Ardea Resources Limited

Highway Nickel Deposit - Mineral Resource Estimate 92 million tonnes at 0.69% nickel and 0.038% cobalt

Ardea is pleased to present an updated JORC 2012-compliant Mineral Resource Estimate (**MRE**) for the Highway nickel deposit (**Highway**) within the Kalgoorlie Nickel Project (**KNP**).

Highway is an integral element in a proposed mining and ore processing infrastructure development at the KNP Goongarrie Hub and is located 30km north of the proposed Goongarrie plant site which in turn is located 70km northwest of the City of Kalgoorlie-Boulder in Western Australia (Figure 1-1).

The KNP is owned 100% by Ardea and is undergoing a Feasibility Study for a 2.25Mtpa High Pressure Acid Leach (**HPAL**) processing operation producing Mixed Hydroxide Product (**MHP**) and Precursor Cathode-active Material (**PCAM**) as an ethical and sustainable supply chain for the Lithium Ion Battery (**LIB**) sector.

The MRE update for Highway has been completed using the same modelling processes applied to the Goongarrie deposits (ASX release 15 February 2021).

The results of the MRE update for Highway are summarised below.

	Highway MRE based on 0.8% Ni cut-off grade	Highway MRE based on 0.5% Ni cut-off grade	KNP MRE based on 0.5% Ni cut-off grade
Measured Indicated & Inferred MRE	**19Mt at 1.00% Ni and 0.053% Co** Contained metal **188kt nickel and 10kt cobalt**	**92Mt at 0.69% Ni and 0.038% Co** Contained metal **633kt nickel and 35kt cobalt**	**830Mt at 0.71% Ni and 0.046% Co** Contained metal **5.9Mt nickel and 384kt cobalt**
Notes	Resources include **23Mt of saprock at 0.68% Ni, 0.023% Co** with 33% carbonate mineral content (as magnesite and dolomite). All tonnages and grades rounded to two digit precision.		

The combined Mineral Resources at the Goongarrie and Highway deposits that are planned to feed a starter 2.25Mtpa processing plant development at the KNP Goongarrie Hub are reported below, with an initial focus on the high grade resource based on a 0.8% Ni cut-off:

	Goongarrie and Highway deposits MRE based on 0.8% Ni cut-off grade	Goongarrie and Highway deposits MRE based on 0.5% Ni cut-off grade
Measured Indicated & Inferred MRE	**78Mt at 1.0% Ni and 0.069% Co** Contained metal **784kt nickel and 54kt cobalt**	**350Mt at 0.70% Ni and 0.044% Co** Contained metal **2.4Mt nickel and 154kt cobalt**
Notes	All tonnages and grades rounded to two digit precision	

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ARL

Ardea Resources Limited

Suite 2 / 45 Ord St
West Perth WA 6005

PO Box 1433
West Perth WA 6872

Telephone

+61 8 6244 5136

Email

ardea@ardearesources.com.au

Website

www.ardearesources.com.au

Directors

Mat Longworth
Non-Executive Chair

Andrew Penkethman
Managing Director & CEO

Ian Buchhorn
Technical Executive Director

Executive Management

Sam Middlemas
Company Secretary & CFO

Matt Painter
General Manager Exploration

Issued Capital

Fully Paid Ordinary Shares
127,670,582

Directors/Employee Performance Rights
4,236,000

ABN 30 614 289 342

Ardea's Managing Director, Andrew Penkethman, said:

"The Highway resource upgrade is an outstanding result, which when combined with the February 2021 Goongarrie resource update, has defined 67.5Mt of Measured and Indicated mineral resource at 1.0% Ni and 0.07% Co (681kt nickel and 49kt cobalt) which are available for conversion to reserve as part of Ardea's KNP, Goongarrie Hub feasibility study. Ardea management have prescribed metallurgical circuit reliability as an essential design element; with the availability of this added resource an important step along that journey.

More significantly, reflecting the detailed mineralogical material type work in the current study, we now have a well-defined source of mineralised neutraliser. This has a significant potential value upgrade for the KNP financial model, as it is expected to introduce additional nickel units to the project production profile.

Based on the 2021 MRE, we have selected diamond drill core hole sites in proposed future Highway and Goongarrie pit locations to acquire drill core for our H2 2021 bench-scale metallurgical programs. A core drilling contract was let for mid-July 2021.

The total KNP MRE is now 830Mt at 0.71% Ni and 0.046% Co (5.9Mt nickel, 380kt cobalt). This is a world-significant asset located in an infrastructure rich location, within the best operating jurisdiction in the world."

Highway and Goongarrie (ASX release 15 February 2021) nickel and cobalt Mineral Resources using a 0.8% Ni cut-off grade

Deposit	Resource Category	Tonnes (Mt)	Ni %	Co %	Contained Metal Ni (kt)	Contained Metal Co (kt)
Goongarrie Hub (GH, GS, BF & SD)	Measured	11.0	1.13	0.106	125	11.6
	Indicated	41.5	0.97	0.070	404	29.0
	Inferred	7.1	0.95	0.051	67	3.6
	Subtotal	59.6	1.00	0.074	595	44.3
Highway	Indicated	15.1	1.01	0.053	152	8.0
	Inferred	3.7	0.98	0.053	36	2.0
	Subtotal	18.8	1.00	0.053	188	10.0
Combined Deposits	Measured	11.0	1.13	0.106	125	11.6
	Indicated	56.5	0.98	0.066	556	37.1
	Inferred	10.8	0.95	0.051	103	5.6
	Grand Total	**78.3**	**1.00**	**0.069**	**784**	**54.3**

The strategic value of Highway to the Goongarrie Hub is that subject to H2 2021 bench-scale metallurgical testwork, it will be a major source of nickel-enriched carbonate and silica dominant saprock neutraliser (**mineralised neutraliser**) for the HPAL autoclave acid neutralisation. The unusually high nickel content of 0.68% Ni in the 23 million tonnes of carbonate-rich saprock is expected to result in a significant increase in total nickel metal output relative to the average grade of the plant feed. The present process design assumes externally-sourced limestone neutraliser, which would have been trucked in from the Rawlinna, over 400km away. The alternative, which is to use in-pit neutraliser, is expected to improve the KNP resource utilisation, as well as reduce the carbon emissions from consumable transport and also reduce operating costs.

Forthcoming metallurgical testwork (ASX release 31 May 2021) is to investigate atmospheric leaching of the mineralised neutraliser, which would be performed in parallel to HPAL leaching of the iron-rich goethitic ore. From a process perspective, atmospheric leaching would be beneficial for stabilising the overall circuit, especially with regards to sulphuric acid plant production and its role in balancing the site energy balance. Investigations are pending.

Additional value adding credits are also envisaged based on assay results for an initial suite of over 3,100 archived drill sample assay pulps from Highway that have been re-assayed and reported both elevated scandium grades of ≥ 20 ppm Sc and nickel grades ≥ 0.5% Ni for over 20% of the samples. Ardea has recently submitted a second suite of archived pulps for analysis to provide sufficient data to enable a formal estimation of the Highway scandium resources and looks forward to reporting this information in a subsequent Highway resource update planned for H2 2021.

1. Background

The Highway nickel deposit (**Highway**) is located 30km north along the Goldfields Highway from Ardea's flagship KNP Goongarrie Hub and 100km northwest of the City of Kalgoorlie-Boulder in Western Australia (Figure 1-1). The Highway resources extend over a strike length of 5.7km and are located on a granted mining lease (M29/214) with Native Title Mining Agreement in place and tenure controlled 100% by Ardea. Highway is also proximal to high quality infrastructure with the Goldfields Highway, rail line and power infrastructure located immediately east of the deposit (Figure 2-1). Ardea envisages that Highway will operate as a satellite mining operation to the Goongarrie Hub deposits with high grade goethitic ore and nickel-rich saprock neutraliser trucked 30km south along the Goldfields Highway to a processing plant to be constructed immediately east of the high-grade Goongarrie South deposit.

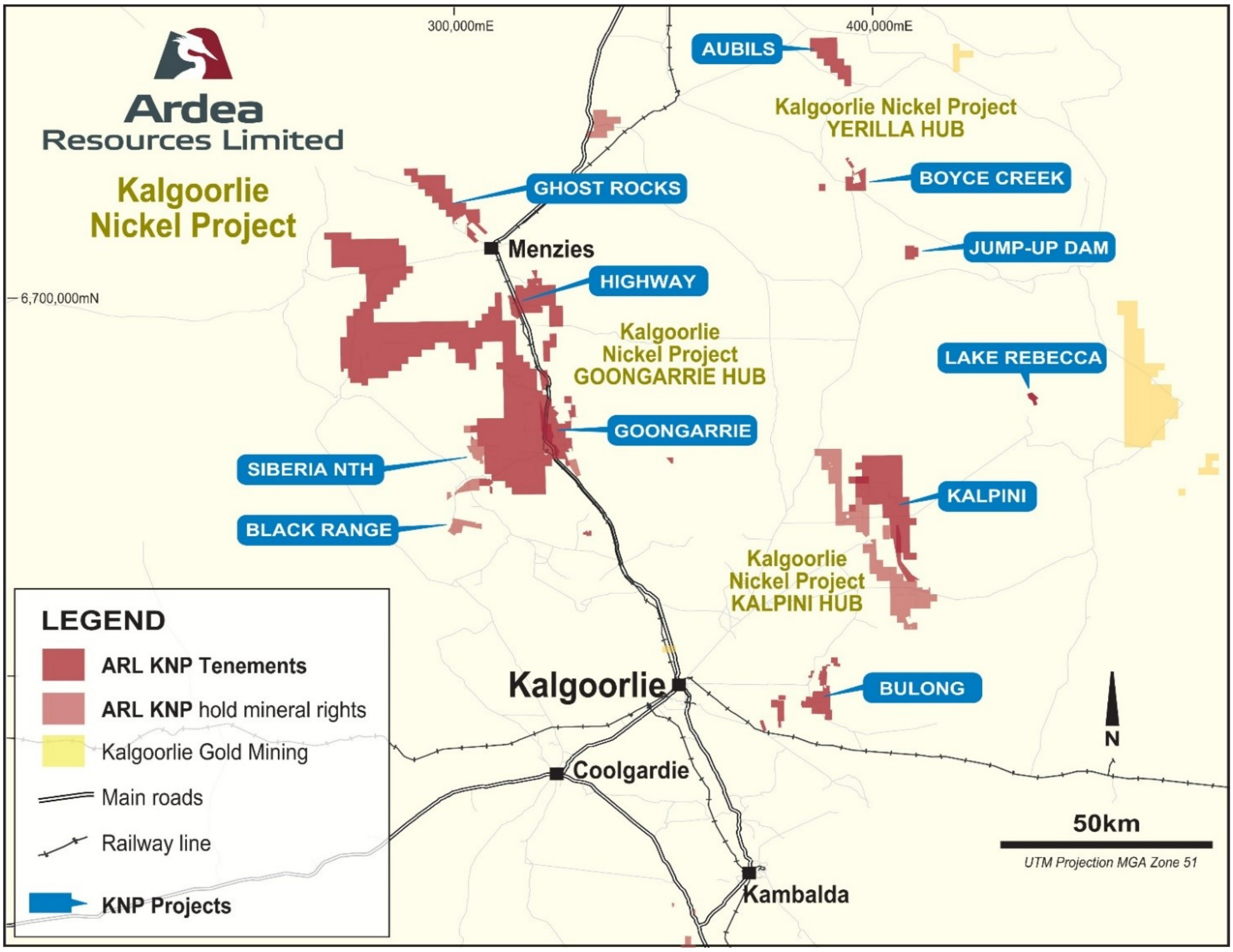


Figure 1-1: The Kalgoorlie Nickel Project (KNP) location plan. Projection: GDA94 MGA Zone 51.

