ASX Release / 24 August 2020

Ore Reserves and Mineral Resources Statements as at 30 June 2020

- **As at 30 June 2020, Group Ore Reserves increased year on year from 4.1 Moz of contained gold to 6.0 Moz, and Group Mineral Resources increased from 9.6 Moz of contained gold to 11.6 Moz.**
- **The increase in Resources and Reserves is due to the Atlantic Gold acquisition concluded in July 2019 and Simberi sulphide drilling completed in December 2019.**

Company Summary

- **Total Ore Reserves are estimated at:** **93.6 Mt @ 2.0 g/t Au for 6.0 Moz of contained gold, comprising:**
  - Leonora Operations — 12.0 Mt @ 5.7 g/t Au for 2.2 Moz of contained gold
  - Simberi Operations — 31.1 Mt @ 2.1 g/t Au for 2.1 Moz of contained gold
  - Atlantic Gold Operations — 50.5 Mt @ 1.1 g/t Au for 1.7 Moz of contained gold

- **Total Mineral Resources[1] are estimated at:** **182.8 Mt @ 2.0 g/t Au for 11.6 Moz of contained gold, comprising:**
  - Leonora Operations — 27.7 Mt @ 5.6 g/t Au for 5.0 Moz of contained gold
  - Simberi Operations — 91.3 Mt @ 1.4 g/t Au for 4.3 Moz of contained gold
  - Atlantic Gold Operations — 63.9 Mt @ 1.1 g/t Au for 2.2 Moz of contained gold

The 30 June 2020 Ore Reserves and Mineral Resources Statements are attached.

1 Mineral Resources are reported inclusive of Ore Reserves

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Overview

St Barbara's Mineral Resources and Ore Reserves position as at 30 June 2020 is summarised and compared with the 2019 statement below.

Project	2019 Ore Reserves				2020 Ore Reserves		
	Tonnes ('000)	Grade (g/t Au)	Ounces ('000)		Tonnes ('000)	Grade (g/t Au)	Ounces ('000)
Gwalia (WA)	10,135	6.4	2,073		9,407	6.3	1,892
Tower Hill (WA)	2,572	3.7	306		2,572	3.7	306
Total Leonora	**12,707**	**5.8**	**2,379**		**11,979**	**5.7**	**2,198**
Simberi Oxide (PNG)	6,893	1.3	288		7,737	1.2	293
Simberi Sulphide (PNG)	18,135	2.4	1,375		22,638	2.4	1,765
Simberi Stockpile	1,058	0.7	24		678	0.6	12
Total Simberi	**26,086**	**2.0**	**1,687**		**31,053**	**2.1**	**2,070**
Atlantic Gold (NS)	-	-	-		45,070	1.1	1,647
Atlantic Stockpile (NS)	-	-	-		5,450	0.5	89
Total Atlantic Gold	**-**	**-**	**-**		**50,520**	**1.1**	**1,737**
Grand Total	**38,793**	**3.3**	**4,066**		**93,552**	**2.0**	**6,005**

Project	2019 Mineral Resources				2020 Mineral Resources		
	Tonnes ('000)	Grade (g/t Au)	Ounces ('000)		Tonnes ('000)	Grade (g/t Au)	Ounces ('000)
Gwalia (WA)	23,690	6.3	4,775		22,595	6.0	4,386
Tower Hill (WA)	5,093	3.8	625		5,093	3.8	625
Total Leonora	**28,783**	**5.8**	**5,400**		**27,688**	**5.6**	**5,011**
Simberi Oxide (PNG)	25,862	1.0	862		18,801	1.0	630
Simberi Sulphide (PNG)	64,938	1.6	3,335		72,459	1.6	3,687
Total Simberi	**90,800**	**1.4**	**4,197**		**91,260**	**1.4**	**4,318**
Atlantic Gold (NS)	-	-	-		63,883	1.1	2,227
Total Atlantic Gold	**-**	**-**	**-**		**63,883**	**1.1**	**2,227**
Grand Total	**119,583**	**2.5**	**9,597**		**182,832**	**2.0**	**11,555**

Data is rounded to thousands of tonnes and thousands of ounces. Discrepancies in totals may occur due to rounding.

The Company's Ore Reserves and Mineral Resources have increased since 30 June 2019 above net mining depletion as a consequence of:

- the completion of resource definition drilling at Simberi and subsequent update of Mineral Resources and Ore Reserves (refer *ASX Release 2 March 2020 - 'Ore Reserves and Mineral Resources Statements for Simberi Gold Mine as at 31 December 2019'*). Corresponding depletion from production for Simberi is therefore for the six-month period from 1 January to 30 June 2020.

- the acquisition of Nova Scotian based Atlantic Gold Corporation in July 2019. The Atlantic Gold Ore Reserves and Mineral Resources at the time of acquisition was updated as at 31 December 2018 as reported in a March 2019 NI43-101 Technical Report. Corresponding depletion from production for Atlantic Gold is therefore for an eighteen month period from 1 January 2019 to 30 June 2020.

- the reassessment of Atlantic Gold Mineral Resources at a higher gold price, up from US$1,400/oz at 31 December 2018 to US$1,800/oz at 30 June 2020.

Ore Reserves Revisions

Gwalia (-181,000 ounces)

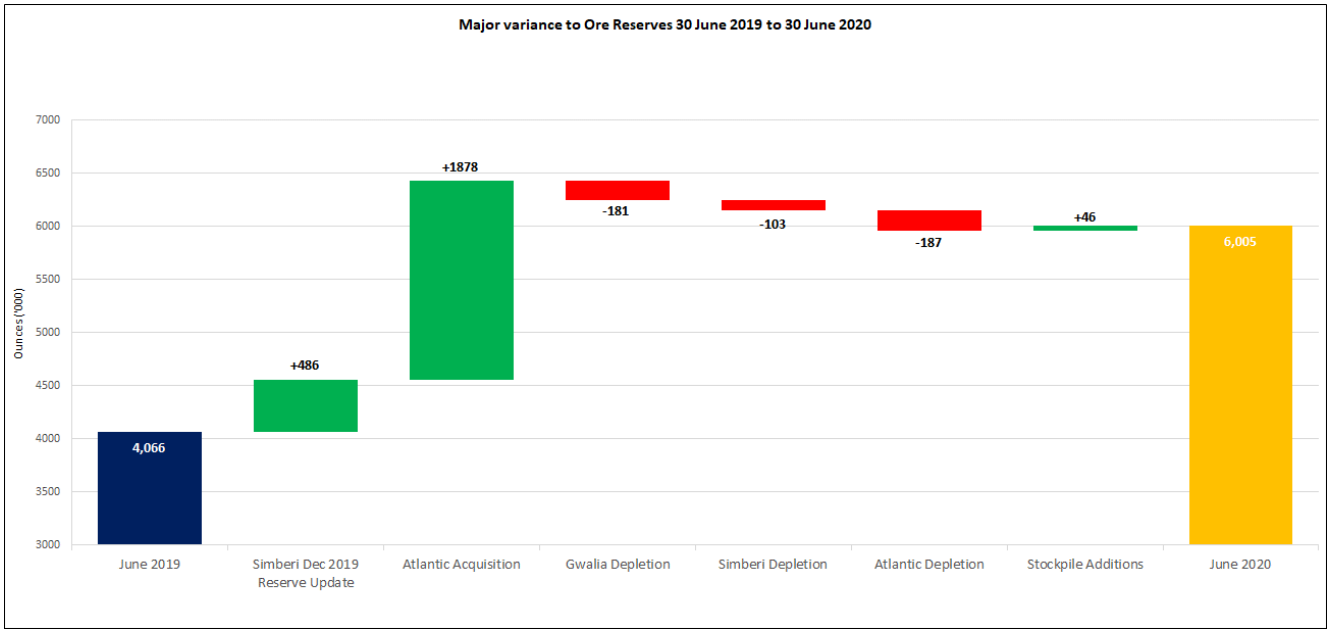
The previous publicly reported Proved and Probable Ore Reserve Estimate reported at 30 June 2019 was 10,135,000 t @ 6.4 g/t Au containing 2,073,000 ounces of gold. This has reduced by 181,000 ounces of gold to 9,407,000 t @ 6.3 g/t Au containing 1,892,000 ounces of gold. The decrease in the Ore Reserve is driven by mining depletion as there was no update to the underlying resource model during the year.

Simberi Oxide and Sulphide (-103,000 ounces)

The previous publicly reported Proved and Probable Ore Reserve Estimate reported at 31 December 2019 was 34,321,000 t @ 2.0 g/t Au containing 2,173,000 ounces of gold. This has reduced since 31 December 2019 by 103,000 ounces of gold to 30,376,000 t @ 2.1 g/t Au containing 2,070,000 ounces of gold. The decrease in the Ore Reserve is driven by mining depletion as there was no update to the underlying resource model since 31 December 2019.

Atlantic Gold (-138,000 ounces)

Atlantic Gold Corporation was acquired by St Barbara in July 2019 and Ore Reserves were initially reported in August 2019 based on a March 2019 NI43-101 Technical Report (with an effective date of 31 December 2018) compiled by Atlantic Gold. The previous publicly reported Proved and Probable Ore Reserve Estimate reported at 13 March 2019 was 51,950,000 t @ 1.12 g/t Au containing 1,875,000 ounces of gold. This has reduced since 31 December 2018 by 138,000 ounces of gold to 50,250,000 t @ 1.07 g/t Au containing 1,737,000 ounces of gold. The decrease in the Ore Reserve is driven by mining depletion for the 18 month period 1 January 2019 to 30 June 2020 as there was no update to the underlying resource model since March 2019.



Notes on selected movements from left to right (as noted in text above):

1. Atlantic Gold acquisition in July 2019, increase represents Ore Reserve as at 31 December 2018.
2. Simberi depletion from production is for the six month period from 1 January to 30 June 2020.
3. Atlantic Gold depletion from production is for the 18 month period 1 January 2019 to 30 June 2020.

Mineral Resources Revisions

Gwalia (-389,000 ounces)

The Gwalia Mineral Resources have been depleted for mining and sterilisation. The previous publicly reported Measured, Indicated and Inferred Mineral Resource Estimate reported at 30 June 2019 was 23,690,000 t @ 6.3 g/t Au containing 4,775,000 ounces of gold. This has decreased by 389,000 ounces of gold to 22,595,000 t @ 6.0 g/t Au containing 4,386,000 ounces of gold. The depletion figure includes 143,000 ounces of gold that should have been depleted in 2018 and 2019 but was overlooked. Depletion processes have been reviewed to prevent a recurrence of this oversight.

Simberi Oxide (-62,000 ounces)

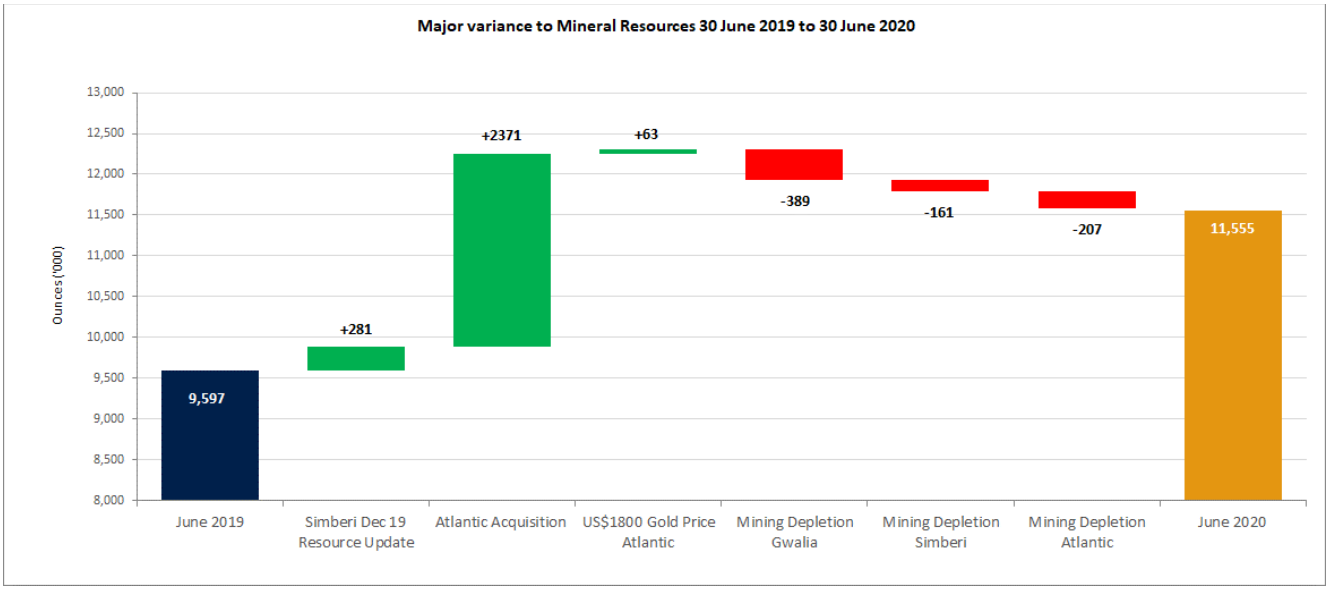
The Simberi Oxide Mineral Resources have been depleted for mining. The previous publicly reported Measured, Indicated and Inferred Oxide Mineral Resource Estimate reported at 31 December 2019 was 20,551,000 t @ 1.0 g/t Au containing 692,000 ounces of gold (*refer ASX Release 2 March 2020 - 'Ore Reserves and Mineral Resources Statements for Simberi Gold Mine as at 31 December 2019'*). This has decreased since 31 December 2019 by 62,000 ounces of gold to 18,801,000 t @ 1.0 g/t Au containing 630,000 ounces of gold.

Simberi Sulphide (-23,000 ounces)

The Simberi Sulphide Mineral Resources have been depleted for mining. The previous publicly reported Measured, Indicated and Inferred Sulphide Mineral Resource Estimate reported at 31 December 2019 was 72,985,824,000 t @ 1.6 g/t Au containing 3,710,000 ounces *(refer ASX Release 2 March 2020 - 'Ore Reserves and Mineral Resources Statements for Simberi Gold Mine as at 31 December 2019'*). This has decreased since 31 December 2019 by 23,000 ounces of gold to 72,459,000 t @ 1.6 g/t Au containing 3,687,000 ounces of gold.

Atlantic Gold (-144,000 ounces)

Atlantic Gold Corporation was acquired by St Barbara in July 2019 and Mineral Resources were initially reported in August 2019 based on a March 2019 NI43-101 Technical Report (with an effective date of 31 December 2018) compiled by Atlantic Gold. The previous publicly reported Measured, Indicated and Inferred Mineral Resource Estimate reported at 13 March 2019 was 63,470,000 t @ 1.2 g/t Au containing 2,371,000 ounces of gold. This has reduced by 144,000 ounces of gold to 63,883,000 t @ 1.1 g/t Au containing 2,227,000 ounces of gold. The resource has been depleted for mining for the 18 month period 1 January 2019 to 30 June 2020 at the Touquoy pit (-207,000 ounces) and reported at a higher gold price of US$1,800/oz, up from US$1,400/oz. The higher gold price has contributed an additional 63,000 ounces to resources.



