

22 July 2019

# **Major Gold Resource and Reserve** Upgrade for Ravenswood

Mineral Resources up 24% to 5.9 Million Ounces Ore Reserves up 58% to 2.7 Million Ounces **Addition of 1 Million Reserve Ounces** Ravenswood Expansion Project gets bigger!

# **Highlights**

- Major upgrade in Ravenswood gold inventory net of depletion
- Ravenswood Mineral Resources have increased by 24% to 5.9 million ounces of gold
- Ravenswood Ore Reserves have increased by 1 million ounces, or 58%, to 2.7 million ounces of gold
- Strategic and technical review of the Ravenswood Expansion Project has identified efficiency and scale improvements with potential for significantly higher throughput expected to support lower unit costs and boost economic outcomes

Resolute Mining Limited (Resolute or the Company) (ASX/LSE: RSG) is pleased to announce a major upgrade in Mineral Resources and Ore Reserves for its Ravenswood Gold Mine (Ravenswood) in Queensland, Australia.

Ravenswood Ore Reserves have increased by 1 million ounces (Moz), or 58%, from 1.7Moz to 2.7Moz. Mineral Resources at Ravenswood have increased by 24% from 4.8Moz to 5.9Moz. These impressive upgrades to Resolute's available gold inventory at Ravenswood are net of depletion as at 30 June 2019.

An updated Mineral Resource estimate has been prepared for Resolute's combined Ravenswood deposits consisting of Buck Reef West, Nolans and Sarsfield. These deposits are all immediately adjacent to the Nolans Processing Plant within a radius of 1.5km<sup>2</sup>. The updated Mineral Resource stands at 270 million tonnes (Mt) at 0.7 grams per tonne (g/t Au) for 5.9Moz of gold.

Mining, metallurgical and engineering studies performed during 2019 as part of Resolute's ongoing strategic review of the Ravenswood Expansion Project (REP) have supported an updated Ore Reserve at Ravenswood of 115.4Mt at 0.7g/t Au for 2.7Moz of gold, equating to an increase of 1Moz net of depletion since the Company's last published Ore Reserve as at 31 December 2018.

Managing Director and CEO, Mr John Welborn was encouraged by the major increase of the Company's gold inventory at Ravenswood and the implications for larger scale production over a long mine life in an upgraded REP:

"One million additional ounces of gold in Ore Reserves at Ravenswood is an excellent outcome from our recent drilling programs and study work. Available gold resources at Ravenswood now exceed five million ounces



demonstrating its status as an outstanding Australian gold mine. With almost three million ounces of gold in Ore Reserves we are now directing our ongoing study work to focus on an optimised REP that can produce ~200,000 ounces annually over a 15-year mine life. The expanded gold inventory demonstrates that Ravenswood presents a unique opportunity for transformation into a large scale, low cost operation with an exceptionally long mine life that will deliver considerable economic benefits to the Ravenswood community, the Queensland Government and Resolute shareholders."

The updated Ravenswood Mineral Resources and Ore Reserves, as detailed in Table 1 and 2, are reported above a cut-off grade of 0.3g/t Au and have been estimated in accordance with the JORC Code 2012.

### **Mineral Resources**

The previously published Ravenswood Mineral Resource estimates comprised discreet models covering each of the main deposits (Buck Reef West, Sarsfield and Nolans). In order to examine opportunities to further expand future open pit operations and maximise fleet scheduling efficiencies, a new combined resource model which captures both the Buck Reef West and Sarsfield-Nolans areas was developed by MPR Geological Consultants Pty Ltd in April 2019.

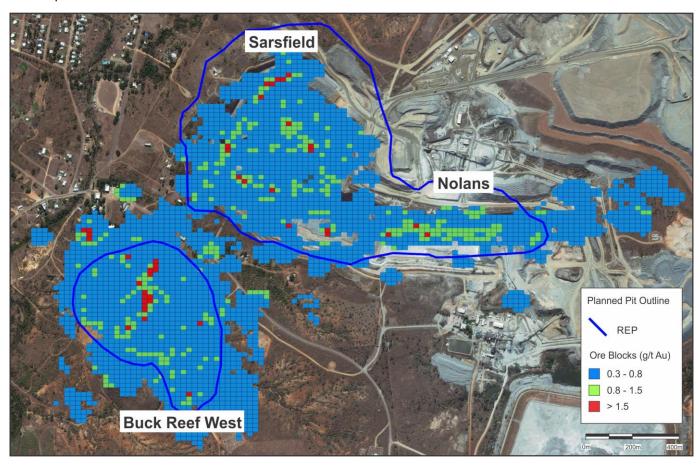


Figure 1: Buck Reef West, Sarsfield and Nolans pits with updated Mineral Resource block model

The Mineral Resource estimate includes recent drilling completed during 2019 and is based on sampling information within a database comprising 2,100 open hole, RC and diamond holes totalling 285,725 metres of drilling. The Mineral Resources are estimated using Multiple Indicator Kriging (MIK) with block support adjustment, a method that has been demonstrated to provide reliable estimates of recoverable open pit resources in gold deposits of diverse geological styles. Modelling of the Buck Reef West and Sarsfield-Nolans areas incorporates several mineralised domains outlining zones of varying mineralisation style and tenor.



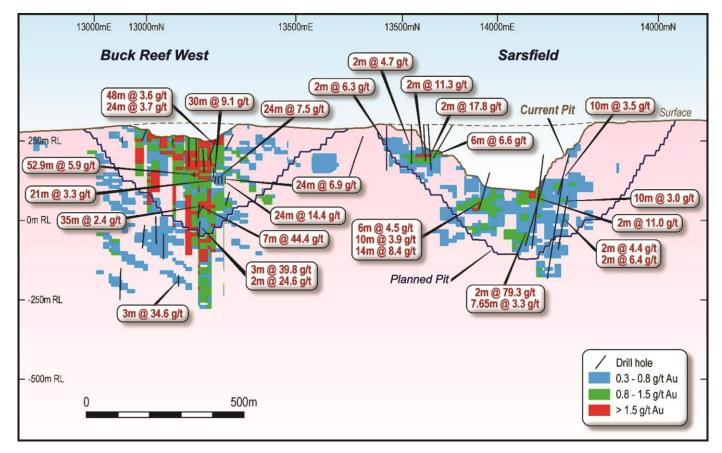


Figure 2: Cross Section through Buck Reef West and Sarsfield resource model and planned pits

The new combined Mineral Resource stands at 270Mt at 0.7g/t Au for 5.9Moz of gold. The classification and location of the new Mineral Resources are presented below in Table 1.

MINERAL RESOURCES	MEASURED			II	INDICATED		INFERRED			TOTAL RESOURCES		
An at 20 June 2040	Tonnes	Grade	Ounces	Tonnes	Grade	Ounces	Tonnes	Grade	Ounces	Tonnes	Grade	Ounces
As at 30 June 2019	(000s)	(g/t)	(000s)	(000s)	(g/t)	(000s)	(000s)	(g/t)	(000s)	(000s)	(g/t)	(000s)
Sarsfield/Nolans	50,960	0.8	1,230	52,520	0.6	1,060	39,400	0.6	810	142,870	0.7	3,100
Buck Reef West	25,480	0.9	710	29,630	0.8	720	36,950	0.6	730	92,060	0.7	2,160
Sarsfield Mineralised Waste	0	0.0	0	0	0.0	0	32,600	0.4	390	32,600	0.4	390
Open Pit Sub Total	76,430	0.8	1,940	82,150	0.7	1,780	108,950	0.6	1,930	267,530	0.7	5,650
Mt Wright	90	3.6	10	0	0.0	0	470	3.6	60	560	3.6	70
Welcome Breccia	0	0.0	0	0	0.0	0	2,040	3.2	210	2,040	3.2	210
Underground Sub Total	90	3.6	10	0	0.0	0	2,510	3.3	260	2,600	3.3	270
Total	76,520	0.8	1,950	82,150	0.7	1,780	111,460	0.6	2,200	270,120	0.7	5,920

**Table 1: Mineral Resources** 

Notes:

- 1. Mineral Resources include Ore Reserves. Differences may occur due to rounding.
- ${\it 2. Resources are reported above 0.3g/t cut-off for Sarsfield/Nolans and Buck \,Reef \,West.}$
- 3. Mt Wright Reserves and Resources are reported above 2.3g/t cut off.



### **Ore Reserves**

Mining studies, metallurgical test work and engineering studies undertaken during the first half of 2019 as part of the ongoing strategic review of the REP focused on optimisation and potential for increased throughput driving improved production and cost outputs.