The updated resource estimate for Highway follows the completion of similar updated resource estimates for the Goongarrie deposits (Goongarrie Hill (GH), Goongarrie South (GS), Big Four (BF) and Scotia Dam (SD)) that were announced to the market on 15 February 2021 (then referred to as the Goongarrie Nickel Cobalt Project – GNCP). The update for Highway has been undertaken using the same modelling processes used to produce the updated resource estimates for the GNCP and incorporating value-adding outcomes derived from Ardea's ongoing Research and Development (**R&D**). The R&D objectives are primarily to identify any significant value-adding bulk materials and by-product metals that could be recovered in an operation primarily focused on nickel. The major means of effecting the R&D has been to re-assay archived drill sample pulps for Ardea's 58 element Critical Minerals assay suite and undertake quantitative XRD analysis of representative pulps to determine the spatial distribution of mineralogy at each deposit.

Critical Mineral re-assay data for an initial suite of over 3,100 archived drill sample assay pulps from Highway have been assessed with elevated scandium grades ≥ 20ppm and nickel grades ≥ 0.5% reported for over 20% of the samples. Ardea awaits assay results for a second suite of archived drill sample pulps (over 2,000), prior to updating the MRE for Highway to include a resource estimate for scandium and possibly Rare Earth Elements (**REE**). These latter Critical Minerals need to be present in sufficient concentrations to be considered economically viable to extract as a by-product of a mining operation focused on nickel (flow-sheet scandium and REE options include PLS ion exchange and solvent extraction, to be assessed during the H2 2021 bench-scale metallurgy – ASX release 31 May 2021).

Quantitative XRD mineralogy data for 92 sample pulps from Highway submitted to BV by Ardea have been assessed and suitable mathematical criteria determined that separate the quantitative mineralogy data into distinct mineral assemblage groups which form the basis of material type classification scheme applied to the resource model. Ardea awaits the return of XRD mineralogy analyses for 20 additional sample pulps with plans to update the material type classification scheme for the goethite-rich Clay Upper horizon of the weathering profile.

The presence of significant nickel grades averaging 0.7% Ni in carbonate-rich saprock at Highway also provides an excellent opportunity to realise substantial value-adding nickel units through its use as a neutraliser of the HPAL discharge from the goethite-dominant high-grade nickel plant feed stock from the Goongarrie deposits. The plant feed material from the KNP Goongarrie Hub alone based on a 0.8% Ni cut-off grade is expected to average 1.0% Ni for at least 25 years of production assuming a plant throughput of 2.25Mt per annum. The nickel credits from using carbonate-rich saprock from Highway as neutraliser will increase the recovered nickel metal compared to using a conventional neutraliser such as imported Eucla Basin limestone or on-site calcrete that contain no nickel.

2. Exploration Data Informing the Highway Resource Update

The updated MRE for Highway is primarily informed with geological and multi-element assay data for 36,735m of RC drilling amongst 785 holes focused on resource definition. This is augmented with data for 944m of diamond drilling (20 holes) and 1,109m of sonic drilling (23 holes) undertaken to verify the geology and sampling from the RC drilling and collect samples for bulk density determinations and material for metallurgical test work. All the drilling was completed from 2003 to 2008, leading to the 2009 Vale Inco KNP Pre-feasibility Study.

Approximately 70% of the mineralisation has been drilled on an 80mE by 80mN grid including two 80mE by 80mN areas of 20m by 20m spaced holes, a 20m by 20m area of approximately 5mE by 5mN spaced holes and several drill traverses of 80mE by 120mN spaced holes. Most of the remaining mineralisation has been drilled with 80m spaced holes along drill traverses (E-W) spaced either 160mN or 200mN apart (Figure 2-1).

A detailed summary of the drilling subdivided by company and drilling method is provided in Table 2-1. To date, 45% of all the RC drilling was completed by Vale Inco in 2006 through 2008, 43% by Heron Resources in 2004 and 2005 and 12% by Helix Resources in 2003. All the diamond and sonic drilling was completed by Vale Inco in 2006 and 2007.

Table 2 -1 – Summary of drilling at Highway deposit; Purpose Coding is: QAQC = Quality Assurance Quality Control, RD = Resource Definition, BDM = Bulk Density Measurements, MTW = Metallurgical Test Work.

Company	Hole Type	No Holes	No Metres	Purpose	Drill Period
Helix	RC	108	4,389	RD	2003
Heron	RC	333	15,749	RD	2004-2005
Vale Inco	DD	20	944	QAQC, BDM and MTW	2006
	RC	344	16,597	RD	2007-2008
	SH	23	1,109	BDM and MTW	2006-2007
	Subtotal	*387*	*18,650*		
Combined	DD	20	944		
	RC	785	36,735		
	SH	23	1,109		
	Total	*828*	*38,788*		

Most of the exploration samples from Highway have been analysed for Ni, Co, Mn, MgO, FeO, Al_2O_3, SiO_2, CaO, Cr, Cu, Zn and As by XRF analysis at UltraTrace Laboratories (now Bureau Veritas - **BV**) in Perth. All the Vale Inco samples have also analysed for loss on ignition (LOI) by thermogravimetric analysis. LOI values for the remaining samples have been calculated by Ardea as 100 minus the sum of all the other grade attributes (as oxides) except the samples from the Helix drilling which could not be reliably calculated in the absence of SiO2 assay results. Assay data are available for over 25,000 drillhole samples representing over 37,000 metres of drilling with most of the samples within the modelled resource envelope collected over 1m or 2m intervals.

Bulk density measurements have been collected by Vale Inco for 261 samples of diamond and sonic drill core using the Archimedes method or weight divided by volume. Moisture measurements were determined by weighing the samples before and after oven drying. In addition, Vale Inco completed 1500m of downhole geophysical density logging across 39 drillholes, with 1,200m of logging matched with 971 sample intervals and combined with the bulk density data for the core samples to determine average density values subdivided by mineralised and waste material types.

Ardea submitted 92 representative Highway sample pulps from 5 RC holes and 1 diamond hole to BV for quantitative XRD mineralogy analysis, targeting all the significant mineralisation styles and overburden transported material types identified in the regolith profile at Highway. The XRD data were merged with multi-element assay data for the samples to develop a detailed regolith material type classification scheme based on relationships between the dominant geochemical attributes and various mineral group associations present in the regolith profile.

Re-assay of over 5,000 archived drill sample pulps from Highway by XRF and laser ablation – MS at Bureau Veritas (**BV**) has / is being used by Ardea to:

- Verify historical assay results.
- Quantify Critical Mineral and metal distributions.
- Provide assay data for scandium and REEs, for use in estimation of scandium Mineral Resources.

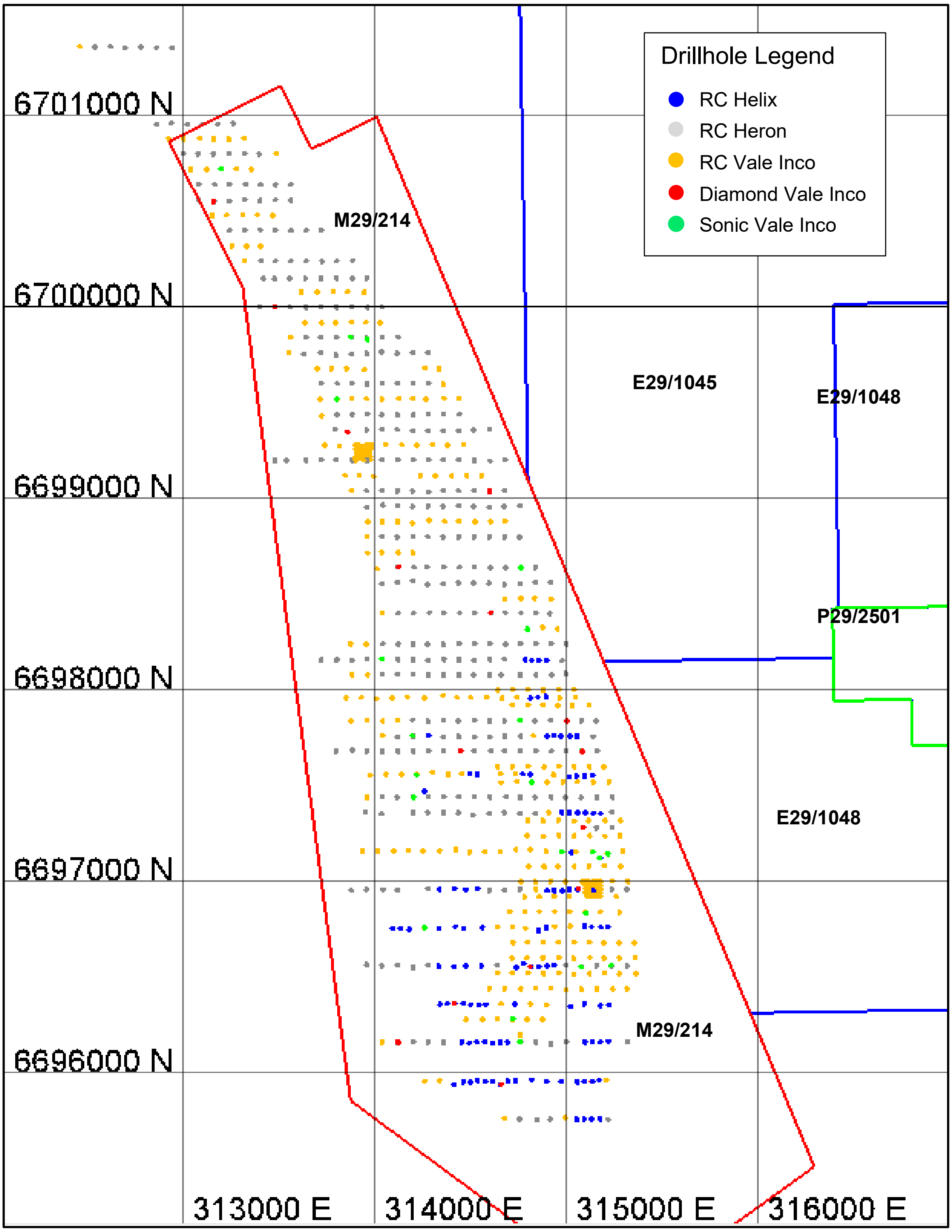


Figure 2-1: Ardea Tenure and distribution of drilling at Highway

3. Highway Updated Resource Estimation

The data from the historical RC, diamond and sonic drilling programmes at Highway and Ardea's more recent R&D re-assay and XRD mineralogy datasets have been used to:

- Complete a comprehensive review of the exploration data quality for Highway.
- Undertake updated geological modelling of the Highway mineralisation and regolith profile boundaries to constrain updated resource estimation (Appendix 3).

