



## NOVA MINERAL RESOURCE ESTIMATE AND EXPLORATION UPDATE

Independence Group NL (IGO or the Company) (ASX: IGO) is reporting an interim Mineral Resource estimate for the Nova Operation, based on improved geological understanding and results of close spaced diamond core 'grade control' drilling on the Nova deposit. Also included in this ASX release are encouraging exploration results from outside the Mineral Resource at Bollinger.

### HIGHLIGHTS

- Completion of 90,858m of grade control diamond drilling has significantly de-risked the Nova deposit. No grade control diamond drilling for the Bollinger area was available for inclusion in this Mineral Resource update.
- The Nova grade control drilling data has been incorporated into an updated Mineral Resource estimate, which has a total JORC Code estimate of:
  - 11.4Mt grading 2.4% Ni, 1.0% Cu and 0.08% Co, which is equivalent to *in situ* metal estimates of 271,000 tonnes of nickel, 113,000 tonnes of copper and 9,000 tonnes of cobalt.
- Measured Mineral Resource estimates are reported for the first time for Nova-Bollinger with 46% of the total estimate, which covers most of the Nova deposit, now in this highest confidence JORC Code category.
- In comparison to the Mineral Resource estimate that was reported in October 2016, the updated Mineral Resource estimate has  $\approx$  15% lower total tonnage with marginally higher nickel and copper grades.
- A substantial part of the 15% tonnage difference between current and prior estimates, occurs outside the current mine plan.
- Early trends on mine reconciliation suggests the updated Mineral Resource estimate may be conservative under-calling tonnage by  $\approx$  2%, and nickel and copper grades by  $\approx$  6% and  $\approx$  11%, respectively.
- Although this remains a work in progress, IGO has adopted this Mineral Resource update as the current best basis for providing FY18 production guidance and for an interim update of Ore Reserve estimates which will follow when available.
- Mineral Resource extensional drilling at Bollinger has returned positive drill intersections approximately 35m outside the limit of the current estimate including 6.9m grading @ 3.52% Ni (NBU0977). This area will be included in the future Mineral Resource update. Resource extensional drilling is ongoing.

IGO's Managing Director, Peter Bradford commented: *"The geometry of the Nova-Bollinger orebodies has put IGO in the unique position of being able to de-risk our geological understanding and future mine plans by completing all grade control drilling during the first full year of production.*

*"This acceleration of our understanding would normally happen over an extended period of time with the benefit of a longer history of resource to mill reconciliations and would normally be offset or supplemented by resource extension work.*

*"We are in the very early stages of understanding Nova. The fact that a large part of the difference in the Mineral Resource lies outside the current mine plan is positive, as is the positive tonnage and grade*

reconciliation. We are also encouraged by the potential for near mine extensions, including the positive results being observed outside the resource model to the south of Bollinger.

“An Ore Reserve estimate is currently being prepared and will be released to the market once available. In parallel grade control drilling is continuing and is expected to be completed by the end of 2017. This will inform an update to the Mineral Resource and Ore Reserve in the second half of FY18.”

## Mineral Resource Estimate

Depleted for mining to 30 June 2017, the Nova-Bollinger deposit has a total Mineral Resource estimate of **11.4Mt grading 2.4% Ni, 1.0% Cu and 0.08% Co** – refer to Table 1. This total estimate equates to *in situ* metal tonnage estimates of  $\approx 271,000\text{t}$  of nickel,  $\approx 113,000\text{t}$  of copper, and  $\approx 9,000\text{t}$  of cobalt.

**Table 1: Nova-Bollinger Mineral Resource Estimate (30 June 2017)**

Deposit Area	JOR Code Classification	Tonnage	Estimated Grades				Estimated In Situ Metal			
		Mt	Ni (%)	Cu (%)	Co (%)	NiEq (%)	Ni (kt)	Cu (kt)	Co (kt)	NiEq (kt)
Nova	Measured	5.20	2.63	1.10	0.08	2.69	136.9	57.1	4.3	139.8
	Indicated	2.39	2.47	1.02	0.08	2.52	59.1	24.4	1.8	60.3
	Inferred	0.7	1.5	0.8	0.05	1.6	10	5	0.4	11
	Subtotal	8.2	2.5	1.0	0.08	2.6	206	87	7.0	211
Bollinger	Measured	-	-	-	-	-	-	-	-	-
	Indicated	2.10	2.54	1.02	0.10	2.58	53.3	21.4	2.1	54.1
	Inferred	1.1	1.1	0.5	0.05	1.2	12	5	0.5	12
	Subtotal	3.2	2.1	0.8	0.08	2.1	65	26	3.0	66
<b>Total</b>		<b>11.4</b>	<b>2.4</b>	<b>1.0</b>	<b>0.1</b>	<b>2.4</b>	<b>271</b>	<b>113</b>	<b>9</b>	<b>277</b>

Notes:

- The estimate is based on grade control drilling, drilling from surface and other data available for modelling with effective drill close-off 16 Mar 2017.
- The estimate is depleted for surveyed and estimated mining volumes to 30 June 2017.
- The Mineral Resource is reported using a  $\geq 0.6\%$  NiEq block cut-off grade – refer to Appendix A for details.
- Inferred Mineral Resources are reported with lower precision to reflect the greater uncertainty in this JORC Code class.
- Approximately 7% of the total Inferred Mineral Resources can be considered extrapolated away from data.
- The totals may not sum or weight average due to the different rounding applied to the Inferred Mineral Resources.
- The Mineral Resource is inclusive of the Ore Reserve
- The Bollinger estimate includes C5 domain, which occurs above and connects to the main Bollinger mineralisation. The Mineral Resource for C5 includes;
  - Indicated Mineral Resource estimate of 0.23Mt grading 0.94%Ni, 0.54% Cu and 0.04% Co.
  - Inferred Mineral Resource estimate of 0.6Mt grading 0.8%Ni, 0.4% Cu and 0.04%Co.
  - Total Mineral Resource estimate of 0.8Mt grading 0.8%Ni, 0.4%Cu and 0.04%Co.
- Refer to Appendix A for details of the basis of the nickel equivalent (NiEq) service variable and JORC Code Table 1

Measured Mineral Resource estimates are reported for the first time for Nova-Bollinger with 46% of the estimate (by tonnage) now in this highest confidence JORC Code category. The total Measured and Indicated Resources now make up 85% of the total estimate, with the Measured Resources wholly within the Nova area of the deposit where close-spaced infill (12.5m by 12.5m) grade control drilling and multiple level ore developments have been completed.

The updated geological domaining developed for Nova, based on recent additional data and detailed geological knowledge gained from close space infill drilling and mine mapping, has been adopted for the

geological re-interpretation of Bollinger to provide an improved interim model update for this portion of the deposit.

### Grade control drilling

To fully de-risk the mine planning over the entire life-of-mine, IGO has made a significant investment in a diamond core infill drill-out of the Nova area on a 12.5m pierce-point grid spacing. Total costs expected to be \$20M. The aim is to complete similar grade control drilling over the Bollinger area by the end of 2017, which will result in the confidence in both deposit areas being upgraded to dominantly Measured Mineral Resources.

The 2017 Mineral Resource estimate is based on 150.1km of drilling at Nova and 42.6km of drilling at Bollinger, representing increases of 127% and 18% respectively in additional drill hole information compared to the data available for the prior publicly reported estimate – refer to Table 2. The close-spaced grade control drilling at Nova is now complete. There is an  $\approx$  50km of close-spaced grade control drilling to complete on the Bollinger deposit.

**Table 2: Nova-Bollinger Comparative Drill Hole Statistics**

Deposit	Drilling Type	Prior Mineral Resource		2017 Mineral Resource Update	
		Drill holes (number)	Length (km)	Drill holes (number)	Length (km)
Nova	Surface DD	163	63.1	163	63.1
	Surface RC	15	2.9	15	2.9
	Underground DD	-	-	599	84.1
	<i>Nova Total</i>	<i>178</i>	<i>66.0</i>	<i>777</i>	<i>150.1</i>
Bollinger	Surface DD	72	35.9	72	35.9
	Surface RC	-	-	-	-
	Underground DD	-	-	53	6.7
	<i>Bollinger Total</i>	<i>72</i>	<i>35.9</i>	<i>125</i>	<i>42.6</i>
<b>Total</b>		<b>250</b>	<b>101.9</b>	<b>902</b>	<b>192.7</b>

Notes:

1. DD = Diamond drilling and RC = Reverse circulation drilling.
2. Surface drilling is collared on a grid spacing ranging from 25m x 25m to 50m x 50m.
3. Underground DD is drilled as fans targeting a nominal 12.5m x 12.5m pierce point spacing in the zone of mineralisation.
4. Bollinger drilling includes drilling targeting the C5 conductor target.

### Comparison to Previous Mineral Resource

The prior Mineral Resource estimate for the Nova Project reported at 30 June 2016 was 14.3Mt grading 2.3%Ni, 0.9% Cu and 0.08% Co. However, this prior estimate was reported using a nickel equivalent (NiEq) calculation that has different recovery and commodity prices assumptions than applied to the current 2017 Mineral Resource update (refer ASX Release 2016 Mineral Resource and Ore Reserves Update dated 14 October 2016). The current NiEq calculation is detailed in Appendix A of this release.

After applying the same NiEq assumptions, a comparison between the updated (2017) Mineral Resource estimates and the prior Mineral Resource estimate, reveals a reduction of  $\approx$  2 Mt grading 2.2%Ni and 0.8%Cu, resulting in a difference in contained metal of 43kt Ni and 15kt Cu – refer to Table 3. The *in situ* relative differences between the two estimates are 15% less tonnage, 13% less nickel metal and 12% less copper metal.

