water supply – White Volta River
  - 25km – Sealed national highway
- **Excellent Community Relationships**
  - Facilitates rapid development objective
- **Open Savannah Grassland**
  - Low population density
- **Mining License Granted for 15 years renewable**



### MINE SCALE REGIONAL GEOLOGY

- Namdini is located within the Birimian terrane of Northeastern Ghana which is 2.1-2.2 billion years old
- Unconformable Volta Basin sediments obscure the great majority of Birimian terrane in eastern and central Ghana



On 29 August 2018, **Cardinal** announced further shallow gold intersections to the exploration drill results from its new gold discovery announced on 16 July 2018 from its new **Ndongo East discovery** on the Ndongo Licence. The **Ndongo East prospect** is located approximately 20 kilometres north of the Company's **Namdini Gold Project** which has a 6.5 million ounces Indicated Mineral Resource.

#### Highlights:

- Significant gold intersections include:
  - **2 metres @ 27.0 g/t gold** from 10 metres in drill hole NDRC 247
  - **6 metres @ 12.6 g/t gold** from 2 metres in drill hole NDRC 275
  - **7 metres @ 2.2 g/t gold** from 55 metres in drill hole NDRC 276

On 18 September 2018, **Cardinal** announced the results of its **Preliminary Feasibility Study (PFS)** for the **Namdini Gold Project**.

#### Highlights:

- **4.76 million ounces from 129.6 Mt @ 1.14 g/t gold** at 0.5 g/t cut-off Maiden Probable Ore Reserve estimate
- **US\$ 1,105/oz gold price** used to provide a Life of Mine (LOM) optimised pit converting 73% of the 6.5 Moz Indicated Mineral Resource to Probable Ore Reserves.
- **US\$ 1,250 gold price** financial model generated a **38% Post-Tax Internal Rate of Return (IRR)**
- **US\$ 599/oz all-in sustaining costs (AISC)** for the first 2.5 years including of **1.8-year payback period**
- **US\$ 414 million Capital development cost for the 9.5 Mt per annum throughput plant**
- **1.06 million ounces 1.31 g/t gold** and strip ratio of 0.5 to 1 (waste to ore) for first 2.5 years of production (Starter Pit)
- 86% Metallurgical recovery for Starter Pit and 84% for LOM with ongoing optimisation test work

#### Comments from Archie Koimtsidis, Managing Director and Chief Executive Officer:

The PFS study confirms the **Namdini Project** as one of Ghana's and Africa's most promising undeveloped, large gold assets. The financial modelling of the project shows it to be technically sound and financially viable and could generate US\$ 1.4 billion free cash flow (pre-tax) utilising the 9.5 Mtpa throughput model.

The **Feasibility Study (FS)** is fully funded and will form the basis for the development of our Namdini Project in Ghana with completion anticipated in Q3 2019.

#### FINANCIAL SUMMARY OF 9.5 Mtpa (Gold Price of US\$ 1,250 / oz)

KEY ECONOMIC RESULTS	UNIT	9.5 Mtpa
Development Capital Cost	US\$ M	414
All in Sustaining Costs (AISC) <sup>1</sup>	<i>Starter Pit</i>	<b>599</b>
	<i>Life of Mine</i>	769
Total Project Payback	Years	1.8
Pre-Tax NPV US\$ (@ 5% discount) <sup>2</sup>	US\$ M	927
Post-Tax NPV US\$ (@ 5% discount) <sup>2</sup>	US\$ M	586
Pre-Tax IRR	%	49
Post-Tax IRR	%	38

Table 1 Notes:

<sup>1</sup> Cash Costs + Royalties + Levies + Life of Mine Sustaining Capital Costs (World Gold Council Standard)

<sup>2</sup> Royalties calculated at flat rate of 5% & corporate tax rate of 35% used; both subject to negotiation.