- Investigate other materials within the weathering profile at Highway that could add value to the project:
  - Pedogenic calcrete and soils at surface overlying the nickel laterite mineralisation that are rich in the calcium and magnesium carbonate minerals calcite and dolomite that could be used for environmental management of tailings and less likely due to its low nickel content as a neutralising reagent in the proposed ore processing flowsheet based on High Pressure Acid Leaching.
  - Materials rich in the carbonate minerals dolomite and magnesite, underlying the nickel laterite mineralisation, particularly nickel-bearing carbonate saprock and serpentine saprock, for use as a high-nickel neutralising reagent.
- Undertake updated nickel and cobalt resource estimation by Ordinary Kriging (**OK**) into 40mE by 40mN by 4mRL size panels followed by Local Uniform Conditioning (**LUC**) to produce recoverable nickel and cobalt grade estimates for a selective mining unit resolution of 10mE by 10mN by 2mRL.
- Generate representative cross-sections of the LUC estimates (Appendix 3).
- Estimate additional grade attributes into the resource models including MgO, FeO, Al_2O_3, SiO_2, CaO, LOI, Mn, and Cr by ordinary kriging into 10mE by 10mN by 2mRL size blocks.
- Develop comprehensive material type classification scheme based on the multi-element geochemistry and the quantitative XRD mineralogy datasets collected by Ardea.
- Assign material type codes to the resource models based on the OK multi-element grade estimates and determined material type classification scheme. Representative cross-sections of the material type assignments are presented in Appendix 3.
- Determine appropriate average dry bulk density (BD) and moisture content values subdivided by the material type classification scheme based on the datasets of physical measurements of core samples and downhole geophysical density logging.
- Apply Mineral Resource classification based on JORC 2012 Guidelines with definitive classification parameters based on input data quality, geological confidence and estimation quality statistics relating to the OK/LUC nickel estimates.
- Undertake detailed Mineral Resource reporting based on the updated resource estimate.

4. Highway Mineral Resources

Compared to the previous MRE for Highway reported by Heron in 2013, the new MRE for Highway based on a 0.5% Ni cut-off grade (Table 4-1) reports a higher global tonnage of 92Mt (+5 Mt), higher global nickel grade of 0.69% (+0.03% Ni) and an increase in the Indicated Resource (+17% relative tonnage) compared to the previous MRE for Highway. The increases in tonnage and grade result from Ardea using the recoverable resource estimation method, Local Uniform Conditioning, which provides an estimate of the resources expected to be recovered upon mining using a minimum mining selectivity of 10mE by 10mN by 2mRL size blocks. This allows for greater discrimination between ore and waste compared to the resource estimate reported by Heron in 2013 which was based on ordinary kriging for 40mE by 80mN by 4mRL size blocks. The LUC method utilises the well understood principal of volume / variance effect that reflects a larger range of grades (higher and lower) relating to locally smaller unit volumes compared to lesser grade ranges relating to larger unit volumes estimated by ordinary kriging.

Table 4-1 – Highway nickel and cobalt Mineral Resources using 0.5%, 0.8% and 1.0% Ni cut-off grades

Resource Category	Cut-off Grade (Ni%)	Tonnes (Mt)	Ni %	Co %	Contained Metal Ni (kt)	Contained Metal Co (kt)
Indicated	0.5	70.6	0.70	0.038	491	26.6
	0.8	15.1	1.01	0.053	152	8.0
	1.0	5.7	1.22	0.065	69	3.7
Inferred	0.5	21.1	0.67	0.040	142	8.4
	0.8	3.7	0.98	0.053	36	2.0
	1.0	1.2	1.19	0.062	14	0.7
Indicated + Inferred	0.5	91.7	0.69	0.038	633	35.0
	0.8	18.8	1.00	0.053	188	10.0
	1.0	6.8	1.21	0.064	83	4.4

The increase in Indicated Resource tonnes compared to the Heron 2013 MRE reflects Ardea's use of less restrictive definitive resource classification criteria for Indicated Resources which is based entirely on continuous slope of regression values $\geq$ 0.7 for the ordinary kriged panel-nickel estimates between adjacent drill sections. This differs from the Heron criteria which utilised the same slope of regression parameters as Ardea, but also required a minimum drillhole spacing of 80mE by 120mN and further restrictions based on the availability of SiO_2 assay data for input to estimation and subsequent material type classification (unavailable for Helix drilling). Ardea considers the simplified criteria based on slope of regression of the ordinary kriged panel-nickel estimates to be appropriate, inclusive of all data quality and geological interpretation considerations and JORC 2012 guidelines. This approach was also endorsed in its application to the Goongarrie South (**GS**) deposit in an independent peer review of the Ardea MRE update for GS by consultants in early 2021.

Ardea has completed two additional comparative estimates in the current MRE update for Highway including ordinary kriging of panels (large blocks with dimensions 40mE by 40mN by 4mRL which inform the LUC estimates) and ordinary kriging of small blocks at the same resolution as the LUC estimates (10mE by 10mN by 2mRL). The results of these estimates and the LUC estimates for Ni and Co at Highway are in line with expectations based on detailed validation of the LUC and ordinary kriged estimates relative to the input grade data.

As per the Goongarrie MRE updates reported in mid-February 2021, higher grade 0.8% and 1.0% Ni cut-off grades have also been applied to the Highway MRE (Table 4-1) to provide insight into the tonnages and grades of high-grade material that could be incorporated into a mining schedule for the initial 25 years of the KNP Goongarrie Hub development while simultaneously exposing underlying nickel and carbonate-rich saprock required for acid neutralisation in the proposed HPAL ore processing flowsheet for the KNP. There is good continuity of high nickel and cobalt grades at Highway (Figures 4-1 and 4-2) which demonstrates the potential for selective mining and processing of this material.

A listing of information used in the Mineral Resource estimation is provided in Appendix 3 (in compliance with ASX Listing Rule 5.8.1). All figures with a grid reference use a projection relative to GDA94 MGA Zone 51.