**Table 3: Comparison of Prior and Current Estimates – Nova-Bollinger**

Estimate	Deposit	Tonnes (Mt)	Estimated Grade		Contained Metal	
			Ni (%)	Cu (%)	Ni (kt)	Cu (kt)
Prior	Nova	9.5	2.5	1.0	236	97
	Bollinger	3.9	2.0	0.8	78	31
	Subtotal	13.4	2.4	1.0	314	128
2017	Nova	8.2	2.5	1.0	206	87
	Bollinger	3.2	2.1	0.8	65	26
	Subtotal	11.4	2.4	1.0	271	113
Ratio	Nova	87%	100%	103%	87%	89%
	Bollinger	81%	104%	103%	84%	83%
	Total	85%	101%	103%	86%	88%

## Notes:

1. Current Resource is the Mineral Resource Estimate effective 30 June 2017
2. Estimated depletion for mining is through to the 30 June 2016
3. Reported for a  $\geq 0.6\%$  NiEq block cut-off grade as per 2017 assumptions for the calculation of NiEq

The key observations and interpretations of Table 3 are that:

- The tonnage reductions in the current estimates occurs in both the high and low-grade portions of the 2017 estimate, as the current and prior estimates have similar average nickel and copper grades.
- Given no grade control infill drilling has been completed at Bollinger, the overall 19% reduction in tonnage at Bollinger is solely a function of the revised geological interpretation.
- The overall 13% reduction in tonnage in the Nova area at  $\geq 0.6\%$  NiEq cut-off is a result of the additional information from infill drilling and the revised geological interpretation.

An updated Ore Reserve estimation is currently in preparation. However, to give an indication of the potential effects, the analysis in Table 4 has been prepared to assess the differences in 'within current stope' Mineral Resources for the prior and updated estimates.

**Table 4: Comparison of Prior and Current Resource Estimates – Within Stopes**

Estimate	Deposit	Tonnes (Mt)	Estimated Grade		Contained Metal	
			Ni (%)	Cu (%)	Ni (kt)	Cu (kt)
Prior	Nova	7.5	2.5	1.0	185	97
	Bollinger	2.2	2.5	1.0	56	31
	Subtotal	9.7	2.5	1.0	240	128
2017	Nova	6.8	2.5	1.0	168	87
	Bollinger	2.4	1.9	0.8	46	26
	Subtotal	9.2	2.3	1.0	215	113
Ratio	Nova	91%	101%	102%	91%	89%
	Bollinger	108%	77%	79%	83%	83%
	Total	95%	94%	96%	89%	88%

## Notes:

1. The Mineral Resource has been constrained and reported within the current stope shapes
2. Stope shape plans are based on the prior Mineral Resource estimate.
3. No mining depletion.
4. Reported for a zero-cut-off grade for all material within the stope volumes.
5. Does not include any mine development outside the stope plans.
6. Results presented for comparative purposes and results do not imply and Ore Reserve estimate.

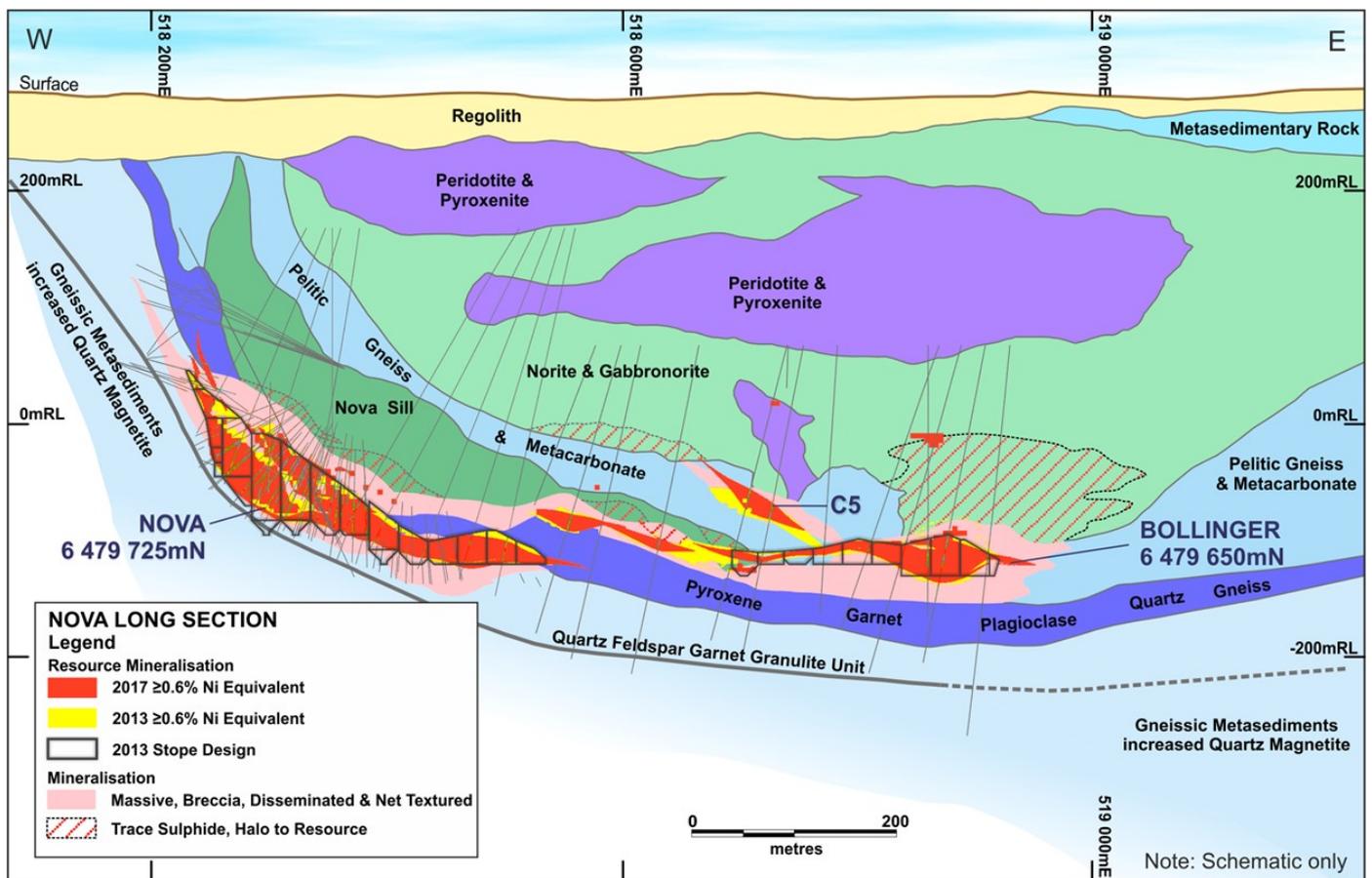
The key observations from Table 4 are as follows:

- The 2Mt difference of Mineral Resources between the prior and updated Mineral Resource estimates, translates to only a 0.5Mt reduction in stope tonnage, which represents a 5% relative reduction.
- The grade has decreased by 6% and 4% for nickel and copper respectively within the stope designs.

It is important to note that the analysis above is for stoping volumes only and does not include Mineral Resources that will be recovered from mine development.

Figure 1 shows a schematic long section through the Nova-Bollinger deposit that illustrates the changes between the prior and updated Mineral Resources with respect to the geology, drill hole information and stope shapes – refer to the figure notes for more details.

**Figure 1: Schematic Long Section of the Nova-Bollinger – Looking North**



Notes:

1. Section is looking north nominally on 6,479,725 mN through Nova and 6,479,650 mN through Bollinger.
2. The grey lines represent surface and underground drilling within 12.5m of each section window.
3. The red and yellow shaded areas represent the limits of current and prior estimates using the same cut-off grade.
4. Overall the updated model is more conservative on tonnage but the greatest tonnage differences appear to be outside planned stoping areas.

### Mine Reconciliation

A mine reconciliation study has been prepared to compare the updated Mineral Resource within the volume mined and surveyed to 30 June 2017 with the process plant tonnages and head grades. This reconciliation reveals that, for the  $\approx$  440kt processed to date, the reconciliation factors (process/mined  $\times$  100) are:



- Tonnage : 102%
- Nickel grade : 106%
- Copper grade : 111%

These positive reconciliation factors indicate that the updated Mineral Resource may be understating the actual tonnage processed by  $\approx 2\%$ , and understating nickel and copper head grades by  $\approx 6\%$  and  $\approx 11\%$  respectively.

The conclusion from the above is that the updated Mineral Resource may be conservative in forecasting tonnage and particularly grade. However, given the relatively small total tonnage processed, and the fact that June 2017 has been the only month of processing from large stopes in Nova main, these first-pass reconciliation factors are considered indicative only. Several more months of production and reconciliation is required to confirm any persistence of these early reconciliation trends before the results can be considered actionable.

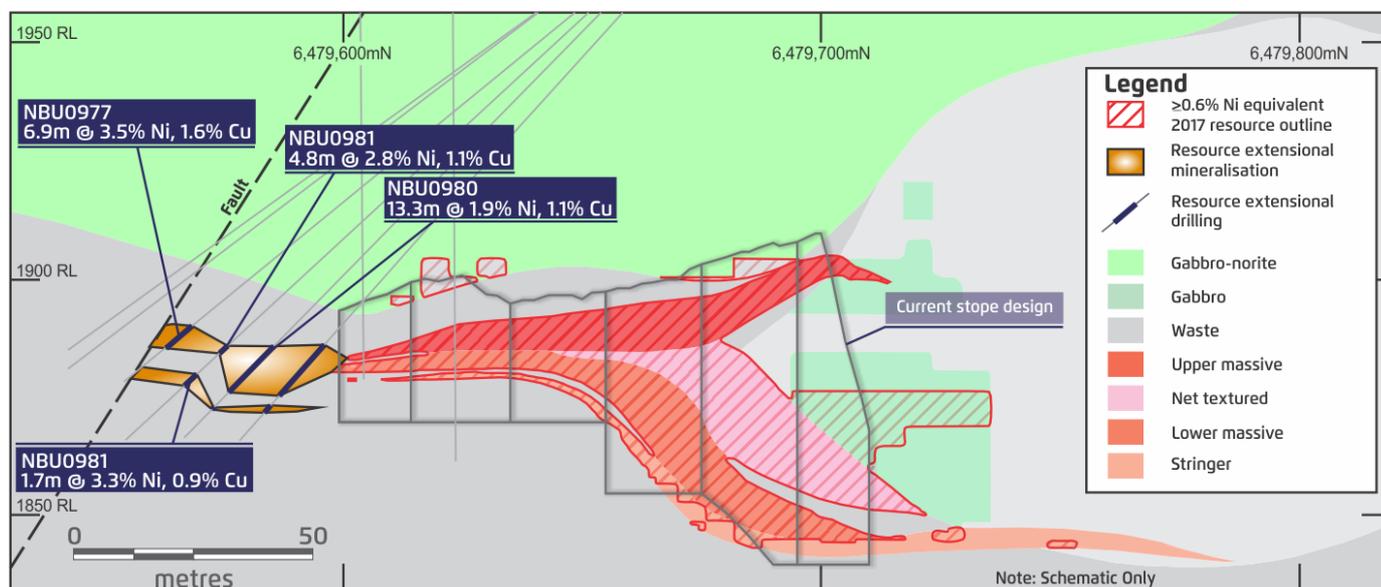
## Resource Extension Drilling

Encouraging drilling results have been returned from underground resource extensional drilling in the south west portion of Bollinger. To date, a total of 30 holes for 5,240m have been completed, with many holes intersecting massive and brecciated sulphides at locations up to 35m away from the outer limits of the updated Mineral Resource estimate. Most assay results from this drilling are pending, but Table 5 is a listing of the more noteworthy results from the available data, and Figure 2 is a schematic section depicting the geometry of these results relative to the current Bollinger stope shapes and Mineral Resource domain outlines. The extension of Bollinger will be incorporated into the next Mineral Resource update.

