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# Further Thick High-Grade Mineralisation Intersected at Cardinia

Follow-up RC drilling intersects coherent thick zones of gold mineralisation at the Helens Main deposit located at Cardinia

The mineralised zone is interpreted to be widening at depth and remains open

### **HIGHLIGHTS**

- Significant recent RC drill intersections from Helens include:
  - 31m @ 2.5 g/t Au from 57m
    including 10m @ 3.7 g/t Au and 8m @ 4.1 g/t Au (HE17RC154)
  - 31m @ 2.0 g/t Au from 71m
    including 6m @ 3.1 g/t Au (HE17RC153)
- Follow up diamond drilling has intersected multiple sheared zones interpreted to be the gold bearing structure; assays pending.
- The southern end of Helens Main is developing into a coherent thick zone of mineralisation that remains open at depth and to the south.
- On the basis of these and previously announced excellent results the Company expects through further drilling to significantly grow the Resources at the Cardinia Mining Centre ahead of 2018 gold production

Managing Director Don Harper said,

"It's great to see consistent thick, shallow high-grade mineralisation being intersected at Helens. We may have the opportunity to achieve our major objectives; to increase our gold Resource inventory and mine life along with potentially significantly increasing gold production beyond the Feasibility<sup>1</sup> base case with a higher feed grade to the proposed mill. We expect continued exploration success may have a material positive impact on the LGP project economics. We look forward to fast tracking our aggressive 2018 exploration campaign." **Kin Mining NL (ASX: KIN)** is pleased to report highly significant gold assay results from a targeted follow-up RC drill program at the Cardinia Mining Centre, part of the 100% owned Leonora Gold Project in the North-Eastern Goldfields of Western Australia. The RC drilling program was designed to follow-up on recent significant intersections discovered at the south end of the Helens Main Resource area (see ASX announcement dated 20 November 2017 "Multiple thick gold zones intersected at Cardinia").

Results have confirmed the presence of a wide mineralised shoot that extends beyond the current Resource envelope within the extensive shear zone at Helens Main. The results confirm the presence of a thick extension to the mineralised system that remains open along strike and down plunge.



Figure 1: Plan of Helens deposits highlighting location of recent RC drill holes and strike of mineralised shoot (red arrow) and regional exploration potential

### Helens Main – Discussion

Helens Main is a coherent, sheared basalt-hosted deposit. The mineralised corridor has been extended by a further 50m to the south as a result of recent drilling to now total 600m of strike length (Figure 1). The results confirm the presence of a thick extension to the mineralised system which remains open along strike and down plunge (Figure 2).



Figure 2: Plan View of the southern end of the Helens Main area

The interpreted south plunging mineralised shoot can be traced on multiple sections with all four recent holes *HE17RC153* to *HE17RC156* intersecting the same target lode (Figures 3, 4 and 5). Mineralisation is interpreted to be widening at depth and now projects at least 80m below the south end of the proposed open pit.



Figure 3: Cross Section A showing recent high-grade intersection below the open pit design

The mineralisation intersected is displaying a coherent form as new results are very similar in grade and thickness to previously announced results in holes *HE17RC151* and *HE17RC152*.

## **Previously Announced Results**

- 30m @ 2.8 g/t Au from 72m including 6m @ 3.2 g/t Au and 9m @ 5.0 g/t Au (HE17RC151)
- 13m @ 3.8 g/t Au from 46m including 7m @ 6.0 g/t Au (HE17RC152)



Figure 4: Cross Section B showing recent high-grade intersection below the open pit design

### **Recent Results**

31m @ 2.5 g/t Au from 57m
 including 10m @ 3.7 g/t Au and 8m @ 4.1 g/t Au (HE17RC154)

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• 31m @ 2.0 g/t Au from 71m,
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including 6m @ 3.1 g/t Au (HE17RC153)
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Recent drilling in the southern end of the deposit is highly significant as the combined results form a consistent wide corridor of mineralisation with multiple high-grade intersections. Results suggest this portion may in fact be the richer section of the deposit as multiple wide mineralised intersections can be traced for 100m along strike. This mineralisation remains open with further drilling required.