## PFS PRODUCTION SUMMARY

- Maiden Ore Reserve 4.76 Moz
- Starter Pit yielding ~900 koz gold with 0.5 : 1 strip ratio
- Life of mine strip ratio of 1.4 : 1
- Mineralisation 1.1 km long and 350m wide
- >10,000 oz ounce per vertical metre at 0.5 g/t cut-off
- New conventional gold plant inclusive of conventional flotation and regrind to CIL

KEY ESTIMATED PRODUCTION RESULTS	UNIT	9.5 Mtpa	
		Starter Pit	Life of Mine
Gold Price – Financial Model	US\$ / oz	1,250	
Gold Produced <i>(Average for full production years)<sup>1</sup></i>	(oz / yr)	361,000	294,000
Gold Produced	(oz)	907,000	3,975,000
Gold Head Grade	g/t Au	1.31	1.14
Gold Recovery	%	86	84
Ore Mined <i>(0.5 g/t cut-off grade)</i>	Tonnes	24,000,000	129,600,000
Strip Ratio	W:O	0.5 : 1	1.4 : 1
Mine Life <i>(Inc ramp-up and mine closure)</i>	years	2.5	14
Development Capital Cost <i>(Including 15% contingency and owners costs)</i>	US\$ M	414	

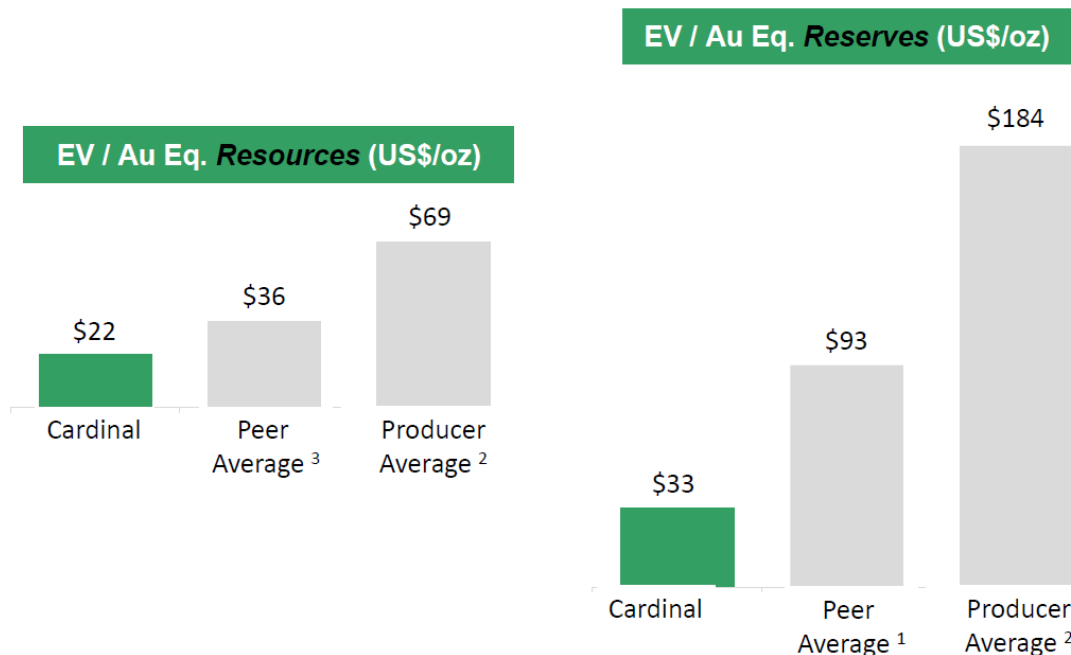
**Table Notes:**

<sup>1</sup> Excludes ramp-up and for the Life of Mine scenario mine closure (Years where full production is not realised)

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CARDINAL RESOURCES

## RELATIVE VALUATION



Source: FactSet and company disclosure.

Notes: Resources shown inclusive of reserves and on attributable basis. Au Eq. based on long-term consensus metal prices.

<sup>1</sup> Includes 18 gold development companies with reserves.

<sup>2</sup> Includes 41 junior and intermediate gold producers.

<sup>3</sup> Includes 28 gold development companies with resources.

ASX / TSX: **CDV**

## PROBABLE ORE RESERVE

### NAMDINI MAIDEN ORE RESERVE September 2018

Cut off (g/t Au)	Tonnes (Mt)	Grade (g/t Au)	Metal (Moz Au)
0.5	129.6	1.14	4.76

4.76 Moz Au contained in 129.6 Mt at 1.14 g/t Au at a cut-off of 0.5 g/t Au  
*Probable Ore Reserve*

The Ore Reserve conforms with and uses JORC Code 2012 recommendations and Canadian Institute of Mining, Metallurgy and Petroleum "CIM Definition Standards for Mineral Resources and Mineral Reserves" (CIM, 2014). No inferred material has been used in the Ore Reserve estimates.