**Table 5: Significant drill intercepts from outside the Mineral Resource at Bollinger**

Drill Hole Name	From (m)	Length (m)	Ni (%)	Cu (%)	Co (%)
NBU0977	156.1	6.9	3.52	1.57	0.14
	49	1.5	1.12	0.37	0.04
NBU0980	91.6	2.8	5.18	0.55	0.20
	157	13.3	1.85	1.05	0.08
NBU0981	151.2	4.8	2.81	1.11	0.11
	160.3	1.7	3.25	0.87	0.14
NBU0982	169	1.5	1.40	0.07	0.06

**Figure 2: Example section from Bollinger (518900mE) looking west showing recent drill intersections returned outside the current Mineral Resource**



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## JORC Code (2012) Competent Persons' Statements

The information in this report that relates to the Nova-Bollinger Exploration is based on and fairly represents information and supporting documentation compiled by Mr David Hammond. Mr Hammond is a full-time employee and security holder of the Company and member of The Australasian Institute of Mining and Metallurgy and member of Australian Institute of Geoscientists. Mr Hammond has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which they have undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves' (JORC 2012).

The information in this report that relates to the Nova-Bollinger Mineral Resources is based on and fairly represents information and supporting documentation compiled by Mr Mark Drabble. Mr Drabble is a Principal Consultant with Optiro Pty. Ltd., member of The Australasian Institute of Mining and Metallurgy and member of Australian Institute of Geoscientists. Mr Drabble has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which they have undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves' (JORC 2012).

Mr Hammond and Mr Drabble consents to the inclusion in the report of the matters based on their information in the form and context in which it appears.



## Forward Looking Statements

*This announcement contains forward-looking statements regarding future events, conditions and circumstances including but not limited to statements regarding plans, strategies and objectives of management, anticipated timelines and expected costs. Often, but not always, forward-looking statements can be identified by the use of forward-looking words such as "may", "will", "expect", "intend", "plan", "estimate", "anticipate", "continue" and "guidance", or other similar words.*

*These forward-looking statements are not a guarantee of future performance and involve unknown risks and uncertainties, many of which are beyond IGO's control, which may cause actual results and developments to differ materially from those expressed or implied. These risks include but are not limited to economic conditions, stock market fluctuations, commodity demand and price movements, access to infrastructure, timing of approvals, regulatory risks, operational risks, reliance on key personnel, reserve and resource estimations, native title and title risks, foreign currency fluctuations, exploration risk and mining development, construction and commissioning risk.*

*Forward-looking statements in this announcement apply only at the date of issue. Subject to any continuing obligations under applicable law or regulations, IGO does not undertake to publicly update or revise any of the forward-looking statements in this announcement or to advise of any change in events, conditions or circumstances on which any such statement is based. Readers are cautioned not to place undue reliance on any forward-looking statements contained in this announcement.*

## APPENDIX A – NOVA MINERAL RESOURCE AND EXPLANATORY NOTES (EFFECTIVE 30 JUNE 2017)

### Mineral Resource Estimate

Using all geoscientific data available as at 16 March 2017, Optiro consultants have estimated that the Nova-Bollinger deposit contains total Mineral Resources of **11.4Mt grading 2.4% Ni, 1.0% Cu and 0.08% Co**. This estimate equates to *in situ* metal tonnages of  $\approx 271,000\text{t}$  of nickel,  $\approx 113,000\text{t}$  of copper, and  $\approx 9,000\text{t}$  of cobalt. Table 6 is a listing of the tonnages, grades and *in situ* metal estimates by deposit area and JORC Code classification.

**Table 6: Nova-Bollinger Mineral Resource Estimate (30 June 2017)**

Estimate	JORC Code Class	Tonnes (Mt)	Estimate Grades			Estimated <i>In situ</i> Metal		
			Ni (%)	Cu (%)	Co (%)	Ni (kt)	Cu (kt)	Co (kt)
Nova	Measured	5.2	2.63	1.10	0.08	136.9	57.1	4.3
	Indicated	2.4	2.47	1.02	0.08	59.1	24.4	1.8
	Inferred	0.7	1.5	0.8	0.05	10	5	0.4
	Subtotal	8.2	2.5	1.0	0.08	206	87	7.0
Bollinger	Measured	-	-	-	-	-	-	-
	Indicated	2.1	2.54	1.02	0.10	53.3	21.4	2.1
	Inferred	1.1	1.1	0.5	0.05	12	5	0.5
	Subtotal	3.2	2.1	0.8	0.08	65	26	3.0
<b>Total</b>		<b>11.4</b>	<b>2.4</b>	<b>1.0</b>	<b>0.08</b>	<b>271</b>	<b>113</b>	<b>9.0</b>

Notes:

1. The estimate is based on drill hole data and other data available for modelling as at 16 Mar 2017.
2. The estimate is reported from the digital block model using a  $\geq 0.6\%$  NiEq block cut-off grade – refer to discussion below.
3. The estimate is depleted for surveyed and estimated mining volumes to 30 June 2017.
4. Inferred Mineral Resources are reported with lower precision to reflect the greater uncertainty in this JORC Code class.
5. Project totals may not sum or weight average due to the rounding to the Inferred Mineral Resource precision.
6. Approximately 7% of the total Inferred Mineral Resources can be considered extrapolated away from data.
7. The Bollinger estimate includes C5 domain, which occurs above and connects to the main Bollinger mineralisation. The Mineral Resource for C5 includes:
  - a. Indicated Mineral Resource estimate of 0.23Mt grading 0.94%Ni, 0.54% Cu and 0.04% Cu.
  - b. Inferred Mineral Resource estimate of 0.6Mt grading 0.8%Ni, 0.4% Cu and 0.04%Co
  - c. Total Mineral Resource of estimate 0.8Mt grading 0.80%Ni, 0.42%Cu and 0.04%Co.
8. The Mineral Resource is inclusive of Ore Reserves

This Mineral Resource estimate update is reported using a digital block model cut-off grade of  $\geq 0.6\%$  NiEq, where the variable nickel equivalent (NiEq) is a function of:

- The Nova Optimisation Study's forecast metallurgical recoveries for nickel and copper metal (88% and 89% respectively – refer to IGO's ASX release on 14 Dec 2015), and
- Recovered copper values scaled to be equivalent to nickel according the ratio of IGO's currently accepted forecasts for the long-term metal prices of copper and nickel (16,420 US\$/t for nickel, and 6,240 US\$/t for copper).

As such, the process-recovered value of copper is calculated to be  $\approx 33.4\%$  of the value of the same mass of process-recovered nickel according to the following equation:

- $NiEq\% = Ni\% \times 0.88 + \left( Cu\% \times 0.89 \times \frac{6,240USD/t}{16,420USD/t} \right) \cong 0.88 \times Ni\% + 0.334 \times Cu\%$

The geological interpretations from the close-spaced drilling and mining of Nova, have been applied to the geological re-interpretation of Bollinger to provide an improved Mineral Resource estimate. Another update of the Nova-Bollinger Mineral Resource will occur following completion of infill drilling programmes targeting the south-east corner of the Nova deposit, and the entire Bollinger deposit. These programmes are well underway and grade control drilling is scheduled for completion by year end 2017.

## Geology and Geological Interpretation

The Nova-Bollinger deposit is located within the south-central Mesoproterozoic age (1.0 Ga to 1.6 Ga) Fraser Zone of the east Albany-Fraser Orogen in Western Australia. The Nova-Bollinger Ni-Cu-Co mineralisation is hosted in and around a series of layered (gabbro to norite) intrusive chonoliths, which are flattened pipe-like bodies trending from east to west in the mine area. These chonoliths are interpreted to have intruded the nose of a local synformal fold that formed during the deformation of the deposit's host sequence. The sequence, intrusive chonoliths, and mineralisation has subsequently been transformed to rocks characteristic of granulite-grade metamorphism, during the Albany-Fraser orogenic event.

Locally, the sulphide mineralisation occurs as four styles within and around the chonolith hosts including:

- Massive sulphide-breccia zones,
- Net-texture zones having a characteristic 'fish-net' like texture of connected disseminated sulphides in a mafic groundmass,
- Stringers of massive sulphides (likely remobilised) into the layering of the footwall metasediments, and
- 'Halo' mineralisation of patchy to disseminated mineralisation within the gabbroic chonoliths.

The norite layers generally host the massive sulphide rich zones, which are identified as the Upper and Lower Breccia in the geological interpretation. The gabbro found between the breccia zones tends to host the lower average grade Net-texture mineralisation style. The Stringer style mineralisation is only found within the footwall metasediments.

The closed-spaced grade control drilling and underground mapping from Nova confirms that the overall mineralisation envelope has a local pinch-and-swell geometry but on a broader scale the mineralisation is generally continuous at thickness amenable to bulk mechanised mining. Geological interpretations from 3D image scans of the underground development have been used to refine and confirm the geological boundaries interpreted from the drilling below.

## Drilling Techniques

The Nova drill hole database for the 2017 estimate includes all holes used for the prior estimate (163 diamond core drill holes totalling 63,099m, and 15 reverse circulation holes totalling 2,910m, and 599 new underground diamond holes totalling 84,105m. The new diamond core holes have been collared from underground sites to intersect the mineralisation on a nominal 12.5m by 12.5m grid spacing. Refer to the JORC Code Table 1 appended to this release for full details regarding drill hole diameters.

