

DISCLAIMER

SAFE HARBOUR: Some statements contained in this presentation are forward-looking statements or forwardlooking information (collectively, "forward-looking statements") within the meaning of the United States Private Securities Litigation Reform Act of 1995 and applicable Canadian securities laws. Investors are cautioned that forward-looking statements are inherently uncertain and involve risks and uncertainties that could cause actual results to differ materially. Such statements include comments regarding: Such statements include comments regarding; gold production of 195-210koz in 2020; AISC of \$1.080-1.180/oz in 2020; Capex of \$55-60m in 2020; refocusing the Company under the new management team to pursue the growth and optimization of the existing portfolio of assets and look to business development for further growth: creating a mid-tier gold miner with 3-4 mines through 2-3 countries; safely and sustainably generating returns from a portfolio of West African gold mines; production increases expected to come with a low level of capital intensity at Wassa; the potential for reserve growth and the continuation of targeted drilling at Wassa through 2020; introducing the longhole mining methodology at Prestea in 2020 and optimizing the Alimak stope heights to reduce dilution and improve cycle time; targeting new assets that deliver immediate cash flow or near-term cash flow; looking to add new assets in West Africa to improve the geographical diversification of the portfolio; Wassa gold production of 155-165koz, cash cost of \$620-660/oz, AISC of \$930-990/oz and Capex of \$42-46m in 2020; Prestea gold production of 40-45koz, cash cost of \$1,400-1,515/oz, AISC of \$1,650-1,850/oz and Capex of \$9-10.5m in 2020; 26,000 m of definition drilling at Wassa to be completed in H2 2019; increasing stope availability and mining flexibility at Wassa; commissioning of paste plant in H2 2020 at total capital cost of \$23 million and operating cost of \$5-7 per tonne; long term target to increase mining rate to 5,000 tpd at Wassa; an updated Resource and Reserve model in Q1 2020; exploration work planned for 2020; and the implementation of a higher level of operating and cost discipline and new systems and controls that will benefit mine planning, cost optimisation and productivity rates. Factors that could cause actual results to differ materially include timing of and unexpected events at the Prestea and/or the Wassa processing plants; variations in ore grade, tonnes mined, crushed or milled; delay or failure to receive board or government approvals and permits; construction delays; the availability and cost of electrical power; timing and availability of external financing on acceptable terms or at all; technical, permitting, mining or processing issues, including difficulties in establishing the infrastructure for Wassa Underground or Prestea Underground, inconsistent power supplies, plant and/or equipment failures and an inability to obtain supplies and materials on reasonable terms (including pricing) or at all; changes in U.S. and Canadian securities markets; heavy rainfall and flooding of underground mines; and fluctuations in gold price and input costs and general economic conditions.

There can be no assurance that future developments affecting the Company will be those anticipated by management. Please refer to the discussion of these and other factors in our Annual Information Form for the year ended December 31, 2018 filed and available at www.sedar.com. The forecasts contained in this presentation constitute management's current estimates, as of the date of this presentation, with respect to the matters covered therein. We expect that these estimates will change as new information is received and that actual results will vary from these estimates, possibly by material amounts. While we may elect to update these estimates at any time, we do not undertake to update any estimate at any particular time or in response to any particular event. Investors and others should not assume that any forecasts in this presentation represent management's estimate as of any date other than the date of this presentation.

In this presentation, we use the terms "cash operating cost per ounce", "All-In Sustaining Cost per ounce" and "AISC per ounce". These terms should be considered as Non-GAAP Financial Measures as defined in applicable Canadian and United States securities laws and should not be considered in isolation or as a substitute for measures of performance prepared in accordance with International Financial Reporting Standards ("IFRS"). "Cash operating cost per ounce" for a period is equal to the cost of sales excluding depreciation and amortization for the period less royalties, the cash component of metals inventory net realizable value adjustments and severance charges divided by the number of ounces of gold sold (excluding pre-commercial production ounces) during the period. "All-In Sustaining Costs per ounce" commences with cash operating costs and then adds sustaining capital expenditures, corporate general and administrative costs, mine site exploratory drilling and greenfield evaluation costs and environmental rehabilitation costs, divided by the number of ounces of gold sold (excluding pre-commercial production ounces) during the period. This measure seeks to represent the total costs of producing gold from operations. These measures are not representative of all cash expenditures as they do not include income tax payments or interest costs. Changes in numerous factors including, but not limited to, mining rates, milling rates, gold grade, gold recovery, and the costs of labor, consumables and mine site general and administrative activities can cause these measures to increase or decrease. We believe that these measures are the same or similar to the measures of other gold mining companies but may not be comparable to similarly totaled measures in every instance. Please see our "Management's Discussion and Analysis of Financial Condition and Results of Operations for the three and nine months ended September 30, 2019" for a reconciliation of these Non-GAAP measures to the nearest IFRS measure.