Notes on selected movements from left to right (as noted in text):

1. Atlantic Gold acquisition in July 2019, represents Mineral Resource as at 31 December 2018.
2. Simberi depletion from production is for the six month period from 1 January to 30 June 2020.
3. Atlantic Gold depletion from production is for the 18 month period 1 January 2019 to 30 June 2020.

Ore Reserves Statement as at 30 June 2020

Project	Proved			Probable			Total		
	Tonnes ('000)	Gold (g/t)	Ounces ('000)	Tonnes ('000)	Gold (g/t)	Ounces ('000)	Tonnes ('000)	Gold (g/t)	Ounces ('000)
Gwalia (WA)	1,583	8.0	409	7,824	5.9	1,483	9,407	6.3	1,892
Tower Hill (WA)	-	-	-	2,572	3.7	306	2,572	3.7	306
Simberi Oxide (PNG)	1,702	1.33	73	6,035	1.13	220	7,737	1.2	293
Simberi Sulphide (PNG)	1,386	2.6	114	21,253	2.42	1,651	22,638	2.4	1,765
Simberi Stockpile (PNG)	678	0.57	12	-	-	-	678	0.57	12
Atlantic Gold (NS)	21,370	1.2	796	23,700	1.1	851	45,070	1.1	1,647
Atlantic Stockpile (NS)	5,450	0.5	89	-	-	-	5,450	0.5	89
Total All Projects	**32,168**	**1.4**	**1,493**	**61,384**	**2.3**	**4,511**	**93,552**	**2.0**	**6,005**

Notes

1. Ore Reserves are based on a gold price of: Gwalia (AU$1,600/oz), Tower Hill (AU$1,250/oz), Simberi and Atlantic Gold (US$1,300/oz).
2. Cut-off Grades Gwalia (4.7 g/t Au), Tower Hill (2.8 g/t Au), Simberi Oxide (0.5 g/t Au), Atlantic Gold (0.3 g/t Au – 0.5 g/t Au).
3. Mineral Resources are reported inclusive of Ore Reserves.
4. Data is rounded to thousands of tonnes and thousands of ounces. Discrepancies in totals may occur due to rounding.

Mineral Resources Statement as at 30 June 2020

Project	Measured			Indicated			Inferred			Total		
	Tonnes ('000)	Gold (g/t)	Ounces ('000)	Tonnes ('000)	Gold (g/t)	Ounces ('000)	Tonnes ('000)	Gold (g/t)	Ounces ('000)	Tonnes ('000)	Gold (g/t)	Ounces ('000)
Gwalia, (WA)	3,991	6.4	819	17,403	6.0	3,353	1,201	5.5	214	22,595	6	4,386
Tower Hill, (WA)	-	-	-	4,604	3.9	574	489	3.3	51	5,093	3.8	625
Simberi Oxide, (PNG)	2,197	1.2	90	8,062	1.1	280	8,542	0.9	260	18,801	1.0	630
Simberi Sulphide, (PNG)	3,119	1.5	168	52,642	1.6	2,772	16,699	1.4	747	72,459	1.6	3,687
Atlantic Gold, (NS)	24,281	1.1	868	32,399	1.1	1,102	7,203	1.1	256	63,883	1.1	2,227
Total All Projects	**33,587**	**1.8**	**1,945**	**115,110**	**2.2**	**8,081**	**34,134**	**1.4**	**1,529**	**182,832**	**2.0**	**11,555**

Notes

1. Mineral Resources are reported inclusive of Ore Reserves.
2. Cut-off Grades Gwalia (2.5 g/t Au), Tower Hill (2.5 g/t Au), Simberi Oxide (0.4 g/t Au), Simberi Transitional and Sulphide (0.6 g/t Au), Atlantic Gold (0.3 g/t Au)
3. Simberi and Atlantic Gold Mineral Resources are reported constrained by a US$1,800/oz pit shell.
4. Data is rounded to thousands of tonnes and thousands of ounces. Discrepancies in totals may occur due to rounding.

JORC Code Compliance Statements

The information in this report that relates to Mineral Resources at Gwalia is based on information compiled by Mr. Robert Love who is a Fellow of the Australasian Institute of Mining and Metallurgy. Robert Love is a full-time employee of St Barbara Ltd and has sufficient experience 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". Robert Love consents to the inclusion in the statement of the matters based on his information in the form and context in which it appears.

The information in this report that relates to Mineral Resources at Tower Hill is based on information compiled by Ms. Jane Bateman who is a Fellow of the Australasian Institute of Mining and Metallurgy and a Member of the Australian Institute of Geoscientists. Jane Bateman is a full-time employee of St Barbara Ltd and has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity which she 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". Jane Bateman consents to the inclusion in the statement of the matters based on her information in the form and context in which it appears.

The information in this report that relates to Mineral Resources at Simberi is based on information compiled by Mr. Chris De-Vitry who is a Member of the Australasian Institute of Mining and Metallurgy. Chris De-Vitry is a full-time employee of Manna Hill Geoconsulting and has sufficient experience 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". Chris De-Vitry consents to the inclusion in the statement of the matters based on his information in the form and context in which it appears.

The information in this report that relates to Mineral Resources at Moose River Consolidated is based on information compiled by Mr. Neil Schofield who is a Member of the Australasian Institute of Geoscientists. Neil Schofield is a full-time employee of FSSI Consultants (Australia) Pty Ltd and has sufficient experience 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". Neil Schofield consents to the inclusion in the statement of the matters based on his information in the form and context in which it appears.

The information in this report that relates to Ore Reserves at Gwalia is based on information compiled by Mr. Glen Carthew who is a Member of the Australasian Institute of Mining and Metallurgy. Glen Carthew is a full-time employee of St Barbara Ltd and has sufficient experience 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". Glen Carthew consents to the inclusion in the statement of the matters based on his information in the form and context in which it appears.

The information in this report that relates to Ore Reserves at Tower Hill is based on information compiled by Mr. Glen Carthew who is a Member of the Australasian Institute of Mining and Metallurgy. Glen Carthew is a full-time employee of St Barbara Ltd and has sufficient experience 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". Glen Carthew consents to the inclusion in the statement of the matters based on his information in the form and context in which it appears.

The information in this report that relates to Ore Reserves at Simberi is based on information compiled by Mr. Ross Halatchev who is a Member of the Australasian Institute of Mining and Metallurgy. Ross Halatchev is a full-time employee of St Barbara Ltd and has sufficient experience 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". Ross Halatchev consents to the inclusion in the statement of the matters based on his information in the form and context in which it appears.

The information in this report that relates to Ore Reserves at Moose River Consolidated is based on information compiled by Mr. Marc Schulte who is a Member of the Association of Professional Engineers, Geologists and Geophysicists of Alberta. Marc Schulte is a full-time employee of Moose Mountain Technical Services and has sufficient experience 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". Marc Schulte consents to the inclusion in the statement of the matters based on his information in the form and context in which it appears.

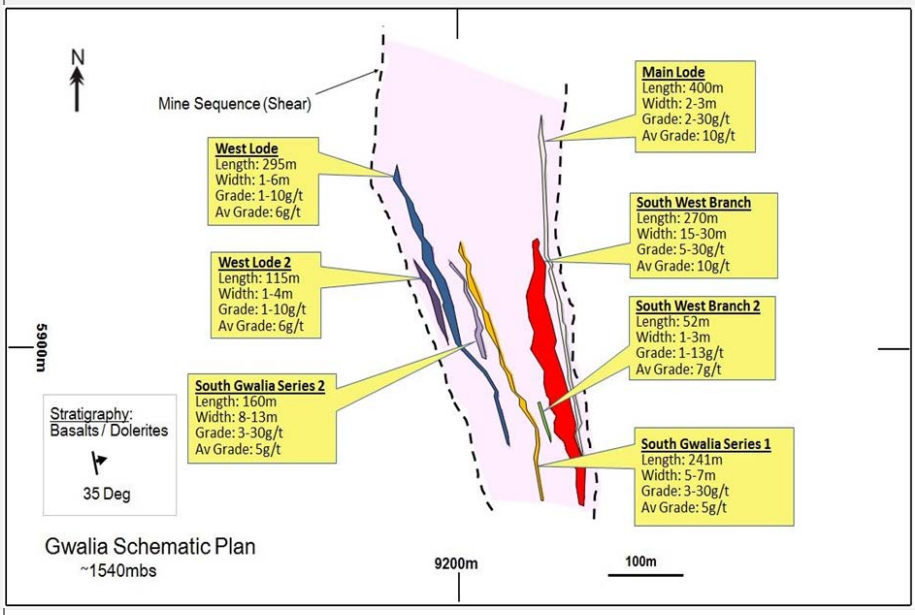
JORC Table 1 Checklist of Assessment and Reporting Criteria

Section 1 Sampling Techniques and Data – Gwalia Mine

CRITERIA	COMMENTS
SAMPLING TECHNIQUES	Sampling boundaries are geologically defined and mostly one metre in length unless a significant geological feature warrants a change from this standard unit. The upper or right-hand side of the core is routinely submitted for sample analysis, with each one metre of half core providing between 2.5 – 3 kg of material as an assay sample.
DRILLING TECHNIQUES	Surface and underground diamond drill holes used NQ2 (50.6mm) sized core (standard tubes). SBM surface drill holes have been down hole surveyed by north seeking gyro and underground drill holes have been surveyed by single shot electronic camera. Surface holes are orientated using a Reflex ACT II RD orientation tool.
DRILL SAMPLE RECOVERY	Core is metre marked and orientated and checked against drillers blocks to ensure that any core loss is accounted for. Sample recovery was rarely less than 100%. Minor occurrences of core loss can in most instances be attributed to drilling conditions and not ground conditions.
LOGGING	All SBM holes are logged primarily for lithology, alteration and vein type/intensity which are key to modelling gold grade distributions. Validation of geological data is controlled via the use of library codes and reliability and consistency of data is monitored through regular peer review.
SUB-SAMPLING TECHNIQUES AND SAMPLE PREPARATION	SBM half core is cut using a core saw before being sent to an accredited lab (SGS laboratory in Kalgoorlie) where the entire sample is crushed to achieve particle size <4mm followed by complete pulverisation (90% passing 75 µm).
QUALITY OF ASSAY DATA AND LABORATORY TESTS	SBM samples were analysed for gold using fire assay with a 50g charge and analysis by flame Atomic Absorption Spectrometry (AAS). QC included insertion of 3 commercial standards (1 per 20 samples), use of barren flush material between designated high grade samples during the pulverising stage, re-numbered sample pulp residues re-submitted to original laboratory, and sample pulp residues submitted to accredited umpire laboratory, submission of residual (duplicate) half core from ore intervals. The analysis of gold was sound and re-analysis of pulps showed acceptable repeatability with no significant bias.
VERIFICATION OF SAMPLING AND ASSAY	Sampling data is recorded electronically in spreadsheets which ensure only valid non-overlapping data can be recorded. Assay and down hole survey data are subsequently merged electronically. All drill data is stored in a SQL database on secure company server.
LOCATION OF DATA POINTS	Collars for surface holes are recorded by DGPS. Upon completion of underground drill holes an authorised surveyor will pick up the collar by placing a survey rod into the hole to measure azimuth and dip. This process may also occur while the hole is in progress by surveying the drill rods in the hole.
DATA SPACING AND DISTRIBUTION	Data spacing for grade control drilling is approximately 10m x 15m from 1000mbs to 1480mbs, resource definition is approximately 20m x 30m from 1480mbs – 1800mbs and surface drilling is approximately 60m x 80m from 1800mbs to 2200mbs. Drilling data is sufficient to establish down plunge continuity for all lodes.
ORIENTATION OF DATA IN RELATION TO GEOLOGICAL STRUCTURE	Sampling is perpendicular to lode orientations, and based on past production and underground mapping.
SAMPLE SECURITY	Only SBM personnel or approved contractors are allowed on drill sites; drill samples are only removed from drill site by approved contractors to SBM's secure core logging/processing facility; cut core is consigned to accredited laboratories for sample preparation and analysis.
AUDITS OR REVIEWS	Regular reviews of core logging and sampling have been completed through SBM monitoring and auditing. Laboratory inspections have been conducted throughout the review period by SBM personnel. Inspections are documented electronically and stored on secure company server. No significant issues were identified.

Section 2 Reporting of Exploration Results – Gwalia Mine

CRITERIA	COMMENTS
MINERAL TENEMENT AND LAND TENURE STATUS	The reported resource is completely located within M37/25, M37/333, M37/849 which are 100% owned by St Barbara Limited. The tenements are in good standing at the time of reporting.
EXPLORATION DONE BY OTHER PARTIES	Drilling of the resource by other parties is discussed in the previous section.

GEOLOGY	Gold mineralisation occurs as a number of en echelon, moderately east dipping foliation parallel lodes within strongly potassic altered mafic rocks and extends over a strike length of approximately 500 m and to a vertical depth of at least 2,300 m. Four primary lodes (Main Lode, South West Branch, South Gwalia Series and West Lode) have been identified and the geometries summarised below. 
DRILL HOLE INFORMATION	No exploration results are presented.
DATA AGGREGATION METHODS	No exploration results are presented.
RELATIONSHIP BETWEEN MINERALISATION WIDTHS AND INTERCEPT LENGTHS	No exploration results are presented.
DIAGRAMS	No exploration results are presented.
BALANCED REPORTING	No exploration results are presented.
OTHER SUBSTANTIVE EXPLORATION DATA	No exploration results are presented.
FURTHER WORK	Future work will focus on testing strike extensions of the Gwalia Lode System to the south. There are opportunities to extend and increase confidence in the resource estimate for Main Lode and Main Lode 2 above and below the dyke where drilling from underground platforms have delineated a potential high grade shoot that remains open to the north.