The Bollinger database for the 2017 estimate includes 72 surface-collared diamond core drill holes (totalling 35,935 m) that intersect the Bollinger mineralisation on nominal grid spacings that range from 25m by 25m to 50m by 50m. Like the surface-collared holes at Nova, the Bollinger surface-collar holes are drilled towards grid west at angles ranging from -60° to -90° from horizontal to intersect the mineralised zones at a high angle. The Bollinger drill hole database also includes 53 new underground holes (totalling 6,752m) that intersect the C5 zone, which is stratigraphically above, and in part connected to Bollinger. The C5 underground drilling consists of fans drilled from the mine hangingwall and footwall developments.



The average diamond drilling core recoveries for both surface-collared and underground drill holes exceeds 99%. All surface-collared drill hole paths have been surveyed using high speed gyroscopic survey tools. Underground drill hole paths have been surveyed with Reflex ACT III equipment, and by Deviflex deviation equipment fitted with Azimuth Aligner tools.

## Sampling and Sub-sampling techniques

IGO's geologists have used the geological boundaries logged in the Nova-Bollinger core as the basis for down hole sampling intervals with diamond core sample lengths ranging from 0.2m to 1.0m. All sampled core has been cut with a wet diamond blade into half-core sub samples (if NQ2 in diameter) or quarter-core (if HQ in diameter) to prepare a laboratory sample submission mass of  $\approx$  3kg.

From the reverse circulation drilling, cuttings were collected over 1 m down hole intervals, which were subsequently split using a static cone or riffle splitter to prepare a  $\approx$  3kg sub-sample for laboratory submission.

IGO's Sampling quality assurance procedures included insertion of quality control samples (certified reference materials, blanks and duplicates) into each batch of routine samples despatched to the laboratory. The quality control insertion frequency averaged 1:15, but more frequent insertions of quality control samples were applied in mineralised zones.

The laboratory sample preparation of diamond core included oven drying for a minimum of 4 to 6 hours at 95°C, then coarse crushing to a <10 mm top size, followed by pulverisation of the entire crushed sample to a particle size distribution of 85% passing 75 microns. The sample preparation for reverse circulation samples was almost identical, but excluded the coarse crushing stage.

Following pulverisation, a  $\approx$  200-g pulp sub-sample was collected for chemical analysis. For 80% of the BQTK diameter infill holes, a  $\approx$  0.4 g aliquot of the pulp was fused with flux into a glass bead, with the bead analysed by XRF to determine the concentration of 8 analytes. For the other 20% of data, a  $\approx$  40-g aliquot of the pulp was digested in a four-acid mixture, and the redissolved digestion salts were then analysed by ICP/OES or MS analysis to determine the concentration of 8 analytes. Both methods are considered a total rock digestion and analysis for the key value analytes of nickel, copper and cobalt.

IGO has submitted 5% of all routine pulps to a second laboratory for an umpire analysis. When comparing to the original results from the primary laboratory, IGO has found good correlation and acceptable precision between the original assays and the umpire results.

## Estimation Methodology

To prepare the estimation control domains for the Nova-Bollinger 2017 update, IGO's and Optiro's geologists used LeapFrog Geo™ software to interpret the drill hole database and prepare 3D digital volume models of mineralisation and waste domains. These models were then used to code the drilling data so that samples within each domain could be subset for statistical and spatial continuity analyses.

The samples within each estimation domain were composited to a target length of one metre using a 'best-fit' optimisation routine that ensured that no data was lost to small residual lengths in the process. The statistical analyses of the domain composites revealed that most domains have low coefficients of variation. However, a few domains do have high outlier values that required high-grade capping to restrict the influence of the few extreme values during block grade estimation.

The high-grade breccia domains are characterised by mixed sample populations of very high-grade mineralisation in the same regions as lower grade, which is problematic for reliable local estimates. As such,

a sub-domaining indicator approach was first applied as a method to separate higher and lower grade regions within the breccia domains.

As the geometry of the Nova-Bollinger mineralisation undulates and is possibly folded in some areas, a dynamic anisotropy sample search was applied to ensure the expected connectivity of high and low grades between adjacent drill holes informing block estimates. Ordinary block kriging, controlled by anisotropy axis directional semivariogram models, was the estimation method applied to estimate grades and density in all domains. The estimation sample searches for all estimated elements (Ni, Cu, Co, Fe, Mg and S) and density were set to the maximum ranges of the nickel semivariogram models interpreted for each respective estimation domain.

Block *in situ* bulk densities were estimated from 20,379 core samples where density had been measured using the Archimedes principle method, and from 16,954 pulp samples where density was measured by gas pycnometer. While the pycnometer method applied to pulps does not account for voids, an analysis of paired results (core versus pycnometer) found no material difference between the two density measurement methods. A small number of sample data where no density measurements were available had the density inferred from a linear regression predictor based on major nickel grades.

A digital block model to encompass the Nova-Bollinger Mineral Resource volume was prepared in Surpac Software using parent-block dimensions of 4.0 mE × 6.0 mN × 4.0 mElev. Sub-blocks were permitted down to dimensions of 1.0 mE × 1.5 mN × 0.5 mElev. to provide acceptable domain boundary resolution. All grades (and density) were estimated at the parent cell size, with sub-block grades estimated based on the assumption of a parent cell centred on the sub-block.

The block estimation sample search ellipsoid for each domain was set to the domain-respective maximum nickel semivariogram model ranges. This approach ensured that the same set of samples was selected for each block estimate so that the moderate to strong correlations that occur between nickel and other elements, were preserved in the block estimates. The estimation of each block required a minimum of 8 samples and was limited to a maximum 20 samples. Up to three estimation search passes were applied to each domain, with blocks not estimated in the first search pass, estimated in subsequent passes by using integer (2x or 3x) multiples of the first pass search ranges. Hard boundaries were set between all estimation domains so that only samples within a domain were used to estimate block grades within that domain.

The block model grade and density estimates were validated by comparing the input composite and output block estimate mean grades globally for each domain, and by preparing local moving window mean 'swath-plots' to check the correspondence of the spatial trends in the data and block estimates. On-screen visual inspections and PDF section plotting of the digital model was also carried out to confirm that the spatial trends in the input data grades to the estimated block grades was as expected. A parallel model was also prepared in Datamine Software to confirm the Surpac estimates. The final depleted estimates were cross checked in two reporting systems by Optiro and IGO.

## JORC Code Classification

The Competent Person considers that the Nova-Bollinger drill hole database and interpreted mineralised domains have acceptable quality, confidence and continuity (in both geology and grade), to permit the reporting of Mineral Resources according to the classifications described in the JORC Code.

High-confidence Measured Mineral Resources in the Nova area have been assigned to the parts of the 2017 Mineral Resource estimate where drilling has intersected the mineralisation on a nominal 12.5m by 12.5m grid spacing, and where mapping in the underground mine has confirmed the drilling interpretations of geology and mineralisation are correct.

Moderate confidence Indicated Mineral Resources have been assigned to areas having a nominal mineralisation pierce-point spacing of 25m by 25m, and where the continuity between drill holes can be reasonably assumed due to the geological understanding. Indicated Resources have been assigned where the data is on a wider average spacing or the geological interpretation is more uncertain.

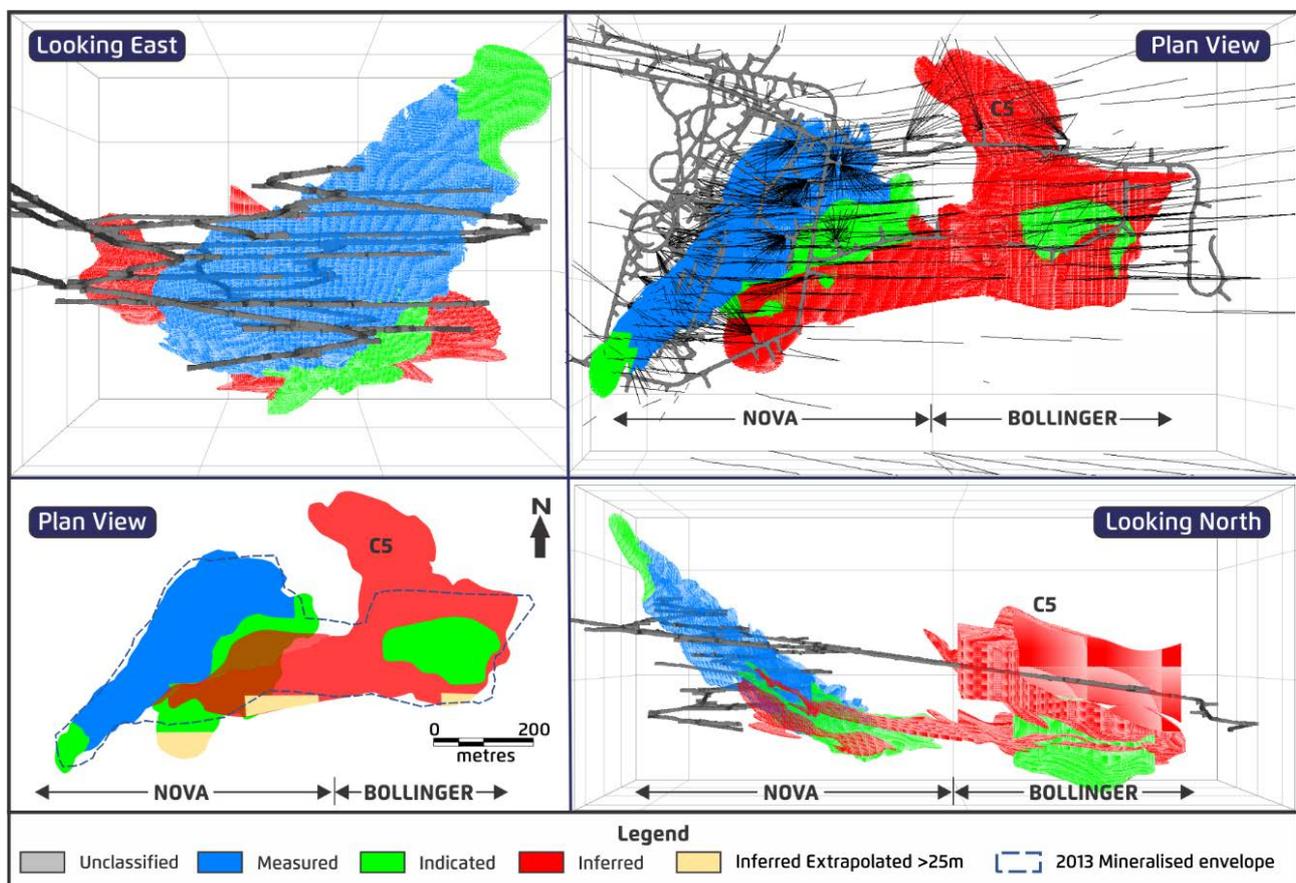
Lowest confidence Inferred Mineral Resources have been assigned to the feeder zone that connects Nova to Bollinger where the drilling is still on a wide spacing, and to areas of extrapolation at the margins of the deposit where the mineralisation extents are uncertain and open.