Appropriate modifying factors have been considered, these include but are not restricted to mining, processing, metallurgical, infrastructure, economic marketing, legal, environmental, social and governmental factors.

6.5 Moz Au contained in 180 Mt at 1.13 g/t Au at a cut-off of 0.5 g/t Au

#### INDICATED MINERAL RESOURCE

Cut off (g/t Au)	Tonnes (Mt)	Grade (g/t Au)	Metal (Moz Au)
0.5	180	1.1	6.5

*Indicated Mineral Resource*

0.5 Moz Au contained in 13 Mt at 1.2g/t Au at a cut-off of 0.5 g/t Au

#### INFERRED MINERAL RESOURCE

Cut off (g/t Au)	Tonnes (Mt)	Grade (g/t Au)	Metal (Moz Au)
0.5	13	1.2	0.5

*Inferred Mineral Resource*

Remains open along strike and down dip

This is in accordance with the guidelines of Reasonable Prospects for Eventual Economic Extraction ("RPEEE") per the Canadian Institute of Mining, Metallurgy and Petroleum "CIM Definition Standards for Mineral Resources and Mineral Reserves" (CIM, 2014) and the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (the JORC Code 2012).

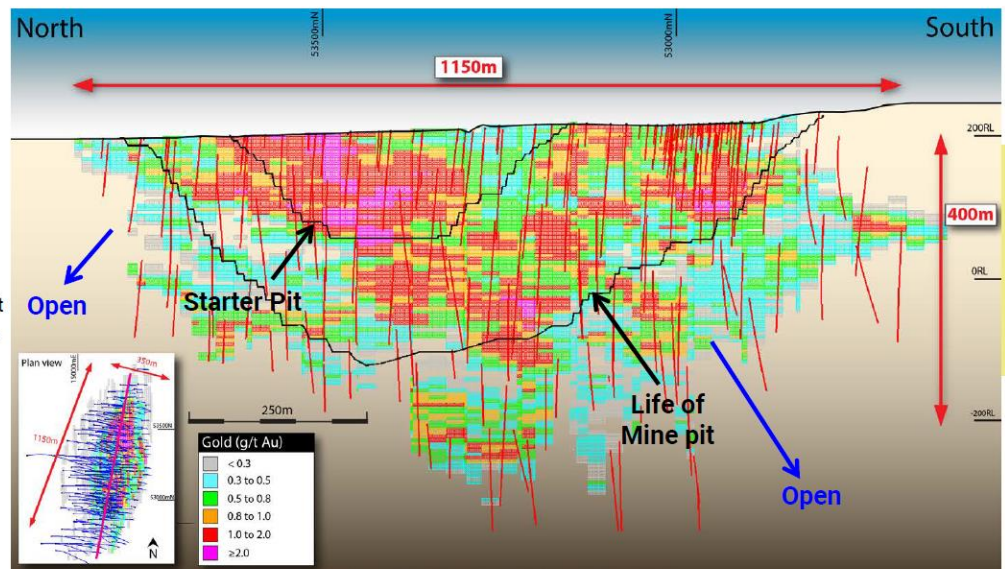
The Mineral Resources are inclusive of the Ore Reserve.

ASX / TSX: CDV |

### Long Section – Grade Distribution

### PFS PIT DESIGNS US\$ 1,105 / oz

- **Starter Pit**
  - Low strip ratio (0.5 : 1)
  - Contains 1.06 Moz @ 1.31 g/t
  - Concentration of higher grade gold from surface
  - Capex payback – 1.8 years
- **Life of Mine Pit**
  - Low strip ratio (1.4 : 1)
  - Probable Ore Reserve of 4.76 Moz @ 1.14 g/t Au



## **Management**

**Archie Koimtsidis, Chief Executive Officer / Managing Director**, has for the last 27 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 a joint TSXV and ASX listed company. During this time he was responsible for all field operational matters relating to that Company'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.

**Kevin Tomlinson, Non-Executive Chairman**, possesses over 30 years' experience in Mining and Finance within the Toronto, Australian and London Stock markets. He was previously Managing Director of Investment Banking at Westwind Partners/Stifel Nicolaus raising equity and providing corporate advice. Mr. Tomlinson has extensive experience in development and financing of mining projects internationally. Previous Directorships include Centamin, an Egyptian gold producer, Orbis Gold, a Burkina Faso gold developer and Medusa Mining, a Philippines gold producer.