Figure 5: Cross Section C highlighting recent high-grade intersections

The historical drilling covering the projected strike extent of the southern shoot extension was shallow (30m) and largely ineffective due to the depth of the plunging mineralised zone. This suggests that there is a high likelihood that the mineralised shoot extends further south than previously thought. Areas immediately south of these significant results will be targeted with RC and Diamond drilling, testing the continuity of the potential southern strike extensions to the Helens Main ore body.



Figure 6: Long Section of the Helens Main Deposit highlighting recent high-grade results within and below the current open pit designs

### **Exploration - Next Steps**

Drilling within the Helens Rangoon corridor has clearly displayed a large mineralised system. Recent developments suggest the mineralised corridor contains a series of shear zones which splay off in some locations. Both the lateral and strike extents of these shear zones within the mineralised corridor remain open, with the possibility of these zones linking up.

The current drill campaign was one of the first to test the potential of strike extensions at Helens.. The results demonstrate that the gold mineralisation at Helens is persistent along strike, and highlights the potential for the mineralisation to extend even further. The majority of the Cardinia Mining Centre has few holes drilled deeper than 100m, highlighting the opportunity for additional exploration success (Figure 8).

Kin plans to aggressively target the Helens Rangoon corridor (see Figure 1), seeking to increase higher grade open pit ounces and potentially re-optimise the current Helens mine plan whilst the company progresses toward production in 2018.









# ALL DRILLING

# DRILLING DEEPER THAN 50m

# DRILLING DEEPER THAN 100m

Hole ID	Depth (m)	Easting (MGA94)	Northing (MGA94)	Dip/Azi	From (m)	To (m)	Width (m)	Grade (g/t Au)
HE17RC153	114	365256	6814675	-60/245	71	108	37	1.8
				Incl	71	102	31	2.0
				Incl	87	93	6	3.1
HE17RC154	102	365255	6814645	-60/245	48	49	1	0.6
					57	91	34	2.3
				Incl	57	88	31	2.5
				Incl	61	71	10	3.7
				and	75	83	8	4.1
HE17RC155	144	365269	6814651	-60/245	75	79	4	1.0
					87	90	3	1.8
					93	108	15	0.6
					129	141	12	1.3
				Incl	129	133	4	2.6
HE17RCD156	89	365265	6814701	-60/245	62	63	1	1.8
					85	86	1	1.2
Diamond Tail	185				ſ			A.W.R.

# Table 1. Significant Gold Intersections - Helens Main(0.5 g/t Au cutoff, with no more than 2m internal dilution, A.W.R. = awaiting resuts)

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#### About Kin Mining NL

Kin Mining (ASX: KIN) is an emerging gold development company with a significant tenement portfolio in the highly prospective North-Eastern Goldfields region of Western Australia. The Company has completed its Definitive Feasibility Study on the Leonora Gold Project forecasting an average production rate of 55,000oz<sup>1</sup> pa. The Company has also upgraded its resources to 1.02Moz<sup>2</sup> and released its Maiden Ore Reserve of 373,000oz<sup>1</sup>. Kin is seeking to increase shareholder value through continued aggressive exploration on its tenements and achieving gold production in the second half of 2018.

Kin Mining NL were the winning recipient of the Diggers and Dealers Best Emerging Company Award 2017.

<sup>1</sup>The Company confirms that it is not aware of any new information or data that materially affects the information included in the ASX announcement of 2 October 2017 "Feasibility confirms a high margin gold mine for Kin at its Leonora Gold Project", and that all material assumptions and technical parameters underpinning the estimates in that announcement continue to apply and have not materially changed.

<sup>2</sup>The Company confirms that it is not aware of any new information or data that materially affects the information included in the ASX Announcement of 30 August 2017 "Kin Defines +1 Million ounces of Gold at the Leonora Gold Project", and that all material assumptions and technical parameters underpinning the estimates in that announcement continue to apply and have not materially changed.