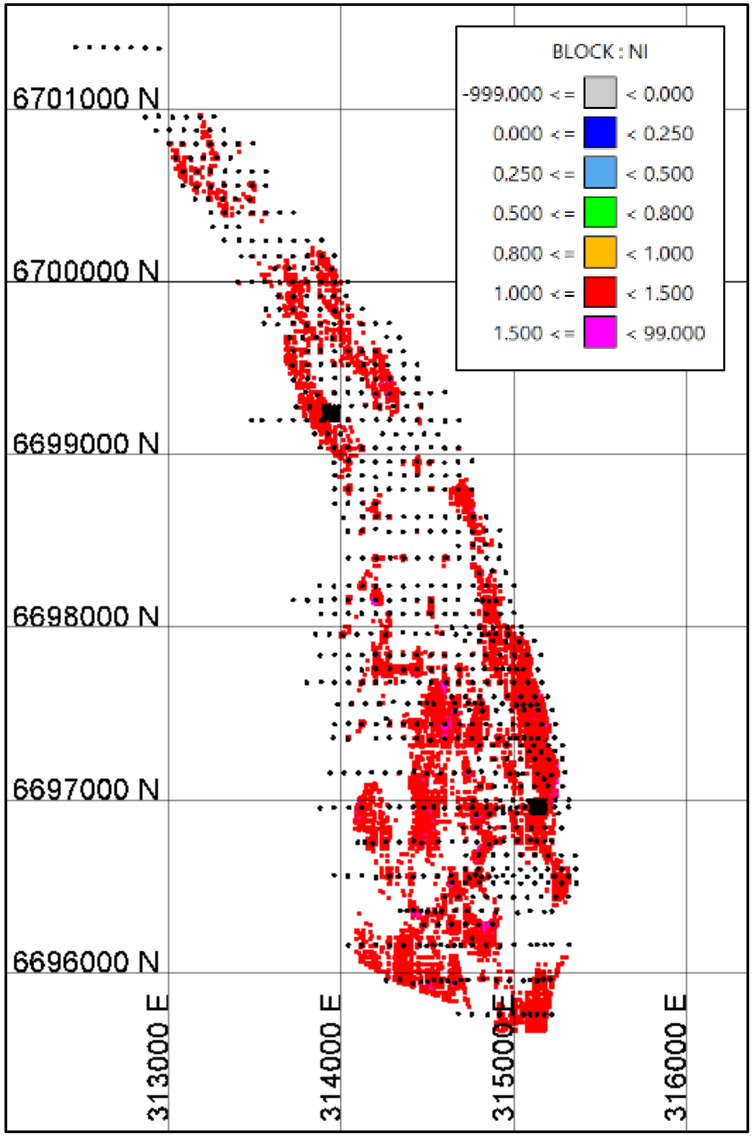


Figure 4-1: Plan view of MRE block model blocks ≥ 1.0 % Ni

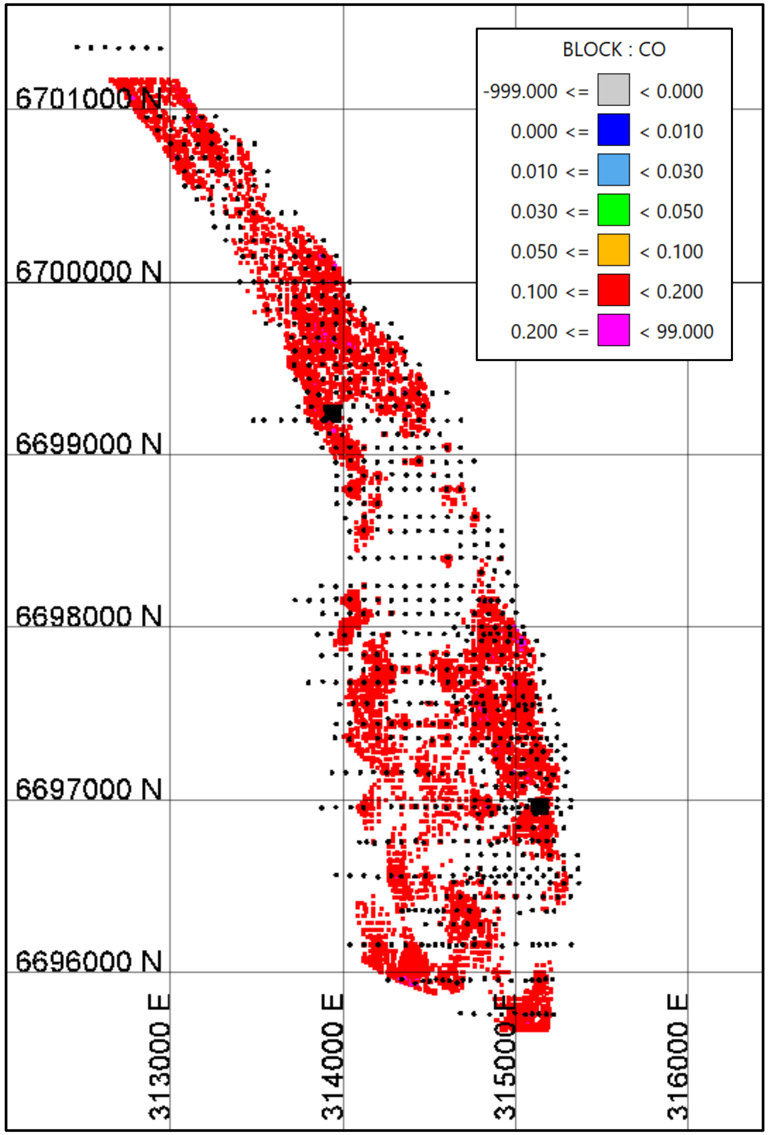


Figure 4-2: Plan view of MRE block model blocks ≥ 0.1 % Co

5. KNP Mineral Resources Update and Feasibility Study

The total Mineral Resource inventory for the KNP has been updated to reflect the most recent resource estimates available for all of Ardea's nickel laterite assets (Table 5-1).

Ardea's total Mineral Resource inventory within the KNP based on a 0.5% Ni cut-off grade now stands at **830Mt at 0.71% Ni and 0.046% Co**. All the resources are constrained within optimised pit shells using appropriate nickel and cobalt prices, mining and processing costs and pit slope parameters to determine the material that could potentially be economically mined in the future.

Ardea advised of the commencement of a Feasibility Study (**FS**) on its Kalgoorlie Nickel Project, with the study focus and future plant site being at Goongarrie, targeting premium goethite ore (ASX release 31 May 2021).

The FS follows the positive Goongarrie Nickel Cobalt Project (**GNCP**) Pre-Feasibility Study (**PFS**) and Expansion Study (**ES**) in 2018[1] and resource upgrade in 2021[2]. With the ever-increasing nickel and cobalt demand, the 2018 studies require an upgrade to accommodate the increasing international level of Lithium Ion Battery nickel and cobalt interest.

The KNP scope has been expanded from Goongarrie alone for Goongarrie to now include high grade silica-goethite satellite pits at Highway and Siberia North (**Goongarrie Hub**). As well as the Highway mineralised neutraliser, the FS will now include mineralised neutraliser from Kalpini and Bulong (**Kalpini Hub**) and Aubils, Boyce Creek, Jump Up Dam and Lake Rebecca nontronite mineralisation (**Yerilla Hub**). The FS is also evaluating the potential revenue contributions from scandium and Rare Earth Elements (REE) throughout the KNP.

Approximately 29% of the KNP Mineral Resources are based on estimates completed by Snowden Mining Industry Consultants on behalf of Heron in 2004, 26% by Snowden and Heron resource geologists in 2007 through 2009, 2% by HGMC on behalf of Ardea in 2017 and the remaining 43% (comprising the GNCP and Highway deposits) by Ardea's Senior Resource Geologist in 2021.

All the Mineral Resource estimates completed prior to the introduction of the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (**JORC Code 2012**) have been reviewed by Ardea Competent Persons and confirmed to comply with JORC Code 2012 guidelines.

The Goongarrie Hub is expected to be the initial target for production as part of the 2.25Mtpa FS update base case. With the majority of the Highway and Goongarrie MRE using a 0.8% Ni cut-off grade classified as Indicated and Measured Resource, this material will be available for conversion to reserve as part of the FS work streams (Table 5-2).

[1] ASX releases – 28 March and 24 July 2018.
[2] ASX releases – 28 March 2018 and 15 February 2021.

Table 5-1 – Updated KNP nickel and cobalt Mineral Resources based on a 0.5% Ni cut-off grade

Camp	Prospect	Resource Category	Size (Mt)	Ni (%)	Co (%)	Contained Metal		Estimation Details		
						Ni (kt)	Co (kt)	Method	Source	Year
Goongarrie	Goongarrie South	Measured	18	0.94	0.085	171	15	LUC	Ardea	2021
		Indicated	82	0.71	0.049	584	40	LUC	Ardea	2021
		Inferred	10	0.64	0.033	61	3	LUC	Ardea	2021
	Highway	Indicated	71	0.69	0.038	487	27	LUC	Ardea	2021
		Inferred	21	0.67	0.040	141	8	LUC	Ardea	2021
	Ghost Rocks	Inferred	47	0.66	0.042	312	20	OK	Snowden	2004
	Goongarrie Hill	Indicated	40	0.65	0.037	259	15	LUC	Ardea	2021
		Inferred	29	0.60	0.025	176	7	LUC	Ardea	2021
	Big Four	Indicated	49	0.71	0.047	346	23	LUC	Ardea	2021
		Inferred	14	0.68	0.043	96	6	LUC	Ardea	2021
	Scotia	Indicated	12	0.71	0.065	82	7	LUC	Ardea	2021
		Inferred	5	0.72	0.043	37	2	LUC	Ardea	2021
	Goongarrie Subtotal	Measured	18	0.94	0.085	171	15			
		Indicated	253	0.69	0.044	1,758	112			
		Inferred	127	0.65	0.037	823	47			
		Combined	***398***	***0.69***	***0.044***	***2,753***	***175***			
Siberia	Siberia South	Inferred	81	0.65	0.033	523	27	OK	Snowden	2004
	Siberia North	Indicated	10	0.64	0.051	64	5	OK	Snowden	2009
		Inferred	53	0.66	0.043	352	23	OK	Snowden	2009
	Black Range	Indicated	9	0.67	0.090	62	8	OK	HGMC	2017
		Inferred	10	0.69	0.100	68	10	OK	HGMC	2017
	Siberia Subtotal	Indicated	19	0.65	0.070	126	13			
		Inferred	144	0.66	0.041	943	59			
		Combined	163	0.66	0.045	1,070	73			
KNP Goongarrie Hub	**TOTAL**	Measured	18	0.94	0.085	171	15			
		Indicated	255	0.69	0.048	1,747	121			
		Inferred	283	0.65	0.039	1,844	111			
		Combined	***556***	***0.68***	***0.045***	***3,761***	***248***			
Bulong	Taurus	Inferred	14	0.84	0.051	119	7	OK	Snowden	2007
	Bulong East	Indicated	16	1.06	0.055	169	9	OK	Snowden	2004
	Bulong East	Inferred	24	0.79	0.053	190	13	OK	Snowden	2004
	Bulong Subtotal	Indicated	16	1.06	0.055	169	9			
		Inferred	38	0.81	0.052	309	20			
		Combined	***54***	***0.88***	***0.053***	***477***	***29***			
Hampton	Kalpini	Inferred	75	0.73	0.044	550	33	OK	Snowden	2004
	Hampton Subtotal	Inferred	75	0.73	0.044	550	33			
KNP Kalpini Hub	**TOTAL**	Indicated	16	1.06	0.055	169	9			
		Inferred	114	0.76	0.047	859	53			
		Combined	***130***	***0.79***	***0.048***	***1,028***	***62***			
Yerilla	Jump Up Dam	Measured	4	0.94	0.048	36	2	OK	Snowden	2008
		Indicated	42	0.78	0.043	324	18	OK	Snowden	2008
		Inferred	18	0.63	0.034	116	6	OK	Snowden	2008
	Boyce Creek	Indicated	27	0.77	0.058	206	16	OK	Snowden	2009
	Aubils	Inferred	49	0.70	0.066	346	33	OK	Heron	2008
KNP Yerilla Hub	**TOTAL**	Measured	4	0.94	0.048	36	2			
		Indicated	68	0.78	0.049	531	33			
		Inferred	68	0.68	0.057	462	39			
		Combined	***140***	***0.73***	***0.053***	***1,028***	***74***			
KNP TOTAL		Measured	22	0.94	0.079	207	17			
		Indicated	357	0.72	0.047	2,584	168			
		Inferred	452	0.68	0.044	3,088	199			
	GRAND TOTAL	***Combined***	***830***	***0.71***	***0.046***	***5,879***	***384***			

Legend: LUC – Local Uniform Conditioning; OK – Ordinary Kriging.

Table 5-2 – Highway and Goongarrie nickel and cobalt Mineral Resources using a 0.8% Ni cut-off grade

Deposit	Resource Category	Tonnes (Mt)	Ni %	Co %	Contained Metal Ni (kt)	Contained Metal Co (kt)
Goongarrie Hill	Indicated	5.3	0.92	0.050	49	2.6
	Inferred	1.9	0.92	0.034	17	0.6
	Subtotal	7.2	0.92	0.046	66	3.3
Goongarrie South	Measured	11.0	1.13	0.106	125	11.6
	Indicated	21.1	0.99	0.071	208	15.0
	Inferred	1.2	0.92	0.043	11	0.5
	Subtotal	33.3	1.03	0.081	344	27.1
Big Four	Indicated	12.1	0.97	0.068	118	8.3
	Inferred	2.7	0.94	0.062	25	1.7
	Subtotal	14.7	0.97	0.067	143	9.9
Scotia Dam	Indicated	2.9	0.98	0.108	29	3.2
	Inferred	1.4	1.02	0.057	14	0.8
	Subtotal	4.3	0.99	0.091	43	4.0
Highway	Indicated	15.1	1.01	0.053	152	8.0
	Inferred	3.7	0.98	0.053	36	2.0
	Subtotal	18.8	1.00	0.053	188	10.0
Combined Deposits	Measured	11.0	1.13	0.106	125	11.6
	Indicated	56.5	0.98	0.066	556	37.1
	Inferred	10.8	0.95	0.051	103	5.6
	Grand Total	**78.3**	**1.00**	**0.069**	**784**	**54.3**

6. Highway Material Types

Using the same approach applied to the Goongarrie deposits, a detailed quantitative R&D XRD mineralogy study was undertaken to identify the mineralogical composition of the mineralised and waste material types at Highway. Strong relationships between the multi-element geochemistry and mineralogy in the weathering profile were identified, similar to those present in the GNCP deposits, resulting in the development of a material type classification scheme for Highway which is summarised in Table 6-1 below.