Section 3 Estimation and Reporting of Mineral Resources –Gwalia Mine

CRITERIA	COMMENTS
DATABASE INTEGRITY	Information is captured through spread sheets and validated prior to loading into the SBM corporate database which ensures only valid non-overlapping data can be recorded. Assay and down hole survey data are subsequently merged electronically. All drill data is stored in an SQL database on secure company server. Validation of data included visual checks of hole traces, analytical and geological data and ad hoc validation of 20 holes to original core photos and hard copy geological logs.
SITE VISITS	The Competent Person directly supervised geological modelling and mineral resource estimation, and is the site Manager Geology.
GEOLOGICAL INTERPRETATION	Mineralisation domains are defined by abundance of quartz and quartz/carbonate veining, the presence of distinctive laminated veining (quartz/sericite/sulphides +/- au), strong potassic alteration, abundance of sulphides (commonly >3% pyrite) and elevated gold grade (>0.5g/t).
DIMENSIONS	The mineralised zone strikes 15 degrees east of true north over a distance of 500m and plunges 45 degrees to the southeast. The mineralised zone consists of several stepped or en echelon style foliation parallel lodes disposed in plan in a “horse-shoe” shape with the limbs converging at the southern end. The mineralised zone and individual lodes dip east at 35 to 45 degrees and are conformable with the foliation of the Mine Sequence mafic schists. Individual lode widths vary from

CRITERIA	COMMENTS
	2m to 30m true width. Mineralisation has been tested to approximately 2,300m below surface and remains open.
ESTIMATION AND MODELLING TECHNIQUES	All domains were estimated using ordinary kriging except for South West Branch below the dyke (~1240mbs) where indicator kriging was used for grade estimation. Three parent block sizes have been estimated; 4mE x 8mN x 4mRL for areas covered by underground grade control drilling, 8mE x 16mN x 4mRL for the area covered by resource development drilling and 16mE x 32mN x 4mRL for areas covered by surface drilling below approximately 1,800 metres vertical depth. Estimation was completed using Datamine Studio RM. Search parameters reflect a high grade plunge orientation north east for WL, east north-east to east for SGS and south-east for SWB and ML consistent with geological observation of high grade mineralisation geometry: • Main Lode – Rotation Azimuth = 350 degrees, Dip = 35 degrees, Pitch = 130 degrees. Max search distances = 355m. Major/Semi-Major anisotropy = 4.2; Major/Minor = 14.2 Min samples = 8, max samples = 20 • South West Branch – Rotation Azimuth = 350 degrees, Dip = 40 degrees, Pitch = 130 degrees. Max search distances = 250m. Major/Semi-Major anisotropy = 3.1; Major/Minor = 8.3. Min samples = 8, max samples =20 • South Gwalia Series 1 – Rotation Azimuth = 340 degrees, Dip = 40 degrees, Pitch = 95 degrees. Max search distances = 145m. Major/Semi-Major anisotropy = 1.5; Major/Minor = 4.1. Min samples = 8, max samples =20 • South Gwalia Series 2 – Rotation Azimuth = 340 degrees, Dip = 40 degrees, Pitch = 80 degrees. Max search distances = 170m. Major/Semi-Major anisotropy = 1.4; Major/Minor = 6.8. Min samples = 8, max samples =20 • West Lode – Rotation Azimuth = 347 degrees, Dip = 40 degrees, Pitch = 60 degrees. Max search distances = 180m. Major/Semi-Major anisotropy = 1.3; Major/Minor = 7.2. Min samples = 8, max samples =20 Isolated high grade composites were top cut prior to estimation for each domain (ML=120g/t, SWB=180/220g/t SGS1=90g/t, SGS2=90g/t, WL=90g/t). The model was validated by plotting composite and block model average grades against RL. Mineral Resources are reported inclusive of Ore Reserves.
MOISTURE	Not applicable. Tonnages are estimated on a dry basis.
CUT-OFF PARAMETERS	The model is reported at a 2.5g/t Au cut-off on 20mRL x 20mN panels for each lode to account for non-selective mining across strike.
MINING FACTORS OR ASSUMPTIONS	The mining method is underground, open stoping with paste fill. Minimum stoping panels are 20mRL x 15mN with the resource reported on similar size panels to reflect this relationship.
METALLURGICAL FACTORS OR ASSUMPTIONS	Metallurgical recovery has been proven to be consistently >95%.
ENVIRONMENTAL FACTORS OR ASSUMPTIONS	The project covers an area that has been previously impacted by mining. The tenement area includes existing ethnographic heritage sites. SBM have undertaken extensive Aboriginal Heritage Surveys within the tenements and management measures are in place.
BULK DENSITY	Bulk density is assigned on a lode by lode basis and is routinely monitored via grade control drilling using the weight in air/weight in water method. Density ranges between 2.71g/cm^3 and 2.79g/cm^3
CLASSIFICATION	The Gwalia resource is classified as a function of drill spacing, geological continuity and mining. Areas where grade control drilling has been completed to 20m x 30m and geological continuity has been established through mining are classified as Measured. Areas where drill density is 30m x 40m, 60m x 80m or less with high geological continuity are classified as Indicated and elsewhere where drill density is sparse classified as Inferred.
AUDITS OR REVIEWS	The Gwalia Mineral Resource Estimate is reviewed internally in August, January and May of each year by site geologists and scrutinised by a panel of competent company geologists. The review covers all aspects of the estimate including source data, geological model, resource estimate and classification In addition, the reporting of the company Mineral Resources is guided by the company's Mineral Resource Estimation System and is overseen by the Executive Leadership team.
DISCUSSION OF RELATIVE ACCURACY/CONFIDENCE	The resource estimate is a global estimate. Grade control drilling is completed in advance of development to improve local estimates of grade.

Section 4 Estimation and Reporting of Ore Reserves – Gwalia Mine

CRITERIA	COMMENTS
MINERAL RESOURCE ESTIMATE FOR CONVERSION TO ORE RESERVES	The underground Ore Reserve estimate is based on the Mineral Resource estimate carried out by St Barbara Limited. Gold grade was estimated using ordinary kriging for all lodes with the exception of

CRITERIA	COMMENTS
	the Southwest Branch at depths exceeding 1,240 metres below surface where indicator kriging was used. The Mineral Resources are reported inclusive of the Ore Reserve. The Mineral Resource model used to estimate this Reserve is described as gw0119d-m.dm
SITE VISITS	The Competent Person is employed in a site-based role.
STUDY STATUS	A Definitive Feasibility Study was completed for the Gwalia mine in 2008. The mine has been in full production since. Any further studies undertaken are to extend the mine or optimise the current operating practices. The Feasibility Study for the Gwalia Extension Project was completed in 2016 and approved by the board. The Gwalia Extension Project provides incremental upgrades to the ventilation infrastructure which support mining down to 2200 mbs.
CUT-OFF PARAMETERS	A break-even type analysis was used to determine the cut-off grades used in the Ore Reserve estimate. o **4.7 g/t Stope Evaluation Cut-Off Grade** Used to define the extent of economic stoping areas on a level. o **1.9 g/t Stope Only Cut-Off Grade** Used to define additional stopes that can be mined without extra development and without delaying the main mining sequence. o **0.7 g/t Process Only Cut-Off Grade** Used to differentiate between development ore and development waste.
MINING FACTORS OR ASSUMPTIONS	The Gwalia Ore Reserve has been estimated based on detailed mine development and stope designs. Modifying factors for dilution and mining recovery have been applied post-geological interrogation to generate the final diluted and recovered Ore Reserve. The Gwalia Mine is in full production with an extensive production history. Mining methods referenced in this report are currently in practice on site or have been subject to trial mining. Reconciliation results and production history show this mining method to be well matched to the ore body. Stope size, development placement and ground support strategies have been designed in line with recommendations from experienced geotechnical personnel and external subject matter experts. Grade control drilling is completed in advance of production with the majority of stopes to be mined in the next two years already grade control drilled. The model used to estimate the Ore Reserve is consistent with that which forms the basis of the Mineral Resource estimate for the Gwalia deposit. This model is internally known as gw0119d-m.dm. For South West Branch (SWB) and South Gwalia Series (SGS), the dilution is estimated for each individual stope based on known influences. These include the mining direction, strike length, stope width, and depth below surface. The relationships between these factors and stope dilution have been modelled through back-analysis of actual reconciled stope performance. The average of the estimated dilution for all SWB stopes in the Ore Reserve is 13% and the average estimated dilution for SGS stopes is 17%. Mining dilution of 20% has been applied to all West Lode stopes. Mining dilution of 30% has been applied to Main Lode stopes. A 92% mining recovery factor has been applied to triple-lift and double-lift long-hole open stopes. A 90% mining recovery factor has been applied to single-lift long-hole open stopes. These factors are consistent with reconciled actual performance. The profiles of development excavations have been designed inclusive of 10% overbreak. No further dilution factors or mining recovery factors have been applied to development ore. A global minimum mining width of 3m is used. While the ore body width generally exceeds the minimum mining width, where the ore body is narrower stoping outlines are designed to honour the minimum width and include planned dilution.

CRITERIA	COMMENTS
	All ore in the Ore Reserve estimate is classified as a Proved or Probable Ore Reserve. No Inferred Mineral Resources are included in the Ore Reserve. The Inferred Mineral Resources in the Life-of-Mine plan have been removed from the Ore Reserve plan and estimate. The infrastructure requirements of the stoping methods used are either already in place or have been accounted for in the Life-of-Mine evaluation on which the project costings are based. The capital and operating costs of extending the ventilation infrastructure to support truck haulage down to the base of the Ore Reserve have been included in the economic evaluation which demonstrates the economic viability of the Ore Reserve.
METALLURGICAL FACTORS OR ASSUMPTIONS	All Gwalia ore is trucked to the Gwalia processing plant. The processing plant is located at St Barbara's Leonora Operations and consists of a three-stage crushing circuit, single-stage milling circuit and hybrid carbon-in-leach (CIL) circuit with one designated leach tank and seven adsorption tanks. Gold is recovered from activated carbon into concentrated solution via a split AARL-type elution circuit. Electrowinning and smelting are conducted in an adjacent secure gold room. The tailings from the process are thickened and pumped to a paddock-type tailings storage facility with multi-spigot distribution. The technology associated with processing of Gwalia ore is currently in operation and is based on industry standard practices. Metallurgical recovery is modelled based on the observed relationship between head grade and recovery. The average of the modelled metallurgical recovery over the Ore Reserve mine plan is 96.8%. A recent study on capacity requirements of the tailings storage facility (TSF) showed that the total capacity that will be created (new lifts and void created by reclaiming) will be adequate for the life-of-mine plan. This includes an additional lift on TSF3 and construction of TSF4, which is planned for FY20.
ENVIRONMENTAL	The Gwalia mine is currently compliant with all environmental regulatory agreements under the Environmental Protection Act 1986 (WA). All external reporting against the environmental licenses are recorded and reported in the Annual Environmental Report available on the St Barbara Limited website.
INFRASTRUCTURE	An upgrade to the mine's primary ventilation system is required to support truck haulage at current production rates down to the base of the Ore Reserve. The capital and operating costs for the ventilation upgrade have been estimated to Feasibility Study level and included in the economic evaluation which demonstrates the economic viability of the Ore Reserve. All other equipment required for the mining and processing of the Ore Reserve is in place and operational. It is located on tenements held by St Barbara Limited. The infrastructure includes, but is not limited to: o Dedicated gas and diesel power station o Water supply from three sources to provide redundancy o Processing plant o Mine development o Underground power and dewatering infrastructure o Workshop facilities on surface and underground o Ventilation fans and refrigeration plant o Paste-fill plant o Camp facilities o Access to public roads and airstrips.
COSTS	All costs used in the estimation of Ore Reserves are based on the Life-of-Mine plan.

CRITERIA	COMMENTS
	Operating costs are estimated as part of the internal budgeting process and approved by the St Barbara Limited board. A gold price of AU$1,600/oz has been used in all calculations. Exchange rates are sourced from recommendations by the Group Treasury and accepted by the Executive Leadership Team (ELT). Costs associated with treatment and transport have been included in the cost modelling completed for the project based on the Life-of-Mine plan. Royalties have been included at the WA government royalty of 2.5% of gold produced. A Resource Capital Royalty (IRC) is also applied to the Gwalia tenements and is applied at 1.5% of gold produced.
REVENUE FACTORS	A gold price of AU$1600/oz has been used in all revenue calculations.
MARKET ASSESSMENT	All gold doré produced at the Gwalia processing plant is transported to the Perth Mint for refining.
ECONOMIC	The mine is an operating asset and is not subject to project-type analysis. Life-of-Mine plans are developed or updated on an annual basis. These plans reflect current and projected performances for the Ore Reserve.
SOCIAL	St Barbara Limited's social licence to operate is underpinned by the excellent relationship that the Company has built, over many years, with the local community of Leonora. St Barbara Limited also recognises, and has a good relationship with, the Aboriginal groups within the Leonora Region. Formal Access and/or Heritage Protection Agreements exist with most of the Aboriginal groups in the Leonora and the eastern Kalgoorlie Region.
OTHER	The Gwalia mine is an operating asset in full production. Construction is well advanced on the Gwalia Extension Project with no known impediments to completion. All other required government and statutory permits and approvals are in place. A company risk register is maintained to address and mitigate against all foreseeable risks that could impact the Ore Reserve. Contracts are in place for all critical goods and services required to operate the mine.
CLASSIFICATION	The Ore Reserve includes only Proved and Probable classifications. The economically minable component of the Measured Mineral Resource has been classified as a Proved Ore Reserve. The economically minable component of the Indicated Mineral Resource has been classified as a Probable Ore Reserve.
AUDITS OR REVIEWS	SRK Consulting undertook a review of the Gwalia underground mine Ore Reserve process and estimate in July 2016. The review included a review of the Ore Reserve estimation process and the basis of the inputs and modifying factors. SRK did not audit the Ore Reserve estimate but considered that the technical basis and process undertaken was of a suitable standard and supports reporting under the JORC Code (2012).
DISCUSSION OF RELATIVE ACCURACY/ CONFIDENCE	The Ore Reserve estimate has been prepared in accordance with the guidelines of the JORC Code (2012). The relative confidence of the estimates contained fall with the criteria of Proved and Probable Ore Reserves. Significant operating history supports the modifying factors applied. The Ore Reserve has been estimated in line with the St Barbara Ore Reserve process. The Ore Reserve process was externally audited in 2012 and found to be of good industry standard. The Ore Reserve has been peer reviewed internally and the Competent Person is confident that it is an accurate estimation of the current Gwalia reserve.