INFORMATION: The information contained in this presentation has been obtained by Golden Star from its own records and from other sources deemed reliable, however no representation or warranty is made as to its accuracy or completeness. The technical information relating to Golden Star's material properties disclosed herein is based upon technical reports prepared and filed pursuant to National Instrument 43-101 - Standards of Disclosure for Mineral Projects ("NI 43-101") and other publicly available information regarding the Company, including the following: (i) "NI 43-101 Technical Report on a Feasibility Study of the Wassa Open Pit Mine and Underground Project in Ghana" effective December 31, 2014; and (ii) "NI 43- 101 Technical Report on Resources and Reserves, Golden Star Resources, Bogoso/ Prestea Gold Mine, Ghana" effective December 31, 2018. Additional information is included in Golden Star's Annual Information Form for the year ended December 31, 2018 which is filed and available on www.sedar.com. Mineral Reserves were prepared under the supervision of Dr. Martin Raffield, Senior Vice President Technical Services for the Company. Dr. Raffield is a "Qualified Person" as defined by NI 43- 101. The Qualified Person reviewing and validating the estimation of the Mineral Resources is Mitchel Wasel, Golden Star Resources Vice President of Exploration.

CURRENCY: All monetary amounts refer to United States dollars unless otherwise indicated.





GOLDEN STAR - Overview



Two producing gold mines



Creating shared value

Focussed on sustainability 98% Ghanaian workforce



Strong cash balance \$53m¹

Net debt \$52m



Management & strategy change



Exploring

The full potential of the Wassa complex



Turnaround

Optimising Prestea



195-210koz

2020 Production Guidance



\$1,080-1,180/oz 2020 AISC Guidance²



Reserves & Resources

P&P 1.8 Moz





M&I 5.9 Moz

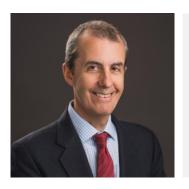




GHANA

WEST AFRICA

MANAGEMENT – Refocusing the head office in London



Andrew Wray

Chief Executive Officer

- Appointed President and Chief Executive Officer in May 2019, member of the Board of Directors since October 2018
- Previously CEO of La Mancha Group
- Served as CFO at Acacia Mining
- Worked at JP Morgan Cazenove in the Corporate Finance team with over 15 years advising mining companies



Peter Spora

Head of Growth & Exploration

- Joined November 2019
- Most recently served as the Head of Discovery at La Mancha
- Previously Head of Discovery at Acacia Mining
- Peter is a geologist with 25 years of experience in discovery and business development roles



André van Niekerk

Chief Financial Officer

- As announced October 2019, André has decided that he will not be making the move to London. Paul Thomson will take over the CFO position after the release of the 2019 results
- Joined Golden Star in 2006 5 years in Ghana as Head of Finance and Business Operations
- Appointed CFO in April 2014, previously Financial Controller



Nathalie Lion Haddad

Head of People

- Joined in September 2019
- Over 20 years experience in HR, previously working for Sherritt International, LG Electronics and BHP in organisational effectiveness roles, as Director of Human Resources and as an in-country HR lead



Graham Crew

Chief Operating Officer

- Appointed Chief Operating Officer in July 2019, previously on the Board of Directors from October 2018 to July 2019
- Strong track record of transforming operations, with 25 years of operational, technical and corporate experience including the roles of General Manager at Barminco and General Manager at Acacia Mining



Philipa Varris

Head of Sustainability

- Joined the executive team in January 2020 having run the environment, sustainability and health & safety functions since 2011
- Previously held environment, health, safety and community management roles in the mining sector for over 20 years, throughout Ghana, Australia and Papua New Guinea





OUTLOOK – Creating a leading African gold producer

Long term vision &
Principles

- Strategy | Refocus the company under the new management team to pursue the growth and optimisation of the existing portfolio of assets and look to business development for further growth.
- Vision | The creation of a sustainable mid-tier gold miner operating across Africa.
- Core principles | To safely and sustainably generate returns for all stakeholders from a portfolio of African gold mines. New management is focused on creating a Golden Star culture and behaviours that can be rolled out across an enlarged portfolio of assets.