Table 6-1 – Material Type Classification for Highway

Profile	Code	Description
Pedolith	PSQ	Sand - quartz dominant
	PSQB	Sand - quartz dominant + carbonate (calcite / dolomite)
	PCF	Clay - Fe oxide dominant
	PCFB	Clay - Fe oxide dominant + carbonate (cal / dol)
Alluvial (Transported)	ALB	Carbonate (dolomite / magnesite) cemented sediments
	ALQK	Quartz dominant sands + kaolinite
	ACKS	Clay - kaolinite dominant + silica sand
	ACKG	Clay - kaolinite dominant + goethite
	ALKFS	Kaolinite + Fe Oxide + silica sand
	LAFKH	Laterite ferruginous - goethite + kaolinite + haematite
Regolith Clay Upper	CUGK	Goethite dominant + kaolinite
	CUGKZ	Goethite dominant + kaolinite + asbolite (cobaltian wad)
	CUGF	Goethite dominant + other Fe oxides
	CUGFZ	Goethite dominant + other Fe oxides + asbolite
	CUSF	Silica dominant + (Fe oxides or nontronite)
	CUSFZ	Silica dominant + (Fe oxides or nontronite) + asbolite
Saprock	SREF	Serpentine dominant + (Fe oxides +silica) or nontronite
	SREB	Serpentine dominant + carbonate (dol / mag)
	SRSE	Silica dominant + serpentine
	SRSB	Silica dominant + carbonate (dol / mag)
	SRBE	Carbonate (dol / mag) dominant + serpentine
	SRBS	Carbonate (dol / mag) dominant + silica
	SROQ	Plagioclase (O)+ quartz (Q) + smectite

Material type classification codes were assigned directly to the updated resource model using domain control based on the geological interpretation and the multi-element geochemistry estimated in the models to enable tracking of mineralised and waste material types in future mining studies and cross correlation with the samples used throughout the extensive historical metallurgical test work. A detailed tabulation of the Mineral Resources using a 0.5% Ni cut-off grade subdivided by the material type classification scheme (Table 6-2) demonstrates the deportment of nickel, cobalt, the multi-element support grade attributes and estimates of the carbonate mineral content amongst the various material types present at Highway.

The dominant material type at Highway is CUSF plus variant material types (mostly silica and iron oxide minerals goethite, haematite and magnetite). Vale Inco demonstrated in their 2008 metallurgical test work that this material is particularly well suited to beneficiation by removing nickel poor opaline silica via screening to concentrate residual iron oxide material enriched in nickel.

Of possibly greater significance, over 25% of the Highway MRE tonnage (23 Mt) based a 0.5% Ni cut-off grade is comprised of carbonate-bearing (mineralogy code B) material types. Subject to bench scale metallurgical test work, this could provide atmospheric leach feedstock and acid neutralisation material to support a 2.25Mt per annum plant throughput of goethite dominant high grade nickel mineralisation from the Goongarrie Hub deposits for at least 25 years. This saprock material, which locally grades in excess of 1.0% Ni can reasonably be expected to deliver a significant premium in the nickel metal output of an operation primarily focused on the goethite dominant mineralisation. Plan views demonstrating the continuity of the nickel and carbonate-rich saprock material types are displayed in Figures 6-5 and 6-6.

Over 55% of MRE tonnage at Highway (51Mt) based on a 0.5% Ni cut-off grade is comprised of CUSF plus variant material types (mostly silica and iron oxide minerals goethite, haematite and magnetite), which Vale Inco demonstrated in their 2008 metallurgical test work, is particularly well suited to beneficiation by removing nickel poor opaline silica via screening to concentrate residual iron oxide material enriched in nickel to increase the resulting HPAL feed grade relative to the beneficiation feed grade material. Operation experience has demonstrated that process design needs to include provision for rejection of siliceous scats from the ore processing area, particularly for arid-type lateritic ores. A consequence of this would be to upgrade the HPAL feed, the extent of which is to be established in forthcoming metallurgical testwork (Refer ARL ASX release 31 May 2021 – "Kalgoorlie Nickel Project – Feasibility Study Underway.")

This siliceous material type generally overlies the saprock neutraliser so will be recovered and stockpiled at the pit ramp exit. Currently, such material is only designated as plant feed where it grades 1% Ni or better. Should a future KNP have a second train (throughput 4.5Mtpa), such siliceous material with beneficiation will become a key plant feed.

The largest remaining tonnage of Clay Upper material (3% of total resource) is CUGF plus CUGFZ which on average also reports the highest in-situ nickel and cobalt grades in the deposit. Upper surface views of the spatial distribution of the Clay Upper material types and corresponding nickel grades are displayed in Figures 6-1 and 6-2 while example plan views of the Clay Upper material type distribution and nickel grades for a 2 metre flitch centred at the 400m RL, which is on average 20m below the surface topography, are also presented in Figures 6-3 and 6-4.

Table 6-2 Explanatory Discussion:

- *The blue shaded rows are overburden to the goethite-hosted mineralisation, being P as in Pedogenic (Quaternary-aged soil profile), AL as in Alluvial, LA as in Laterite (Tertiary-aged weathering surface).*

  Their metallurgical performance will not match the Clay Upper material types, but resource tonnes are not significant.

  The orange shaded rows are Clay Upper mineralisation material types, with variously G being goethite, K being kaolinite, Z being asbolite, F being ferruginous (haematite, magnetite, maghemite), S for silica and B for rare occurrences of perched carbonate minerals. The dominant Clay Upper material is a combination of silica and Fe oxide minerals including goethite (CUSF). Previous bench-scale metallurgical performance completed by Vale Inco demonstrated good upgradability of CUSF material by screening as well as good rheology and low acid consumption.

- *The green shaded rows represent Saprock (SR) with variable E being serpentine, S being weathering zone silica and B being the weathering zone carbonates dolomite and magnesite.*

  As acid consumers, the saprock material types are excluded as autoclave feed but most are excellent sources of acid neutraliser, in particular saprock containing dolomite and magnesite (code B).

Table 6-2 – Highway Mineral Resources subdivided by Material Type classification using a 0.5% Ni cut-off grade.