At Bollinger, Indicated Mineral Resources are assigned to areas of the model where there is a nominal 25m by 25m mineralisation pierce-point spacing, and the continuity of geology and mineralisation between drill holes can be reasonably assumed. These assumptions are currently supported by grade continuity analyses (variography) and mine mapping. Inferred Mineral Resources at Bollinger are allocated in areas where the drill spacing is on a nominal 50m by 50m grid and where the confidence in geology and grade continuity is uncertain.

Extrapolated Inferred Mineral Resources, constituting  $\approx 7\%$  of the Inferred Mineral Resource estimates, are assigned in a few areas where the estimates are extrapolated away from, rather than bounded by data.

The spatial relationships of the different JORC Code classifications at Nova-Bollinger is complex due to the many different estimation domains. Figure 3 contains plans, a section and a long section 3D views of the Nova-Bollinger estimation model blocks colour coded by JORC Code class. A simplified 2D map is also included to depict the locations of extrapolated Inferred Mineral Resources.

**Figure 3: Various projections of the Nova-Bollinger deposits showing Mineral Resource Classification**





## Cut-off Grade and Modifying Factors

The Mineral Resource reporting block cut-off grade of  $\geq 0.6\%$  NiEq is consistent with the threshold reported for the previously reported JORC Code estimate for Nova-Bollinger. However, the calculation and assumptions of the NiEq calculation has changed slightly from the prior report as discussed above.

The selection of the  $\geq 0.6\%$  NiEq is consistent with the assumption that this 0.6% Ni concentration approximately represents the break-even cost of ore processing. Based on the 88% metallurgical recovery forecast in the 2017 NiEq equation, the recovered metal value of 1 t grading 1% Ni is  $\approx 145$  US\$ ( $16,420$  US\$  $\times 0.01 \times 0.88$ ). Therefore 0.6% NiEq value is equivalent to a break-even processing cost of ( $145$  US\$  $\times 0.6$ )  $\approx 87$  US\$/t.

The material modifying factors assumed for this Mineral Resource report are:

- Underground mechanised mining using sub-level stoping
- Conventional crushing, grind and float recovery to produce saleable nickel and copper concentrates
- Metallurgical recoveries of 88% for nickel and 89% recovery for copper to concentrate for which off-take agreements are in place
- All necessary approvals are in place to continue with the development and exploitation of the mine into the future

Full details of all the inputs and assumptions for this Mineral Resource update are included in Appendix B: Nova Bollinger Mineral Resource June 2017: JORC Code Table 1, which is attached to this release.

## APPENDIX B: NOVA BOLLINGER MINERAL RESOURCE JUNE 2017: JORC CODE TABLE 1

### Section 1: Sampling Techniques and Data

Criteria	Explanation
<p><b>Sampling techniques</b></p> <p><b>Note:</b> Due to the similarity of the deposit setting, procedures and estimation these tables present the combined Nova-Bollinger tabulation. <b>Explanations to the Bollinger area are in bold font, and Nova (or both where appropriate) is in normal font.</b></p>	<ul style="list-style-type: none"> <li>- The Nova area has been sampled using diamond drill holes (DD) on a nominal 12.5 m x 12.5 m grid spacing with a small number of Reverse Circulation (RC) holes.</li> <li>- A total of 15 RC, 163 Surface DD and 599 Underground DD holes were drilled for 2,910 m, 63,099 m and 84,105 m respectively.</li> <li>- The holes drilled from surface are generally oriented towards grid west but the plunge angles vary to optimally intersect the mineralised zones.</li> <li>- The underground infill drilling took place from hanging wall and footwall mine infrastructure.</li> <li>- <b>The Bollinger deposit is sampled using diamond core drill holes (DD) on a nominal 25 m x 25 m to 50 m x 50 m grid spacing.</b></li> <li>- <b>A total of 72 Surface DD holes and 53 Underground DD holes were drilled for 35,935 m and 6,753 m respectively.</b></li> <li>- <b>Holes drilled from surface are generally angled towards grid west plunging from -60° and -90° or from underground development drilling positions at various angles to optimally intersect the mineralised zones.</b></li> <li>- DD core drilling has been used to obtain high quality samples that were logged for lithological, structural, geotechnical, density and other attributes.</li> <li>- Representivity has been ensured by monitoring core recovery to minimise sample loss.</li> <li>- Sampling was carried out under IGO protocols and QAQC procedures consistent with good industry practices.</li> <li>- <b>Bollinger is defined by diamond drilling only, and with same measures as employed at Nova for controls and sample representivity.</b></li> </ul>
<b>Drilling techniques</b>	<ul style="list-style-type: none"> <li>- Diamond drilling accounts for 96% of the drilling in the Mineral Resource area and comprises BQTK (40.7mm diameter), NQ2 (50.7mm diameter) or HQ (63.5mm diameter) sized core.</li> <li>- Surface drill hole pre-collar lengths range from 6 m to 150 m and hole lengths range from 50 m to 1,084 m.</li> <li>- Where possible, the core was oriented using Camtech or Reflex Act III orientation tools. RC percussion drilling used a 140 mm diameter face-sampling hammer drilling with RC representing 4% of the total drilling database. RC hole lengths range from 90 m to 280 m.</li> <li>- <b>DD accounts for all the current drilling at Bollinger and comprises BQTK, NQ2 or HQ sized core.</b></li> <li>- <b>Surface pre-collar depths lengths range from 20 m to 84 m and hole depths range from 53 m to 667 m.</b></li> <li>- <b>The core was oriented using Camtech or Reflex Act III orientation tools.</b></li> </ul>
<b>Drill sample recovery</b>	<ul style="list-style-type: none"> <li>- DD recoveries are quantified by as the ratio of measured core recovered lengths to drill advance lengths for each core-barrel run.</li> <li>- RC recoveries are logged qualitatively from poor to good.</li> <li>- Overall DD recoveries are on average <math>\geq 99\%</math> for both Nova and Bollinger and there are no core loss issues or significant sample recovery problems.</li> <li>- RC samples were visually checked for recovery, moisture and contamination.</li> <li>- For orientation marking purposes, the DD core from Nova and Bollinger is reconstructed into continuous runs on an angle iron cradle.</li> <li>- Down hole depths are checked against the depth recorded on the core blocks and rod counts are routinely carried out by the drillers to ensure the marked core block depths were accurate.</li> <li>- RC samples were visually inspected for recovery, moisture and possible cross contamination. There is no relationship between sample recovery as there is minimal sample loss. The bulk of the Nova DD resource definition drilling has very high core recoveries.</li> <li>- The Bollinger mineralisation is defined by diamond core drilling, which has also has very high core recoveries.</li> <li>- A sample bias due to preferential loss or gain of material is unlikely given the high core recovery.</li> </ul>
<b>Logging</b>	<ul style="list-style-type: none"> <li>- Geotechnical logging at Nova and Bollinger was carried out on all diamond drill holes for recovery, RQD and number of defects (per interval). Information on structure type, dip, dip direction, alpha angle, beta angle (oriented core only), texture, shape, roughness and fill material is stored in the structure table of the database.</li> <li>- The information collected is appropriate to support any downstream studies.</li> <li>- Qualitative logging of DD core and RC samples at Nova and Bollinger included lithology, mineralogy, mineralisation, structural (DDH only), weathering, colour and other features of the samples.</li> <li>- All DD core ore has been photographed in both dry and wet condition.</li> <li>- Quantitative logging has been completed for geotechnical purposes.</li> <li>- The total lengths of all drill holes have been logged except for rock-roller DD pre-collars that have lengths not logged for the intervals from surface to 20 m to 60 m.</li> </ul>