Organic growth &
Optimisation

- Wassa | A long life gold mine with very significant growth potential. The underground mine is currently generating c.4kt/day with plant capacity of c.8kt/day. Production increases expected to come with a low level of capital intensity.
- Wassa exploration & growth | Potential for reserve growth through depth extension toward the south and in the footwall to the main mining areas. Targeted drilling started in 2019 and continues through 2020.
- Prestea optimisation | The focus is currently on near-term operational improvements, while also working through internal studies for the longer-term mine plans. These plans will introduce the longhole mining methodology to a new level in the mine during 2020 and will optimize the Alimak stope heights to reduce dilution and improve cycle time.

External growth

- Approach | Disciplined approach to growth opportunities, targeting new assets that deliver immediate cash flow or near-term cash flow.
- **Diversification** | The Company will remain focussed on gold but will look to add new assets across Africa to improve the geographical diversification of the portfolio.

WASSA GUIDANCE



155-165kozProduction Guidance



\$620-660/oz Cash cost \$930-990/oz AISC¹



\$42-46mCapex Guidance

PRESTEA GUIDANCE



40-45kozProduction Guidance



\$1,400-1,550/oz Cash cost \$1,650-1,850/oz



\$9-10.5mCapex Guidance

GROUP GUIDANCE - 2020



195-210koz Production Guidance



\$790-850/oz Cash cost \$1,080-1,180/oz **\$55-60m**Capex Guidance

1,080-1,180/ozAISC Guidance¹





PORTFOLIO SNAPSHOT – Two gold mines 40km apart in Southern Ghana

Wassa Quick Facts (100% BASIS)					
Ownership	90% GSR (Wassa) 10% Ghana government				
Transition to underground mining	2017				
M&I Mineral Resources	3.4 Moz contained ounces Grade – 2.4g/t (4.3g/t underground)				
Inferred Mineral Resources	6.4 Moz Grade – 3.8g/t				
P&P Mineral Reserves	1.5 Moz Grade – 2.5g/t (3.95g/t underground)				
Processing Plant	CIL (capacity 7,800 tpd) Current utilisation 51%				
Gold Recovery	95.7%				
Mining Type	Underground (Longhole) Ramp capacity 5ktpd				
Production	2017A 137 koz 2018A 150 koz 2019A 156 koz 2020E 155-165 koz				
Cash Cost AISC US\$/oz ⁽¹⁾	2017A - \$880 AISC not reported 2018A - \$629 AISC not reported 2019E - \$600-650 \$880-940 2020E - \$620-660 \$930-990				

Prestea Quick Facts (100% BASIS)					
Ownership	90% GSR (Prestea/Bogoso) 10% Ghana government				
History	H2 2018				
M&I Mineral Resources	2.6 Moz contained ounces Grade – 3.5g/t (16.8g/t underground)				
Inferred Mineral Resources	701 koz Grade – 7.2g/t				
P&P Mineral Reserves	317 koz Grade – 11.6g/t (11.9g/t underground)				
Processing Plant	CIL (capacity 4,000 tpd)				
Gold Recovery	87.4%				
Mining Type	Underground (Alimak) Shaft capacity 1.5ktpd				
Production	2017A 130 koz 2018A 75 koz 2019A 48 koz 2020E 40-45 koz				
Cash Cost AISC US\$/oz ⁽¹⁾	2017A \$632 AISC not reported 2018A \$1,292 AISC not reported 2019E \$1,450-1,650 \$1,900-2,150 2020E \$1,400-1,550 \$1,650-1,850				





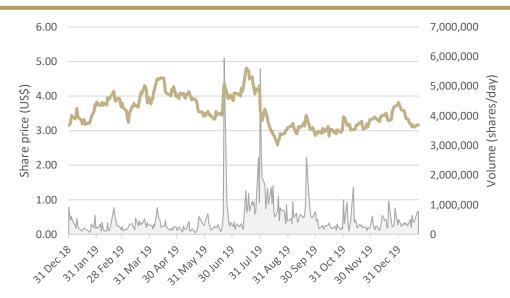


CORPORATE SUMMARY — (NYSE:GSS | TSX:GSC | GSE:GSR)

Market Information

	US\$	C\$		
Share price ¹	\$3.17	\$4.12		
Shares in Issue ²	109m			
Options ²	3.9m			
Market Capitalisation ¹	\$348m	\$451m		