Resource Category	Material Type	Tonnes (Mt)	BD (t/m3)	Grade Attributes (%)										Carbonate Minerals (%)			
				Ni	Co	Mn	FeO	Al2O3	SiO2	MgO	CaO	LOI	Cr	Cal	Dol	Mag	Carb
Indicated	CUGK	0.35	1.9	0.65	0.021	0.11	46	9.4	25	1.6	0.3	10.8	1.2	0.0	0.6	1.2	1.8
	CUGKZ	0.00	1.8	0.82	0.165	1.10	45	9.3	26	4.0	0.1	9.6	1.0	0.0	0.2	0.5	0.7
	CUGF	2.45	1.9	0.79	0.044	0.31	50	5.0	22	2.0	0.3	10.3	1.5	0.0	0.7	1.5	2.3
	CUGFZ	0.37	1.4	1.01	0.164	0.98	53	3.8	24	1.9	0.1	9.5	1.5	0.0	0.3	0.7	1.0
	CUGFB	0.04	1.9	0.85	0.064	0.46	46	3.3	17	5.7	0.8	15.0	1.9	0.2	2.2	9.9	12.3
	CUSF	32.30	1.6	0.69	0.040	0.22	21	2.8	60	3.1	0.3	6.2	0.9	0.0	0.2	0.3	0.4
	CUSFZ	2.62	1.5	0.85	0.137	0.54	27	2.9	54	2.8	0.2	6.5	1.1	0.0	0.1	0.2	0.3
	SREF	5.32	1.7	0.71	0.035	0.19	14	3.7	46	16.4	1.0	13.5	0.7	0.0	2.6	7.4	10.0
	SREB	0.47	1.8	0.64	0.020	0.14	11	1.0	44	22.3	2.0	16.0	0.6	0.0	6.2	9.4	15.5
	SRSE	4.56	1.8	0.65	0.029	0.16	12	1.5	57	13.5	0.7	9.5	0.6	0.0	1.0	0.9	2.0
	SRSB	4.33	2.0	0.67	0.026	0.14	11	0.8	47	17.4	1.3	17.6	0.6	0.0	4.0	15.0	19.0
	SRBE	0.37	1.9	0.60	0.015	0.11	8	0.5	38	25.1	2.7	23.3	0.4	0.0	9.1	20.8	29.9
	SRBS	17.18	2.1	0.68	0.022	0.10	8	0.4	38	21.5	1.4	27.2	0.4	0.0	4.9	31.7	36.7
	SROQ	0.21	1.7	0.87	0.033	0.11	5	7.4	42	15.5	1.6	20.1	0.2	0.0	5.4	20.4	25.9
	ALL	70.56	1.7	0.70	0.038	0.20	18	2.2	51	10.3	0.7	13.2	0.7	0.0	1.9	9.7	11.6
Inferred	PSQ	0.03	1.8	0.64	0.033	3.45	8	3.8	59	6.6	6.0	11.6	0.3	0.0	4.1	0.0	4.1
	PSQB	0.01	1.8	0.65	0.027	1.16	8	4.1	52	6.7	7.8	16.0	0.4	1.5	13.1	0.0	14.6
	PCF	0.60	2.0	0.63	0.031	4.17	18	4.3	46	6.7	5.9	14.1	0.6	0.0	3.0	0.0	3.0
	PCFB	0.44	1.9	0.67	0.032	1.52	18	3.7	38	11.2	6.1	18.7	0.8	0.1	14.9	1.8	16.9
	ALB	0.03	1.6	0.67	0.021	0.12	31	3.8	27	7.0	0.5	15.2	1.2	0.0	1.9	12.5	14.4
	ALQK	0.22	1.7	0.63	0.024	0.08	15	3.1	68	3.1	0.7	6.1	0.7	0.0	0.2	0.0	0.2
	ALKFS	0.41	2.0	0.63	0.028	0.10	26	5.2	49	3.8	0.6	8.7	1.2	0.0	1.1	1.0	2.0
	LAFKH	0.06	2.0	0.65	0.027	0.14	48	6.6	21	2.7	0.5	11.9	1.8	0.0	1.7	3.0	4.7
	CUGK	0.03	1.9	0.72	0.020	0.12	40	10.5	25	2.3	0.1	10.5	0.9	0.0	0.4	1.6	1.9
	CUGKZ	0.00	1.8	0.57	0.143	0.48	42	9.2	31	1.8	0.9	10.5	0.9	0.0	2.0	0.8	2.8
	CUGF	0.17	1.9	0.76	0.042	0.30	48	3.7	22	3.1	0.4	11.5	2.1	0.0	1.4	2.5	3.9
	CUGFZ	0.01	1.4	1.06	0.137	0.73	48	3.7	23	3.8	0.3	10.4	2.2	0.0	0.5	1.7	2.2
	CUGFB	0.00	1.9	0.83	0.055	0.33	47	3.0	23	6.4	0.3	15.5	1.8	0.0	0.9	10.6	11.5
	CUSF	14.87	1.6	0.66	0.038	0.16	19	3.5	60	3.4	0.4	6.4	0.8	0.0	0.2	0.2	0.4
	CUSFZ	0.80	1.5	0.84	0.131	0.39	25	4.6	53	3.4	0.5	6.9	1.0	0.0	0.3	0.1	0.3
	SREF	1.21	1.7	0.67	0.031	0.16	14	4.5	49	15.7	1.3	11.1	0.6	0.0	2.7	3.0	5.7
	SREB	0.02	1.8	0.55	0.022	0.17	12	1.2	42	22.9	2.4	17.3	0.7	0.0	7.2	10.3	17.5
	SRSE	1.50	1.8	0.68	0.037	0.14	12	3.5	64	7.0	1.7	7.2	0.5	0.0	0.5	0.3	0.8
	SRSB	0.09	2.0	0.68	0.022	0.14	12	1.1	47	16.7	0.8	17.5	0.7	0.0	2.6	16.2	18.8
	SRBE	0.01	1.9	0.59	0.017	0.12	10	0.9	36	25.0	2.1	22.0	0.6	0.0	7.1	20.9	28.0
	SRBS	0.62	2.1	0.69	0.022	0.12	10	0.5	38	19.8	1.3	26.0	0.5	0.0	4.5	30.5	35.0
	SROQ	0.02	1.7	0.75	0.026	0.10	5	9.1	54	11.9	0.8	13.8	0.2	0.0	2.3	11.3	13.6
	ALL	21.14	1.6	0.67	0.040	0.32	19	3.6	57	5.2	0.9	8.0	0.8	0.0	0.9	1.4	2.3
Indicated + Inferred	PSQ	0.03	1.8	0.64	0.033	3.45	8	3.8	59	6.6	6.0	11.6	0.3	0.0	4.1	0.0	4.1
	PSQB	0.01	1.8	0.65	0.027	1.16	8	4.1	52	6.7	7.8	16.0	0.4	1.5	13.1	0.0	14.6
	PCF	0.60	2.0	0.63	0.031	4.17	18	4.3	46	6.7	5.9	14.1	0.6	0.0	3.0	0.0	3.0
	PCFB	0.44	1.9	0.67	0.032	1.52	18	3.7	38	11.2	6.1	18.7	0.8	0.1	14.9	1.8	16.9
	ALB	0.03	1.6	0.67	0.021	0.12	31	3.8	27	7.0	0.5	15.2	1.2	0.0	1.9	12.5	14.4
	ALQK	0.22	1.7	0.63	0.024	0.08	15	3.1	68	3.1	0.7	6.1	0.7	0.0	0.2	0.0	0.2
	ALKFS	0.41	2.0	0.63	0.028	0.10	26	5.2	49	3.8	0.6	8.7	1.2	0.0	1.1	1.0	2.0
	LAFKH	0.06	2.0	0.65	0.027	0.14	48	6.6	21	2.7	0.5	11.9	1.8	0.0	1.7	3.0	4.7
	CUGK	0.38	1.9	0.66	0.021	0.11	46	9.5	25	1.7	0.2	10.7	1.2	0.0	0.6	1.2	1.8
	CUGKZ	0.01	1.8	0.75	0.159	0.92	44	9.3	27	3.4	0.3	9.8	1.0	0.0	0.7	0.6	1.3
	CUGF	2.62	1.9	0.79	0.044	0.31	50	4.9	22	2.1	0.3	10.3	1.6	0.0	0.8	1.6	2.4
	CUGFZ	0.38	1.4	1.01	0.164	0.98	53	3.8	24	1.9	0.1	9.6	1.5	0.0	0.3	0.7	1.0
	CUGFB	0.04	1.9	0.85	0.063	0.45	46	3.3	18	5.7	0.8	15.0	1.9	0.2	2.1	10.0	12.3
	CUSF	47.17	1.6	0.68	0.039	0.20	21	3.0	60	3.2	0.3	6.3	0.9	0.0	0.2	0.2	0.4
	CUSFZ	3.41	1.5	0.85	0.136	0.50	26	3.3	54	2.9	0.3	6.6	1.0	0.0	0.2	0.1	0.3
	SREF	6.53	1.7	0.70	0.034	0.19	14	3.8	47	16.2	1.1	13.1	0.7	0.0	2.6	6.6	9.2
	SREB	0.48	1.8	0.64	0.020	0.14	11	1.0	44	22.3	2.0	16.0	0.6	0.0	6.2	9.4	15.6
	SRSE	6.06	1.8	0.66	0.031	0.16	12	2.0	59	11.9	1.0	8.9	0.6	0.0	0.9	0.8	1.7
	SRSB	4.42	2.0	0.67	0.026	0.14	11	0.8	47	17.4	1.3	17.6	0.6	0.0	4.0	15.0	19.0
	SRBE	0.38	1.9	0.60	0.015	0.11	8	0.6	38	25.1	2.7	23.3	0.4	0.0	9.0	20.8	29.9
	SRBS	17.80	2.1	0.69	0.022	0.10	8	0.4	38	21.4	1.4	27.2	0.4	0.0	4.9	31.7	36.6
	SROQ	0.23	1.7	0.86	0.032	0.11	5	7.6	43	15.2	1.5	19.5	0.2	0.0	5.2	19.6	24.7
	ALL	91.70	1.7	0.69	0.038	0.22	18	2.5	52	9.1	0.8	12.0	0.8	0.0	1.7	7.8	9.5

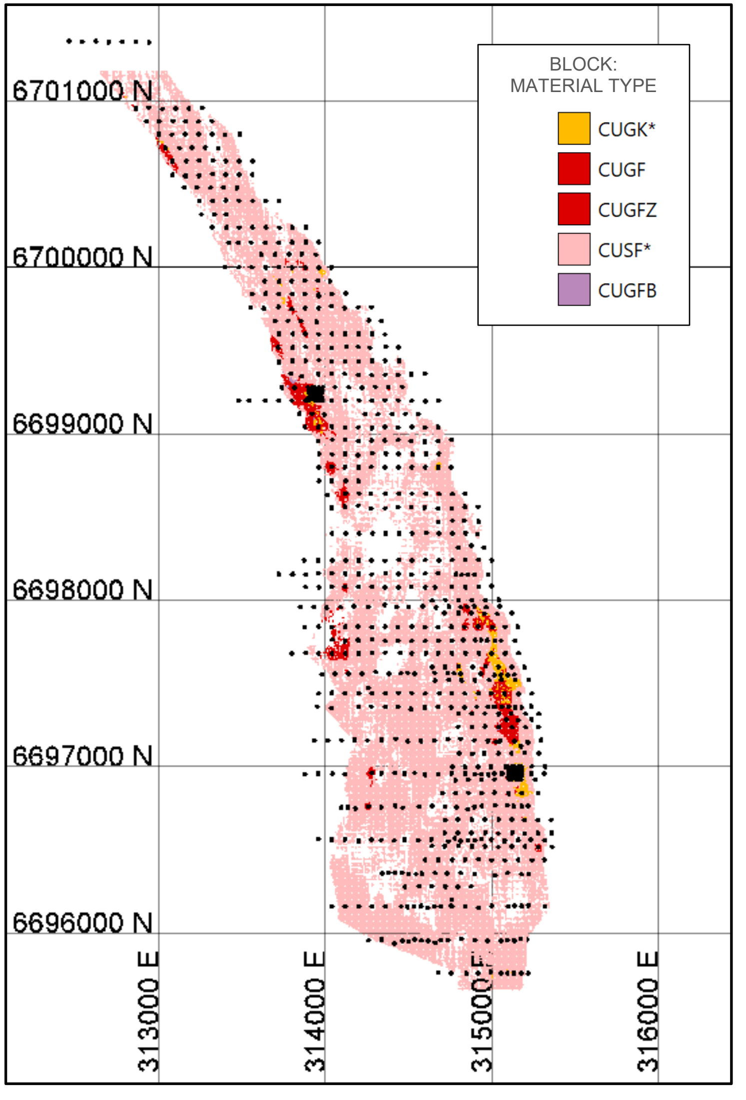


Figure 6-1: Plan view of MRE block model Clay Upper material types with ≥ 0.5 % Ni

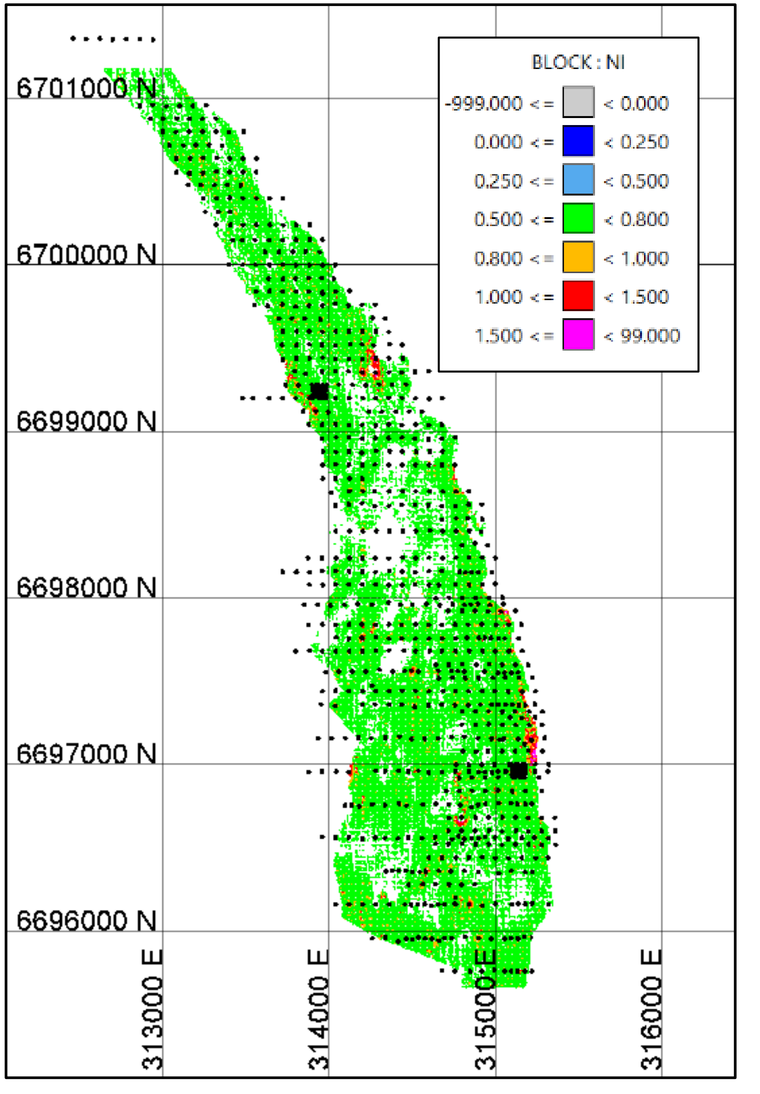


Figure 6-2: Plan view of MRE block model nickel grades of top exposure of Clay Upper material types ≥ 0.5 % Ni