Section 1 Sampling Techniques and Data – Tower Hill

CRITERIA	COMMENTS
SAMPLING TECHNIQUES	Post 2007 St Barbara Limited (SBM) drilling used Reverse Circulation drilling to obtain 1m samples through the mineralised zone. Most samples were dry, but where wet samples were encountered they were allowed to dry before being split by company personnel. Half core was sampled on largely 1m intervals based on geological boundaries. Core was cut along a plane passing through the basal orientation mark using a diamond saw.
DRILLING TECHNIQUES	SBM diamond holes typically used NQ (47.6mm) and HQ (63.5mm) sized core (standard double tubes). Core was oriented using Ace Core Orientation and Ezy Mark orientation tools. Drill holes were down hole surveyed by either north seeking gyro within the rods or by electronic multi-shot in open holes. Less than 10% of SBM holes were surveyed down hole using a Reflex Single Shot camera. RC holes used mainly 5½" reverse circulation face sampling hammers.
DRILL SAMPLE RECOVERY	Recovery of core from SBM drill holes was rarely less than 100%. Ore zone intersections are NQ and HQ (for geotechnical holes) sized diamond core using standard double tubes. Recovery information for historic holes is unavailable, although this data largely impacts the mined out portions of the project and is not material to the resource estimate.
LOGGING	All SBM holes were qualitatively and quantitatively logged for a combination of geological and geotechnical attributes. Pre-2007 holes were commonly logged for major lithology, alteration, vein minerals, and vein and sulphide percentage. Historic logging data was reviewed and deemed acceptable.
SUB-SAMPLING TECHNIQUES AND SAMPLE PREPARATION	SBM RC samples were recovered through a cone splitter to obtain mostly 1m samples from which 3 kg was pulverised to produce a 40g charge for fire assay. Half core was sampled on largely 1m intervals based on geological boundaries. Core was cut along a plane passing through the basal orientation mark using a diamond saw and was submitted for total pulverisation (85% passing 75 µm).
QUALITY OF ASSAY DATA AND LABORATORY TESTS	Only limited information is available for holes drilled prior to 2007. SBM samples were analysed for gold using fire assay with a 40g charge and analysis by flame atomic absorption spectrometry. QC included insertion of 4 commercial standards per submission batch (4 commercial standards every 50 samples for diamond core), insertion of field duplicates every 40m and 2 blank control samples for every 100 samples. Sample pulp residues were submitted to an alternate laboratory. Results indicate that pulveriser bowls were adequately cleaned between samples, that analysis of gold was sound and re-analysis of pulps showed acceptable repeatability with no bias.
VERIFICATION OF SAMPLING AND ASSAY	SBM sampling data is recorded electronically which ensures only valid non-overlapping data can be recorded. Assay and down hole survey data are subsequently merged electronically. All drill data is stored in a SQL database on a secure company server. Statistical comparison of SBM (2007-2008) and pre-2007 assay results indicate that all data are compatible.
LOCATION OF DATA POINTS	SBM holes were surveyed using a Real Time Kinetic (RTK) GPS system. Historical drilling was located using mine surveyors and standard survey equipment.
DATA SPACING AND DISTRIBUTION	Average data spacing of between 40m N-S by 30m E-W (up to 80m by 60m) is available for the bulk of the Tower Hill Resource. Drilling data is sufficient to establish continuity of the mineralised lodes.
ORIENTATION OF DATA IN RELATION TO GEOLOGICAL STRUCTURE	Sampling is perpendicular to lode orientation which is well understood from past production.
SAMPLE SECURITY	Company personnel or approved contractors only allowed on drill sites. Drill samples are only removed from drill site to secure sampling or core logging/processing facility; core logged and cut and consigned to accredited laboratories for processing.
AUDITS OR REVIEWS	Historical data was reviewed and extensively validated in 2003 including cross-checking data against original hard copy records where available. All data has been reviewed by a Competent Person who is satisfied that the data is sound and suitable for resource estimation.

Section 2 Reporting of Exploration Results – Tower Hill

CRITERIA	COMMENTS
MINERAL TENEMENT AND LAND TENURE STATUS	The reported resource is completely located within M37/0055 which is 100% owned by St Barbara Limited. The tenement is in good standing at the time of reporting.
EXPLORATION DONE BY OTHER PARTIES	Drilling of the resource by other parties is discussed in the previous section.
GEOLOGY	Gold mineralisation at Tower Hill is hosted within a moderately (35 - 50°) east-dipping quartz vein package adjacent to the contact of granite and strongly foliated ultramafic rocks. Quartz-gold vein lodes strike north to north-northwest with strike lengths of up to 600 m and widths from less than a metre to a vein package with a horizontal width of up to 50 m.

DRILL HOLE INFORMATION	No exploration results are presented.
DATA AGGREGATION METHODS	No exploration results are presented.
RELATIONSHIP BETWEEN MINERALISATION WIDTHS AND INTERCEPT LENGTHS	No exploration results are presented.
DIAGRAMS	No exploration results are presented.
BALANCED REPORTING	No exploration results are presented.
OTHER SUBSTANTIVE EXPLORATION DATA	No exploration results are presented.
FURTHER WORK	Future work will be reviewed pending updates to mining studies

Section 3 Estimation and Reporting of Mineral Resources – Tower Hill

CRITERIA	COMMENTS
DATABASE INTEGRITY	Information initially captured through hard copy logs was subsequently entered into spread sheets and validated prior to loading into the SBM corporate database which ensures only valid non-overlapping data can be recorded. Assay and down hole survey data are subsequently merged electronically. All drill data is stored in a SQL database on a secure company server. Validation of data included visual check of drill hole traces and basic checks for overlapping sample and geological logging intervals.
SITE VISITS	The Competent Person for the drill hole data is an employee of SBM and directly supervised drilling on site during 2007-2008.
GEOLOGICAL INTERPRETATION	The mineralised domain was defined by quartz veining, the granite contact and structural controls as well as gold grade.
DIMENSIONS	Quartz-gold vein lodes strike north to north-northwest and dip moderately (30-50^{o}) east with strike lengths of up to 600 m and widths from less than 1m to a vein package with a horizontal width of up to 50m. Mineralisation has been defined over a 1.1km strike length and has been tested to a maximum depth of approximately 525m below surface.
ESTIMATION AND MODELLING TECHNIQUES	Gold grade was estimated by ordinary kriging 1m composites constrained by lode boundaries for a parent block size of x = 10m * y = 20m * z = 4m. Search parameters reflect the moderate NE plunge control of mineralisation: Rotation: Azimuth = 345 degrees, Dip = 35 degrees, Pitch = 50 degrees. Max. search distance = 200m. Major/Semi-Major anisotropy = 1.2; Major/Minor = 3. Min. samples = 12, Max. samples = 32 A top-cut of 60ppm was applied to the composite data prior to estimation. Model was validated by plotting composite and block model average grades against northing and were reasonable. Mineral Resources are reported inclusive of Ore Reserves
MOISTURE	Tonnages are estimated on a dry basis.
CUT-OFF PARAMETERS	The model is reported at a 2.5g/t Au cut-off which is close to the expected marginal cut-off grade based on a A$1400/ounce gold price.
MINING FACTORS OR ASSUMPTIONS	The anticipated mining method is open stoping and cut and fill mining.
METALLURGICAL FACTORS OR ASSUMPTIONS	Metallurgical test work completed between 2007 and 2009 shows 95% metallurgical recovery for fresh rock.
ENVIRONMENTAL FACTORS OR ASSUMPTIONS	The project covers an area that has been previously impacted by mining. The tenement area includes existing ethnographic heritage sites. SBM have undertaken extensive Aboriginal Heritage Surveys within the tenement and management measures are in place.
BULK DENSITY	The dry bulk density is estimated to be 2.67/cm^{3}. This is based on weighing whole core samples in air and water for 25 samples.
CLASSIFICATION	The variogram model shows that 90% of total sill is reached at approximately 100m down plunge and within 45m perpendicular (D2) to this. Based on this, the average data spacing of between 40m by 30m (up to 80m by 60m) for the bulk of the Tower Hill Resource below the pit is considered adequate to classify the majority of the resource as Indicated. The down dip extensions to the resource, which are based on limited data, are considered Inferred.
AUDITS OR REVIEWS	The geological model and Mineral Resource estimate was independently reviewed by SRK Consulting in 2011 and no material issues were found. In addition, the reporting of Mineral Resources is guided by the Company's Mineral Resource Estimation System and overseen by the SBM Resources and Reserves Committee.
DISCUSSION OF RELATIVE ACCURACY/CONFIDENCE	The resource estimate is a global resource estimate. Closer spaced drilling should be completed well ahead of mining to improve local estimates of grade.

Section 4 Estimation and Reporting of Ore Reserves – Tower Hill

CRITERIA	COMMENTS
MINERAL RESOURCE ESTIMATE FOR CONVERSION TO ORE RESERVES	The underground Ore Reserve estimate is based on the Mineral Resource estimate carried out by St Barbara. Gold grade was estimated using ordinary kriging. The Mineral Resources are reported inclusive of the Ore Reserve.
SITE VISITS	The Competent Person is employed in a site-based role.
STUDY STATUS	A Pre-Feasibility Study has been completed for the Tower hill project that has identified a technically achievable and economically viable mine plan. This PFS has since been reviewed and updated with modifying factors calibrated for company experience with a similar operating mine within the same mining district.
CUT-OFF PARAMETERS	A reserve cut-off grade of 2.8 g/t has been used in line with the now-divested King of the Hills mine which used similar mining methods with the same production profile. Two cut-off grades have been calculated and applied based on historical costs from the King of the Hills mine and forecasted costs and modifying factors for the Tower Hill life-of-mine plan. o **Fully Costed** cut-off grade includes all operating costs associated with the extraction and processing of ore material. o **Incremental** cut-off grade applies to all material that does not require additional development.
MINING FACTORS OR ASSUMPTIONS	The Tower Hill Ore Reserve has been estimated by generating detailed mining shapes for all development and stoping shapes. Modifying factors for dilution and mining recovery have been completed post-geological interrogation to generate the final diluted and recovered ore reserve. A pre-feasibility level of study has been completed for the Tower Hill mine. St Barbara successfully operated the King of the Hills mine using the mining methods planned for Tower Hill. The planned mining methods align with external geotechnical recommendations for the regional geology. Stope size, development placement and ground support strategies have been designed in line with recommendations from external evaluations. Grade control drilling will be completed in advance of production with Grade control drilling plans generated as part of the final Definitive Mining Study. The model used to estimate the Ore Reserve is consistent with that produced for the Mineral Resource declared for the Tower Hill deposit. This model is internally known as twh_feb2011.mdl. Mining dilution has been applied at 5% at a grade of 1.3g/t for the Long Hole stoping areas and 6% at a grade of 0g/t for the cut and fill stoping areas. This is consistent with the dilution factors applied for the similar King of the Hills mine. A mining recovery of 95% has been applied to all stopes. This recovery has been applied to allow for any ore loss that may occur during stoping extraction. This is consistent with the recovery factors achieved for the similar King of the Hills mine. For the longhole stoping production, a global minimum mining width of 3.5m is used. While the ore body width generally exceeds the minimum mining width, where the ore body is narrower, stoping outlines are designed to honour the minimum width and include planned dilution. The cut and fill areas are mined to a minimum height of 5m, though split firing of the production face is used to prevent dilution of the ore zone. The vast majority of the life-of-mine plan is classified as a Probable Ore Reserve. Inferred Mineral Resources are included in the life-of-mine plan to allow for well-informed strategic planning. They are not included in the Ore Reserve estimate. The infrastructure requirements of the stoping methods used have been accounted for in the life-of-mine evaluation on which the project costings are based.
METALLURGICAL FACTORS OR ASSUMPTIONS	All Tower hill ore will be trucked to the Gwalia processing plant. The processing plant is located at St Barbara's Leonora Operations and consists of a three stage crushing circuit, single stage milling circuit and hybrid CIL circuit with one designated leach tank and 7 adsorption tanks. Gold is recovered from activated carbon into concentrated solution via a split AARL type elution circuit. Electrowinning and

CRITERIA	COMMENTS
	smelting are conducted in an adjacent secure gold room. The tailings from the process are thickened and pumped to a paddock type tailings storage facility with multi-spigot distribution. The technology associated with processing of Tower Hill ore is currently in operation and is based on industry standard practices. Target Recovery Performance is 95%.
ENVIRONMENTAL	St Barbara currently holds a license for Tower Hill and is compliant with all environmental regulatory agreements under the Environmental Protection Act 1986 (WA). All external reporting against the environmental licenses are recorded and reported in the Annual Environmental Report available on the St Barbara website.
INFRASTRUCTURE	All equipment required for the mining and processing of the reserve is either already available or anticipated to be available as required by the Life of Mine plan. Existing infrastructure is located on St Barbara held tenements and leases. Surrounding tenements have been secured for the purpose of new infrastructure installation. The infrastructure currently available for usage for the Tower Hill project includes but is not limited to: • Dedicated gas and diesel power station • Water supply • Processing plant • Access to Workshop facilities on surface and underground • Paste Plant Additional planned infrastructure includes but is not limited to: • Explosive magazine • Fuel bay and wash bay • Ventilation fan and associated works • Workshop facilities
COSTS	All costs used in the generation of the Ore Reserve estimate have been based on the life-of-mine plan. Operating costs are based on actual costs from the King of the Hills mine, and approved by the St Barbara board. A gold price of AU$1,250/oz has been used in all calculations. Exchange rates are sourced from recommendations by the Group Treasury and accepted by the Executive Leadership Team (ELT). Costs associated with treatment and transport have been included in the cost modelling completed for the project based on the life-of-mine plan. Royalties have been included at the WA government royalty of 2.5% of gold produced. A Resource Capital Royalty (IRC) is also applied to the Gwalia tenements and is applied at 1.5% of gold produced.
REVENUE FACTORS	A gold price of AU$1,250/oz has been used in all revenue calculations.
MARKET ASSESSMENT	All Gold doré bars produced at the Gwalia processing plant are transported to the Perth Mint for refining.
ECONOMIC	The project has been defined to a pre-feasibility study level of confidence. Operating assumptions are supported by company experience with similar operating mines within the same mining district. The mine is intended to operate as a satellite mine.
SOCIAL	St Barbara Limited's social licence to operate is underpinned by the excellent relationship that the Company has built, over many years, with the local community of Leonora. St Barbara Limited also recognises, and has a good relationship with, the Aboriginal groups within the Leonora Region. Formal Access and/or Heritage Protection Agreements exist with most of the Aboriginal groups in the Leonora and the eastern Kalgoorlie Region.

CRITERIA	COMMENTS
OTHER	A company risk register is maintained to address and mitigate against all foreseeable risks that could impact the Ore Reserve.
CLASSIFICATION	The Ore Reserve has been classified as a Probable Ore Reserve. The economically minable component of the Indicated Mineral Resource has been classified as a Probable Ore Reserve.
AUDITS OR REVIEWS	While a direct audit of the Tower Hill reserve has not been conducted, the St Barbara reserve estimation process was independently reviewed in December 2012 by Scott Dunham of Quantitative Group (QG). "The review did not identify any material flaws in either the ore reserve estimate itself or the process used to generate the estimate. In QG's opinion the estimate is suitable for reporting under the JORC Code (2004 edition) and is of a good industry standard" (Dunham, S. 2012). "The ore reserve estimate is incorporated into St Barbara's long, medium and short term planning processes and this increases confidence in the deliverability of the ore reserve. The ore reserve represents a snapshot of the expected metal production over the life of each operation based on currently available data and mine planning assumptions" (Dunham, S. 2012).
DISCUSSION OF RELATIVE ACCURACY/ CONFIDENCE	The Ore Reserve estimate is prepared within the guidelines of the JORC code (2012). The relative confidence of the estimates contained fall with the criteria of Probable Ore Reserves. Significant operating history supports the modifying factors applied. The Ore Reserve has been estimated in line with the St Barbara Ore Reserve process. The Ore Reserve process was externally audited in 2012 and found to be of good industry standard. The Ore Reserve has been peer reviewed internally and the Competent Person is confident that it is an accurate estimation of the current Tower Hill reserve.