NYSE share price performance

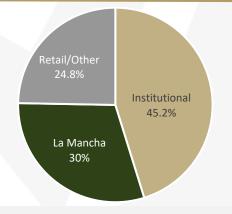


NYSE AMERICAN: GSS | TSX: GSC

Key Shareholders⁴

	La Mancha Holding	30%
	CPMG Inc. (Condire)	8.7%
	Invesco Advisers, Inc.	4.4%
	Franklin Templeton	4.2%
	Van Eck Associates Corp	3.5%
	Lyxor Funds Solutions S.A.	3.0%
	Renaissance Technology LLC	1.9%
	ASA Gold and Precious Metals Ltd	1.7%
	Tocqueville Asset Management	1.6%
	Konwave AG	1.5%
	Merk Investments LLC	1.3%

Ownership Breakdown³



- Strong support from the 30% strategic shareholder, La Mancha. A proven and successful investor in the gold sector
- Recently requested (and was granted) ability to increase their holding to 35%

Analyst Coverage

- Beacon Securities | Michael Curran
- CIBC Capital Markets | Bryce Adams
- HC Wainwright & Co | Heiko Ihle
- National Bank | Don DeMarco
- Numis Securities | Justin Chan
- Scotiabank | Ovais Habib

- L. As at January 21, 2020
- . As at October 31, 2019
- 3. As at January 22, 2020
- 4. As at December 31, 2019



#



WASSA — Recent production performance and outlook

Q4 2019 - operating detail

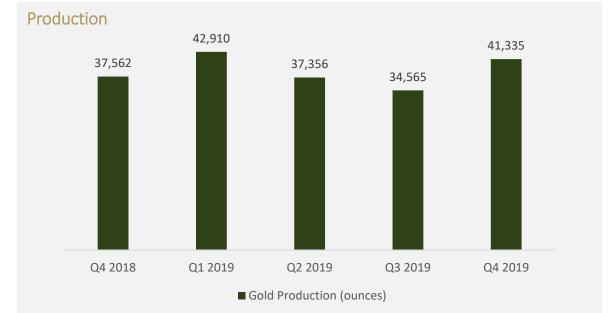
- 41koz produced in Q4 2019
- Mining progressed in the 595 & 620 levels, moving out of the areas of lower than expected grade that impacted Q3 2019
- The underground mined grade increased 33% QoQ
- Mining rates remained above 4,000tpd during Q4
- Plant throughput continued to slightly exceed the mining volumes due to the processing of lower grade stockpile material
- The stockpiles did not mask the increase in mined grades, with the plant feed grade increasing by 28% QoQ

2019 – results vs guidance

 Wassa delivered 156koz of production in 2019, in line with the 150-160koz guidance range

2020 – production guidance

- Production guidance of 155-165koz represents a 3% increase on 2019, at the midpoint of the range
- Mining rates will exceed 4,000tpd and lower grade stockpile processing will be minimal



Operating data

		Q4 2019	Q3 2019	Q4 2018	FY 2019	FY 2018
Ore Mined UG	kt	375,958	406,922	309,504	1,421,742	1,075,218
Grade Mined UG	g/t	3.8	2.8	3.8	3.6	4.2
Ore Processed	kt	389,415	427,380	401,715	1,548,486	1,600,884
Recovery	%	95.4	95.4	95.4	95.6	95.7
Gold Produced	OZ	41,335	34,565	37,562	156,166	149,697





WASSA — Recent cost performance and outlook

Q4 2019 costs

 The Q4 and FY 2019 cost performance will be reported with the 2019 financial results on February 18, 2020

2019 – cost guidance

- Cash operating costs⁽¹⁾ \$600/oz to \$650/oz
- AISC⁽¹⁾ \$880/oz to \$940/oz

2020 – cost guidance

- Cash operating costs⁽¹⁾ \$620/oz to \$660/oz
- AISC⁽¹⁾ \$930/oz to \$990/oz
- The 2020 cost guidance shows a slight increase over 2019 guidance due to:
 - Higher expected royalties
 - The introduction of paste filling in H2
 - An acceleration of maintenance spend
 - Increased allocation of corporate costs

2020 – capex guidance

- Capex is expected to total \$42-46m in 2020, including:
 - \$17.5m allocated to capitalized development
 - \$6m for new mobile equipment and replacement components for the existing fleet
 - \$13.5m to complete the paste fill plant