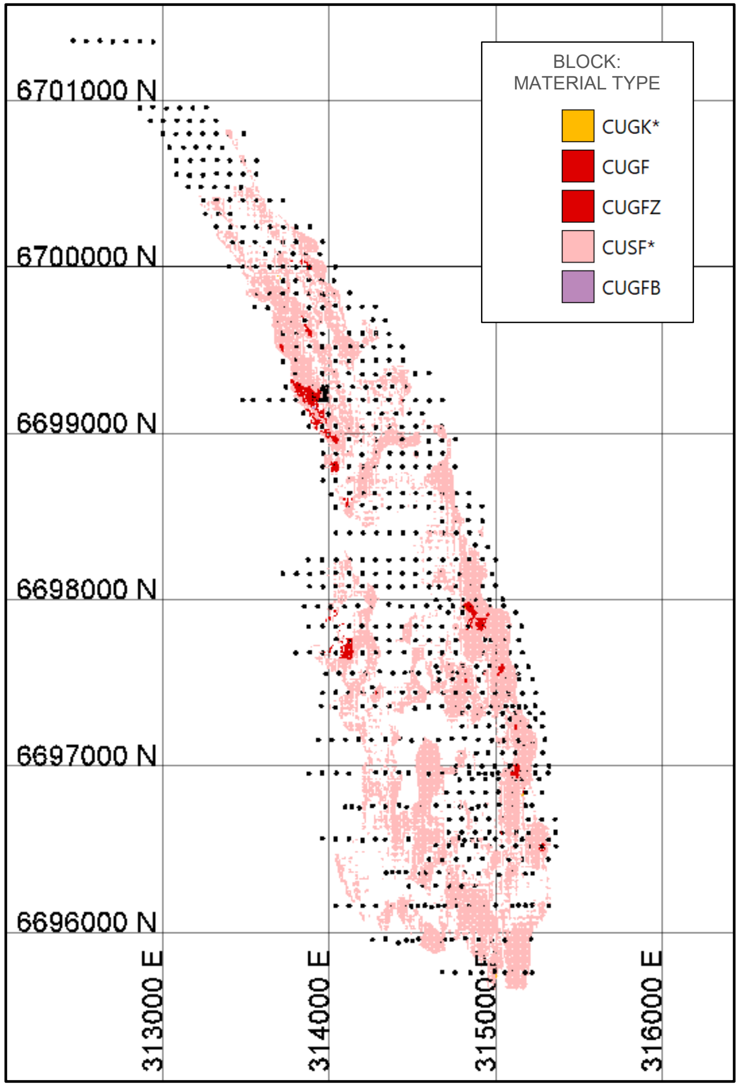


Figure 6-3: Plan view of MRE block model Clay Upper material types with ≥ 0.5 % Ni for 2m flitch centred at 400mRL

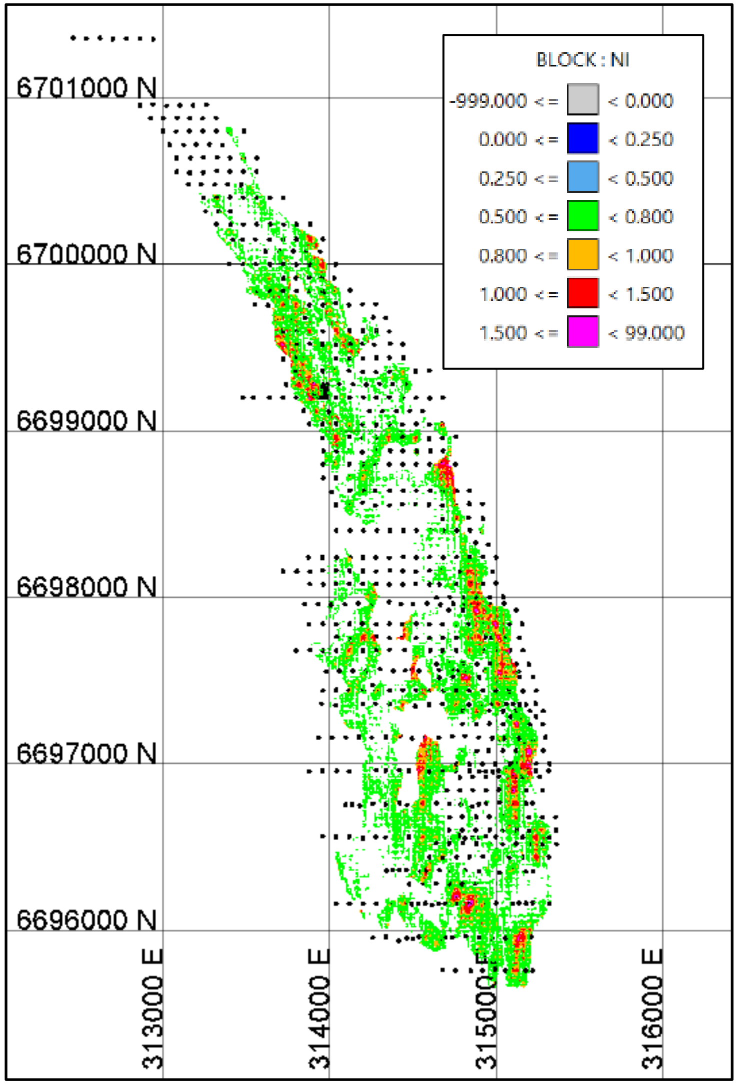


Figure 6-4: Plan view of MRE block model nickel grades of Clay Upper material types ≥ 0.5 % Ni for 2m flitch centred at 400mRL

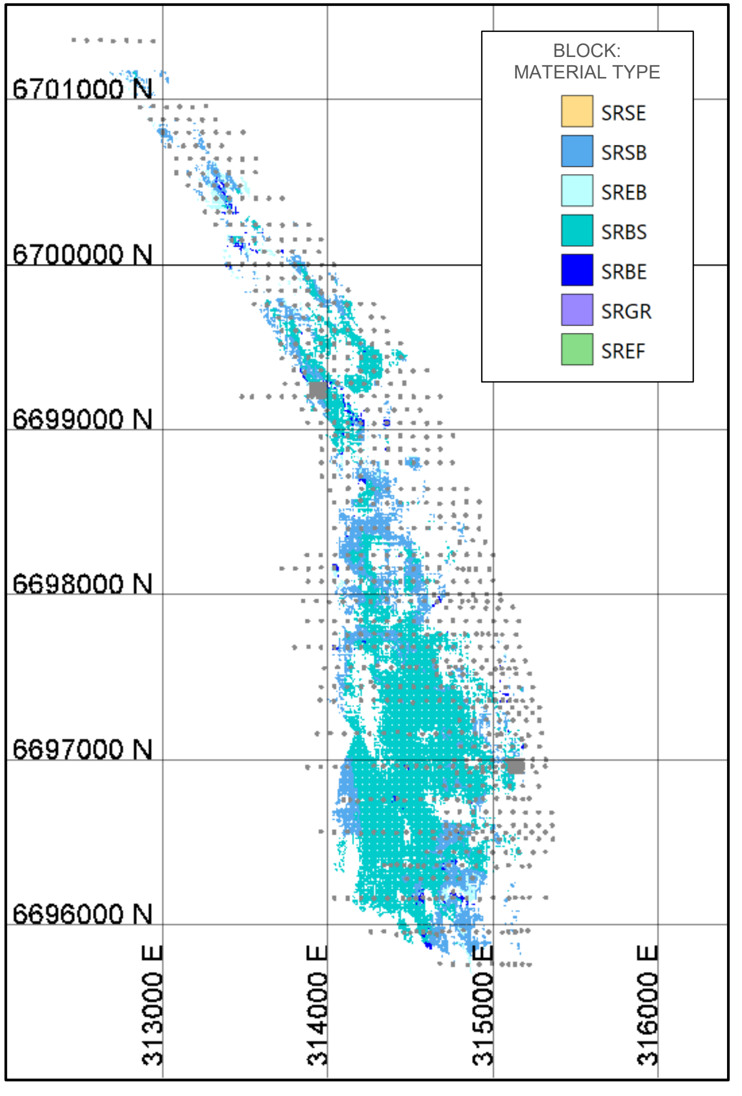


Figure 6-5: Plan view of MRE block model carbonate bearing saprock material types with ≥ 0.5 % Ni (filtered by presence of "B" code)

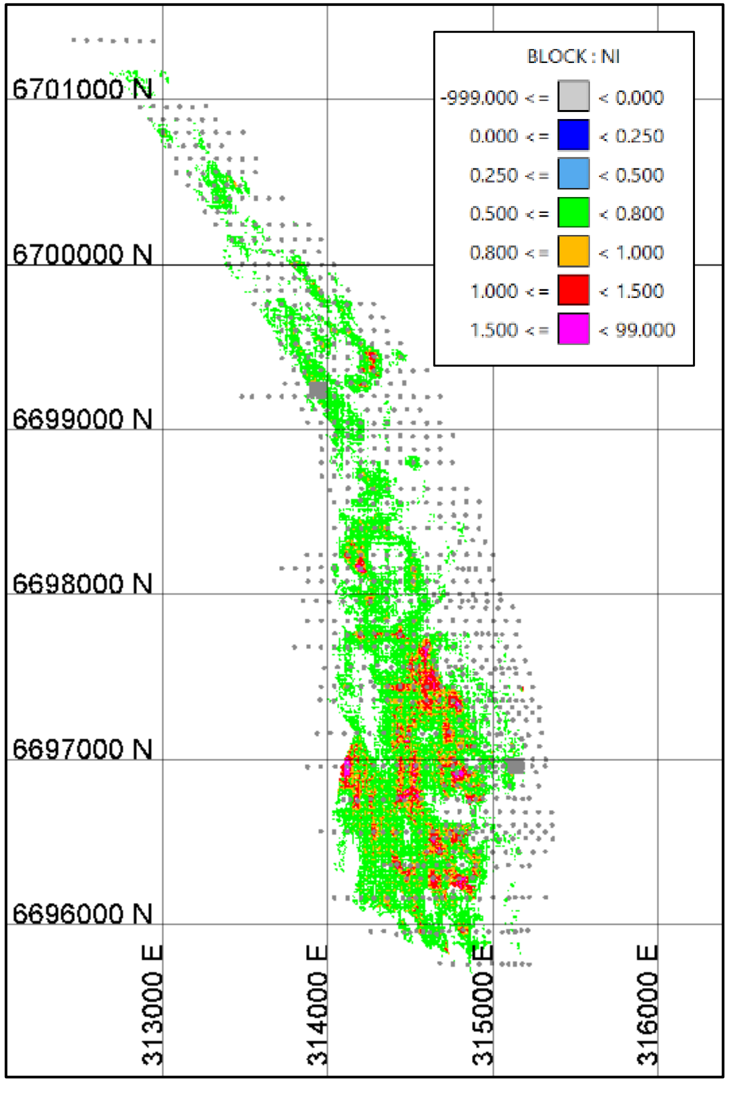


Figure 6-6: Plan view of MRE block model nickel grades of carbonate bearing saprock material types with ≥ 0.5 % Ni

7. Highway - Scandium and Rare Earth Elements

Critical Mineral re-assay data for an initial suite of over 3,100 archived drill sample pulps from Highway have been assessed with elevated scandium grades > 20ppm and nickel grades > 0.5% being reported for over 20% of the samples. Ardea awaits assay results for a second suite of archived drill sample pulps (over 2,000) prior to updating the MRE for Highway to include a resource estimate for scandium.