Section 1 Sampling Techniques and Data - Simberi

CRITERIA	COMMENTS
SAMPLING TECHNIQUES	Chips from reverse circulation (RC) drilling and half-core from diamond holes (DH) have been used to sample the Simberi deposits. Drilling by Kennecott occurred between 1984 and 1989. Subsequent drilling by Nord was carried out between 1995 and 1998. Allied drilled from 2004 to 2012. From September 2012 St Barbara Limited have owned and operated the Simberi project. During the early part of the Kennecott percussive drilling program (up to approximately RC320, February-May 1989), each 1 m sample was collected from a cyclone in a calico bag. The sample was dried, and jaw crushed to less than 7 mm and a 1.5 kg riffle split sub-sample dispatched for assay. The Kennecott 1m diamond drill core samples were cut in half using a diamond saw, dried, jaw crushed, and hammer milled to -30 mesh. A 200-250 g sub-sample was pulverised to -80mesh before submitting to the laboratory. Nord sampled percussive and diamond holes every 1 m. RC samples were collected in polyweave bags direct from a cyclone. Approximately 100 g of every RC sample were washed, dried and retained for reference. RC samples were hammer milled at a Nord sample preparation facility, located on Simberi Island, to approximately -30 mesh. The sample preparation facility was supervised by contract personnel from Astrolabe Pty Ltd, an analytical laboratory in Madang. A 1 kg subsample was riffle split for dispatch for assay and the remainder stored. Nord diamond core was photographed, logged and cut in half using a diamond saw. One half was dried, jaw-crushed, hammer milled and reduced to a 1 kg sub-sample using a riffle splitter. The sub-samples were dispatched to Astrolabe (Madang, PNG) for final preparation and assay up until September 1996. Allied RC samples were collected at 1 m intervals then dried. Each sample was jaw-crushed, hammer milled to -80 mesh and reduced to two approximate 1 kg sub-samples using a riffle splitter. One 1 kg sample was hammer milled to -30 mesh and the other 'reject' split was archived on site for a minimum of 3 months after assays were returned. The 1 kg crushed samples were dispatched to ALS. In mid-2008, a new core shed and sample preparation facility was constructed with upgraded

CRITERIA	COMMENTS
	security and new sample processing equipment. This allowed a change to the RC sampling and preparation procedures. Samples from the cyclone were collected in large polyweave bags and weighed. Sub-samples were placed in calico bags. For dry/damp samples a riffle splitter was used to produce approximately 500 g for processing and approximately 500 g for 'reject' or archive. Spear sampling was conducted on wet samples to obtain two 800 g sub-samples, one for archive and one for processing. Sub-samples were sent to sample prep for drying in electric ovens. Before mid-2008, Allied diamond core samples were processed in a similar way to the RC samples. Core was sampled on 1 m intervals, cut in half using diamond saws and dried. One half of each sample was stored on site in the secured core shed, the other half was crushed with a jaw crusher and split to two approximately 1 kg samples. One was hammer milled to -30 mesh and the 'reject' sample archived for a minimum of 3 months after assays were returned. The 1 kg samples were dispatched to ALS Townsville for fire assay. St Barbara have sampled core at 1m intervals irrespective of geology using a petrol clipper saw along its long axis on a plane representing approximately half of the core. RC drill spoil was collected at 1m intervals direct from the cyclone in polyweave bags. SBM personnel riffle split to collect 1 kg to 3 kg sub-samples that were crushed and pulverised at the Simberi laboratory.
DRILLING TECHNIQUES	From 1984 to 1990 drilling was carried out by Kennecott, comprising 447 (43,727 m) RC drill holes (3.75 - 4 inch), 73 (15,970 m) diamond drill holes and 11 (153 m) diamond holes drilled for metallurgical purposes. Most diamond holes were drilled PQ to depths of up to 200-250 m and HQ thereafter. From 1994 to 1998 Nord completed a further 432 (26,241 m) RC holes and 35 (6,415 m) diamond holes. Many of these diamond holes were triple-tubed for metallurgical sampling and test-work. Allied drilled 816 RC (62,003 m) holes and 219 (42,098 m) diamond holes after 2003. All diamond drill hole core has been photographed. Downhole surveys were restricted to only some of the early Kennecott and Nord diamond drill holes and the bulk of the later Allied diamond drilling. Most of the RC drilling is shallow, averaging less than 100m, and errors due to hole deviation are considered to be minimal. SBM (2014-present) completed diamond holes using a track mounted Cortech CSD1300G drill rig. RC drilling was completed using a track mounted Gemrok 1000H MP rig. In March 2018, SBM commenced a major RC drilling program to test the down dip extensions of the Sorowar orebodies. Drilling was completed in December 2019. Holes were generally drilled on an azimuth of 30 degrees to the mine grid, with a dip of -60 degrees and a total depth of 250 m. Other than for the first 11,934m (61 holes), all holes have been down hole surveyed for dip, at the end of hole, and mid-hole. No survey for information for azimuth was recorded, as the measurements were completed inside the rod string. The campaign has used three drills supplied by Quest Exploration Drilling (QED) running a mixture of 4.5 inch and 5.25 inch RC hammers, a Schramm 685WS (500 psi/1350 cfm onboard compressor), a DML 45 (350 psi/500 cfm onboard compressor) and a UDR 1200 (no onboard compressor). All drills required additional air at high pressure to achieve the required depths. This was provided by a number of independent compressor and booster units, including a Sullair 900 20/12 (500 psi/1150 cfm), an Atlas Copco 487 (350 psi/900 cfm), an Atlas Copco XVRS (450 psi/1000 cfm), Hydro Booster AV92 (350 psi/720 cfm) and a Hurricane Booster Copco (350psi/500cfm). Drilling has proved challenging, with broken ground and high water inflows occurring in certain areas of the Sorowar pit. This has led to the loss of one rod string, and considerable time spent retrieving at least three others during the course of the program. The sample generated by the rigs was initially passed through a cyclone/cone-splitter system which delivered a nominal 2-3 kg size sample which was collected in a calico bag for each metre. When drilling wet due to water inflows, samples were collected in a 20 l bucket, the water decanted and the sample transferred to the calico bag. For each one metre interval, a sieved chip sample was also collected and deposited in a chip tray for later photographing and logging.

CRITERIA	COMMENTS
	The calico bags were then packed in large green polyurethane bags and delivered to the Simberi's onsite laboratory for drying and aqua regia Au analysis. The pulp residues from this process were sent to the SGS laboratory in Townsville for Au (50 g fire assay) and multi-element ICP analysis.
DRILL SAMPLE RECOVERY	In 2016 RC sample recovery was calculated from oven-dried weight of the sample and the assumed volume. RC sample recovery is low at surface but increases up to about a downhole depth of 40 m, and then the average recovery slowly decreases. Presumably this relates to poor recovery in the clay rich oxidised material which can also have higher moisture content and then lower recovery again at greater depths were sample recovery may be more difficult and sometimes wet drilling conditions are encountered. The average sample recovery of 68% is very low. RC drilling recoveries around this level are possible but they are very low. There is a possibility that the density used to calculate the recovery is being overestimated, which would underestimate the recovery. This could for example be caused if the samples are sometimes not dried sufficiently. The RC drilling is recorded as mostly 5.25 inches but with some 5.5 inch diameters. If holes were sometimes breaking out wider than expected this would only make the recoveries lower. Ten percent of RC samples were logged as wet and 24% moist. It appears that moist RC samples occur at shallower downhole depths and wet samples are more abundant at greater hole depths. In relative terms, sample recovery is a little lower in moist and wet samples than in dry samples. Core recovery is around 90% at surface increasing to about 95% at a depth of 70 m below surface where it remains relatively constant. Some holes have extremely variable recovery (while others have 100% recovery for the complete hole. Holes with completely 100% recovery sometimes have large sections of the drill hole that are broken without a piece of intact core. Measuring core recovery is difficult in such holes.
LOGGING	Lithology, alteration, structure and assay data exists as well as an extensive set of core photographs. All holes were logged for a combination of geological and geotechnical attributes. Twin holes suggest that there is often a lack of consistency between the geological logging of various geologists. Some check re-logging will be required if reliable 3D alteration and lithology models are to be built. Data is validated and stored in the company's Datashed database.
SUB-SAMPLING TECHNIQUES AND SAMPLE PREPARATION	During the Kennecott percussive drilling program (up to approximately RC320, February-May 1989), the jaw-crushed sample was split to 250 g, disc pulverised to -80 mesh, further split to a 50 g aliquot and finely pulverised for assay. Lack of correlation between duplicate and original sample assays led Kennecott to revise the sample preparation procedure. Subsequently (up to RC447, 1992) a 250 g split (-80 mesh) was sent to the laboratory. At the laboratory a 50g aliquot was taken for pulverising and assay. A similar sized aliquot from the 200-250 g sub-samples (-80 mesh) from the Kennecott diamond core samples was fire assayed. Every Nord 1m RC sample was hammer milled to approximately -30 mesh and a 5 g aliquot finely pulverised and fire assayed. Nord diamond core sub-samples were dispatched to Astrolabe (Madang, PNG) for final preparation and assay up until September 1996. At the laboratory the 1 kg sub-samples were dried, pulverised and a 50 g sub-sample was fire assayed for gold using an atomic absorption spectrometer (AAS) finish. After September 1996, the samples were dispatched to Australian Laboratory Services (ALS) in Townsville, Queensland, for preparation and assay using the same method. The 1 kg (-30 mesh) sub-samples from the Allied RC drilling were dispatched to ALS and finely pulverised. A 50 g sub-sample was fire assayed and the remainder stored at their facility in Garbutt, Queensland. The Simberi processing equipment was flushed with glass before each hole was processed. After the new core shed and sample preparation facility was constructed (2008) spear sampling was conducted on wet samples to obtain two 800 g sub-samples, one for archive and one for processing. Dried RC samples of up to 600 g were milled in an LM2 to obtain a 90% pass through 75 microns for dispatch to the laboratory. The laboratory procedures on Simberi Island were reviewed by ALS Chemex in October 2004 and found to be satisfactory.

CRITERIA	COMMENTS
	Before mid-2008, Allied drill core samples were processed in a similar way to the RC samples. 1 kg from the half-core sample was hammer milled to -30 mesh and the 'reject' sample archived for a minimum of 3 months after assays were returned. The processing equipment was flushed with glass before each hole was processed. The 1 kg samples were dispatched to ALS Townsville for pulverising and a 50 g sub-sample was fire assayed. For SBM drilling all samples were prepped using the on-site laboratory. Samples were initially crushed to <2 mm using a Terminator jaw crusher. Samples greater than 1 kg were riffle split and this subsample was pulverised using an Essa LM2 pulveriser, with 150-200 g dispatched to ALS in Townsville for analysis. An adequate number of field, course and fine duplicates have generally been taken. No major issues were detected from this duplicate sampling. If there are any issues with the representivity of samples, it would most likely be in the primary sample before any splitting can occur. No studies exist to determine if the sample sizes are appropriate for the grainsize being sampled. Sample sizes are however similar to other gold deposits.
QUALITY OF ASSAY DATA AND LABORATORY TESTS	Kennecott evaluated the results of a re-assay program in 1992 dividing the data into oxide, transition and sulphide as well as grade classes. As a result, the following corrections were made to the Au assay data: oxide -6.1%, transition -10.3% and sulphide -9.2%. These corrections were not used for SBM estimates. Duplicate sampling by Nord concluded that the majority of the duplicate pairs agreed well. Nord's internal standard samples were reported as having acceptable agreement. Allied's sample preparation and analytical control procedures included the use of blanks to monitor contamination, duplicates to test splitting and milling efficiency and standards to monitor analytical accuracy and precision. Gold assays for 288 standards showed precision well within two standard deviations. Gold assays for 574 duplicates, representing 4.2% of the (Allied) samples assayed show good agreement with a correlation coefficient of 0.994. In addition, Au assays for 570 samples submitted to a second laboratory also showed good agreement, with a correlation coefficient of 0.996. Between drill holes, sample preparation equipment was cleaned with crushed glass and compressed air. Between samples the same equipment was cleaned with compressed air and a brush. Due to the poor initial selection of blank material, the blanks analysis data could not be used to accurately determine the degree of contamination. Allied conducted Round Robin inter-laboratory checks in 2009 and 2010 with satisfactory results. SBM have inserted non-certified blank material at a ratio of 1:25; inserted certified reference material at a ratio of 1:21; field duplicates (RC) 1:47 and the pulverisation and analysis of coarse reject (core) at a ratio of 1:22. No bias or contamination issues were detected however, some assays of standards suggest that precision can at times be lower than ideal. Analysis of blanks suggest the occurrence of some sample mix ups particularly since April 2018.
VERIFICATION OF SAMPLING AND ASSAY	The following discussion is based on a data quality study by De-Vitry (2016). There are 12 diamond versus RC twin drill holes. Also present are 5,385 RC versus diamond sample pairs that are located within 10 m or less that may or may not have been intentionally drilled as twin holes. For example, holes that cross close to each other or grade control RC holes next to exploration diamond drill holes. Based on a detailed analysis of the above information and the underlying geology it is possible that gold grades in some of the older RC drilling is biased high. This may be due to difficult drilling conditions (faults, high porosity etc), down hole moisture and insufficient air pressure during RC drilling resulting sample loss and/or contamination. Much higher pressures are now used in RC drilling and operators are more experienced with the ground conditions at Simberi. Reconciliation exists from 2017 onwards and there is no evidence of a bias in the current RC drilling. Six twin holes are still planned to be drilled in areas of difficult ground conditions to verify the current RC drilling. Increasingly the older RC drilling is in mined out oxide areas with recent drilling focusing on sulphide resources.

CRITERIA	COMMENTS
LOCATION OF DATA POINTS	All drill collars were surveyed using traditional EDM instruments based on UTM WGS 84. An audit by McMullen Nolan and Partners Surveyors Ltd in 2005, using two dual frequency GPS units, determined that the Simberi survey had very high accuracy. Since 2007, an additional QC step was introduced to record all collars with a GPS to cross check the surveyed coordinates. Simberi island was surveyed in 2007 before mining commenced. A LiDAR survey was flown in early 2012 post mining. The two surveys have been merged to create a pre-mining surface. There are areas in which the RL of the collar coordinates and pre-mining surface vary by up to 30 meters. The reason for these difference needs to be identified and corrected. SBM mine survey team has surveyed the SBM drilling. No down hole surveys were completed on the RC holes prior to March 2018. Post March 2018, deep RC holes have been surveyed for dip as described above. Diamond holes were surveyed down hole every 15 metres using a single shot camera.
DATA SPACING AND DISTRIBUTION	For the generation of the 0.25 g/t Au grade shell and the oxide domains all available data is used i.e. diamond, RC, auger and blast hole. For resource estimation diamond, RC and RC grade control data are used. The RC grade control data is nominally on a 10m x 10m grid however, below the pits drill spacing is highly variable and this is taken into account during resource classification. Drilling is composited to 2m for resource estimation.
ORIENTATION OF DATA IN RELATION TO GEOLOGICAL STRUCTURE	Gold mineralisation does not appear to be closely associated with any particular lithology although the contacts between lithologies can at times be a favourable host to gold mineralisation. It is recognised that the primary control of gold mineralization are NW–SE and NE–SW steeply dipping structures and the intersection of these also has the potential to host mineralization. Gold mineralisation is generally associated with sulphides or iron oxides occurring within all variety of hydraulic fractures, and broad disseminations in the naturally porous volcaniclastic rocks. The mix of vertical and inclined drilling goes some way to optimally intersect these mineralisation styles.
SAMPLE SECURITY	Company personnel or approved contractors only were allowed on drill sites. Drill samples were removed from drill sites only to a secure sampling or core logging/processing facility. Logged and cut core was consigned and dispatched as secure cargo to accredited laboratories for processing.
AUDITS OR REVIEWS	In 2004, Golder Associates prepared an Independent Qualified Person's Technical Report of the Simberi Oxide Gold Project and in June 2011 Golders produced the Competent Person's Report for the Simberi Gold Project, which found no compromising factors deleterious to the resource. In 2015, QG completed a review of the Simberi grade control which highlighted a potential bias between RC and diamond drilling. The results of a follow up study are discussed in the section above on verification of sampling and assaying.