### **Competent Persons Statement**

The information contained in this report relates to information compiled or reviewed by Paul Maher who is a member of the Australasian Institute of Mining and Metallurgy (AusIMM) and Mr. Simon Buswell-Smith who is a Member of the Australian Institute of Geoscientists (MAIG), both are employees of the company and fairly represent this information. Mr. Maher and Mr. Buswell-Smith have sufficient experience of relevance to the styles of mineralisation and the types of deposit under consideration, and to the activities undertaken to qualify as Competent Persons as defined in the 2012 edition of the "JORC Australian code for reporting of Exploration Results, Mineral Resources and Ore Reserves". Mr. Maher and Mr. Buswell-Smith consent to the inclusion in this report of the matters based on information in the form and context in which it appears.

### HELENS

### SECTION 1 – Sample Techniques and Data

Criteria	Commentary
Sampling techniques	Reverse Circulation (RC) drill holes are sampled over one metre (1m) intervals, as drilled. Samples were collected and individually riffle split at one metre intervals. Approximately 3-4kg of sample was collected over each sampled interval. All samples are drill chips collected via a cyclone attached to the rig. At the end of each metre drilled the cyclone underflow is closed off, the underside of the sample box is opened and the sample passes down through the riffle splitter. Samples are collected as a sub sample in calico bags and the remainder in large plastic bags. Sampling techniques are considered to be in line with the standard industry practice and are considered to be representative.
	Samples are collected using a standard RC face sampling hammer drill bit, they are split, bagged and logged at the drill site. Samples were analysed via Fire Assayed (50 gram charge) for Au only.
	Only the drill results contained in the table of significant intersections are considered in this document. All sample collection, sample handling and drilling procedures are conducted and guided by Kin Mining protocols, QA/QC procedures are implemented during the drilling program as per industry standard.
Drilling techniques	Drilling from surface is completed by standard Reverse Circulation drilling techniques. RC drilling was conducted by Orbit Drilling Pty Ltd using a Hydco 350 8x8 Actross drilling rig with a 350psi/1250cfm air capacity. A support booster compressor 900psi/1300cfm was utilised in the deeper sections of the drill holes. RC drilling used a face-sampling hammer bit over 140mm diameter drill holes. The vast majority of drilling retrieved dry samples, on occasion a booster air compressor was used beneath the water table to maintain dry sample return. The drill holes have been surveyed using a Reflex Ezi-trac downhole camera.
Drill sample recovery	Sample recovery is measured and monitored by the drill contractor and Kin Mining representatives, bag volume is visually estimated and sample recovery was generally very good. The volume of sample collected for assay is considered to be a composite representative sample of the metre drilled. Sample recovery is maximized by using best-practice drill techniques, the entire 1m sample is blown back through the rod string, the cyclone is sealed at the completion of each metre, and the sample interval collected and split with a three tiered riffle splitter. The riffle splitter is attached to the rig cyclone; the entire (1m) sample is split. The riffle splitter, cyclone and sample collection box is cleaned with compressed air at the end of each metre and at the completion of the hole. Duplicate 1m samples and known standards (CRM's) and blanks are inserted at constant intervals at a rate of five per one hundred samples.
	The vast majority of samples were collected dry however on very rare occasions wet or damp samples were encountered. The reported intersections were all collected over dry intervals; sampling equipment is cleaned periodically to reduce cross bag contamination. RC drill samples are collected, recorded and stored in numbered calico bags and then removed from the field.
	No relationship was observed between sample recovery and grade.
Logging	Kin's procedure for geological logging of RC sample includes recording the colour, lithology, sulphide mineralisation content, veining, alteration, texture, oxidation, grid coordinates, sample interval, depth and other features. Data is physically and electronically recorded and stored. The level of logging detail is considered appropriate for resource drilling. Logging of geology and colour are interpretative and qualitative, whereas logging of mineral percentage is quantitative.
	All drill holes are logged in their entirety, at 1m intervals, to the end of hole. All drill hole logging data is digitally and physically captured, data was entered directly into a "tablet" computer in the field. Data is validated prior to being uploaded to the data base.