The REP optimisation work has identified opportunities to expand annual mill throughput and gold production through developing and mining the Buck Reef West, Sarsfield and Nolans East orebodies via:

- Bulk, open-pit mining with large mobile fleet classes;
- Rejection of waste (beneficiation) from Sarsfield-Nolans ore prior to milling;
- Expanding milling capacity of the existing process plant, in two stages, from 2.8Mtpa to 5.0Mtpa and then to 7.1Mtpa;
- Extending and expanding the existing Nolans Tailings Storage Facility to store process tailings, including those currently stored in the Sarsfield open pit;
- Accessing the Sarsfield open pit through redeposition of in-pit tailings; and
- Low-cost owner-operated mining.

This work has formed the basis for an updated Ore Reserve estimate for Ravenswood. The new Ore Reserve stands at 115.4Mt at 0.7g/t Au for 2.7Moz of gold. The classification and location of the new Ore Reserves are presented in Table 2.

ORE RESERVES		PROVED		Р	ROBABLE			TOTAL	
A + 20 June 2040	Tonnes	Grade	Ounces	Tonnes	Grade	Ounces	Tonnes	Grade	Ounces
As at 30 June 2019	(000s)	(g/t)	(000s)	(000s)	(g/t)	(000s)	(000s)	(g/t)	(000s)
Sarsfield/Nolans	47,450	0.8	1,170	42,640	0.7	890	90,100	0.7	2,060
Buck Reef West	19,670	0.9	540	5,520	0.7	130	25,190	0.8	670
Open Pit Sub Total	67,120	0.8	1,710	48,170	0.7	1,020	115,290	0.7	2,730
Mt Wright	70	2.2	5	0		0	70	2.2	5
Underground Sub Total	70	2.2	5	0	0.0	0	70	2.2	5
Total	67,190	0.8	1,720	48,170	0.7	1,020	115,360	0.7	2,740

**Table 2: Ore Reserves** 

Notes:

- 1. Mineral Resources include Ore Reserves. Differences may occur due to rounding.
- 2. Reserves are reported above 0.3g/t cut-off for Sarsfield/Nolan and Buck Reef West.
- 3. Mt Wright Reserves and Resources are reported above 2.3 g/t cut off.
- 4. The Ravenswood Expansion Project assumed a gold price of US\$1,275/oz.

Resolute is evaluating the identified opportunities to increase mining and processing rates as the optimal development plan for the extremely large low-grade gold deposits at Ravenswood. The broad disseminated nature of the gold mineralisation at Ravenswood lends itself to non-selective bulk mining strategies which are in turn very low risk due to the robust resource models. The expected reduction in mining and processing costs associated with the proposed expansion has enabled a lower cut-off grade to be used and has significantly increased the gold inventory available for open pit mining.

A unique advantage of gold mineralisation at Ravenswood is that the gold content per tonne can be upgraded by beneficiation crushing and screening by size. The beneficiation of gold is related to preferential comminution and liberation which occurs due to the contrast of high strength barren host rock and soft, or brittle, gold bearing veins. The beneficiation results of low-grade crushed ore products conclude that approximately half of the rock can be rejected as waste, with approximately 5% loss of the contained gold. The beneficiation process targets the rejection of barren host rock at a nominal size of 50mm. As such, a run of mine (ROM) grade of 0.7g/t Au can result in a mill feed grade of 1g/t Au after beneficiation.



Open pit mine optimisation and design work conducted during 2019 resulted in final pit shells which encompass a much greater portion of the Ravenswood gold mineralisation than that included in the Ore Reserve Statement as at 31 December 2018 and the earlier REP studies. The overlay of pit designs with orebody block model is set out in Figure 1 above. The recoverable mine inventory has increased significantly with only a nominal decrease in average mined grade. The pit design was scheduled using Deswik software with the key criteria based on delivering a nominal 7Mtpa of post-beneficiated ore to the ROM.

## **Ravenswood Expansion Project Strategic Review**

The updated Ore Reserve and Mineral Resource for Ravenswood supports Resolute's ongoing strategic review and optimisation study work. As part of Resolute's preparation for the REP, the Company has undertaken various activities including funding and development of a new State School, drilling of previously underexplored areas between the Sarsfield and Buck Reef West pits, examination of enhanced crushing and milling strategies, and the redesign and re-optimisation of the open pits. In late 2018, the Company commissioned a new beneficiation circuit as part of the existing Nolans Processing Plant. This circuit has demonstrated, on a commercial scale, Resolute's ability to upgrade low grade ores via simple two-stage crushing and screening.

The Company is expecting to conclude the REP strategic review during calendar 2019 and will update the market with completed study work and decisions on capital commitments and project timing and funding immediately the review is concluded.

## **Competent Persons Statement**

The information in this announcement that relates to the Mineral Resource estimate is based on, and fairly represents, information and supporting documentation compiled by Mr Bruce Mowat, a Competent Person who is a Member of the Australian Institute of Geoscientists. Mr Mowat is a full-time employee of Resolute Corporate Services Pty Ltd, a wholly owned subsidiary of Resolute Mining Limited. Mr Mowat has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves". Mr Mowat consents to the inclusion in the report of the matters based on his information in the form and context in which they appear.

The information in this announcement that relates to the Ore Reserve estimate is based on, and fairly represents, information and supporting documentation prepared by Mr David Mackay, a Competent Person who is a Member of The Australasian Institute of Mining and Metallurgy. Mr Mackay is a full-time employee of Carpentaria Gold Pty Ltd, a wholly owned subsidiary of Resolute Mining Limited. Mr Mackay has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves". Mr Mackay consents to the inclusion in the report of the matters based on his information in the form and context in which they appear.

For further information, contact:

John Welborn Managing Director & CEO **Jeremy Meynert**General Manager – Business Development & Investor Relations

### **ASX/LSE: RSG Capital Summary**

Fully Paid Ordinary Shares: 758,094,588 Current Share Price: A\$1.74 as at 19 July 2019 Market Capitalisation: A\$1.32 billion FY19 Guidance (to 30 June): 300,000oz @ AISC US\$960/oz (A\$1,280/oz)

### **Board of Directors**

Mr Martin Botha Non-Executive Chairman
Mr John Welborn Managing Director & CEO
Ms Yasmin Broughton Non-Executive Director
Mr Mark Potts Non-Executive Director
Ms Sabina Shugg Non-Executive Director
Mr Peter Sullivan Non-Executive Director

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### **About Resolute**

Resolute is a successful, dividend paying gold miner with more than 30 years of experience as an explorer, developer and operator of gold mines in Australia and Africa which have produced more than 8 million ounces of gold.

Resolute currently owns three gold mines. Its flagship asset is the world class Syama Gold Mine in Mali (Syama) which can produce more than 300,000 ounces of gold per annum from existing processing infrastructure. Resolute is currently commissioning the world's first fully automated underground mine at Syama which will deliver a low cost, large scale operation with a mine life beyond 2032. Alongside Syama, Resolute owns the Ravenswood Gold Mine in Australia and the Bibiani Gold Mine in Ghana. Resolute has a pathway to annual gold production in excess of 500,000 ounces from a Global Mineral Resource base of more than 17 million ounces of gold.

### **Contact Information**

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# **Board of Directors**

300,000oz @ AISC US\$960/oz (A\$1,280/oz)

Mr Martin Botha Non-Executive Chairman Mr John Welborn Managing Director & CEO Ms Yasmin Broughton Non-Executive Director Mr Mark Potts Non-Executive Director Ms Sabina Shugg Non-Executive Director Mr Peter Sullivan Non-Executive Director

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**ASX/LSE: RSG Capital Summary** 

Fully Paid Ordinary Shares: 758,094,588

Market Capitalisation: A\$1.32 billion

**Current Share Price:** 

A\$1.74 as at 19 July 2019

FY19 Guidance (to 30 June):