Section 2 Reporting of Exploration Results - Simberi

CRITERIA	COMMENTS
MINERAL TENEMENT AND LAND TENURE STATUS	The reported resource is completely located within ML 136 which is 100% owned by the Simberi Gold Company Limited (SGCL), a wholly owned subsidiary of St Barbara Limited. ML 136 expired in December 2018, but the lease remains in effect while the reapproval process is undertaken.
EXPLORATION DONE BY OTHER PARTIES	Drilling of the resource by other parties is discussed in the previous section.
GEOLOGY	The Simberi Gold Project is located on Simberi Island in the Tabar Islands Group situated in the New Ireland Province of Papua New Guinea (PNG), approximately 80 km north-west of Lihir Island. Simberi is the oldest and northernmost island of the Tabar Group. It measures approximately 10 km east-west, 8 km north-south and rises to over 300 m above sea level. The currently known gold prospects (Sorowar, Pigiput, Pigibo, Botlu, Pigicow, Samat, Bekou and Monun Creek) on Simberi Island are located in the eastern half of the island within the central volcanic core. They are contained within a sub-cropping epithermal alteration system and structural corridor extending 4km north-south and 2km east-west. The host rocks for the mineralisation comprise Pliocene altered alkaline lava flows or intrusives (porphyries), volcaniclastics and tuffs. Of the eight separate deposits, Pigiput in the south is by far the largest gold resource. Monun Creek is located immediately to the north-east of Pigiput, with Sorowar, the second largest resource, further north again. Pigibo, Botlu, Samat and Bekou lie to the west and south of Pigiput, and while

CRITERIA	COMMENTS
	relatively small, are relatively higher grade. All deposits lie within 2 to 3km of each other. Sorowar, Pigiput and Botlu are currently being mined via open pit methods. Fine grained free gold in oxide material is the target of current operations. Within the sulphide zone gold is also fine grained (most grains are under 15 µm in diameter) but is generally within pyrite. Modifications are required to the current processing plant to allow flotation of pyrite and recovery of the gold. The grade of the mineralisation is related to the natural porosity and degree of fracturing of the host rocks, greatest in the vicinity of steep and moderately dipping feeder structures interpreted to have been the pathways for both alteration and mineralising fluids.
DRILL HOLE INFORMATION	No exploration results are presented.
DATA AGGREGATION METHODS	No exploration results are presented.
RELATIONSHIP BETWEEN MINERALISATION WIDTHS AND INTERCEPT LENGTHS	No exploration results are presented.
DIAGRAMS	No exploration results are presented.
BALANCED REPORTING	No exploration results are presented.
OTHER SUBSTANTIVE EXPLORATION DATA	No exploration results are presented.
FURTHER WORK	Future work will focus on converting Inferred oxide and sulphide resources to Indicated resources. Work will also be conducted on areas which are currently unclassified due to not meeting the classification criteria (see below), in the hope they can be brought into the Inferred category.

Section 3 Estimation and Reporting of Mineral Resources - Simberi

CRITERIA	COMMENTS
DATABASE INTEGRITY	Drilling in 2004 and 2005 by Allied Gold was subject to significant external review. Golder Associates visited the site in April 2004 and reviewed data collection procedures. In early 2009, the historic data was transferred into a Maxwell's Datashed model and subjected to QAQC, which traps and reports errors on import. Data is now entered directly into the Datashed SQL database.
SITE VISITS	The Competent Person (Chris De-Vitry) visited the Simberi mining operation in 2016 and 2019.
GEOLOGICAL INTERPRETATION	Gold does have lithological and structural controls, but these controls are complex and cannot be easily used to generate domains for resource estimation. Leapfrog software was used to generate a 0.25 g/t Au grade shell for resource estimation. A grade shell is needed to avoid smearing grades between mineralized and essentially unmineralized areas. This grade shell is sufficiently below the resource reporting cut-offs to not introduce any significant conditional bias during resource estimation. Locally the orientation, degree of anisotropy and extrapolation of the 0.25 g/t Au grade shell tends to be somewhat subjective however, the current grade shell is considered appropriate by the Competent Person. Further improvements could be made by incorporating pit mapping (lithology, alteration and structure) into the interpretation. To better understand the impact of uncertainty it is recommended that multiple 0.25 g/t Au grade shells be generated and used for resource estimation. Oxidation domains (oxide, transitional and sulphide (fresh)) are based on logging from drill holes. The domains were defined in Leapfrog by a combination of offset surfaces and solids. The offset surfaces utilise the logging and depth below topography to create geologically realistic oxidation surfaces. The modelling of oxidation solids in Leapfrog was also required because a single oxidation surface could not always model the observed spatial complexity. For example, there can be pods of oxide completely enclosed by sulphide and vice versa. Based on statistical analysis and contact plots the 0.25 g/t Au grade shell was subdivided into two zones for the estimation of gold grades; a combined oxide and transitional zone and a sulphide only zone.

CRITERIA	COMMENTS
DIMENSIONS	The northernmost deposit is Sorowar, its bulk is aligned SE-NW (1,550 m) with minor (structurally controlled) orthogonal splays towards the southwest and northeast. These splays are less than 750 m long and 300 m wide. Pigibo is oriented W-E for approximately 740 m with a central bulge about 300 m wide and tapering to about 100 m at the western and eastern extremities. It is located about 1,500 m to the southwest of the central part of Sorowar. Pigiput is east of Pigibo and about 1000 m south of Sorowar. It is roughly equidimensional (640 m diameter) in plan. Monun Creek is between Pigiput and Sorowar however, there is now enough drilling to define continuous mineralisation between Pigiput and Sorowar. Botlu is about 800 m south of Pigibo. It strikes SE-NW for approximately 680 m with an average width of around 250 m. About 700 m to the SE of Botlu is the discontinuous Pigicow deposit which strikes SW-NE for nearly 600 m with a variable width (200-450 m). Samat is located about 700 m to the southeast of Pigicow and is aligned north-south for approximately 720 m with an average width of 300 m. Like Pigicow, Bekou is discontinuous and oriented towards the east-northeast with a strike length of around 600 m. Located about 650 m to the southwest of Samat, its width varies from 40 m to 170 m.
ESTIMATION AND MODELLING TECHNIQUES	Ordinary Kriging with 2m composites was used to estimate Au with the following parameters: 1. Minimum of 6 composites; 2. Maximum of 16 composites; 3. No quadrant or octant search; 4. Search of 600 m x 600 m x 200 m (blocks informed by large composite to block distances are not classified as a resource – see section on resource classification); 5. Anisotropic distances were used to select the closest composites; 6. Parent cell discretisation for kriging of 5 x 5 x 2 in X, Y and Z dimensions; 7. All composites within a block are used to estimate that block; and 8. All domain boundaries except for the oxide-transitional boundary were treated as hard during estimation. The parent block model dimensions were 10 mX x 10 mY x 5 mZ, which is equal to the spacing of the better drilled areas. Outlier restricted kriging was used with grade above a specified cut-off cut to that value when the composite is greater than 15 m from the block being estimated. For the mineralized domains the cut-off was chosen at the point which the global gold distribution starts to break up. An outlier cut-off of 35 ppm Au was used for the Oxide-Transitional Mineralized domain and 30 ppm Au for the Sulphide Mineralized domain Orientation disks were placed throughout the Simberi deposit using geology, structure and gold grade continuity to define each disks rotation. The orientations from these disks were then interpolated into every block in the mineralized domains using nearest neighbour interpolation. During estimation the search ellipse and variogram were rotated according the orientation stored in each block being estimated. The Au estimate was validated using an inverse distance squared check estimate as well as comparison against the declustered composites. The model was also validated using swath plots and visual comparison between composited and the kriged grades. In the deeper less well drilled parts of the deposit kriging from wide spaced data into relatively small blocks will tend to over-smooth the estimate and conditional simulation or non-linear estimation is recommended for these areas. The current estimate is yet to be compared against mill production. Mineral Resources are reported inclusive of Ore Reserves.

<table>
<tr><th>CRITERIA</th><th>COMMENTS</th></tr>
<tr><td>MOISTURE</td><td>Tonnages are estimated on a dry basis.</td></tr>
<tr><td>CUT-OFF PARAMETERS</td><td>The resource is reported at a gold cut-off of 0.4 g/t for oxide and 0.6 g/t for transitional and sulphide.</td></tr>
<tr><td>MINING FACTORS OR ASSUMPTIONS</td><td>The mining method for all deposits is open pit, using 5 m flitches and 20 m benches. The principle pieces of digging equipment are four Hitachi 1200 excavators, matched with a mixed fleet of CAT 740 and BELL 50D articulated dump trucks.

Ore blocks are generated within the site's MineSight software utilising a Dig Block Optimisation module with a base SMU of 5 m x 5 m x 5 m. The optimal blocks are modified by the mine geologists to achieve a practical ore mark out, which is then located on the ground via differential GPS.

Ore markout widths vary from 5 m to 60 m, the average being in the 30 m to 40 m range. When forecasting and budgeting, mining dilution and ore loss are set at 15% and 5% respectively, and this has given a suitable result when compared against actual.

All material within the marked out block, regardless of oxidation state, is delivered to ROM stockpiles, either at the Sorowar Feeder, for the rope conveyor, or to the Mill. The 365 tph rope conveyor from the Sorowar Feeder to the Mill ROM pad is an integral part of the mining process flow at Simberi; as is the downhill trucking that HBS conducts using Astra haul trucks to bring an additional 700 kt to 1 Mt per annum to the Mill ROM.</td></tr>
<tr><td>METALLURGICAL FACTORS OR ASSUMPTIONS</td><td>Gold recovery in oxide was calculated as follows:

<table><tr><th>S (%)</th><th>Fixed Tail (ppm)</th><th>Max Recovery (%)</th></tr><tr><td><0.2</td><td>0.2</td><td>86%</td></tr><tr><td>>0.2 and <0.4</td><td>0.3</td><td>78%</td></tr><tr><td>> 0.4 and <1</td><td>0.5</td><td>70%</td></tr><tr><td>>1</td><td>0.7</td><td>50%</td></tr></table></td></tr>
<tr><td>ENVIRONMENTAL FACTORS OR ASSUMPTIONS</td><td>Historically, there has been no large-scale mining and the previous alluvial workings have had no significant impact. There are no pre-existing environmental liabilities. During a 2004 environmental baseline study, a network of monitoring stations was established to support the ongoing collection of data. A 2005 Feasibility Study addressed the environmental impacts associated with waste dumps, open pits, pipelines, access/haul roads, process plant, deep sea tailings and stormwater. However, no attempt at identifying the acid rock drainage potential was made, although the resource model was domained with respect to visible oxidation intensity. A report by Environmental Geochemistry International suggests that the distribution of the acid rock drainage (ARD) material types be spatially determined. In this way the non-acid forming (NAF) and potentially acid forming (PAF) factors can be evaluated – using the sulphur values in the model.</td></tr>
<tr><td>BULK DENSITY</td><td>The dry bulk densities were determined using the water immersion method. Only intact pieces of core can be measured by this approach and in extremely broken ground there is potential for a bias to be introduced. Core is wrapped in cling wrap before weighing in water. This approach can be unreliable due to either entrapped air bubbles or water leaking into the sample. Further work is required to verify the reliability of the density data and to ensure that clay rich samples have been adequately dried before density is measured.

There is limited density data. Generally, one measurement per core tray or less. Density was estimated into the block model using inverse distance squared interpolation.</td></tr>
<tr><td>CLASSIFICATION</td><td>The resource estimate is initially classified on data spacing using the following ellipsoidal search criteria:
1. Measured - Utilising a quadrant search of 15 mX x 15 mY x 7.5 mZ (total size of the ellipse is 30 m x 30 m x 15 m), there must be at least one composite in each quadrant;
2. Indicated - Utilising a quadrant search of 30 mX x 30 mY x 15 mZ (total size of the ellipse is 60 m x 60 m x 30 m), there must be at least one composite in each quadrant;
3. Inferred - Utilising a quadrant search of 50 mX x 50 mY x 25 mZ (total size of the ellipse is 100 m x 100 m x 50 m), there must be at least one composite in three of the quadrants.</td></tr>
</table>

CRITERIA	COMMENTS
	All the material unclassified by the above steps remains unclassified. Material outside of the mineralized domain is unclassified irrespective of the drill spacing. These unclassified areas represent potential drill targets. After applying the above criteria there were still significant areas classified as Inferred which in the opinion of the Competent Person had higher confidence. Wireframes were generated around areas that had enough gold grade continuity and drill spacing to be classified as Indicated and the classification was updated accordingly. The final resource classification is considered appropriate given the data quality and continuity of the gold mineralization. Almost all the material classified as Measured has been RC grade control drilled at an approximately 10m x 10m spacing. A Measured classification is considered appropriate given that over the 12-month periods of 2017 and 2018 the gold ounces between grade control and the mill are within 5%. The resource estimate utilises the grade control RC drilling. In order to meet the JORC Code (2012) criteria for reasonable prospects of eventual economic extraction, only the material above an optimistic pit shell has been considered as a resource. This ultimate pit shell was calculated using a gold price of US $1800. Resources were depleted using an end of June surface.
AUDITS OR REVIEWS	In June 2011, Golders produced the Competent Person's Report for the Simberi Gold Project, which found no compromising factors deleterious to the resource. The Sorowar and Pigiput/Pigibo Mineral Resource Estimate were reviewed internally in 2014 by a panel of experienced company geologists. The review covered all aspects of the estimate including source data, geological model, resource estimate and classification. In addition, the reporting of the company Mineral Resources is guided by the company's Mineral Resource Estimation System and is overseen by the Executive Leadership team prior to being reviewed by the company's Audit Committee.
DISCUSSION OF RELATIVE ACCURACY/CONFIDENCE	Uncertainty in the interpretation of the 0.25 g/t Au grade shell and the interpretation of oxidation domains are key areas of uncertainty. Gold grade uncertainty within the estimation domains is also high with about three quarters of the variability occurring in under 10m. Finally, there is still the possibility that some of the older RC drilling has gold grades that are biased high. This risk is reducing as additional drilling is ongoing. No geostatistical study has been carried out to determine confidence limits for the resource. Conditional simulation into conservative, intermediate and optimistic domains is recommended.