Criteria	Commentary			
Sub	See Sampling techniques in the above section.			
sub- sampling techniques and sample preparation	The sample collection methodology is considered appropriate for RC drilling and is within today's standard industry practice. Riffle split one metre sample (1m) results are regarded as reliable and representative. RC samples are split with a riffle splitter at one metre intervals as drilled. Analysis was conducted by SGS Australia Pty Ltd Laboratories. At the laboratory samples are dried, crushed and pulverised until the sample is homogeneous. Analysis technique for gold (only) was a Fire Assay 50 gram charge AAS finish (Lab method FAA505).			
	The vast majority of samples were collected dry; on rare occasion's ground water was encountered and a minimal number of samples were collected damp or wet. Sample size in considered appropriate to give an accurate indication of mineralisation. At regular intervals certified reference standards, blanks and field duplicate samples were submitted with the sample batch, the assay laboratory (SGS) also included their own internal checks and balances consisting of repeats and standards; repeatability and standard results were within acceptable limits.			
	No issues have been identified with sample representatively. The sample size is considered appropriate for this type of mineralisation style.			
Quality of assay data and	Analysis was conducted by SGS Laboratories in Kalgoorlie. Sample preparation included drying the samples (105°C) and pulverising to 95% passing 75µm. Samples were then riffle split to secure a sample charge of 50 grams. Analysis was via Fire Assay (FAA505) with AAS finish. Only gold analysis was conducted (ppm detection). The analytical process and the level of detection are considered appropriate for this stage of exploration.			
tests	Fire assay is regarded as a complete digest technique.			
	No geophysical tools were used to determine any element concentrations.			
	Internal laboratory quality control procedures have been adopted and accepted. Certified reference material (CRM's) in the form of standards, blanks and duplicates are periodically imbedded in the sample batch by Kin Mining at a ratio of 1:20. Sample pulp assay repeatability, internal blank and CRM standard assay results are within acceptable limits.			
Verification of sampling and	The reported significant intersections have been verified by Kin Mining's company geologists. The sampling and assay data has been compiled, verified and interpreted by company geologists. The assay data has been stored physically and electronically in the company database using Kin Mining's protocols. Data has been entered and validated by experienced database personnel.			
ussuying	No holes were twined. No adjustments, averaging or calibrations are made to any of the assay data recorded in the database. QA/QC protocol is considered industry standard with standard reference material submitted on a routine basis.			
Location of data points	Drill hole collars were located and recorded in the field using a hand held GPS with a three metre or better accuracy. At a later date drill hole collars will be picked up and verified by licensed surveyors using a RTK DGPS (with a horizontal and vertical accuracy of ±50mm). The grid coordinate system utilised is (GDA94 Zone51). Hole locations were visually checked on the ground and against existing plans for spatial verification. Topographic control is nominal (i.e. surface RL) but will be recorded accurately by the surveyors as part of the DGPS collar pick-up.			
Data spacing and distribution	The drill hole spacing at Helens is project specific; the RC drilling pattern employed is dependent on previous drilling results and geological interpretation. The sample spacing is considered close enough to identify any significant zones of gold mineralisation. The drill programme is a follow up/ongoing exploration exercise that was designed to identify areas of geological interest and follow up existing mineralisation at Helens (M37/317). Closer spaced drilling on surrounding cross sections and follow up diamond drilling maybe required to further delineate the extent, size and geometry of some areas within the identified zones of gold mineralisation. Drill spacing and drill technique is sufficient to establish the degree of geological and grade continuity appropriate for the mineral resources and ore reserve estimation procedures and classifications applied however the mineralised system remains open and additional extensional, infill and/or deeper drilling maybe required to close off and confirm the full extent of the Helens ore body, particularly along strike and at depth.			