WASSA — Opportunity to capitalise on latent plant capacity and geological upside

Improving geological understanding

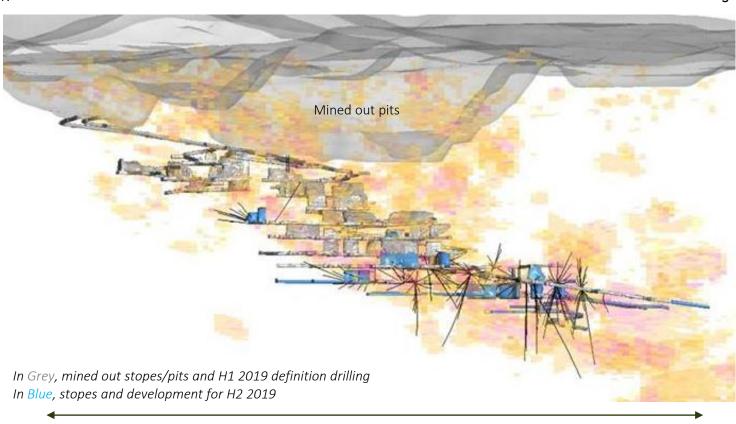
- Ongoing investment to increase drill density to identify lower-grade stopes and sequence them accordingly
- Target 12 months of definition drilling available
- 26,000 metres of definition drilling to be completed in H2 2019

Increasing stope availability & mining flexibility

- Ongoing investment in development to increase stope availability
- Paste plant construction started in H2 2019
 - Commissioning expected in H2 2020
 - Capital cost: \$23m (\$13.5m in 2020)
 - Operating cost: \$5-7 per tonne

Higher mining rate to unlock increases in gold production

- Long term target to increase mining rate to 5,000tpd (from current rates around 4,000tpd). Strengthening of mining fleet required: purchase of loaders, jumbo, 60t trucks
- Plant capacity 7,800tpd c.50% utilisation



1,100 m

Wassa long section







Prestea — Recent production performance and outlook

Q4 2019 - operating detail

- 11koz produced in Q4 2019
- The underground mined grade increased 37% QoQ to 6.9g/t with stope S12 showing improved mining execution and lower dilution.
- Initiative to separate development waste from ore removed
 9kt of waste from being processed in Q4
- Underground mining volumes fell 18% QoQ due to ore being locked up in stope S13, this ore is expected to be released in Q1 2020 when mining the adjacent stope S14

2019 - results vs guidance

Prestea delivered 48koz of production in 2019, exceeding the revised 40-45koz guidance range. The guidance beat is attributable to the realisation of the initial benefits of the implementation of the operational review during H2

2020 – production guidance

- Guidance of 40-45koz is in line with 2019 performance
- Underground mining rates will increase significantly as the open pit contribution is expected to be minimal (2koz from 23koz in 2019)
- H2 2020 will see the introduction of ore from longhole stopes on the new 17 Level







PRESTEA — Recent cost performance

Q4 2019 costs

 The Q4 and FY 2019 cost performance will be reported with the 2019 financial results on February 18, 2020

2019 – cost guidance

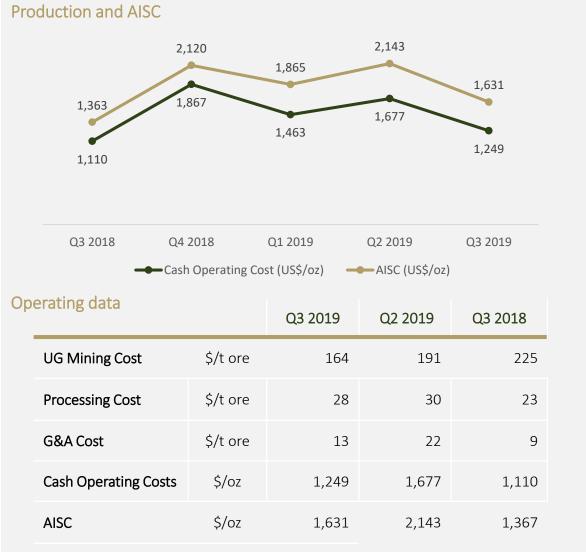
- Cash operating costs⁽¹⁾ \$1,450/oz to \$1,650/oz
- AISC⁽¹⁾ \$1,900/oz to \$2,150/oz

2020 – cost guidance

- Cash operating costs⁽¹⁾ \$1,400/oz to \$1,550/oz
- AISC⁽¹⁾ \$1,650/oz to \$1,850/oz
- The 2020 cost guidance shows a significant improvement over 2019 guidance due to:
 - Improved underground volumes and grades
 - Accelerating Alimak stope cycle time
 - Lower dilution led by the waste separation initiative, reduced Alimak stope heights and a smaller Alimak platform

2020 – capex guidance

- Capex is expected to total \$9-10.5m in 2020, including:
 - A new development jumbo, loader and longhole drill rig are due to be operational in H1 2020