**Malik Easah, Executive Director**, is the principal of a successful alluvial mining operation 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 is a resident in Ghana and 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.

**Jacques McMullen, Non-Executive Director**, retired in 2012 after a distinguished 35-year career in the mining industry of which the last 17 years were with Barrick Gold where he held the positions of Senior VP Special Projects and Technical Services. In this role, 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. Following his retirement, Mr. McMullen joined BBA, a global engineering firm, as Principal, Mines & Metals and Director. Additionally, Jacques was Chairman of Orvana Minerals and is currently a Director at Equinox Gold, all TSX.V listed companies.

**Michele Muscillo, Non-Executive Director**, is a Partner with HopgoodGanim Lawyers in Australia. He has practiced 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, including IPOs and debt and equity raising. Mr. Muscillo is currently a Non-Executive Director with ASX-listed Aeris Resources Limited and Xanadu Mines. Formerly, he was also Non-Executive Director of Orbis Gold, which is currently owned by TSX-listed SEMAFO.

**Robert Schafer, Non-Executive Director**, 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, he led teams to the discovery of several deposits in the western USA (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 RPGeo and is also an active member of the Society for Mining, Metallurgy and Exploration (SME) in the USA, where he served on its Board for more than a decade.

## Finance

On 22 August 2018, **Cardinal** announced that it had successfully finalised a US\$ 25 million (A\$ 32 million) senior secured credit facility with Sprott Private Resource Lending (Collector), L.P. (Sprott).

The Facility has a 30-month repayment term and bears an interest rate of LIBOR +7.75%. The Facility is secured against assets of the Company and its wholly-owned subsidiary. **Cardinal Namdini Mining**.

**Cardinal** has issued 4.25 million ordinary shares to Sprott.

<b>Consolidated statement of financial position as at</b>	<b>June 30</b>	<b>June 30</b>
<i>in A\$ million</i>	<b>2018</b>	<b>2017</b>
<b>ASSETS</b>		
Current	9.68	29.64
Non-current	0.56	0.47
<b>Total assets</b>	<b>10.24</b>	<b>30.11</b>
<b>LIABILITIES</b>		
Current	4.77	3.90
Non-current assets	-	-
<b>Total liabilities</b>	<b>4.77</b>	<b>3.90</b>
<b>Shareholders' equity:</b>	<b>5.47</b>	<b>26.21</b>
<b>Net cash outflow used in operating activities</b> , of which	<b>(32.75)</b>	<b>18.03</b>
<i>expenditures on mineral assets</i>	<i>(25.73)</i>	<i>(14.55)</i>
Net cash flow used in <b>investing activities</b>	(0.32)	(0.34)
Net cash flow from <b>financing activities</b>	12.15	42.08
Net cash flow used in <b>investing activities</b>		
<b>Net decrease in cash and cash equivalent</b>	<b>(20.92)</b>	<b>23.71</b>
<b>Cash and cash equivalents at the end of the financial year</b>	<b>7.30</b>	<b>28.59</b>

**Investment recommendation:**

**Cardinal's** main focus is the flagship **Namdini Gold Project** with the recently completed PFS having delivered a **Maiden Probable Ore Reserve estimate of 4.76 million ounces of gold from 129.6 Mt @ 1.14 g/t gold at a 0.05 g/t cut-off**. The resource could generate **US\$ 1.4 billion free cash flow (pre-tax utilising a business case 9.5 million tonnes per annum throughput processing facility model)**.

The PFS study confirms the **Namdini Project** as one of Ghana's and Africa's most promising undeveloped, large gold assets. The financial modelling of the project shows it to be technically sound and financially viable.

A **Feasibility Study (FS)** is fully funded and will form the basis for the development of our Namdini Gold Project in Ghana with completion anticipated in Q3 2019.

**Ghana** to be considered Africa's highest ranked destination for investing in gold mining, referring specifically to its low peer comparison valuation, in my view, **Cardinal Resources**, at its current market valuation of US 121 million, offers a highly attractive investment opportunity.

**I maintain my 12 months price target at A\$ 0.90 over an extended period of a year.**