Criteria	Explanation
<p><b>Sub-sampling techniques and sample preparation</b></p>	<ul style="list-style-type: none"> <li>- DD core from Nova and Bollinger was subsampled over lengths ranging from 0.3 to 1.3m using an automatic diamond-blade core saw as either whole core (BQTK infill), half-core (BQTK, NQ2 resource definition) or quarter core (HQ metallurgical drilling).</li> <li>- All subsamples were collected from the same side of the core.</li> <li>- The sample preparation of DD core from Nova and Bollinger involved oven drying (4-6 hrs at 95°C), coarse crushing in a jaw-crusher to 100% passing 10 mm, then pulverisation of the entire crushed sample in Essa LM5 grinding mills to a particle size distribution of 85% passing 75 microns.</li> <li>- The sample preparation for RC samples is similar, but excludes the coarse crush stage.</li> <li>- QC procedures involve insertion of certified reference materials, blanks, collection of duplicates at coarse crush stage, pulverisation stage, assay stage and barren quartz washes of equipment every 20 samples.</li> <li>- The insertion frequency of quality samples averaged 1:15 to 1:20 in total for both deposits, with a higher insertional ratio used in mineralised zones.</li> <li>- For RC samples, duplicates were collected from 1 m routine sample intervals using a riffle splitter.</li> <li>- The primary tool use to monitor drill core representivity was monitoring and ensuring near 100% core recovery.</li> <li>- While no specific heterogeneity testing has been completed on the mineralisation. The sample sizes are appropriate to correctly represent the sulphide mineralisation at Nova and Bollinger based on the style of mineralisation (massive sulphides), the thickness and consistency of the intersections, the sampling methodology and percent value assay ranges for the primary elements.</li> <li>- The results of duplicate sampling are consistent with satisfactory sampling precision.</li> </ul>
<p><b>Quality of assay data and laboratory tests</b></p>	<ul style="list-style-type: none"> <li>- No geophysical tools were used to determine any element concentrations.</li> <li>- The laboratory complete sample preparation checks for particle size distribution compliance as part of routine internal quality procedures to ensure the target particle size distribution of 85% passing 75 microns is achieved in the pulverisation stage.</li> <li>- Field duplicates are inserted routinely at a rate of 1:20 samples and demonstrate good repeatability of results within the mineralised zones.</li> <li>- Laboratory quality control processes include the use of internal lab standards using certified reference materials (CRMs), blanks, and duplicates.</li> <li>- Umpire laboratory checks are routinely carried out on 5% of the total number of samples. The results returned to date have good precision as quantified by the HARD statistics discussed below.</li> <li>- CRMs used to monitor accuracy have expected values ranging from low to high grade, and the CRMs were inserted randomly into the routine sample stream to the laboratory.</li> <li>- The results of the CRMs confirm that the laboratory sample assay values have good accuracy and results of blank assays indicate that any potential sample cross contamination has been minimised.</li> </ul>
<p><b>Verification of sampling and assaying</b></p>	<ul style="list-style-type: none"> <li>- Optiro's consultants have inspected and the verified significant intersections in DD on multiple occasions as part of the on-site collaborative Mineral Resource estimation process.</li> <li>- The current mine development has intersected the mineralisation and the exposures are consistent with the observations from drilling intersections.</li> <li>- Two PQ and one HQ metallurgical holes have been drilled at Nova since March 2013 and the logging of these is consistent with the geological and mineralisation domain interpretations from the Mineral Resource definition drilling.</li> <li>- One hole at Nova has been twinned. The twin hole results confirmed the prior hole geology. The twin was used as a metallurgical hole. No twin holes have been drilled at Bollinger. Primary data for both area has been directly entered into an Acquire database via data entry templates on Toughbook laptop computers.</li> <li>- The logging has been validated by onsite geology staff and compiled onto a SQL database server by the IGO Database Administrator.</li> <li>- Data is backed up regularly in off-site secure servers.</li> <li>- No adjustments or calibrations were made to any assay data used in either estimate, other than conversion of half detection limit text values to numeric values prior to grade estimation work.</li> </ul>
<p><b>Location of data points</b></p>	<ul style="list-style-type: none"> <li>- The hole collar locations of surface holes were surveyed by Whelan's Surveyors of Kalgoorlie using RTK GPS equipment, which was connected to the state survey mark (SSM) network.</li> <li>- Survey elevation values are recorded in a modified AHD elevation where a constant of +2,000 m was added to the AHD RL for the mine coordinate grid. The expected survey accuracy is ± 30 mm in three dimensions.</li> <li>- Down hole drill path surveys have been completed using single shot camera readings during drilling at 18m, then every 30 m down hole.</li> <li>- Gyro Australia carried out gyroscopic surveys using a Keeper high speed gyroscopic survey tool with readings every 5 m after hole completion. Stated accuracy is ±0.25° in azimuth and ±0.05° in inclination.</li> <li>- QC involved field calibration using a test stand.</li> <li>- Underground holes collar locations were surveyed using Leica TS15P total station units by IGO's mine surveyors.</li> <li>- The underground drill hole paths were surveyed using reflex single shot surveys with reading taken every 30 m down hole.</li> <li>- The final down hole survey for underground holes was by Deviflex (non-magnetic strain gauge) electronic multishot and Minnovare Azimuth Aligner tools that survey hole trace paths on 1 m intervals relative to the collar azimuth and dip. The stated accuracy is ±0.2° in azimuth and ±0.1° in inclination. Only gyro and Deviflex data is used for Mineral Resource work.</li> <li>- The grid system for Nova-Bollinger is MGA Zone 51 projections and a modified GDA94 datum (local RL has 2,000 m added to value). Local easting and northing coordinates are in MGA.</li> <li>- The topographic surface for Nova-Bollinger is a 2012 Lidar survey with 50 cm contours, which is acceptable for mine a planning and Mineral Resource estimation purposes.</li> </ul>



Criteria	Explanation
<b>Data spacing and distribution</b>	<ul style="list-style-type: none"> <li>- The nominal drill hole mineralisation pierce point spacing for Nova is 12.5 mN x 12.5 mE.</li> <li>- The nominal drill hole spacing for Bollinger is 25 mN x 25 mE in the centre of the deposit, and is up to 50 mN x 50 mE on the margins.</li> <li>- The drilling and mine development into the mineralised domains for Nova-Bollinger has demonstrated sufficient continuity in both geological and grade continuity to support the definition of Mineral Resources and Reserves, and the classifications applied under the JORC Code.</li> <li>- For grade estimation purposes samples have been composited to a target of a one metre lengths for both deposits, with an optimised compositing approach used to ensure that no residual sample are created.</li> </ul>
<b>Orientation of data in relation to geological structure</b>	<ul style="list-style-type: none"> <li>- The deposit is drilled from surface and underground locations on a variety of orientations designed to target the mineralised zones at the nominal spacing whilst maintaining reasonable intersection angles.</li> <li>- Structural logging based on oriented core indicates that main sulphide controls are largely perpendicular to the average drill orientation.</li> <li>- Due to the constraints of infrastructure location a small number of holes are oblique to the C5 mineralisation at the northern margin of the deposit.</li> <li>- No orientation based sampling bias is expected from Mineral Resource drilling at Nova-Bollinger.</li> </ul>
<b>Sample security</b>	<ul style="list-style-type: none"> <li>- The chain-of-sample custody is managed by IGO. Samples for Nova-Bollinger are stored on site and collected by McMahon Burnett Transport and delivered to their depot in Perth, then to the assay laboratory.</li> <li>- Whilst in storage, samples are kept on a locked yard. Tracking sheets are used to track the progress of batches of samples.</li> <li>- A sample reconciliation advice is sent by the laboratories to IGO on receipt of the samples.</li> <li>- The risk of deliberate or accidental loss or contamination of samples is considered very low.</li> </ul>
<b>Audits or reviews</b>	<ul style="list-style-type: none"> <li>- A review of the sampling techniques and data was carried out by Optiro as part of each resource estimate and onsite in September 2016.</li> <li>- An independent audit of the database was carried out in April 2017 by Optiro.</li> <li>- Optiro considers that the database is of sufficient quality for Mineral Resource estimation studies.</li> </ul>

## Section 2: Reporting of Exploration Results

Criteria	Explanation
<b>Mineral tenement and land tenure status</b>	<ul style="list-style-type: none"> <li>- Nova and Bollinger are located wholly within Mining Lease M28/376. The tenement is 100% owned by Independence Nova Pty Ltd.</li> <li>- The tenement sits within the Ngadju Native Title Claim (WC99/002).</li> <li>- There are no third-party rights or encumbrances on the Nova Nickel Project.</li> <li>- Native title royalties of 0.5% on the nickel and copper production will apply as outlined in the Ngadju Mining Agreement.</li> <li>- The calculation method for this royalty will be as outlined in the Mining Act 1978 (WA). The State royalty paid is in accordance with the Mining Act 1978 (WA).</li> </ul>
	<ul style="list-style-type: none"> <li>- IGO have provided written assurance that the tenement is in good standing and no known impediments exist. The tenement is held by Independence Nova Pty Ltd and expires on 14/08/2035.</li> </ul>
<b>Exploration done by other parties</b>	<ul style="list-style-type: none"> <li>- Exploration was undertaken at the Fraser Range area by Sirius Resources NL over a three-year period which resulted in the discovery of the Nova prospect in July 2012, with Bollinger discovered shortly after.</li> <li>- No previous systematic exploration was carried out in this area prior to the 2012 discovery.</li> </ul>
<b>Geology</b>	<ul style="list-style-type: none"> <li>- The global geological setting is a high grade metamorphic terrane in the Albany Fraser mobile belt of Western Australia.</li> <li>- The Ni-Cu-Co deposits are hosted by Proterozoic age gabbroic intrusions that have intruded a metasedimentary package within a synformal structure.</li> <li>- The sulphide mineralisation is interpreted to be related to the intrusive event. The deposits are analogous to many mafic hosted nickel-copper deposits worldwide such as Raglan and Voiseys Bay in Canada</li> <li>- The Bollinger deposit is spatially related to the Nova deposit and is interpreted to represent one of several intrusive events that transgress sedimentary layers to the immediate east of Nova.</li> </ul>
<b>Drill hole Information</b>	<ul style="list-style-type: none"> <li>- As this is an advanced stage report related to a Mineral Resource estimate, it is not practical to list drill information for all drill holes used in the estimate.</li> <li>- Representative intercepts have been reported in previous Public Reports.</li> </ul>
<b>Data aggregation methods</b>	<ul style="list-style-type: none"> <li>- Early exploration results are included in this Public report for 5 drill holes in the Bollinger South area.</li> <li>- The intercepts are calculated on a length weighted basis with no particular cases of very high-grade intercepts within lower grade intervals.</li> <li>- No drill hole related exploration results are included in this Public report.</li> <li>- Where stated, the NiEq% calculation is based on the following formula: <math>((Cu\% \times 0.89) \times (6420/16420)) + (Ni\% \times 0.88)</math>, where the long-term nickel price is forecast to be US\$16,420/tonne and the long-term copper price is US\$6,420/tonne.</li> </ul>
<b>Relationship between mineralisation widths and intercept lengths</b>	<ul style="list-style-type: none"> <li>- The Nova deposit is moderately east dipping in the west, flattening to shallow dipping in the east and</li> <li>- The Bollinger deposit is dominantly flat lying.</li> <li>- Due to the style of mineralisation under consideration there is no expectation of sampling bias due to the relationship between drill hole interception angle with the mineralisation and the length.</li> <li>- The exploration results from the Bollinger South area are also considered to low likelihood of intercept angle bias</li> </ul>
<b>Diagrams</b>	<ul style="list-style-type: none"> <li>- Representative sections and plans are included in the body of the ASX release and prior releases of exploration results</li> </ul>
<b>Balanced reporting</b>	<ul style="list-style-type: none"> <li>- The MRE is based on all available data and as such provides the best-balanced view of the deposits.</li> </ul>
<b>Other substantive exploration data</b>	<ul style="list-style-type: none"> <li>- Information relating to other exploration data, such as density, metallurgical assumptions are detailed in Section 3 further below</li> </ul>
<b>Further work</b>	<ul style="list-style-type: none"> <li>- The grade control drill out from underground diamond drill platforms will continue at least until the end of 2017 to infill and test for extensions of Nova South and Bollinger.</li> <li>- Further work on targets such as Conductor 5 and the Feeder zone between Nova and Bollinger is budgeted for FY2018.</li> </ul>