PRESTEA - CSA Global independent review observations





Observations

Well established operation

- Resource model aligned with standard Industry Practice
- Processing plant well adapted to lower throughput
- Competent workforce
- Highly prospective land package
- Multiple upside options

Lower grade than planned: Excessive dilution & ore loss

- Insufficient geological and geotechnical data
- Poor definition of reef position
- Inadequate alignment of Alimak raises to reef position
- Low QAQC on long hole drilling and blasting
- Lack of geotechnical expertise

Lower productivity than planned

- Alimak raise length (150-160 metres) contributing to poor geotechnical conditions
- Low equipment mechanical availability
- Lack of access to top level

Initial recommendations and next steps

Aug 2019 – Feb 2020 - Prioritisation and implementation of low-cost quick win initiatives

- Increase definition drilling to provide accurate information on reef location and grade distribution within the reef
- More than 100 low-cost initiatives identified by CSA, including:
 - Develop geotechnical block model
 - Improve supervision, implement KPIs and management operating system
 - Purchase critical small equipment (e.g. forklift) for Alimak installation and supervision
- Run a workshop on site to prioritise cost initiatives
- Initiatives to be implemented by the operational team supported by a dedicated project team

Oct 2019 – Implementation of long-term plan

- Established whether existing or modified Alimak mining is appropriate
- Assessed the potential to introduce a complementary mining method to bring additional flexibility (trade off review)

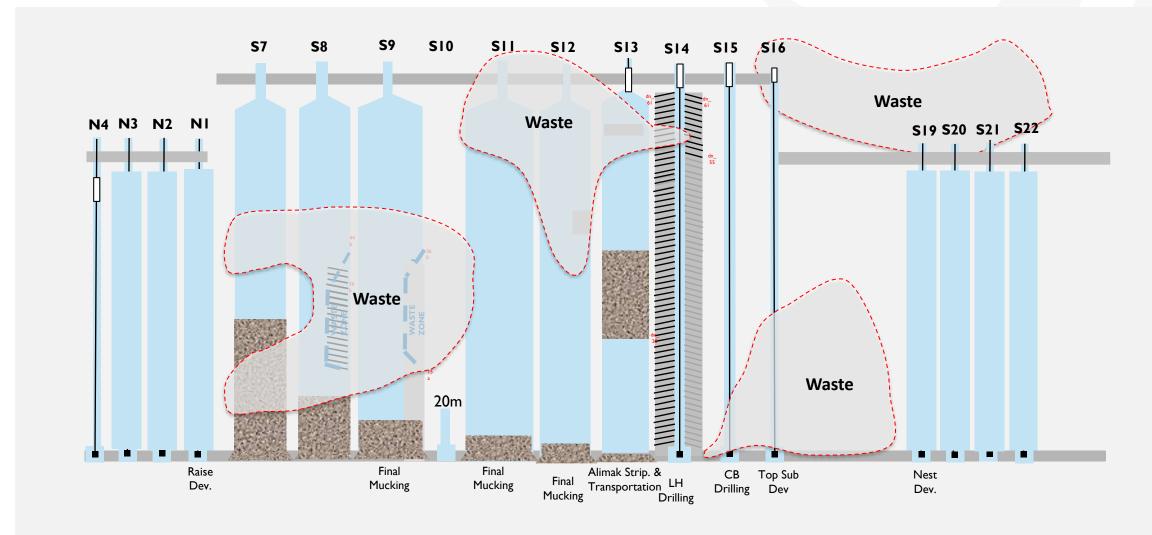
2020 - Improvements embedded and new plan starting to deliver

- Level 24 | Reduce Alimak stope height and transition to use of a narrower Alimak platform to reduce the mining execution risk and reduce dilution, respectively
- Level 17 | Establish longhole stope mining methodology on a new operating level