# Ravenswood Gold Mine – Buck Reef West, Sarsfield and Nolans deposits JORC Code, 2012 Edition Table 1

CRITERIA	JORC CODE EXPLANATION	COMMENTARY
Sampling techniques	<ul> <li>Nature and quality of sampling (e.g. cut channels, random chips, or specific specialized industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling.</li> <li>Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.</li> <li>Aspects of the determination of mineralisation that are Material to the Public Report.</li> <li>In cases where 'industry standard' work has</li> </ul>	The mineral resource estimate was based on a combination of recent data (Carpentaria Gold 2003-2019) collected from reverse circulation (RC) and diamond core (DD) drill holes, and historic data (MIM Exploration 1980-1999) RC, DD, open hole percussion (OHP) and air core (AC) drill holes.  Historic DD holes that had AC, OHP or RC precollars were classified as air core diamond (ACD), open percussion diamond (OPD) or reverse circulation diamond (RCD) respectively.  For recent data each 1m RC interval was riffle split to obtain a 2-3.5 kg sample, which was sent to the laboratory for pulverisation to produce a 200g sub-sample for analysis.  Historical RC holes were sampled at either 1m or 2m intervals to obtain a sample whose weight was not recorded.  Recent diamond core were sampled at 1m intervals and cut in half to provide a 2-4kg sample which was sent to the laboratory for crushing to 10mm, splitting and pulverising to 85% passing 75 microns, to provide a 30g charge for analysis.  Historic diamond core was sampled at 1 or 2m intervals and halved and sent to the laboratory.  Historic OHP and AC cuttings were sampled at 1m or 2m riffle split intervals providing samples whose weight was not recorded.
	been done this would be relatively simple (e.g. 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information.	Sampling and sample preparation protocols for recent drilling are industry standard and are deemed appropriate for the mineralisation being analysed.  Historical sampling preparation protocols were deemed appropriate at the time.
Drilling techniques	<ul> <li>Drill type (e.g. core, reverse circulation, open- hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (e.g. core diameter, triple or standard tube, depth of diamond tails,</li> </ul>	HQ, NQ and some unspecified sizes.  Drill core for recent data is oriented at 30m down hole intervals using spear method. It is unknown what method was



CRITERIA	JOF	RC CODE EXPLANATION	COMMENTARY
		face-sampling bit or other type, whether core is oriented and if so, by what method, etc.).	used for historic data.
Drill sample recovery	•	Method of recording and assessing core and chip sample recoveries and results assessed.	Diamond core interval recoveries are measured by reconciling against driller's depth blocks in each core tray with data recorded in the database.
	•	Measures taken to maximise sample recovery and ensure representative nature of the	For some historical drilling programs recovery data has rarely been logged and recorded with the historical data. Recovery data is typically not recorded for RC, OHP and AC drilling.
	•	samples.  Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.	Drilling and sampling crews are informed of the importance of core recovery. Measures taken to maximise recovery include the selection of drilling methods and core sizes suited to the geology and mineralisation. Appropriate measures are taken to maximise sample recovery and ensure the representative nature of the samples. At the Buck Reef West deposit core recovery was reduced within areas of historic stoping. Areas of stoping have been identified in the drilling and sampling database and excluded from the resource volume estimate through the use of interpretative wireframes.  No apparent relationship was observed between recovery loss and gold grade for any of the recent drilling methods.
Logging	•	Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and	Geological logging is conducted in all recent and historic RC, AC, OHP and DD drill holes with observations recorded for colour, grainsize, lithology, minerals and alteration. RC drill holes are logged on 1m intervals and DD drill holes are logged on geologically domained intervals.  Historic RC, AC and OHP holes were logged to match the sampling interval of 1 or 2m.
	•	metallurgical studies.  Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc)	Geotechnical rock mass logging, structure orientation, recovery and magnetic susceptibility data are measured and recorded for diamond core intervals.
		photography.  The total length and percentage of the relevant	Diamond core is photographed (wet and dry) for recent data but few photographs exist for historic core; RC chips are occasionally photographed for recent data, RC, AC and OHP chips are not photographed for historic data.
		intersections logged.	Recent diamond core and RC chips are logged onto a laptop computer either at the drill site (RC) or the core shed (DD) using Excel templates. Data is validated prior to import to the drillhole database.
			Historic logging was completed on paper templates at the core shed or drill rig and occasionally entered into the computer database via an excel template.
			Holes are logged in their entirety (100%).
Sub-sampling techniques and sample preparation	•	If core, whether cut or sawn and whether quarter, half or all core taken.  If non-core, whether riffled, tube sampled, rotary	Each 1m RC interval is riffle split (dry) to obtain a 2-3.5 kg sample, which is sent to the laboratory for pulverisation.  A similar protocol was followed for historical RC, OHP and AC samples for either 1m or 2m intervals; however the



CRITERIA	JOF	RC CODE EXPLANATION	COMMENTARY
		split, etc. and whether sampled wet or dry.	sampling details are not recorded.
	•	For all sample types, the nature, quality and appropriateness of the sample preparation technique.	Diamond core has been sampled at 1m intervals and cut into half to provide a 2-4kg sample which is sent to the laboratory for oven drying, crushing to 10mm, splitting and pulverising to 85% passing 75 microns. An approximate 200g subsample is used for assay determination.
	•	Quality control procedures adopted for all sub- sampling stages to maximise representivity of	A similar protocol was followed for historical DD samples and core was cut and halved for sampling at either 1m or 2m intervals; however details of the sampling were not clearly recorded for induvial samples.
	•	samples.  Measures taken to ensure that the sampling is	Field duplicates (RC) for recent data are collected every 1:30 samples at the same time using the same method (riffle split) as the parent sample.
		representative of the in situ material collected, including for instance results for field	QC data is not available for the historical RC, AC or OHP type drilling.
		duplicate/second-half sampling.	Diamond core coarse duplicates were sampled and collected after crushing, by the laboratory, at a rate of 1:15 samples for recent drilling.
	•	Whether sample sizes are appropriate to the grain size of the material being sampled.	QC data is not available in the historical DD drilling records.
			Sampling, sample preparation and quality control protocols are considered appropriate for the material sampled.
Quality of assay data and laboratory	•	The nature, quality and appropriateness of the assaying and laboratory procedures used and	RC and DD samples are assayed for gold by ALS Global Townsville using method code Au-AA25 which uses a 30gram fire assay fusion with AAS instrument finish. The analytical method is appropriate for this style of mineralisation.
tests		whether the technique is considered partial or otal.	Methods for historic RC, AC, OHP and DD drilling included Au-AA25, FA50_Pb_AA, UN_UN and unknown methods for gold by ALS_TNV and a number of unspecified laboratories in the Townsville region.
	•	For geophysical tools, spectrometers, handheld XRF instruments, etc., the parameters used in	No geophysical tools were used to determine elemental concentrations used in resource estimations.
	determinin make and factors app	determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc. Nature of quality control procedures adopted	Quality control (QC) procedures for recent data include the use of certified standards (at a rate of 1:20 samples), certified blanks (1:20), non-certified coarse blanks (1:15), field duplicates (RC) (1:30) and coarse crush duplicates (DD) (1:15). QC samples are included in all dispatches to the laboratory and the results are routinely analysed for accuracy and precision.
		(e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.	Quality control (QC) procedures for historic RC, AC, OHP, and DD drilling are assumed to have been carried out to industry standard regarding QAQC procedures however the documentation is incomplete.
			Umpire pulp analysis of selected pulps is performed by a second external laboratory in Townsville for recent data
	'	producti nave been established.	There is no evidence of historic umpire sampling for any drill type.
			Laboratory quality control data, including laboratory standards, blanks, duplicates, repeats and grind size results are



CRITERIA	JORC CODE EXPLANATION	COMMENTARY
Verification of sampling and assaying	<ul> <li>The verification of significant intersections by either independent or alternative company personnel.</li> <li>The use of twinned holes.</li> <li>Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.</li> <li>Discuss any adjustment to assay data.</li> </ul>	also captured into the database and analysed for accuracy and precision for recent data.  Analysis of the available QC sample assay results indicates that an acceptable level of accuracy and precision has been achieved.  The level of accuracy and precision for historic data is unknown, but there was no reason not to assume industry standards were applied by MIM and Xstrata, the previous owners of the Ravenswood Project.  The verification of significant intersections has been completed by company personnel and the competent persons.  No drill holes within the resource were twinned.  Recent drill holes are logged digitally into Excel templates with lookup codes, validated and then compiled into relational SQL2008 database using DataShed data management software. The database is backed up on a daily basis to the head office server.  Historic drill holes were logged onto paper templates and partially transcribed onto an excel spreadsheet and logged into the database as described above. Some historic drill logs are only partially loaded onto the database with existing geotechnical and geological logs available as paper copies only.  Recent Assay files are reported by the laboratory in CSV format and are imported into the SQL database without adjustment or modification.  Historic assay files were reported by the laboratory in CSV, SIF, text, paper and unknown formats and either transcribed into appropriate electronic formats, or directly imported into the SQL database. It appears that no adjustment was made to the assay data.  There were no adjustments to assay data.
Location of data points	<ul> <li>Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.</li> <li>Specification of the grid system used.</li> <li>Quality and adequacy of topographic control.</li> </ul>	Collar coordinates for recent drill holes are picked up in UTM by contract and staff surveyors using Leica 1203 DGPS surveying instrument.  The survey pickup method has not been recorded in the database records for a large number of historic holes.  Down hole surveys are collected at 30m intervals using instruments including Gyro, Devi flex, single shot and multi shot.  Coordinates and azimuth are reported in UTM AMG84 Zone 55.  Coordinates are translated to local mine grid where required.
Data spacing and	Data spacing for reporting of Exploration	The drill hole spacing is sufficient to demonstrate geological and grade continuity appropriate for the Mineral Resource