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

Criteria	Explanation
<p><b>Database integrity</b></p>	<ul style="list-style-type: none"> <li>- All data entry is direct into data electronic templates with lookup tables and fixed formatting are used for logging, spatial and sampling data at Nova-Bollinger.</li> <li>- All data transfer and assay loading is electronic.</li> <li>- Sample numbers are unique and pre-numbered bags are used.</li> <li>- IGO's data management procedures make transcription and keying errors unlikely and digital merging by unique sample number keys reduces the risk of data corruption.</li> <li>- IGO's geological staff validate the data under the direction of the Acquire Database Administrator using IGO protocols.</li> <li>- The data for Nova-Bollinger is stored in a single database.</li> </ul>
<p><b>Site visits</b></p>	<ul style="list-style-type: none"> <li>- Mark Drabble (Principal Consultant - Optiro), who is acting as Competent Person, has carried out multiple site visits to the Nova deposit during 2016 and 2017.</li> <li>- The Competent Person has inspected the deposit area, the core logging and sampling facility, density measurement area, Minalyser analysis station and underground exposures in ore drives and stopes.</li> <li>- The Competent Person's opinion is that IGO's protocols and procedures are consistent with good industry standard and acceptable to support Mineral Resource estimation work.</li> </ul>
<p><b>Geological interpretation</b></p>	<ul style="list-style-type: none"> <li>- The confidence in the geological interpretation of Nova and Bollinger is considered high in areas of close-spaced drilling, and is supported by an additional 652 underground and 14 drill holes from surface totalling 90,858m and 6,111m (respectively) drilled since the last estimate reported in 2013.</li> <li>- Mining of three levels of ore development has added substantially to the geological understanding of the deposit.</li> <li>- The geological confidence of the Inferred Mineral Resource is based on extension of the current mineralisation domains to the margins of the deposit, and the connecting "feeder" zone between Nova and Bollinger that will be infill drilled in 2017.</li> <li>- Core samples taken for petrography and litho-geochemical analysis have been used to identify and define the rock type subdivisions applied in the interpretation process.</li> <li>- The assumptions made are that zones of similar sulphide have a spatial association that allows them to be interpreted as continuous or semi-continuous (dependent on setting).</li> <li>- There are also assumptions that the breccia zones can have variable continuity due to the internal nature of the domains, which is accounted for in the estimation methodology.</li> <li>- The Nova-Bollinger deposit has a generally tabular geometry, with geological characteristics that define the mineralised domains.</li> <li>- The infill drilling has confirmed the outer bounds of the 2013 geological interpretations, but local complexity has been now identified and incorporated into the 2017 Mineral Resource estimate.</li> <li>- One outcome of the interpretation changes has been a reduction in the total metal tonnage, due to:                         <ul style="list-style-type: none"> <li>- Complex anastomosing geological relationships reducing the volume of breccia domains</li> <li>- Reduction in the continuity of high grade mineralisation within the breccia domains</li> <li>- Extension of breccia zones into lower grade areas</li> <li>- removal of the low-grade halo domain interpreted at a 0.4% NiEq cut-off grade, but which contained mineralisation above 0.6% NiEQ in the 2013 MRE.</li> </ul> </li> <li>- The current interpretation is geologically controlled, and supported by the new drilling and underground development, and is thus considered to be robust.</li> <li>- Geological controls and relationships were used to define grade estimation domains with hard boundary constraints applied on an estimation domain basis.</li> <li>- The Nova and Bollinger breccia zones have mixed grade sample populations due to spatial mixing of massive sulphides and mineralised clasts within these domains.</li> <li>- MgO -Ni grade relationships are interpreted to be influences on local grade estimates and the estimation domaining has addressed these controls in the resource estimation process.</li> <li>- The infill drilling of Nova has confirmed the interpreted geological complexity, such as the pinch and swell nature of the mineralised domains, and the local effects of the intrusive gabbro units.</li> <li>- The spatial continuity of high and low MgO geological units has assisted in refining contact relationships.</li> </ul>
<p><b>Dimensions</b></p>	<ul style="list-style-type: none"> <li>- The Nova mineralisation commences from 40 m below surface and extends to 470 m below surface.</li> <li>- The Nova area extents are ≈650 m (northeast to southwest) and ≈300 m (northwest to southeast).</li> <li>- The Bollinger Mineral Resource area abuts the Nova zone and starts at ≈ 360 m below surface (highest point) and extends to ≈ 425 m below surface.</li> <li>- Bollinger has areal extents of ≈ 300 m (north) and 400 m to 125 m (east).</li> <li>- The two resources areas are split for model reporting purposes along the 518,600 mE MGA easting.</li> <li>- The Nova and Bollinger deposits are joined by an interpreted narrow east-west trending feeder zone that has a length of ≈180 m, thickness of 10 m to 20 m and north-south width of up to 80 m.</li> </ul>



Criteria	Explanation
<p><b>Estimation and modelling techniques</b></p>	<ul style="list-style-type: none"> <li>- Concentrations of Ni%, Cu%, Co%, Fe%, Mg%, S% and in situ bulk density (t/m<sup>3</sup>) were estimated into the Nova and Bollinger digital block models using the Ordinary Block Kriging (OK) routines implemented in GEOVIA Surpac 6.7.3™ and Datamine Studio V3.24™.</li> <li>- The estimation drill hole sample data was coded for estimation domain using the three-dimensional wireframe interpretations prepared in LeapFrog Geo™ 4.0.1 software.</li> <li>- The drill hole sample data from each domain was then composited a target of a one metre downhole length using an optimal best fit-method, to ensure no short residuals were created.</li> <li>- Where necessary in some domains, the influence of extreme sample distribution outliers was controlled by capping grades to maximum value. The top-cut thresholds were determined using a combination of top-cut analysis tools (grade histograms, log probability plots and CVs). Very few top-cuts were applied.</li> <li>- The Breccia domains at Nova and Bollinger have spatially and statistically mixed sample populations which cannot be separated by wireframing at the current data spacing. As such a categorical indicator approach using a single threshold within the domains was applied to provide a statistical best-fit sub-domaining of the mixed populations using a ±5% Ni indicator threshold for Nova data, and ±4.4% Ni indicator threshold for Bollinger.</li> <li>- A dynamic anisotropy sample search approach was applied during estimation to optimise the grade connectivity in often undulating domain geometry.</li> <li>- For all domains, directional anisotropy axis semivariograms were interpreted using traditional experimental semivariograms or back-transformed normal-scores model interpretations. Semivariogram nugget effects were found to be moderate to high (Nova &lt;50%, Bollinger &lt;30% of the data variance). The maximum range of grade continuity varied and was found to be deposit/domain dependant. Typically, maximum continuity ranges varied from 20 m to 170 m in the major direction dependent on mineralisation style.</li> <li>- Where small or poorly sampled domains had too few data to interpret continuity models, the variography parameters were inferred from the results of larger well sampled domains.</li> <li>- Estimation sample searches passes were set to the ranges of the nickel variogram for each domain in the first sample pass and increased by factors for subsequent passes. The maximum distance to nearest sample for any estimated block was 100 metres. Approximately 7% of the Inferred Mineral Resource is extrapolated greater than 25 metres beyond the data.</li> <li>- This estimate is an update of the prior Mineral Resource Estimates (MREs) for Nova and Bollinger.</li> <li>- Nova has been updated using data from 612 infill underground holes (for 85,395m of diamond drilling), in addition to the 215 surface holes for 85,829m drilled by Sirius up to 2014, along with mapping data from ore drive development on three levels.</li> <li>- This information has been applied to update the geology and mineralisation models and the interpretation outcomes of the 2017 Bollinger update using the predominantly unchanged dataset of surface drilling from the 2013 MRE.</li> <li>- Ore production is at an initial stage as the mine ramps up to full production so the reconciliation information is largely based on results of processing ore from development headings that have a high planned dilution component. Refer to the item on accuracy further below for reconciliation factors.</li> <li>- The main by-product of the nickel and cobalt co-products is cobalt. Cobalt value is dependent on any off-take agreement and may realise a credit but the value of cobalt is not currently included in the NiEq basis.</li> <li>- The accessory grades estimated in the update are Fe%, Mg% and S%. No specific acid-mine drainage variable has been estimated but sulphur can be used as a proxy where needed.</li> </ul>