PRESTEA - Alimak mine plan optimised to reduce dilution

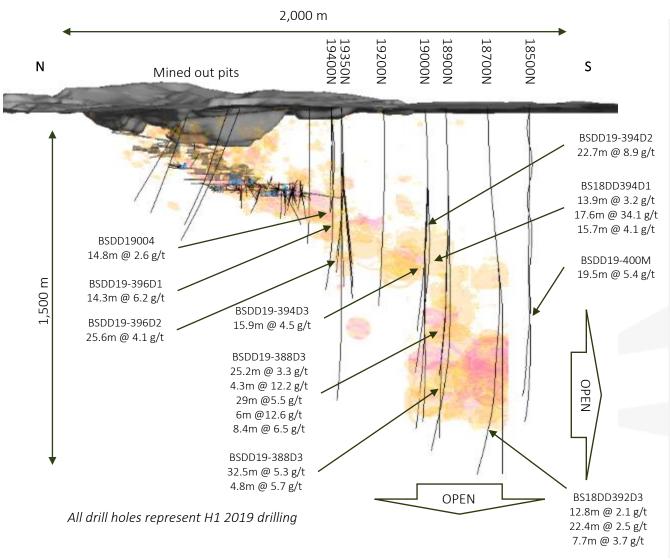








EXPLORATION - Extending mineralisation at Wassa Deeps



2019 Group exploration results

- Exploration activity focussed largely on Wassa in 2019
- 62,350 metres of infill and step-out drilling completed
- Assay results were announced November 13, 2019, this demonstrated that high grade mineralisation is extends more than 1km south of the underground infrastructure
- Deposit remains open to the south and at depth
- Improved understanding of the orebody thanks to infill drilling
- Confirmed continuity of the grade and thickness

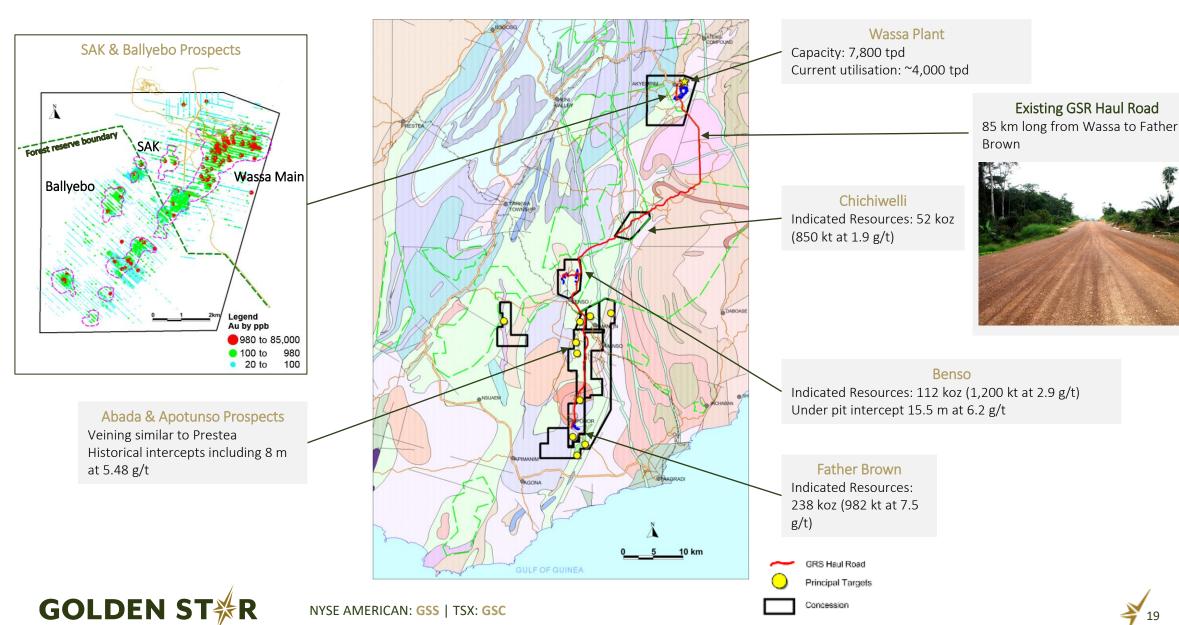
2020 Exploration outlook

- Following the 2019 drilling programme an update of the Resource and Reserve model has commenced and is expected Q1 2020
- The 2020 greenfield and brownfield exploration programmes will focus on near mine targets around Wassa and Prestea, as well as on regional exploration targets
- At Wassa, drilling will focus on targets in the footwall to the main mining area (B-Shoot) — Targeting mineralisation between the mined out Wassa South East pit and the "deeps"
- No exploration spend planned at Father Brown in 2020.
 Resource estimation work and desktop mine design work is ongoing