CRITERIA	JORC CODE EXPLANATION	COMMENTARY
distribution	Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.      Whether sample compositing has been applied.	and the classifications applied under the 2012 JORC Code.  The drill spacing applied to each deposit is considered suitable for the style of mineralisation and mineral resource estimation requirements.  No sample compositing is applied during the sampling process.
Orientation of data in relation to geological structure	<ul> <li>Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.</li> <li>If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.</li> </ul>	Drill holes were drilled predominantly perpendicular to mineralised domains where possible.  No orientation based sampling bias has been identified in the data.
Sample security	The measures taken to ensure sample security.	The sample chain of custody is managed by Carpentaria Gold personnel. Both RC and diamond core samples are securely stored on site for logging and sampling procedures prior to being dispatched to the ALS Townsville laboratory for assay analysis Dispatch sheets are used to document sample numbers through the delivery process. ALS laboratories maintains a Webtrieve application to confirm and monitor samples and jobs within the laboratory process. It is assumed that appropriate security protocols were taken for historical drill hole samples to be despatched to the Laboratory.
Audits or reviews	The results of any audits or reviews of sampling techniques and data.	External audits of procedures indicate protocols are within industry standards for recent drilling.  No evidence of external reviews has been recorded for historical drilling data.



# **Section 2 Reporting of Exploration Results**

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	<ul> <li>Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.</li> <li>The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.</li> </ul>	Exploration activity is conducted within Queensland Government authorised tenure including exploration permits and mining leases which are held by Carpentaria Gold Pty Ltd.  Formal individual agreements are negotiated with the traditional landowners and property owners for each of the exploration prospects before carrying out exploration activities.  Exploration activities conducted within these leases are highly regulated and reports are routinely submitted to the Queensland government containing details of work conducted in the area and expenditure.
Exploration done by other parties	<ul> <li>Acknowledgment and appraisal of exploration by other parties.</li> </ul>	The Ravenswood area has a well documented and extensive history of mining and exploration. Gold was discovered in 1868 and alluvial and shallow oxidised quartz-sulphide veins were worked in the initial gold rush. Carpentaria Gold Pty Ltd has been exploring in the area since 1978.
Geology	Deposit type, geological setting and style of mineralisation.	Mineralisation occurs in variably orientated tabular sulphide – quartz veins and mineralised shear zones and in numerous vein stock works. Areas of weak veining separate the more strongly stock-worked areas into discrete zones. Individual veins can vary in width from hairline fractures up to one metre locally. Mineralisation extends from the topographic surface and has been confirmed to extend at depth in deep drilling. The mineralisation remains open at depth.  The Jessop Creek Tonalite, an Early to Middle Devonian age unit of the Ravenswood Batholith, hosts the mineralisation. In the project area the Jessop Creel Tonalite can be divided into diorite, quartz diorite and minor gabbro. Boundaries between these units vary from sharp to indistinct and often show complex relationships including stoping xenoliths and irregular dykes. No association between the host lithology and the gold mineralisation has been established other than it is a suitable competent host that allowed the cross cutting sulphide veins to develop.  The major commodity being investigated is gold.
Drill hole Information	<ul> <li>A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes:</li> <li>easting and northing of the drill hole collar</li> </ul>	No exploration results have been reported in this release.  Detailed drilling information that relates to the estimation of mineral resources and ore reserves has not been included in this release.  Drilling information that is used for the estimation of mineral resources includes the following:  1.Location data including Easting, Northing and RL of drill hole collars recorded in UTM AMG84 (Zone 55) co-



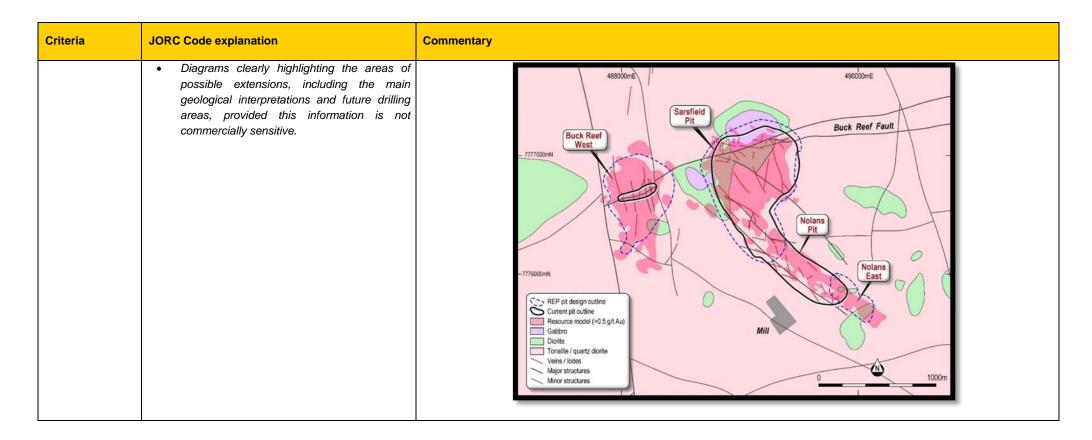
Criteria	JORC Code explanation	Commentary
	<ul> <li>elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar</li> <li>dip and azimuth of the hole</li> <li>down hole length and interception depth</li> <li>hole length.</li> <li>If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.</li> </ul>	<ul> <li>2.Drillhole dip is the inclination of the drill hole from horizontal. A drill hole at a dip of -60° is 60° below the horizontal.</li> <li>3.Down hole length is the distance down the inclination of the hole and is measured as the distance from the collar to the end of hole.</li> <li>4.Intercept depth is the distance from the start of the hole down the inclination of the hole to the depth of the zone of interest.</li> <li>The listing of the entire drill hole database used to estimate the mineral resource was not considered relevant for this release.</li> </ul>
Data aggregation methods	<ul> <li>In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.</li> <li>Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.</li> <li>The assumptions used for any reporting of metal equivalent values should be clearly stated.</li> </ul>	No top cuts are applied.  Lower cut-off grade applied was 0.4g/t. Maximum consecutive 4m of internal dilution within a reported interval was used. Minimum intercept length of 3m down hole.  Accuracy of the survey measurements is considered to meet acceptable industry standards.  Metal equivalent values are not used in reporting.
Relationship between mineralization widths and	<ul> <li>These relationships are particularly important in the reporting of Exploration Results.</li> <li>If the geometry of the mineralisation with</li> </ul>	are based on interpreted geology recorded in drilling logs.



Criteria	JORC Code explanation	Commentary
intercept lengths	respect to the drill hole angle is known, its nature should be reported.	Here they are provided, results are reported as down hole length.
	If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known').	
Diagrams	Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.	No exploration results have been reported in the release.
Balanced reporting	Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.	Significant intercepts of new drill holes have not been reported in this release.
Other substantive exploration data	Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.	Geophysical and geochemical data and any additional exploration information are reported regularly in annual exploration tenement government reports, and monthly, quarterly and annual Resolute reporting.
Further work	The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).	Further work is planned to evaluate exploration opportunities that extend the known mineralisation at the Buck Reef West and Sarsfield deposits to improve confidence of the model.