Section 4 Estimation and Reporting of Ore Reserves - Simberi

CRITERIA	COMMENTS
MINERAL RESOURCE ESTIMATE FOR CONVERSION TO ORE RESERVES	The Ore Reserve estimate is based on the Mineral Resource estimate carried out by Chris De-Vitry of Manna Hill Geoconsulting. Gold grade was estimated using ordinary kriging. The Mineral Resources are reported inclusive of the Ore Reserve.
SITE VISITS	The Competent Person is employed in a site based role
STUDY STATUS	SGCL is currently an operating mine. Pit Optimisation and Design conducted to enable the Mineral Resource to be converted to Ore Reserves. Oxide Reserves are supported by operational budget planning and evaluations based on operational designs and current practices. The Sulphide component has been subject to a pre-feasibility study (PFS) carried out internally by St Barbara Limited during 2016. A Feasibility Study for the sulphide component is due to be completed late 2020.
CUT-OFF PARAMETERS	The economic cut-off was determined from the non-mining breakeven value. The non-mining breakeven value was estimated for each block in the Ore Reserve model and takes the following factors into consideration: • Gold Price • Milling Cost • G&A Costs • Metallurgical Recoveries

CRITERIA	COMMENTS
	• Royalties • Transport and refining charges Only blocks with positive value are Reported in the Ore Reserve estimate. Open pit mining costs are excluded from the cut-off grade calculation. The impact of mining costs is accounted for in the calculation of the optimal pit shell including differences between ore and waste mining due to haul distances.
MINING FACTORS OR ASSUMPTIONS	The Simberi Reserve has been estimated after running pit optimisations using costs, recoveries, dilution and slope angles that are based on zero base build approach using current operating history as a data source. The mining methods used to do the LOM schedules are in line with what is currently used on site. The overall slopes used for the pit optimisation and design work were sourced from reports carried out by external geotechnical consultants. Grade control drilling is carried out in advance of mining and the information obtained from this drilling is made available for decision making in advance of mining. The models used for the Ore Reserve are consistent with that produced for the Mineral Resource declared for the Simberi deposits. This model is internally known as simc10.dat. Dilution is included in the Ore Reserve estimate through the estimation process. Ore losses and external dilution were assumed to be 0% due to the limited operating experience with the updated Mineral Resource model. An average minimum mining width of 30m was applied for all design work. Inferred material is set to zero value in the optimisation. Subsequently, inferred material reported in the pit shells is considered in the Life of Mine, but not included in the Reserve. Additional optimisations were run, and shells produced, to evaluate the influence of inferred material prior to the Mine Design phase to ensure potential future mill feed is not sterilised when generating current optimum Pit Designs. Inferred material can only present a potential upside to the ore reserve if and when it is reclassified as indicated. The infrastructure requirements of the current mining methods used are already in place. Replacement costs, expected maintenance costs or costs of additional items required have been accounted for in the life of mine evaluation on which the project costings are based.
METALLURGICAL FACTORS OR ASSUMPTIONS	Material from the various Simberi Deposits is trucked and conveyed to the Simberi processing plant. The Simberi processing plant consists of a Wet Scrubber, Oversize Ball Mill, Semi-Autogenous Grinding Mill, Cyclone Circuit, CIL Circuit, elution and acid washing facilities, electrowinning cells, and Kiln. Tails from the process are discharged using a Deep Sea Tailings Placement where the tailings is diluted with sea water, to the ratio of 8:1, prior to its disposal. Expansion of the Oxide Circuit was completed towards the end of 2013 and since then, the operation has been operating at 3.5 Mtpa. A PFS has been completed to evaluate the options for Sulphide processing. The technology associated with processing of Simberi ore is conventional carbon in leach and based on industry standard practices. Recovery performance is variable for the different weathering profile of the material. The metal recovery for oxides is calculated by a formula that uses gold grade as a predictor. The gold recovery has an upper limit of 93%. This gold recovery relationship was developed from plant performance data. A fixed gold recovery of 75.3% was used for sulphides, based on PFS.
ENVIRONMENTAL	SGCL holds two environmental permits. One for the extraction of water and one for the discharge of waste. Together these two permits form the environmental legislative basis in which the SGCL can operate. Compliance with these conditions is continuously monitored and reported on in Quarterly Environment Performance Reports which are submitted to the National Government, Department of Environment and Conservation (DEC).

CRITERIA	COMMENTS
	SGCL has received a new permit for the 3.5Mtpa expansion project to replace the previous discharge permit. Both the environmental permits are only relevant to operational mining activities within the Mining Lease. In addition, SGCL maintains an Environment Permit for Exploration relating to Waste Discharge. This Permit is referred to as Environment Permit WDL-2A(65).
INFRASTRUCTURE	All equipment required for the mining and processing of the reserve is in place and operational, or have been selected and costed for installation as part of the sulphide PFS. They are, or will be, located on St Barbara held tenements and leases. The infrastructure includes but is not limited to: • Dedicated heavy fuel oil diesel generators • Water supply • Simberi Oxide Processing plant • Future Simberi Sulphide Processing Plant • Surface roads and communications • Plant maintenance workshop facilities • Process plant buildings, administration offices, training rooms, assay laboratory, site security buildings, ablution and stores. • Core shed • Mobile communication tower • Accommodation and camp facilities • Airstrip • Wharf
COSTS	All costs used in the generation of the reserves have been derived from first principles, actual performance and the sulphide PFS work. Operating costs are estimated as part of the internal budgeting process and approved by the St Barbara board. A gold price of US$1,250/oz has been used in all calculations. Exchange rates are sourced from recommendations by the Group Treasury and accepted by the Executive Leadership Team (ELT). Costs associated with treatment and transport have been included in the cost modelling completed for the project based on actual performance and the sulphides PFS. Royalties have been included at the PNG government royalty of 2.0% of gold produced. A MRA levy is also applied to at 0.25% of gold produced.
REVENUE FACTORS	A gold price of US$1,300/oz has been used in all revenue calculations.
MARKET ASSESSMENT	Gold doré bars are transported fortnightly by dedicated service provider from Gold room to final destination Perth Mint. Armoured vehicles are used from start to end of shipment process. Gold is sold on an $A basis with a call option of $USD sales. Sulphide ore is proposed to be treated in a Sulphide Circuit and sold as a concentrate.
ECONOMIC	SGCL is an operating asset and is not subject to project type analysis.
SOCIAL	There are two community agreements which set the guidelines for community relations at Simberi. • The Memorandum of Agreement between SGCL, the national government, New Ireland Provincial Government, Simberi Land Owners Association and the Tabar Community Government • The compensation Agreement.
OTHER	SGCL is operating on St Barbara 100% held mining leases with all required government and statutory permits and approval in place. A company risk register is maintained to address and mitigate against all foreseeable risks that could impact the Ore Reserve.

CRITERIA	COMMENTS
CLASSIFICATION	The ore reserve includes only Proved and Probable classifications. The economically mineable component of the resource material identified as Measured has been included in the Proved category. The economically mineable component of the resource material identified as Indicated has been included in the Probable category. No portion of the Probable ore reserve has been derived from Inferred Mineral Resources. The Competent Person believes the ore reserve declared is an accurate representation for the Simberi deposit.
AUDITS OR REVIEWS	No external audits or reviews have been conducted on the current ore reserve.
DISCUSSION OF RELATIVE ACCURACY/ CONFIDENCE	The Ore Reserve estimate is prepared within the Guidelines of the JORC code (2012). The relative confidence of the estimates contained fall within the criteria of Proved and Probable Reserves. Significant operating history supports the magnitude of modifying factors which have been applied. The ore reserve has been estimated in line with the St Barbara Ore Reserve process. The ore reserve process has been conducted to industry standard. The ore reserve has been peer reviewed internally and the Competent Person is confident it is an accurate estimation of the current Simberi ore reserve.

Section 1 Sampling Techniques and Data – Atlantic Gold

CRITERIA	COMMENTS
SAMPLING TECHNIQUES	Sample lengths have varied depending on the drill program, ranging from about 1 cm to 4.85 m, averaging about 0.9–1 m. Core has been halved for sampling using mechanical core splitters and core saws. Some early programs submitted whole core The default sample length was 1.0 m, and all half-core samples were sawn. The main independent laboratories used for sample preparation and analysis include ALS Chemex and SGS; these laboratories hold accreditations for selected analytical techniques. Samples have been typically crushed and pulverized to P85 75 µm. Initial, pre-Atlantic Gold, assaying at Touquoy used a proprietary sample preparation method, known as KMS-15, which used a Kuryluk Mineral Separator to extract the coarse gold from the sample. The resulting material was fire assayed for gold.
DRILLING TECHNIQUES	Drilling has used primarily NQ (47.6 mm diameter) core. Some drill holes at Touquoy were HQ (63.5 mm) or PQ (85mm) size. A grade control program at Touquoy in 2006 was completed using BQ (37 mm) size. Drilling performed by Masval and Northumberland at Cochrane hill used AQ (30.5 mm) and BQ sizes.
DRILL SAMPLE RECOVERY	Diamond drilling recovery percentages were measured by comparing actual metres recovered per drill run versus metres measured on the core blocks. Recoveries averaged over >90% with increased core loss present in fault zones and zones of strong alteration.
LOGGING	Drill core logging procedures are described on a metre-by-metre basis with regards to lithology, texture, sulphide mineralization, alteration, quartz veining, structure, and in some cases magnetic susceptibility. All drill core has been photographed both wet and dry. Core recovery and rock quality designation (RQD) were measured for each hole at the same metre-by-metre intervals. Information was initially captured using logging sheets; later programs used direct computer entry. Core recoveries are very good overall.
SUB-SAMPLING TECHNIQUES AND SAMPLE PREPARATION	The main independent laboratories used for sample preparation and analysis include ALS Chemex and SGS; these laboratories hold accreditations for selected analytical techniques. Samples have been typically crushed and pulverized to P85 75 µm. Sample preparation, analysis, and security procedures undertaken are performed in accordance with exploration best practices and industry standards.
QUALITY OF ASSAY DATA AND LABORATORY TESTS	Drill programs to 2002 typically relied on quality assurance and quality control (QA/QC) procedures implemented at the analytical laboratory. Later programs incorporated QA/QC sample submissions including blank, duplicate, and standard reference

	materials (SRMs). A number of review and resampling programs have been conducted, including: • Trial grade control reconciliation from the upper edge of the Touquoy Mine. It was concluded that the KMS-15 method generated data that were higher in average grade compared to other methods such as traditional 30FA and screened fire assay; • Resampling of selected drill core from earlier exploration efforts; • Nearest neighbourhood comparison of grade control data collected from 2017 and 2018 to KMS-15 method-generated data and historic resource data; • Comparison of grade control model to resource model in areas where estimations are affected by KMS assays.
VERIFICATION OF SAMPLING AND ASSAY	Internal data verification programs have included review of QA/QC data, re-sampling and sample reanalysis programs, and database verification for issues such as overlapping sample intervals, duplicate sample numbers, or lack of information for certain intervals. Validation checks are performed on data used to support estimation, and comprise checks on surveys, collar co-ordinates, lithology data, and assay data. A review of the Touquoy database was conducted in 2007 by external consultants, Hellman and Schofield.
LOCATION OF DATA POINTS	Drill collars have been captured using global positioning system (GPS) instruments. Holes are surveyed downhole at approximately 30 m intervals and at the final hole depth. Survey instruments have included Pajari, Sperry-sun, FlexIT and Reflex tools.
DATA SPACING AND DISTRIBUTION	Data spacing for all deposits is generally on 25m spaced sections. Drilling data is sufficient to establish continuity for all lodes.
ORIENTATION OF DATA IN RELATION TO GEOLOGICAL STRUCTURE	**Touquoy:** Gold mineralization broadly conforms to the orientation of stratigraphy which has been tightly folded into an upright anticline, such that drill holes angled into the northern limb are inclined towards the south and vice-versa for drill holes angled into the southern limb. In this way, depending on where drill holes have been collared relative to the changing dips of bedding in the anticline, the angled holes intersect bedding at between 45° and 90°, exaggerating true widths by up to 1.4 times. Samples taken from vertical holes do not exaggerate actual widths of mineralization at the anticline hinge but can exaggerate widths by up to 2.9 times where bedding dips are steepest (70°). **Beaver Dam:** The orientation of mineralisation in both the Mill Shaft Zone and the Northeast Zone is uncertain at this stage and therefore the relationship between sample lengths and the true thickness of mineralisation is not known. **Fifteen Mile Stream:** Gold mineralisation at Fifteen Mile Stream is to some degree stratiform. Bedding was intersected at angles of between 45° and 90° such that the true thickness of mineralisation is generally between 70% and 100% of the downhole intercepts. **Cochrane Hill:** Holes drilled from surface were inclined to the south at angles between 80° and 40° from horizontal. Mineralisation is confined to a zone or envelope that dips to the north at approximately 70° such that drill holes intersect the mineralization at angles of between 30° and 70° respectively and down-hole mineralized intercepts are exaggerated over true widths by between 1.1 and two times.
SAMPLE SECURITY	Security procedures prior to Atlantic Gold Corp's involvement in the Project are not known, although check sampling and re-examination of core from a large number of drill holes has not shown any sign of sample tampering. Core was typically kept in a secure and locked area with limited access. Samples are typically conveyed from the Project site to the laboratory using commercial transport firms.
AUDITS OR REVIEWS	The CP has visited the Touquoy pit to view the geology exposed by the mining and to verify the collars of selected recent drill holes.

Section 2: Reporting of Exploration Results – Atlantic Gold

CRITERIA	COMMENTS
MINERAL TENEMENT AND LAND TENURE STATUS	St Barbara has 100% ownership of the tenements over Touquoy (ML11 -1, EL10377) Cochrane Hill deposit (EL51477); Fifteen Mile Stream (EL05889, EL52901 and EL10406) and Beaver Dam Area (EL50421).
EXPLORATION DONE BY OTHER PARTIES	No Mineral Resources drilling has been completed by St Barbara. Work completed by other parties is covered in the previous section.
GEOLOGY	The Meguma Terrane of Nova Scotia hosts the Moose River Member, Tangier Member, and Taylors Head Member of the basal greywacke-dominated Goldenville Formation. Gold mineralization is generally hosted in argillite and/or greywacke sequences of the

	Moose River Member and is associated with regional-scale anticlines. Structural repetition due to folding and faulting may result in thickening of gold-bearing units. Gold occurs as native gold, and has been observed in a number of settings, including along shear cleavage, hair line fractures; in pressure shadows; as inclusions; on the margins of sulphide grains; in thin, bedding-parallel quartz veins and stringers. Mineralization is associated with sulphides, including arsenopyrite, pyrite and pyrrhotite. Lesser chalcopyrite, galena, and sphalerite have been observed. Gold grade was estimated using multiple indicator kriging (MIK) for all deposits. The basic unit of estimation is a panel with horizontal dimensions equal to the average drill hole spacing.
DRILL HOLE INFORMATION	No exploration results are presented.
DATA AGGREGATION METHODS	No exploration results are presented.
RELATIONSHIP BETWEEN MINERALISATION WIDTHS AND INTERCEPT LENGTHS	No exploration results are presented.
DIAGRAMS	No exploration results are presented.
BALANCED REPORTING	No exploration results are presented.
OTHER SUBSTANTIVE EXPLORATION DATA	No exploration results are presented.
FURTHER WORK	Further work is not planned at this time.