Criteria	Explanation
	<ul style="list-style-type: none"> <li>- A single digital block model for Nova-Bollinger was prepared using an 4 mE by 6 mN by 4 mElv parent block size with sub-blocks permitted down to dimensions of 1 mE x 1.5 mN x 0.5 mRL.</li> <li>- All block grade estimates were completed at the parent cell scale using estimation search parameters calibrated in the 2013 estimation work.</li> <li>- Block discretisation was set to 5 x 5 x 2 nodes per block for all domains.</li> <li>- The dimensions of the sample search ellipse per domain was set based on the nickel variography parameters, due to the moderate to strong correlations between nickel with the other variable estimated.</li> <li>- Two estimation search passes were applied to each domain in Nova. The first estimation pass had ranges set to the nickel semi-variogram maximum with a requirement to find minimum of 8 and maximum of 20 samples for a block to be estimated. Sample selection was unlimited per hole. In the estimation second pass, the search ranges were doubled, and the minimum sample requirement was reduced to four.</li> <li>- For the Bollinger estimates, a third pass search was required using a 3x the maximum ranges of the respective domain semi-variogram models. Sample search constraints were set to a minimum of 4, and a maximum of 30 for a block grade to be estimated. A limit of maximum of 5 samples per hole was also applied.</li> <li>- In the most of domains, most blocks were estimated in the first estimation pass (particularly for the main domains). However, some more sparsely-sampled domains were predominantly estimated on the second or third pass. Blocks not estimated in the final search passes were assigned the estimated domain mean grade for each respective variable and assigned a lower confidence category in the JORC Code classifications.</li> <li>- No assumptions regarding selective mining units were made in this estimate.</li> <li>- A neural networking analysis was used to investigate relationships between the variables at Nova in the 2013 estimate. The findings of this study were then incorporated into the domain interpretation process.</li> <li>- Strong positive correlations occur between nickel, sulphur and cobalt, with copper sometimes not as strongly correlated. The correlation between nickel and copper is variable with domain and mineralisation style. All variables have been estimated within the nickel domains.</li> <li>- The geological interpretation modelled the sulphide mineralisation into geological domains at Nova- Bollinger. The deposit framework incorporates gabbroic intrusives, high and low MgO intrusive units, deformation partitioning, folding, sulphide remobilisation, brecciation and replacement.</li> <li>- These form a complex deposit where geological relationships are used to define mineralisation domain geometries and extents. Grade envelopes are not applied, apart from reference to the natural <math>\geq 0.4\%</math> Ni cut-off that appears to define extents of the global mineralised system.</li> <li>- The boundaries of mineralised domains were set hard boundaries to select sample populations for variography and estimation.</li> <li>- The statistical analyses of the drill hole sample populations in each domain at Nova and Bollinger generally have low coefficients of variation with no extreme values that could potentially cause local grade biases during estimation. However, a few number of estimation domains do have outlier values, which were capped to the 98th percentile value of each respective domain.</li> <li>- Validation of the block model volumes was carried out using a comparison of the domain wireframes volumes to the block model volumes. Grade/density validation included comparing the respective domain global mean grades of block model grades to the estimation drill hole composites, and moving window mean grade comparisons using swath plots within northing, easting and elevation slices.</li> <li>- Visual validation was completed on screen to review that the input data grade trends were consistent with the block estimate trends.</li> <li>- The final mine depleted estimates were reported out of two different software systems an checked by both IGO and Optiro for accuracy.</li> <li>- Refer further below to the item on estimation accuracy for model to mill reconciliation results</li> </ul>
<b>Moisture</b>	The tonnages are estimated on a dry basis.
<b>Cut-off parameters</b>	<ul style="list-style-type: none"> <li>- A nominal grade cut-off of <math>\geq 0.4\%</math> Ni is interpreted to be the statistically 'natural' grade boundary between disseminated and trace sulphides for the Nova- Bollinger mineralised system.</li> <li>- This cut-off grade was used in 2013 to define the mineralised envelope within which the higher-grade sub domains were interpreted.</li> <li>- However, unlike the previous 2013 interpretation, the 2017 interpretation does not include an alteration envelope as the isolated intersections in previous the interpretation are now largely included into other spatially consistent domains.</li> <li>- The Mineral Resource is reported using <math>\geq 0.6\%</math> NiEq block cut-off as an approximate proxy for break-even net-smelter-return (NSR) and for comparing the 2017 estimate to the 2013 estimate.</li> </ul>
<b>Mining factors or assumptions</b>	<ul style="list-style-type: none"> <li>- Mining of the Nova-Bollinger deposit is and will be, by underground mining methods including mechanised mining, open stoping and/or paste backfill stoping.</li> </ul>
<b>Metallurgical factors or assumptions</b>	<ul style="list-style-type: none"> <li>- The ore processing method at Nova-Bollinger is well-established and the recoveries from the two stages of concentrate generation (copper-cobalt and nickel cobalt) have been used to define the nickel-equivalent formula.</li> <li>- Metallurgical recovery values are sourced from the 2015 optimisation study where the steady-state metallurgical recoveries to concentrates are forecast to be 88% for nickel and 89% for copper (refer to page 14 of IGO ASX release 14/12/2015 for details)</li> </ul>
<b>Environmental factors or assumptions</b>	<ul style="list-style-type: none"> <li>- IGO has assured the Competent Person that all necessary environmental approvals have been received.</li> <li>- Sulphide tails are being pumped to a specific waste storage facility and non-sulphide tails are used in paste backfill.</li> <li>- Underground wastes are stored in a conventual waste dump.</li> </ul>



Criteria	Explanation
<b>Bulk density</b>	<ul style="list-style-type: none"> <li>- In situ bulk density measurements were carried out on 43,209 core samples using the Archimedes method of dry weight versus weight in water.</li> <li>- The use of wax to seal the core was trialled but was shown to make less than 1% difference. Density standards were used for QAQC using an aluminium billet and pieces of core with known values.</li> <li>- Pycnometer density readings (from sample pulps) were carried out for 21,632 samples by assay laboratories to accelerate a backlog of density samples.</li> <li>- A comparison of 263 samples from holes that had both methods carried out showed an acceptable correlation coefficient of 0.94 but also that the pycnometer results are reporting slightly lower than the measured results, which is expected given pycnometer readings do not provide an <i>in situ</i> bulk density. This is not considered to be material to the estimate.</li> <li>- The density ranges for the mineralised units are: Massive sulphides 2.0 to 4.7 g/cm<sup>3</sup> (average: 3.9 g/cm<sup>3</sup>), net textured sulphides 3.0 to 4.4 g/cm<sup>3</sup> (average: 3.6g/cm<sup>3</sup>) and disseminated sulphides 2.5 to 4.6 g/cm<sup>3</sup> (average: 3.5 g/cm<sup>3</sup>).</li> <li>- The host geology comprises high grade metamorphic rocks that have undergone granulite facies metamorphism. The rocks have been extensively recrystallised and are very hard and competent.</li> <li>- Vugs or large fracture zones are generally annealed with quartz or carbonate in breccia zones. Porosity in the mineralised zone is low. As such, voids have been accounted for in all but the pycnometer density measurements</li> <li>- The bulk density values were estimated using OK using the nickel search parameters and the density samples taken within the geological domains.</li> <li>- A linear regression formula of {Density = 0.182 x (Ni) + 3.12} derived from the measured samples was applied to 1,814 samples that did not have density measurements completed at the data cut-off date for commencement of Mineral Resource estimation work.</li> </ul>
<b>Classification</b>	<ul style="list-style-type: none"> <li>- The Measured Mineral Resource classified at Nova are based on the high confidence in the geological and grade continuity, along with 12.5 m x 12.5 m spaced drill hole density and information from three levels of ore mining in development.</li> <li>- Estimation parameters, including Kriging efficiency have also been utilised during the classification process, along with the assessment of geological continuity.</li> <li>- The Indicated Mineral Resource at Nova is classified based on high confidence geological modelling using the knowledge gained from the close spaced infill drilling to update the mineralisation domains in areas of 25m x 25m spaced drilling.</li> <li>- The grade continuity is modelled by conditional indicator selection to proxy the nature of the massive sulphide breccia domains, which contain the bulk of the metal at Nova. Grade continuity is also assessed by measures such as a Kriging efficiency of &gt;0.5.</li> <li>- The Inferred Mineral Resource category was applied to extensions of domains to the margins of the deposit, and to the connecting "feeder" zone that joins the Nova and Bollinger areas (drill spacing in this area is often greater than 50m x 50m).</li> <li>- The Indicated Mineral Resource classification at Bollinger is based on good confidence in the geological and grade continuity, along with 25 m x 25 m spaced drill hole density in the core and bulk of the deposit.</li> <li>- The Inferred Mineral Resource classification at Bollinger is applied to extensions of mineralised zones to the margins of the deposit, where drill spacing is greater than 50m x 50m, the upper extents of domains such as Conductor 5, and the margins of the gabbro units where limited disseminated mineralisation is noted.</li> <li>- The input data is comprehensive in its coverage of the mineralisation and does not favour or misrepresent in situ mineralisation. Geological control at Nova-Bollinger consists of a primary mineralisation event modified by metamorphism and structural events.</li> <li>- The definition of mineralised zones is based on an elevated level of geological understanding producing a robust model of mineralised domains. This model has been confirmed by infill drilling and ore development which supported the initial interpretation.</li> <li>- The validation of the block model has confirmed satisfactory correlation of the input data to the estimated grades and reproduction of data trends in the block model</li> <li>- The Mineral Resource estimate appropriately reflects the view of the Competent Persons.</li> </ul>
<b>Audits or reviews</b>	<ul style="list-style-type: none"> <li>- This is an update of the prior Mineral Resource estimate and an update of the Bollinger prior Mineral Resource estimate. The Nova resource was extensively reviewed as part of the infill drilling and modelling, with a collaborative approach to interpreting the geology.</li> <li>- The prior Bollinger model was reviewed internally IGO and Optiro after the Nova April 2017 MRE and some significant improvements were made to the geological domains to produce the June 2017 Bollinger MRE update.</li> </ul>



Criteria	Explanation
<p>Relative Accuracy/Confidence</p>	<ul style="list-style-type: none"> <li>- The Mineral Resource at Nova has been estimated using standard industry practices for the style of mineralisation under consideration.</li> <li>- The geological and grade continuity of the domains is such that the Indicated Mineral Resource has a local level of accuracy which is suitable for achieving annual targets, while Measured Mineral Resource estimates are considered commensurate with meeting quarterly production targets. Inferred Mineral Resource are indicated of volumes that warrant further drill testing.</li> <li>- There has been no quantitative geostatistical risk assessment such that a rigorous confidence interval could be generated but the nature of the nickel/copper mineralisation is such that, at the grade control drill spacing, there is low risk to the schedule on a quarterly basis.</li> <li>- Production data has provided a satisfactory assessment of the actual accuracy compared to the estimate for development ore.</li> <li>- The Measured and Indicated Resources are considered suitable for Ore Reserve conversion studies and should provide reliable (<math>\pm 15\%</math>) estimates for quarterly and annual production planning respectively.</li> <li>- The Inferred Mineral Resource estimates identify areas that required further drilling and assessment before such areas can be considered for mine planning.</li> <li>- Total ore processed to 30 Jun 2017 has been <math>\approx 450</math> kt grading 1.15% Ni, 0.52% Cu and 0.04% Co.</li> <li>- Mine-claimed ore from the model update is <math>\approx 440</math> kt grading 1.09% Ni, 0.47% Cu, 0.04% Co, with <math>\approx 6</math> kt on ROM stockpiles on 30 Jun 2017.</li> <li>- Reconciliation factors (mill <math>\div</math> mine-claimed) are therefore 102% for tonnage, 106% for nickel grade, 111% for copper grade and 105% for cobalt grade.</li> <li>- As most of the ore processed to date is development ore with high planned dilution, the reconciliation factors indicate that the updated Mineral Resource estimate may be a conservative predictor, however as the mine is still in ramp-up the results should be considered satisfactory with further review required over coming months</li> </ul>