# Resolute ASX Announcement





# Resolute ASX Announcement

# **Section 3 Estimation and Reporting of Mineral Resources**

Criteria	JORC Code explanation	Commentary
Database integrity	<ul> <li>Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes.</li> </ul>	Data have been compiled into a relational SQL database. The setup of this database precludes the loading of data which do not meet the required validation protocols. The data is managed using Maxell Geoservices' DataShed <sup>TM</sup> drill hole management software using SQL database techniques. Validation checks are conducted using SQL and DataShed relational database standards. Data has also been checked against original hard copies for 75% of the data, and where possible, loaded from original data sources.
	Data validation procedures used.	Carpentaria Gold Pty Ltd carried out the following basic validation checks on the data supplied prior to resource estimation:
		Drill holes with overlapping sample intervals.
		Sample intervals with no assay data. Duplicate records.
		Assay grade ranges.
		Collar coordinates ranges.
		Valid hole orientation data.
		There are no significant issues with the data.
Site visits	Comment on any site visits undertaken by the	The Competent Persons have conducted numerous site visits to the Ravenswood Project Qld.
	Competent Person and the outcome of those visits.	All aspects of drilling, sampling and mining are considered by the Competent Persons to be of a high industry standard.
	<ul> <li>If no site visits have been undertaken indicate why this is the case.</li> </ul>	
Geological interpretation	<ul> <li>Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.</li> </ul>	Buck Reef West / Sarsfield-Nolans Deposit lies within the northern part of the Thomson fold belt which forms part of the Charters Towers province, in a tight cluster of calc-alkaline intrusives of Ordovician to Devonian age known as the Ravenswood Batholiths. Individual intrusive compositions vary from adamellite to diorite: - granite and granodiorite are the
	<ul> <li>Nature of the data used and of any assumptions made.</li> </ul>	most common. The Buck Reef West / Sarsfield gold deposit is located within and around the junction of three prominent fault systems.
	The effect, if any, of alternative interpretations on Mineral Resource estimation.	At each deposit weathered zone persists to an average of 15 metres below surface. Supergene effects are restricted to a discontinuous horizon within a partially oxidised zone less than 5 metres thick.
	The use of geology in guiding and controlling	At least 95% of gold is located within a network of flatly dipping sulphide-quartz veins. Movement on the faults has controlled dilation within the veins, and at least 17 different structural movements and alteration events have reactivated



Criteria	JORC Code explanation	Commentary
	Mineral Resource estimation.  The factors affecting continuity both of grade and geology.	the vein. Veins (20mm to 250mm thick) are typically associated with a phyllic alteration selvedge up to 500mm wide. Vein mineralogy is sulphide dominant with quartz and calcite constituting the major gangue phases. Total sulphide content of the ore is less than 5% with the most common phases being pyrite, pyrrhotite, sphalerite and chalcopyrite. Gold occurs as mostly sub 50 micron free milling grains on fractures and sulphide mineral boundaries.
		Historic production figures from 1870 to 1918 and then 1987 to 2005 indicate approximately 400 koz of gold was recovered from underground mining methods.
		Geologically, the Buck Reef West and Sarsfield-Nolans resource modelling was divided into several domains based on geological structures/ lithologies and gold distribution.
		The Buck Reef West domain interpretation comprises a broad, moderately dipping envelope with a locally developed higher grade footwall zone which is cross cut y two sub-vertical north-northeast trending, commonly higher grade zones. They are named; Background, Main envelope – lower grade zone, Main envelope – higher grade footwall zone, Eastern vertical zone and Western vertical zone.
		The Sarsfield–Nolans area mineralised domains comprise a main moderately northerly dipping envelope representing the general Sarsfield-Nolans trend, and several variably oriented and cross-cutting zones in the Sarsfield area. They are named; East background, Main envelope, Bell zone, Keel zone, Buck Reef trend and West background.
Dimensions	The extent and variability of the Mineral Resource expressed as length (along strike or otherwise), plan width, and depth below surface to the upper and lower limits of the Mineral Resource.	The Sarsfield deposit outcrop over a 900 by 900 metre area with mineral resources defined to a depth of approximately 650 metres below pre-mining land surface. The Nolans deposit extends in an eastward direction from the Sarsfield deposit for 1.7 kilometres with mineral resources estimated to a depth of 330 metres below pre-mining land surface. The Buck Reef deposit is centred 500 metres south west of Sarsfield deposit and outcrops over an area of 500 by 800 with mineral resources defined to a depth of approximately 600 metres.
Estimation and modelling techniques	The nature and appropriateness of the estimation technique(s) applied and key assumptions, including treatment of extreme grade values, domaining, interpolation parameters and maximum distance of extrapolation from data points. If a computer assisted estimation method was chosen	MPR used the method of Multiple Indicator Kriging (MIK) with block support adjustment to estimate gold resources into blocks with dimensions of 25m (east) by 20m (north) by 10m (elevation). MIK of gold grades used indicator variography based on either the two metre (Buck Reef) or five metre (Sarsfield and Nolans) resource composite sample grades. Gold grade continuity was characterised by indicator variograms at 14 indicator thresholds spanning the global range of grades. A block support adjustment was used to estimate the recoverable gold resources at each deposit. The shape of the local block gold grade distribution has been assumed lognormal and an additional adjustment for the "Information Effect" has been applied to arrive at the final Mineral Resource estimates.
	<ul> <li>include a description of computer software and parameters used.</li> <li>The availability of check estimates, previous estimates and/or mine production records and</li> </ul>	MIK was used as the preferred method for estimation of gold resources at Ravenswood as the approach has been demonstrated to work well in a large number of deposits of diverse geological styles. The gold mineralisation seen at the Ravenswood deposits is typical of that seen in most structurally controlled gold deposits where the MIK method has been



Criteria	JORC Code explanation	Commentary
	whether the Mineral Resource estimate takes appropriate account of such data.  The assumptions made regarding recovery of	found to be of most benefit.  Data viewing, compositing and wire-framing were performed using MicromineTM software. Exploratory data analysis, variogram calculation and modelling, and resource estimation have been performed using FSSI Consultant (Australia) Pty
	by-products.	Ltd GS3MTM software. GS3MTM is designed specifically for estimation of recoverable resources using MIK methodology.  Open pit and underground mining has occurred at Buck Reef West and Sarsfield by previous owners of the project. Where
	non-grade variables of economic significance (e.g. sulphur for acid mine drainage	appropriate the resource estimate takes into account historic production using wireframes that represent the open cut pit and the underground stoping voids.
	characterization).	Gold is the only economic metal estimated in the current model with no by-products or deleterious elements modelled.
	<ul> <li>In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.</li> </ul>	The selected resource model blocks had dimensions of 25mE by 20mN by 10mRL and were used as this approximates the average drill spacing in the modelled resource areas. Initially a three pass (Sarsfield-Nolans) or four pass (Buck Reef West) octant search strategy was used to define the local neighbourhood data used in the kriging to produce confidence
	Any assumptions behind modelling of selective mining units.	categories. The highest confidence blocks at Buck Reef West are estimated using search radii of 40mE by 40mN by 10mRL and a minimum of 16 data coming from a minimum of 4 octants. For Sarsfield-Nolans the highest confidence blocks are estimated using search radii of 40 mE by 30 mN by 20 mRL and a minimum of 16 data coming from a minimum
	Any assumptions about correlation between variables.	of 4 octants. The second and third pass for both estimates used an expanded search of 50% with 16 and 8 minimum data and 4 and 2 minimum octants, respectively. The final pass for Buck Reef West used an expanded search of 100% (from the first pass) with 8 minimum data from a minimum of 2 octants. All estimation passes use a maximum of 48 data.
	Description of how the geological interpretation was used to control the resource estimates.	
	<ul> <li>Discussion of basis for using or not using grade cutting or capping.</li> </ul>	For Buck Reef West, confidence categories were assigned to model panels by estimation search pass and an additional set of east-west sectional polygons outlining areas of closer spaced drilling. The search pass 1 blocks outside these polygons were downgraded to Indicated. For the Sarsfield-Nolans area, confidence categories were assigned directly from search passes.
	The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.	Mineralised domain wire-frames were used to flag resource composites and code domain proportions to the block model. A further division of the model domains into oxide and fresh rock is applied by triangulated surfaces interpreted from the logging of the drill samples.
		All class grades were determined from bin mean grades with the exception of the upper bins, which were reviewed on a case by case basis and bin grades selected from the bin mean, or median. This approach was adopted to reduce the impact of a small number of outlier composites and is considered appropriated for MIK modelling of highly variable mineralisation such as Greater Sarsfield.
		The gold resource estimates include a variance adjustment to give estimates of recoverable resources above gold cut-off grades for selective mining (SMU) dimensions of 5 mE by 5 mN by 5 mRL. The variance adjustments were estimated from