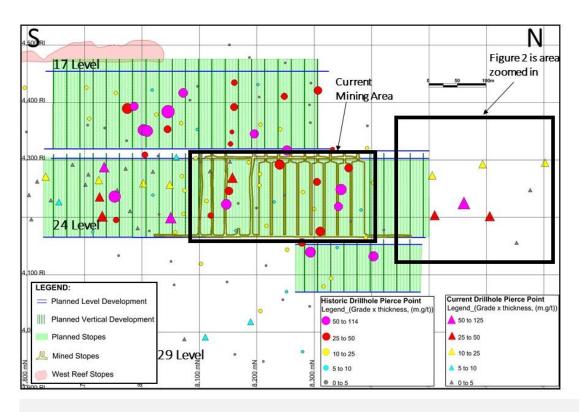


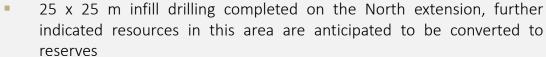


WASSA BROWNFIELD — Prospective targets along an existing haul road

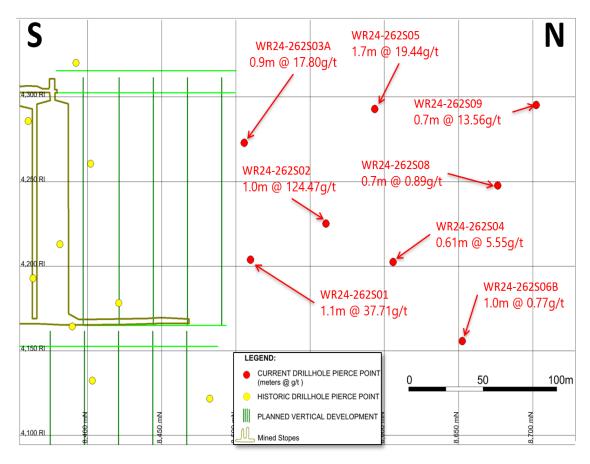


PRESTEA - HIGH GRADE EXTENSION DRILLING RESULTS





- Opens additional exploration targets
- Potential to add to the resources and reserves on 24L









CORPORATE RESPONSIBILITY & HEALTH AND SAFETY



LEADING PRACTICE

- Featured in UN Global Compact Canada Leading Practice Guide Sustainable Development Goal (SDG) 1,3 & 8¹
- Over 250 workforce safety champions
- Oil palm plantation supports over 700 families
- Featured in UN Global Compact Canada Leading Practice Guide SDG 1 & 8

LEADERSHIP & PERFORMANCE

- 93% of leaders completed leadership training
- 10 safety standards developed by workforce
- TRIFR of 1.19 in line with peer group
- Near miss reporting 2.5 times better than 2017
- Systems enhanced
- No reportable environmental incidents
- 100% conformance to statutory monitoring and regulatory guidelines

MALARIA

- Least cases in 7 years
- Order of magnitude better than background
- Case rates just 0.35 per capita

LOCAL CONTENT

- Employees 30% host community and 98% Ghanaian
- Contractors 74% host community

PARTNERSHIP

- Community agreements in development for Wassa operations
- World Environment Day celebrations

WORLD GOLD COUNCIL

- Golden Star is a member of the World Gold Council ("WGC")
- 10 Responsible Gold Mining Principles ("RGMPs") were recently disclosed by the WGC which are aligned with the Golden Star approach to business:
 - 1. Ethical conduct
 - 2. Understanding our impacts
 - 3. Supply chain
 - 4. Safety & Health
 - 5. Human rights & conflict
 - 6. Labour rights
 - 7. Working with communities
 - 8. Environmental stewardship
 - 9. Biodiversity, land use & mine closure
 - 10. Water, energy and climate change





WRAP-UP

A new focus & discipline

- Sustainability | Proven focus on responsible mining to be continued and enhanced.
 Golden Star has been recognised by industry awards in Ghana and internationally
- Structural changes | The new management team is implementing a higher level of operating and cost discipline. Implementation of new systems and controls will benefit mine planning, cost optimisation and productivity rates.

WASSA

- Mining rates are not constrained by plant capacity | Growth opportunity with a low capital intensity. The underground mine is currently generating a little in excess of 4kt/day with plant capacity of c.8kt/day.
- **Exploration** | Potential for depth extension towards the south and in the footwall to the main mining areas. Drilling targeting resource and reserve growth is ongoing

Opportunities

PRESTEA

 Transformation | Investment in an optimised Alimak process and a new mining methodology on a new production level will unlock higher mining rates and reduce dilution. Positioning Prestea for improved cost performance.

BUSINESS DEVELOPMENT

• Growth & diversification | The company has capacity to operate additional assets. Our focus is on diversifying the portfolio with cash generative African gold mines

2020 Outlook • Guidance | Production guidance of 195-210koz at and AISC of \$1,080-1,180/oz implies some modest improvement on 2019 guidance.

NYSE AMERICAN: GSS | TSX: GSC

• Underlying change | Guidance belies the underlying operational change that will be delivered in 2020. Productivity will improve at both operations