Section 3: Estimation and Reporting of Mineral Resources – Atlantic Gold

CRITERIA	COMMENTS
DATABASE INTEGRITY	Internal data verification programs have included review of QA/QC data, re-sampling and sample reanalysis programs, and database verification for issues such as overlapping sample intervals, duplicate sample numbers, or lack of information for certain intervals. Validation checks are performed on data used to support estimation, and comprise checks on surveys, collar co-ordinates, lithology data, and assay data. A review of the Touquoy database was conducted in 2007 by external consultants, Hellman and Schofield.
SITE VISITS	The Competent Person has previously visited site. No site visits were undertaken during the last year as the resources have only been depleted for mining.
GEOLOGICAL INTERPRETATION	Depending on the deposit, samples were composited to either 1 m or 2 m intervals. Statistical properties of the composites were reviewed in terms of histogram and spatial continuity to identify areas of consistent mineralization style. For a number of the resource models, a single mineralized domain was used. However, in Cochrane Hill, Fifteen Mile Stream Egerton Zone, and Touquoy, distinctly different mineralization styles with clearly different histograms of composite grade were identified and modelled with different parameters.
DIMENSIONS	**Touquoy:** strike extent = 810m; width = 50m; vertical extent = 150m. **Beaver Dam:** strike extent = 810m; width = 50m; vertical extent = 200m. **Fifteen Mile Stream:** strike extent = 1400m; width = variable 20m to 100m; vertical extent = 225m. **Cochrane Hill:** strike extent = 950m; width = 70m; vertical extent = 285m.
ESTIMATION AND MODELLING TECHNIQUES	Multiple indicator kriging (MIK) was used to estimate the Mineral Resources based on an anticipated approach to mill feed material selection in mining. The basic unit of estimation is a panel with horizontal dimensions equal to the average drill hole spacing. Depending on the deposit, samples were composited to either 1 m or 2 m intervals. Statistical properties of the composites were reviewed in terms of histogram and spatial continuity to identify areas of consistent mineralization style. For a number of the resource models, a single mineralized domain was used. However, in Cochrane Hill, Fifteen Mile Stream Egerton Zone, and Touquoy, distinctly different mineralization styles with clearly different histograms of composite grade were identified and modelled with different parameters. Typically grade capping was not considered to be warranted; however, some high-grade samples in the Fifteen Mile Stream database were top-cut. Where possible, directional sample variograms and variogram models were generated for the domains, and the resulting data used to inform estimation search criteria. The resource estimates assume mining ore selection in all deposits will take place on 5m flitches with a minimum mining width of around 5 m. For all deposits, following

	variance adjustment, the resultant block histograms were assumed to be log-normal in shape. The variance included an adjustment for the information effect introduced by grade control sampling. A grade control drill hole pattern of 10 m by 5 m with a downhole sampling interval of 2.5 m was assumed for Touquoy, Cochrane Hill and the Fifteen Mile Stream zones of Egerton and Hudson. The assumptions for the remaining deposits of Plenty and Beaver Dam was a 5 m by 5 m pattern, with a down-hole sampling interval. of 2.5 m.
MOISTURE	Tonnages are estimated on a dry basis.
CUT-OFF PARAMETERS	All deposits are reported at a 0.3g/t cut-off. The cut-off grade includes the following considerations: Gold Price US$1,800/oz; Exchange rate of 0.77 US$:C$; Process recovery of 92%; Variable overall pit slope angles.

Operating Cost Inputs: **OPERATION**	**COST**
PIT RIM MINING COST, TOUQUOY	$3.70/T (PIT RIM AT 115 M)
PIT RIM MINING COST, BEAVER DAM	$2.90/T (PIT RIM AT 130 M)
PIT RIM MINING COST, 15 MILE STREAM	$3.35/T (PIT RIM AT 110 M)
PIT RIM MINING COST, COCHRANE HILL	$3.10/T (PIT RIM AT 120 M)
INCREMENTAL HAULAGE COST	$0.02 PER EVERY 5-METRE BENCH BELOW PIT RIM
PROCESSING COST, TOUQUOY	$11.00/T
PROCESSING COST, BEAVER DAM	$18.00/T
PROCESSING COST, 15 MILE STREAM	$8.22/T
PROCESSING COST, COCHRANE HILL	$8.64/T
GENERAL/ADMINISTRATION COST	$2.50/T

MINING FACTORS OR ASSUMPTIONS	The mining method is conventional open pit.
METALLURGICAL FACTORS OR ASSUMPTIONS	Metallurgical recovery is 92%.
ENVIRONMENTAL FACTORS OR ASSUMPTIONS	Environmental approvals are in place for the Touquoy mine. It is assumed that Federal and Provincial approvals will be granted for Beaver Dam, Fifteen Mile Stream and Cochrane Hill ahead of mining.
BULK DENSITY	Bulk density (specific gravity) determinations have been performed using the water displacement method. Mineral Resource estimates typically use the one value for ore and waste as follows: Touquoy: 2.79 t/m3; Beaver Dam: 2.73 t/m3; Fifteen Mile Stream: 2.78 t/m3; Cochrane Hill: 2.77 t/m3.
CLASSIFICATION	The resource estimate for each panel was initially classified as Category 1, 2 or 3 based on the results of octant data searches in the panel neighbourhood. The number of composites required to inform an estimate varied by deposit and by category. Typically, Category 1 panel estimates were assigned to Measured Mineral Resources, Category 2 to Indicated Mineral Resources and Category 3 to Inferred Mineral Resources. An additional constraint on the Touquoy estimate was applied to take into account the uncertainty associated with the KMS-15 data that were used in the resource estimation. Panel estimates that are significantly affected by KMS-15 data in their neighbourhood and were initially assigned a category 1 flag were downgraded to a category 2 flag. This condition was activated if the weighted proportion of KMS-15 samples in the neighbourhood exceeded 0.20. Approximately 5 Mt of mineralization affected by the KMS-15 sampling was downgraded from Measured to Indicated.
AUDITS OR REVIEWS	The Atlantic Gold Mineral Resources Estimates were compiled originally in 2019 to CIM 2014 Definition Standards by a suitably Qualified Person. The Resource Estimates have

	subsequently been reviewed internally by qualified St Barbara personnel and are considered fit for purpose.
DISCUSSION OF RELATIVE ACCURACY/CONFIDENCE	The resource estimates are global estimates. Grade control drilling is completed in advance of mining to improve local estimates of grade.

Section 4 Estimation and Reporting of Ore Reserves – Atlantic Gold

CRITERIA	COMMENTS
MINERAL RESOURCE ESTIMATE FOR CONVERSION TO ORE RESERVES	The Ore Reserves estimate is based on the Mineral Resources estimates carried out by Neil Schofield of FSSI Consulting (Australia) Pty Ltd. Gold grade was estimated using multiple indicator kriging (MIK). The Mineral Resources are reported inclusive of the Ore Reserves.
SITE VISITS	The Competent Person has visited the site from 7 – 13 January 2018.
STUDY STATUS	The Touquoy mine is an operating mine. Lerchs-Grossman (L-G) analysis and pit designs to enable the conversion of Mineral Resources to Ore Reserves is supported by an NI43-101 Technical Report completed for Atlantic Gold Corporation with an effective date of 25 March 2019.
CUT-OFF PARAMETERS	Cut-off grade assumes US$1,300/oz gold at a currency exchange rate of 0.77 C$ per US$; 99.9% payable gold; $5.00/oz offsite costs (refining and transport), a 2% royalty; and uses a 92% metallurgical recovery. The cut off-grade covers processing costs of $11.00/t at Touquoy, $8.22/t at Fifteen Mile Stream, $8.64/t at Cochrane Hill, and $18.00/t at Beaver Dam and general and administrative (G&A) costs of $2.50/t. A breakeven incremental cut-off grade of 0.30 g/t Au is used for Touquoy, Fifteen Mile Stream and Cochrane Hill, and 0.50 g/t Au for Beaver Dam.
MINING FACTORS OR ASSUMPTIONS	Lerchs-Grossman (L-G) analysis and pit designs to enable the conversion of Measured and Indicated Mineral Resources to Proved and Probable Ore Reserves has been completed for all deposits. Inferred Mineral Resources are set to waste. The mining operations are planned to be typical of similar small-scale open pit operations in flat terrain. The overall slopes used for the pit optimisation and design work were sourced from reports carried out by independent geotechnical consultants. Grade control drilling is carried out in advance of mining and the information obtained from this drilling is made available for decision making in advance of mining. Mining recovery of 98.4% and external mining dilution of 1.6% at 0.20 g/t Au grade is applied in addition to the modelled in-block dilution.
METALLURGICAL FACTORS OR ASSUMPTIONS	The process design assumes a conventional flowsheet, including crushing, grinding, gravity recovery, CIL, desorption/electrowinning/refining, cyanide destruction and tailings management. A new, simple, satellite primary crushing facility consisting of a grizzly feeder, jaw crusher and primary coarse ore stockpile feed conveyor will be required at Beaver Dam. A process facility with a nominal treatment rate of 2.0 Mt/a has been designed to recover and concentrate gold from ore mined at the proposed Fifteen Mile Stream open pit. The plant operates two shifts per day, 365 d/a at an overall plant availability of 92%. The process plant will produce a gold concentrate to be transported and further treated at the Touquoy process plant. A process facility with a nominal treatment rate of 2.0 Mt/a has been designed to recover and concentrate gold from ore mined at the Cochrane Hill open pit. The plant will operate two shifts per day, 365 d/a at an overall plant availability of 92%. The process plant will produce a gold concentrate to be transported and further treated at the Touquoy process plant. Metallurgical recoveries are assumed to be 92%.
ENVIRONMENTAL	Environmental approvals are in place for the Touquoy mine. It is assumed that Federal and Provincial approvals will be granted for Beaver Dam, Fifteen Mile Stream and Cochrane Hill ahead of mining.

INFRASTRUCTURE	The Touquoy property can be accessed via 110 km of sealed road from Halifax to Moose River. The administration area is accessed via a 1.3 km gravel access road from Mooseland Road. Major onsite roads at Touquoy include the ore haulage and waste haulage roads. Access to the Beaver Dam administration area will be via the 7.5 km Beaver Dam road from Provincial Highway 224 in combination with the upgraded 30 km corridor used for ore haulage from Year 6. Ore will be transported from the Beaver Dam site to the Touquoy mine site by semi-trailer trucks using a 9-axle B-train configuration carrying a 50 t payload. The trucks will travel a total distance of 30 km between the two sites, over four, either upgraded or new sections of road. A well-maintained bituminized road (Provincial Highway 374), which connects several large towns in Pictou County (Stellarton, New Glasgow) with the coastal community of Sheet Harbour, will provide access to the Fifteen Mile Stream site. The administration office and need to shut down the public highway during blasting operations, a 2.9 km section of Provincial Highway 7 will be relocated approximately 300 m to the west. In addition to the mine access road, three major ex-pit haul roads to haul ore and waste materials will be constructed. Built infrastructure supporting the Touquoy Mine operations includes administration offices, control room complex, mill maintenance office, process plant building, reagent storage, laboratory, workshop and warehouse and the main plant motor control centre room. As ore will be transported to Touquoy for processing, building infrastructure at Beaver Dam will be limited. Building infrastructure will consist of a small workshop and warehouse facility. The infrastructure requirements for Fifteen Mile Stream and Cochrane Hill will include administration offices, gatehouse, mining office and change room, process plant, plant office and change room, plant workshop, and reagents and consumables storage. At Touquoy, the power supply comes from a connection to the Provincial distribution grid. The power demand at Beaver Dam is insufficient to justify providing permanent powered generators will provide the required 600 V electrical power for Beaver Dam surface consumers. The Fifteen Mile Stream site will be connected to the power grid by a 1 km overhead power line connected to the 69 kV line that runs adjacent to the planned Fifteen Mile Stream mine site. The closest point of power supply for the Cochrane Hill site is the 25 kV circuit 57C-426 located at the Salmon River Substation. To connect the site to the substation it is necessary to upgrade a 4 km section of overhead singlephase line, and to build an additional 9 km of overhead three phase line to supply the site with 25 kV power. Concentrates from Fifteen Mile Stream and Cochrane Hill will be transported to the Touquoy process plant along a combination of existing public and private roads. The trucks will complete approximately 6–8 return trips per day at the design production rate.
COSTS	The capital cost estimate for the project includes four separate cost estimates, one each for Touquoy, Beaver Dam, Fifteen-Mile Stream and Cochrane Hill: The Touquoy cost estimate represents the 2019 capital budget for the operation; The Beaver Dam capital cost estimate is based on the developed 2015 Feasibility Study, escalated to first quarter 2019, and has an accuracy range of -15%, +25% of final cost. Updates to the 2015 Beaver Dam capital cost estimate include scope additions such as a new jaw crusher in place of relocating the existing crusher from Touquoy, as well as escalating the 2015 Feasibility Study cost elements to first quarter 2019; The estimates for Fifteen Mile Stream and Cochrane Hill estimates are based on the developed 2018 Pre-Feasibility Study, updated for scope and escalation to first quarter 2019, and have an accuracy range of -15%, +25% of final cost. Operating costs were calculated based on manpower, process and maintenance consumables, transport, and G&A costs. Operating costs incurred and revenue from production realized during the period prior to achieving commercial production were capitalized within the Owner's costs.
REVENUE FACTORS	A gold price of US$1300/oz has been used in all revenue calculations.
MARKET ASSESSMENT	A contract was entered into for the transportation, security, insurance, and refining of doré gold bars from Touquoy, and doré is currently shipped to a customer for refining. It is expected that doré produced from Beaver Dam, Fifteen Mile Stream and Cochrane Hill would be subject to similar contracts to that in place for Touquoy.
ECONOMIC	The mine is an operating asset and is not subject to project-type analysis.

	Life-of-Mine plans are developed or updated on an annual basis. These plans reflect current and projected performances for the Ore Reserve.
SOCIAL	There are no First Nations (Mi'kmaq) communities within the Touquoy, Beaver Dam, Fifteen Mile Stream and Cochrane Hill site boundaries. No significant archaeological sites were identified during surveys.
OTHER	There are major contracts currently in place to support the Touquoy Mine operations, in addition to the refining contract. These contracts cover items such as bulk reagents, operational and technical services, process equipment maintenance support, earthworks projects, transportation and logistics, and administrative services. Atlantic Gold may enter into additional operational contracts including, but not limited to, equipment maintenance and ore haulage between Touquoy and Beaver Dam, Fifteen Mile Stream and Cochrane Hill, depending upon operational requirements. These will be reviewed on a continual basis as the project moves forward. Contracts would be negotiated and renewed as needed. Contract terms would be in line with industry norms, and typical of similar contracts in Nova Scotia that Atlantic Gold is familiar with.
CLASSIFICATION	The Ore Reserve includes only Proved and Probable classifications. The economically minable component of the Measured Mineral Resource has been classified as a Proved Ore Reserve. The economically minable component of the Indicated Mineral Resource has been classified as a Probable Ore Reserve.
AUDITS OR REVIEWS	The Atlantic Gold Mineral Resources Estimates were compiled originally in 2019 to CIM 2014 Definition Standards by a suitably Qualified Person. The Resource Estimates have subsequently been reviewed internally by qualified St Barbara personnel and are considered fit for purpose.
DISCUSSION OF RELATIVE ACCURACY/ CONFIDENCE	The Ore Reserves based are global estimates of Mineral Resources. Grade control drilling is completed in advance of mining to improve local estimates of grade.