Criteria	JORC Code explanation	Commentary
		the gold grade variogram models and were applied using the direct lognormal method and the adjustment factor.  Visual validation of grade trends and gold distributions was carried out.
Moisture	<ul> <li>Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.</li> </ul>	All tonnages are estimated on a dry basis.
Cut-off parameters	<ul> <li>The basis of the adopted cut-off grade(s) or quality parameters applied.</li> </ul>	The Mineral Resource has been reported at a 0.3 g/t Au grade cut-off for Buck Reef West and Sarsfield-Nolans deposits. This cut off was chosen as the insitu marginal cut- grade estimation, using current Ravenswood economic parameters applicable for open cut mining methods.
Mining factors or assumptions	<ul> <li>Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the</li> </ul>	Mining methods for the extraction of gold at Buck Reef West and Sarsfield-Nolans has primarily been by open pit and underground methods. It is anticipated that large scale open pit mining methods will be applied for the remaining resources. Grade control of mining blocks will be based on sampling from high quality reverse circulation drilling spaced at approximately 5mE by 12.5mN with samples taken at 1.5 metre intervals down-hole.
	process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and	The Buck Reef West and Sarsfield pits were mined historically using routine open pit mining methods with a backhoe type excavator to excavate benches. Beneath the open cut, open stope underground mining methods were used historically dating back to 1870.
	parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.	Historically, (1870-1918) + recent (1987-2005) production, totaled around 400koz of high grade gold.
Metallurgical	The basis for assumptions or predictions  The basis for assumptions or predictions	The crushing circuit at the Nolans Plant treating Buck Reef West and Sarsfield-Nolans ore will use either two or three stage
factors or assumptions	regarding metallurgical amenability. It is always necessary as part of the process of determining reasonable prospects for eventual	crushing depending on the gold grade of the material being delivered.  Gold is recovered using crushing, milling (SAG + ball), gravity circuit (Knelson Concentrator), and a CIL circuit.
	economic extraction to consider potential metallurgical methods, but the assumptions	Gold is recovered from loaded carbon in a four tonne capacity AARL elution plant. Gold is then deposited on to stainless steel cathodes in an electrolytic circuit.
	regarding metallurgical treatment processes and parameters made when reporting Mineral	Gold will be poured into dore bars, containing approximately 80% gold and 20% silver.
	Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the metallurgical	The dore bars are sent to the Perth Mint for refining.



Criteria	JORC Code explanation	Commentary
	assumptions made.	
Environmental factors or assumptions	and process residue disposal options. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider the potential environmental impacts of the mining and processing operation. While at this stage the determination of potential environmental impacts, particularly for a greenfield project, may not always be well advanced, the status	The Buck Reef West and Sarsfield-Nolans deposits at Ravenswood are adjacent to the Nolans plant site. Ore from the Mt Wright underground mine is also trucked to the plant for extraction and refining of gold. The tailings from this mineral processing are discharged into the Sarsfield Open Pit. These tailings are potentially acid forming and subaqueous settlement beneath a pit lake (water cover) prevents the oxidation of the stored tailings. Future processing operations may utilise a dry stacked tailings storage facility which combines a waste landform with filtered tailings in a lined facility and subsequently covered by mine waste material.
		Carpentaria Gold Pty Ltd (CG) originally initiated the Environmental Approval process required to reopen the Sarsfield pit in July 2011. A draft Environmental Impact Statement (EIS) was submitted in July 2012 and then progressed through the submission process until being suspended pending further design changes. A revised EIS was submitted in March 2014 and then progressed through the EIS completion phase with the Department of the Environment and Heritage Protection (DEHP) issuing an EIS Assessment Report in June 2014.
	Where these aspects have not been considered this should be reported with an	The Sarsfield Expansion Project EIS Assessment Report concluded that the project would be suitable, provided CG thoroughly addressed certain outstanding matters which principally related to:
	explanation of the environmental assumptions made.	- impacts to human health and safety and social well-being in the Ravenswood community
	made.	- impacts to groundwater and surface water
		- the ability of the proposal to comply with appropriate environmental outcomes.
		Following review of the feedback from the DEHP, a number of key changes were made to the Sarsfield Expansion Project to address some of the key issues raised in the EIS Assessment Report. These key changes include:
		<ul> <li>A modification of the proposed tailings management system which now includes a Dry Stack Tailings Storage Facility (DSTSF) within and adjacent to the existing Nolans Pit;</li> </ul>
		<ul> <li>A change to the project footprint area due to a reduction in the Waste Rock Dump (WRD) footprint and location of the DSTSF (reduced in volume due to dry stacking), in an area of existing land disturbance; and</li> </ul>
		<ul> <li>A plan to manage accumulated legacy water in the Sarsfield Pit using a Reverse Osmosis (RO) Plant, instead of evaporative fans as originally proposed.</li> </ul>
		Some waste rock from future mining of a cut-back at Buck Reef West / Sarsfield may be potentially-acid forming while the majority of waste rock will be non-acid forming. Waste rock dumping has been scheduled, along with encapsulation designs and optimization determined to minimize the risk of acid forming conditions from the waste rock dumping landform.



Criteria	JORC Code explanation	Commentary
		The rehabilitation plan of that landform is also a key control.
		Tailings generated from the overall life of mining from a Buck Reef West / Sarsfield cutback would not have a net acid forming potential and will be placed in the regulated dry storage facility over the Nolans pit.
Bulk density	<ul> <li>Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.</li> <li>The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc), moisture and differences between rock and alteration zones within the deposit.</li> <li>Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.</li> </ul>	A substantial population of rock density (SG) measurements for the Buck Reef West / Sarsfield-Nolans deposits were collected by BPB Slimline Services in 2 campaigns during 1995-1996. Gamma-gamma density logging was collected from a total of 14 drill holes with samples taken at 10cm intervals over a combined total length of 2,900 metres.  A total of 2,551 readings were made of fresh rock from which an average value of 2.781 was calculated.  • Minimum Value 2.365  • Maximum Value 3.002  • Average Value 2.781  • Median Value 2.78  • Std. Deviation 0.05019  A typical dry bulk density of 2.78 t/bcm has been used for fresh material and 2.40 t/bcm for oxidised material
Classification	<ul> <li>The basis for the classification of the Mineral Resources into varying confidence categories.</li> <li>Whether appropriate account has been taken of all relevant factors (i.e. relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).</li> <li>Whether the result appropriately reflects the Competent Person's view of the deposit.</li> </ul>	The Resource model uses primarily a classification scheme producing a resource code based on the number and location of gold composites used to estimate proportions and gold grade of each block. This is based on the principle that larger numbers of composites, which are more evenly distributed within the search neighbourhood, will provide a more reliable estimate.  The strategy adopted in the current study uses category 1 and 2 from the 3 pass octant search strategy as Measured and Indicated, respectively, and category 3 as Inferred. This results in a geologically sensible classification whereby Category 1 and 2 are surrounded by data in close proximity. Category 3 blocks may occur on the peripheries of drilling but are still related to drilling data within reasonable distances.  The Mineral Resource classification method which is described above has also been based on the quality of the data collected (geology, survey and assaying data), the density of data, the confidence in the geological models and mineralisation model, and the grade estimation quality.  The reported Mineral Resource estimate is consistent with the Competent Person's view of the deposits.
Audits or	The results of any audits or reviews of Mineral	No external audits or independent reviews have been undertaken on the current Mineral Resource estimates. As this deposit was mined previously by Resolute Mining Limited from 2004 to 2009 significant internal experience can be drawn



Criteria	JORC Code explanation	Commentary
reviews	Resource estimates.	on.
Discussion of relative accuracy/ confidence	<ul> <li>Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.</li> <li>The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.</li> <li>These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.</li> </ul>	The relative accuracy of the Mineral Resource estimate is reflected in the reporting of Measured, Indicated and Inferred categories as defined by 2012 JORC Code guidelines.  The resource's relative accuracy is based on data quality, data quantity, geological confidence and the estimation accuracy.  The precision of the estimation is globally acceptable with the assumption that at a mining level more detailed grade control drilling and sampling will be undertaken.  In the Competent person's view the geostatistical techniques applied to estimate the Buck Reef West and Sarsfield-Nolans deposits are deemed appropriate for the anticipated large scale, open cut mining method proposed.