Criteria	Commentary
Orientation of data in relation to geological structure	The sheared Cardinia greenstone sequence displays a NNW to North trend. The tenement package is contiguous. The Helens Main mineralisation is within M37/317. The drilling and sampling programme was designed to provide, as best as practicable, an unbiased location of drill sample data.
	The chance of sample bias introduced by sample orientation is considered minimal. No orientation sampling bias has been identified in the data thus far.
	The vast majority of historical drilling and this campaign (HE17RC153 to HE17RC156 for 449m) are orientated at approximately 245°/-60° (WSW) generally orthogonal to the strike of the mineralisation.
	Gold mineralisation at Helens occurs in a sheared, brecciated, carbonated, sulphidic mafic (Basalt). Primary mineralisation has been identified at depth. Gold mineralisation appears to be shear related and associated with sulphide mineralisation and quartz carbonate veining. The deposit is deeply weathered and open at depth. Originally the deposit was Aircore drilled on a nominal 20m x 40m grid pattern by Navigator Resources. Kin Mining have infilled the grid pattern with RC drilling. The four reported drill holes are drilled on a nominal 25m x 15m grid, drilling in between and below the existing Navigator drill pattern.
Sample security	Samples are bagged, numbered, collected from the field and then stored in a secure lockable location in Leonora until collection. There is no perceived opportunity for the samples to be compromised. Upon completion of several drill holes batches of samples were transported to Kalgoorlie by an SGS representative. The samples were then stored at the SGS lab in a secure lockable building. Samples are checked against the field manifest, sorted and prepared for assay. Samples are assayed under the supervision of SGS at their Kalgoorlie laboratory. Once in the laboratory's possession adequate sample security measures are utilised.
Audits or reviews	Sampling methodologies and assay techniques used in this drilling programme are considered to be mineral exploration industry standard and any audits or reviews are not considered necessary at this particular exploration stage. No audits or reviews have been conducted apart from internal reviews and field quality controls.

# Section 2 Reporting of Exploration Results

Criteria	Commentary
Mineral tenement and land tenure status	The RC drill programme was conducted on the Helens prospect on tenement M37/317 at Helens Main; the general area is referred to as the Cardinia Mining Centre. The tenements are held in the name of Navigator Mining Pty Ltd, a wholly owned subsidiary of Kin Mining NL. The tenements are managed, explored and maintained by Kin Mining NL. The drilled tenement represents a small portion of the larger Cardinia-Mertondale Project which hosts the 22.3Mt @ 1.43 g/t Au (1.02Moz) Leonora Gold Project (LGP) Resources. The tenement is located within the Shire of Leonora in the Mt Margret Mineral Field in the centre of the North Eastern Goldfields. The Cardinia area is located approximately 30km ENE of Leonora. There is no known heritage or environmental impediments over the resource areas.
Exploration done by other parties	The Cardinia deposits have been extensively explored and drilled by a number of companies including Mt Edon, Sons of Gwalia and in more recent times Navigator. A review of the collar file data reveals the following companies: Navigator (NAV), NR (Normandy Resources?), MET (Metana), SGW (Sons of Gwalia), CIM (Centenary), AZT (Aztec) and HLM (Harbour Lights) have all contributed to drill programmes at several sites at various times, however the vast majority of recent exploration at Helens was conducted by Navigator. A test parcel of ore was mined by NAV from the nearby Bruno pit (100,000t), grade and recoveries exceeded expectations. Navigator commissioned Runge Limited to complete a Mineral Resource estimate for the Cardinia deposits in January 2009. The resource was recently re-evaluated (2017) by independent mining consultant Carras Mining Pty Ltd who calculated a new resource estimate of 1.27Mt @ 1.5 g/t Au for 61,000 oz Au at Helens.
	Existing historical drilling was previously conducted in the immediate area surrounding the Kin drill holes by Navigator. The data base has been interrogated and scrutinised to a level where the LGP gold resources are JORC 2012 compliant (ASX announcement 30th August 2017). Visual validation, using 3D software, has been conducted as well as cross referencing with historic plans and reports. Mineralisation between cross sections is cohesive and robust, suggesting that the data is valid.