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# **Section 4 Estimation and Reporting of Ore Reserves**

Criteria	JORC Code explanation	Commentary
Mineral Resource estimate for conversion to Ore Reserves	<ul> <li>Description of the Mineral Resource estimate used as a basis for the conversion to an Ore Reserve.</li> <li>Clear statement as to whether the Mineral Resources are reported additional to, or inclusive of, the Ore Reserves.</li> </ul>	Resources and Reserves at Buck Reef West and Sarsfield-Nolans are reported above a 0.3 g/t cut-off. This was calculated as a marginal cut off utilising open pit mining methods. Material below this cut-off is not included in the mineral resource.  Ore Reserves are the material reported as a sub-set of the resource, that which can be extracted from the mine and processed with an economically acceptable outcome.  Mineral Resources are reported inclusive of Ore Reserves.
Site visits	<ul> <li>Comment on any site visits undertaken by the Competent Person and the outcome of those visits.</li> <li>If no site visits have been undertaken indicate why this is the case.</li> </ul>	The Competent Person for the Ore Reserves at Buck Reef West and Sarsfield-Nolans, Mr. David Mackay, is a full-time employee of Carpentaria Gold Pty Ltd, which is the wholly-owned subsidiary of Resolute that operates the Ravenswood Gold Mine. Mr Mackay has been responsible for the open pit mine planning processes at Ravenswood Operations since commencement of operations at Nolans East in 2016, and has been closely involved with site operations since this time.
Study status	<ul> <li>The type and level of study undertaken to enable Mineral Resources to be converted to Ore Reserves.</li> <li>The Code requires that a study to at least Pre-Feasibility Study level has been undertaken to convert Mineral Resources to Ore Reserves. Such studies will have been carried out and will have determined a mine plan that is technically achievable and economically viable, and that material Modifying Factors have been considered.</li> </ul>	Pit optimisations were completed by an independent consultant using the Vulcan Optimiser software to calculate the optimal pit at specified input parameters that were determined prior to the study.  A wireframe pit shell for each gold price considered was the resultant output. One of these was selected as the base for the new pit design.  An operational pit design was completed and mine scheduling conducted as part of the Feasibility process. A recent strategic review of the Feasibility Study has improved some of the operating parameters. The pit optimisations, designs and mine schedules were updated as part of the strategic review, which resulted in higher production rates and corresponding lower processing costs and cut-off grades. These results have recently been incorporated into the Company's Life of Mine planning process for the Buck Reef West, Sarsfield and Nolans projects.
Cut-off parameters	The basis of the cut-off grade(s) or quality parameters applied.	Cut-off grades for the mine design were calculated using recent budget cost models, including owner-mining cost estimates and actual cost data. Processing recovery and other factors were determined from actual process plant performance combined with relevant historic data. The mine design was completed using the output from the Vulcan optimisation
Mining factors or assumptions	The method and assumptions used as reported in the Pre-Feasibility or Feasibility Study to convert the Mineral Resource to an Ore Reserve (i.e. either by application of appropriate factors by	The open pit mine design is based on normal sequential bench mining methods. The orebody comprises quartz veins and some disseminated mineralisation hosted within a granodiorite batholith. Mining incorporates a single access ramp into the pit, 10m bench height mined in multiple flitches.  Only Measured and Indicated ore has been used to generate the Ore Reserve.



Criteria	JORC Code explanation	Commentary
	optimization or by preliminary or detailed design).  • The choice, nature and appropriateness of the	A minimum mining width of 30m has been applied. Ramp widths are set at 30m (double lane – 180 t rear dump truck), with narrower single lane ramps (16m wide) for the bottom 40m of the pit design.
	selected mining method(s) and other mining parameters including associated design issues such as pre-strip, access, etc.	Mining dilution and recovery are addressed in the model method (MIK) and the utilisation of flitch mining.  There are currently no Inferred Resources included in the Ore Reserves.
	<ul> <li>The assumptions made regarding geotechnical parameters (e.g. pit slopes, stope sizes, etc.), grade control and pre-production drilling.</li> </ul>	At Buck Reef West, grade control will be based on sampling from high quality reverse circulation drilling at spacing appropriate to the mineralised structures under investigation and historic mining voids. Grade control drill orientation will be adjusted at Buck Reef West to accommodate the changing orientation of mineralisation structures where required.
	The major assumptions made and Mineral Resource model used for pit and stope	Existing geotechnical parameters, used in previous mining and validated through external consultant studies as part of the Feasibility have been applied which include:
	optimization (if appropriate).	Oxide – Single 10m bench height with a batter face angle of 60° and berm width of 8m.
	The mining dilution factors used.	Fresh - Double stacked 10m high benches (20m overall height) with a batter face angle of 80° and 7m berm
	The mining recovery factors used.	width.
	Any minimum mining widths used.	Inferred resources were considered in the strategic review; however a smaller pit shell and design that is not impacted by Inferred Resources was selected for reporting of Ore Reserves.
	<ul> <li>The manner in which Inferred Mineral Resources are utilized in mining studies and the sensitivity of the outcome to their inclusion.</li> </ul>	For Buck Reef West additional infrastructure will be required as part of the mining process. The existing Ravenswood State School will be impacted by mining and a new school is currently under construction. Existing powerlines, and a section of the public access road plan will need to be relocated to an area outside of the pit limits. Capital expenditure has been
	<ul> <li>The infrastructure requirements of the selected mining methods.</li> </ul>	allowed for this in the financial modelling. Additional noise bunding and waste rock dump construction has been allowed for, and locations planned on the existing tenements. All other infrastructure is in place.
Metallurgical factors or assumptions	<ul> <li>The metallurgical process proposed and the appropriateness of that process to the style of mineralization.</li> <li>Whether the metallurgical process is well-tested technology or novel in nature.</li> </ul>	Gold is recovered using crushing, milling (SAG + ball), gravity circuit and a conventional CIL circuit. The recent Strategic Review incorporated the use of High Pressure Grinding Rolls (HGPR) to reduce the nominal particle size fed to the milling circuit, thus increasing the nominal plant throughput from 5.0 Mtpa to 6.8 Mtpa. A series of laboratory tests were completed to confirm the ability of the HPGR to perform as expected and to develop valid comminution models. The HPGR is well-tested technology that is utilised at a number of similar operations.
	The nature, amount and representativeness of metallurgical test work undertaken, the nature of the metallurgical domaining applied and the corresponding metallurgical recovery factors	The metallurgical process is well established technology and the processing plant has been operating in its current configuration for several years with no significant changes to the circuit anticipated. The increased throughput rates will be supported by additional infrastructure (such as leach tanks) to maintain residence time and gold recovery rates.  No deleterious elements have been experienced to date and are not expected.



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	<ul> <li>Any assumptions or allowances made for deleterious elements.</li> <li>The existence of any bulk sample or pilot scale test work and the degree to which such samples are considered representative of the ore body as a whole.</li> <li>For minerals that are defined by a specification, has the ore reserve estimation been based on the appropriate mineralogy to meet the specifications?</li> </ul>	A crushing and screening beneficiation circuit will be introduced as part of the processing circuit to reduce the mass of ore reaching the milling circuit and to elevate the feed grade. Test work and pilot scale trials conducted in the Nolan's plant have indicated that beneficiation can be achieved at appropriate size fractions with minimal loss of gold.  The crushing and screening process to be used for Sarsfield low grade ores has been proven at Ravenswood in 2004 - 2009 and on other mine sites.  The beneficiation study conducted on Sarsfield material was a large scale operation where some 16kt of ROM feed was subjected to testing. This degree of test work provided further confidence to earlier laboratory scale testwork. Adding to the confidence level was a parcel of 27,000 tonnes of Nolans ore treated in 1998 that supported the economic improvements through the use of beneficiation.  No bulk samples were deemed necessary due to the current successful metallurgical performance of the extraction methods applied.
Environmental	The status of studies of potential environmental impacts of the mining and processing operation. Details of waste rock characterization and the consideration of potential sites, status of design options considered and, where applicable, the status of approvals for process residue storage and waste dumps should be reported.	The Ravenswood Project is in the mature phase of its operating life. Its environmental management is permitted by an Environmental Authority and supported by an Environmental Management Plan  An Environmental Authority Amendment for the open pit mining operations at Buck Reef West, Sarsfield and Nolans has been issued by the Queensland State Government.  An EA Amendment Application has been lodged to permit expansion of the existing Nolans Tailings Storage Facility (NTSF), which will proved cost-effective tailings management and improve the long term environmental outcomes of the existing facility. There have not been any significant impediments to the approval of the EA Amendment identified to date and approval of the expanded NTSF is considered low risk to the project.  Processing of the tailings will comprise thickening and filtering to provide a residue or filter cake which can be dry stacked.
Infrastructure	The existence of appropriate infrastructure:	The tailings will be placed with conventional earth moving equipment to shape the final landform and gradient with surface compaction completed with smooth drum rollers.  The waste rock formations have a very low permeability and the mine is a net user of water for operational purposes. An acid base accounting study was conducted on the Buck Reef West / Sarsfield open pit mine's ore and waste, determining the waste to be non-acid forming and the ore to be potentially acid forming.  The site is currently serviced by mains power, a water supply line from the Burdekin River and accessed by sealed roads.
	availability of land for plant development, power, water, transportation (particularly for bulk commodities), labour, accommodation; or the ease with which the infrastructure can be provided, or	Water is pumped from the Burdekin River approximately 18km southwest of Ravenswood to a local storage (Suhrs Creek Dam). From here, raw water is pumped to the processing plant, Mt Wright, the golf course, and the water treatment plant. Carpentaria Gold operates the water treatment plant on behalf of the Charters Towers Regional Council (CTRC) and



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	accessed.	supplies potable water to the Ravenswood township as well as the Buck Reef West and Sarsfield sites.
		There are two mains power feeds available in the event that one becomes unserviceable.
		The site is located approximately 120km from Townsville and 90km from Charters Towers. Camp style accommodation is available to all employees in Ravenswood. Some employees live in Ravenswood.
		Being close to major centres, one of which with an International Airport ensures easy and quick supply of parts and materials.
		Carpentaria Gold has received all the Mining Leases required for the open pit mining operations. An application to incorporate surface rights on existing Mining Lease has been lodged to support the associated NTSF expansion required for the project. This application process is running in parallel with the Environmental Authority Amendment Application.
Costs	<ul> <li>The derivation of, or assumptions made, regarding projected capital costs in the study.</li> <li>The methodology used to estimate operating costs.</li> </ul>	The operating history of the mine has validated the capital requirements. Projected capital costs are made up of forecast capital spend for the known capital expenditure requirements. The capital estimate is determined by the needs of the site as required to continue to produce in a safe and efficient manner and comply with all environmental requirements.
	<ul> <li>The methodology used to estimate operating costs.</li> <li>Allowances made for the content of deleterious elements.</li> </ul>	Operating costs have been calculated from first principles using both fixed and variable components. Recent operating history and performance against budget costs has validated the cost assumptions. The mining cost model has been independently reviewed and benchmarked, with recommendations applied as appropriate.
	The derivation of assumptions made of metal or commodity price(s), for the principal minerals and co-products.	Assumed gold prices have been derived by reference to recent AUD spot gold prices.  All revenue and cost estimates have been made in AUD.
	The source of exchange rates used in the study.	Transportation charges have been derived from existing contractual arrangements.
	Derivation of transportation charges.	Refining charges have been derived from existing contractual arrangements.
	The basis for forecasting or source of treatment and refining charges, penalties for failure to meet specification, etc.	Current Queensland Government royalties equal to 5% of sales proceeds are included in the cost model. There are no other royalties or Joint Venture agreements.
	The allowances made for royalties payable, both Government and private.	
Revenue factors	The derivation of, or assumptions made regarding revenue factors including head grade, metal or commodity price(s) exchange rates, transportation	It has been assumed that gold will be sold at the prevailing spot gold price. All revenue and cost estimates have been made in AUD. Transportation charges have been derived from existing contractual arrangements. Refining charges have been derived from existing contractual arrangements.

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	<ul> <li>and treatment charges, penalties, net smelter returns, etc.</li> <li>The derivation of assumptions made of metal or commodity price(s), for the principal metals, minerals and co-products.</li> </ul>	Assumed gold prices have been derived by reference to recent AUD spot gold prices.
Market assessment	The demand, supply and stock situation for the particular commodity, consumption trends and factors likely to affect supply and demand into the future.	There is a transparent quoted market for the sale of gold.
	<ul> <li>A customer and competitor analysis along with the identification of likely market windows for the product.</li> </ul>	
	Price and volume forecasts and the basis for these forecasts.	
	<ul> <li>For industrial minerals the customer specification, testing and acceptance requirements prior to a supply contract.</li> </ul>	
Economic	The inputs to the economic analysis to produce the net present value (NPV) in the study, the source and confidence of these economic inputs including estimated inflation, discount rate, etc.	A variety of gold price points and discount rates were used to assess the robustness of the project, likely payback periods, the breakeven point and the projected internal rate of return. In the estimate, a discount rate of 8% was used and a gold price of A\$1,750 per oz.
	<ul> <li>NPV ranges and sensitivity to variations in the significant assumptions and inputs.</li> </ul>	
Social	The status of agreements with key stakeholders and matters leading to social license to operate.	The Carpentaria Gold personnel maintain a good relationship with neighbouring stakeholders, including engagement with the local pastoralists. Part of the tenure held by the Company is located on leasehold pastoral land with compensation agreements in place with the local pastoralist. Granted mining leases cover all of the proposed mining and processing assets and there are no Native title claims pending.
Other	To the extent relevant, the impact of the following on the project and/or on the estimation and	Events such as cyclones and fires present a risk, although due to risk mitigants, these naturally occurring risks, have not impacted the estimation or classification of the Ore Reserves.



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	classification of the Ore Reserves:  Any identified material naturally occurring risks.  The status of material legal agreements and marketing arrangements.  The status of governmental agreements and approvals critical to the viability of the project, such as mineral tenement status, and government and statutory approvals. There must be reasonable grounds to expect that all necessary Government approvals will be received within the timeframes anticipated in the Pre-Feasibility or Feasibility study. Highlight and discuss the materiality of any unresolved matter that is dependent on a third party on which extraction of the reserve is contingent.	The climate in Ravenswood is typical of northern Australia with "wet" and "dry" seasons. The wet season is aligned with the hotter months of December through to March. The dry season typically starts around April and runs through to November, when the humidity starts to build prior to the wet season.  Queensland is said to be a seismically active area (intraplate activity), but is relatively inactive compared to other parts of Australia or plate margin regions (interplate activity) of the world such as New Zealand, Indonesia, California, Japan, or Chile. The Burdekin region has been identified as a seismic source zone (Matthews et al, 2011). Australian Standard 1170.4-2007 (Structural design actions Part 4: Earthquake actions in Australia) shows the area has an elevated earthquake hazard factor compared to most of Australia, although not as high as the major concentration points in other parts of the world. There have been in excess of 50 events ranging from M <sub>L</sub> 0.5 to 5.7 in the Bowen region since 1900 (Matthews et al, 2011).  The mining leases are in good standing and are all part of the suite of leases held by Carpentaria Gold and host a combination of both current activities and infrastructure, and historic workings.  Carpentaria Gold are working collaboratively with the Queensland Government to achieve an amended Environmental Authority for the updated Ravenswood Expansion Project.  Carpentaria Gold have submitted a Development Application for construction of additional noise bunds adjacent the proposed BRW pit. Approval of this application is outstanding at present, but not considered as a significant risk to the project.  Carpentaria Gold also owns a number of freehold land parcels in Ravenswood that includes company housing and blocks purchased adjacent to the Sarsfield open pit.
Classification	The basis for the classification of the Ore Reserves	company complies with modern environmental conditions.  Only Measured Resources are converted to Proved Reserves
CiassincauOii	<ul> <li>into varying confidence categories.</li> <li>Whether the result appropriately reflects the Competent Person's view of the deposit.</li> <li>The proportion of Probable Ore Reserves that have been derived from Measured Mineral Resources (if any).</li> </ul>	Only Indicated Resources are converted to Probable Reserves  Inferred Resources are not included in the Ore Reserves  The Resource to Reserve conversions were deemed appropriate for the Ore Reserve estimates by the Competent Person.
Audits or	The results of any audits or reviews of Ore	No external audits of resources / reserves were undertaken. Due to the success and maturity of the processes applied, the



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reviews	Reserve estimates.	company has deemed this unnecessary. However, periodic reviews of the mining methods have been undertaken and reported as very successful.
Discussion of relative accuracy/ confidence	<ul> <li>Where appropriate a statement of the relative accuracy and confidence level in the Ore Reserve estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the reserve within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors which could affect the relative accuracy and confidence of the estimate.</li> <li>The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.</li> <li>Accuracy and confidence discussions should extend to specific discussions of any applied Modifying Factors that may have a material impact on Ore Reserve viability, or for which there are remaining areas of uncertainty at the current study stage.</li> <li>It is recognized that this may not be possible or appropriate in all circumstances. These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.</li> </ul>	Recent historic operational performance against the mine plan for tonnage produced and production head grade, indicate the assumptions used to generate the Ore Reserves, are valid.  There has been over the life of the Sarsfield Project, strong mine to mill reconciliations. The updated Ore Reserves, are the same mineralisation being mined with similar sized mining equipment being used.  The same mining and grade control methods will be applied and the ore will continue to be processed through the existing facility, with the addition of some additional infrastructure in the process plant.  Assuming all QA/QC standards are applied in the drilling, mining and processing, then it is reasonable to expect similar levels of resource recovery experienced in previous years of mining 2004 to 2009.  All the parameters assumed and adopted along with financial modelling and analysis have been subject to internal peer review.