Criteria	Commentary			
Geology	The regional geology comprises a suite of NNE-North trending greenstones positioned on the Mertondale Shear Zone (MSZ), a splay limb of the Kilkenny Lineament. The MSZ denotes the contact between Archaean felsic volcanoclastic and sediment sequences (west) and Archaean mafic volcanics (east). Proterozoic dykes and Archaean felsic porphyries have intruded the altered mafic basalt/felsic volcanoclastic/sedimentary sequence of the MSZ.			
	Locally within the Cardinia project area the stratigraphy consists of intermediate mafic and felsic volcanics and intrusive lithologies with locally derived epiclastic sediments which strike NNW with a sub vertical attitude. Structural foliation of the stratigraphy generally dips moderately to the west. The central area is dominated by strongly weathered NW trending basalts with intercalated beds of felsic rocks and minor shales.			
	At Helens Main the stratigraphy comprises a sequence of sheared intermediate mafic volcanic lithologies. The basalt host rock is sheared, altered, carbonated, bleached, brecciated and mineralised.			
	Gold distribution can be highly variable and closely spaced drilling is required to confidently delineate the mineralised zones. Primary gold mineralisation is associated with increased shearing accompanying the host lithology. Disseminated pyrite, silicified quartz veining and carbonate-chloritic alteration zones are adjacent to and associated with the gold mineralisation.			
	At the Helens deposit the mineralisation trends either NNW or N-S, with a sub vertical eastern attitude. The mineralisation is confined to the mafic stratigraphy where it is associated with increased shearing, intense alteration and disseminated sulphides.			
Drill hole Information	The location of all drill hole collars, orientation and significant gold intersections are presented as part of the significant intersection table in the body of this report. All hole depths refer to down hole depth in metres. All hole collars are MGA94 Zone51 GPS positioned. Elevation (R.L.) is nominally recorded as part of the collar pick up.			
	Drill holes are measured from the collar of the hole at surface to the bottom of the hole.			
Data Aggregation methods	No averaging of the raw assay data was applied; the raw data was used to determine the location and width of gold intersections and anomalous gold trends. Geological assessment and interpretation was used to determine the relevance of the plotted intersections with respect to the sampled medium.			
	Individual grades are reported as down hole length weighted averages. Only RC intersections greater than or close to 0.5g/t are regarded as significant. Anomalous intersections are tabled in the body of this report. Reported mineralised zones have a cut-off grade of 0.5g/t Au with no more than 2m of internal dilution (<0.1g/t Au).			
	No top cuts were applied to any assay values. There is no reporting of any metal equivalent values.			
Relationship Between Mineralisation widths and intercept lengths	The orientation, down hole widths and geometry of the mineralisation has been determined by interpretation of historic drilling and confirmed by Kin's recent drill programs. The Drilling at Helens was on an Azimuth of 245° and an angle of -60° which is considered to be the optimum drill orientation to intersect the targeted mineralisation. However, the drill hole orientation may not be at an optimal angle to the mineralised structure but the holes are orientated in the same direction as the historic Navigator drilling. Since the mineralisation is steeply dipping to the east the intersections are reported as down hole widths and not true widths. The reported mineralised intercepts are outside and south of the confines of the existing proposed open cut pit at Helens. They have not yet been incorporated into the current parameters of the Helens resource calculation.			
	The maximum and minimum sample width within the mineralised zones is 1m.			
Diagrams	Relevant "type example" plans, sections, and long sections are included in this announcement.			
Balanced Reporting	Only the significant gold results are discussed and reported, assay results are diagrammatically displayed and tabled in this report. The available historic database includes a large inherited data set compiled by previous project owners dating back to 1982. There are limitations in the amount of information provided in the data set. It has not been possible to fully verify the reliability and accuracy of some portions of the data however it appears that no serious problems have occurred and validation check results were within acceptable limits. In general the recent data is more reliable than historic data. The vast majority of the historic drilling at Helens was conducted by Navigator Resources.			
	Considering the complex history of grid transformations there must be some residual risk in converting			

Criteria	Commentary
	old local grids to GDA94 however the survey control appears to be accurate and satisfactory.
	In the case of the existing LGP resource calculation there is always an area of technical risk associated with resource tonnage and grade estimations.
Other Substantive	Regarding the results received there is no other substantive data.
exploration data	All meaningful and material information is or has been previously reported.
Further work	The potential to expand the gold mineralisation identified at Helens is viewed as probable, however committing to further exploration drilling does not guarantee that an upgrade in the resource would be achieved. Kin Mining intend to conduct more drilling in and around the Helens deposit. The overall objective of any future drill programs is to increase the existing Helens resources, define any lateral extensions and convert the Inferred portions of the resources to the Indicated category.