Assessment of the assay data for REEs has not identified sufficiently high concentrations within the currently defined nickel resource envelope to consider estimation of REE Mineral Resources coincident with the nickel mineralisation at Highway. However, Ardea notes that higher REE assays are strongly associated with high grade cobalt-manganese mineralisation and could potentially be recovered as by-products of processing of material rich in nickel, cobalt and manganese.

During future mining grade control, parts of any pit displaying high REE concentrations could be separately stockpiled on the ROM pad for batch processing of the autoclave discharge through a specialist REE refinery.

Indicative scandium and REE intersections associated with nickel laterite mineralisation at Highway are displayed in Table 7-1 while details of drillhole source data are provided in Appendix 4.

Table 7-1 – Highway Indicative scandium and REE intersections associated with nickel laterite mineralisation

Drill Hole	Int Depth (m)	Int Length (m)	Ni (%)	Co (%)	Mn (%)	Sc (ppm)	Y (ppm)	Ce (ppm)	La (ppm)	Nd (ppm)	Pr (ppm)
HWRC0268	4-6	2	2.40	0.224	0.12	100	250	**1230**	901	685	193
HWRC0295	58-78	20	0.47	0.265	2.74	5	21	179	125	85	26
HWRC0066	0-3	3	0.80	0.058	0.05	10	42	126	122	92	26

No bench-scale metallurgical test work has yet been completed on REE mineralisation styles. However, desk-top studies suggest a compatibility between REE and scandium in terms of potential metallurgical attributes, which would be expected due to their similar reaction chemistries.

Scandium and REEs are expected to be taken into solution in the proposed HPAL processing flowsheet for the KNP and could be produced as a by-product. Preliminary calculations for the extraction and deportment of the REEs have been developed and, with testwork support, will be used for the guidance of future investigations.

Authorised for lodgement by the Board of Ardea Resources Limited.

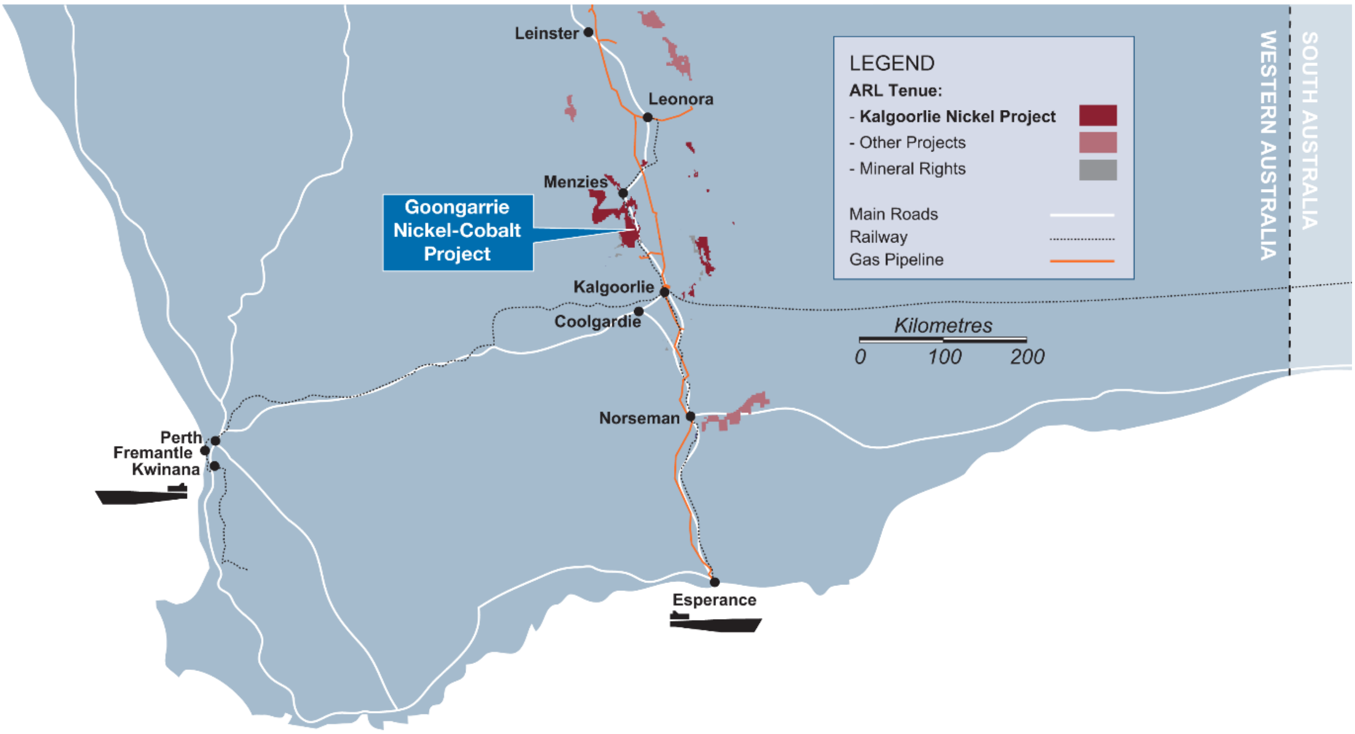
For further information regarding Ardea, please visit https://ardearesources.com.au/ or contact:

Andrew Penkethman
Managing Director and Chief Executive Officer
Tel +61 8 6244 5136

About Ardea Resources

Ardea Resources (ASX:ARL) is an ASX-listed resources company, with a large portfolio of 100%-controlled West Australian-based projects, focussed on:

- Development of the Kalgoorlie Nickel Project (**KNP**) and its sub-set the Goongarrie Hub, a globally significant series of nickel-cobalt and Critical Mineral deposits which host the largest nickel-cobalt resource in the developed world at **826Mt at 0.70% nickel and 0.046% cobalt for 5.8Mt of contained nickel and 384kt of contained cobalt** (ARL ASX announcement 15 February 2021) located in a jurisdiction with exemplary ESG credentials.
- Advanced-stage exploration at compelling nickel sulphide, Critical Minerals and gold targets within the KNP Eastern Goldfields world-class nickel-gold province, with all exploration targets complementing the KNP nickel development strategy.



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CAUTIONARY NOTE REGARDING FORWARD-LOOKING INFORMATION

This news release contains forward-looking statements and forward-looking information within the meaning of applicable Australian securities laws, which are based on expectations, estimates and projections as of the date of this news release.

This forward-looking information includes, or may be based upon, without limitation, estimates, forecasts and statements as to management's expectations with respect to, among other things, the timing and amount of funding required to execute the Company's exploration, development and business plans, capital and exploration expenditures, the effect on the Company of any changes to existing legislation or policy, government regulation of mining operations, the length of time required to obtain permits, certifications and approvals, the success of exploration, development and mining activities, the geology of the Company's properties, environmental risks, the availability of labour, the focus of the Company in the future, demand and market outlook for precious metals and the prices thereof, progress in development of mineral properties, the Company's ability to raise funding privately or on a public market in the future, the Company's future growth, results of operations, performance, and business prospects and opportunities. Wherever possible, words such as "anticipate", "believe", "expect", "intend", "may" and similar expressions have been used to identify such forward-looking information. Forward-looking information is based on the opinions and estimates of management at the date the information is given, and on information available to management at such time.

Forward-looking information involves significant risks, uncertainties, assumptions, and other factors that could cause actual results, performance or achievements to differ materially from the results discussed or implied in the forward-looking information. These factors, including, but not limited to, the ability to create and spin-out a gold focussed Company, fluctuations in currency markets, fluctuations in commodity prices, the ability of the Company to access sufficient capital on favourable terms or at all, changes in national and local government legislation, taxation, controls, regulations, political or economic developments in Australia or other countries in which the Company does business or may carry on business in the future, operational or technical difficulties in connection with exploration or development activities, employee relations, the speculative nature of mineral exploration and development, obtaining necessary licenses and permits, diminishing quantities and grades of mineral reserves, contests over title to properties, especially title to undeveloped properties, the inherent risks involved in the exploration and development of mineral properties, the uncertainties involved in interpreting drill results and other geological data, environmental hazards, industrial accidents, unusual or unexpected formations, pressures, cave-ins and flooding, limitations of insurance coverage and the possibility of project cost overruns or unanticipated costs and expenses, and should be considered carefully. Many of these uncertainties and contingencies can affect the Company's actual results and could cause actual results to differ materially from those expressed or implied in any forward-looking statements made by, or on behalf of, the Company. Prospective investors should not place undue reliance on any forward-looking information.

Although the forward-looking information contained in this news release is based upon what management believes, or believed at the time, to be reasonable assumptions, the Company cannot assure prospective purchasers that actual results will be consistent with such forward-looking information, as there may be other factors that cause results not to be as anticipated, estimated or intended, and neither the Company nor any other person assumes responsibility for the accuracy and completeness of any such forward-looking information. The Company does not undertake, and assumes no obligation, to update or revise any such forward-looking statements or forward-looking information contained herein to reflect new events or circumstances, except as may be required by law.

No stock exchange, regulation services provider, securities commission or other regulatory authority has approved or disapproved the information contained in this news release.

Compliance Statement (JORC 2012)

The information in this report that relates to KNP Exploration Results is based on information originally compiled by previous full time employees of Heron Resources Limited and or Vale Inco. The Exploration Results and data collection processes have been reviewed, verified and re-interpreted by Mr Ian Buchhorn who is a Member of the Australasian Institute of Mining and Metallurgy and currently an executive director of Ardea Resources Limited. Mr Buchhorn has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the exploration activities undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr Buchhorn consents to the inclusion in this report of the matters based on his information in the form and context that it appears.

The information in this report that relates to Mineral Resources is based on information compiled by Mr James Ridley who is a Member of the Australasian Institute of Mining and Metallurgy, a full time employee of Ardea Resources and has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Mr Ridley consents to the inclusion in the report of the matters based on this information in the form and context in which it appears.

The information in this report that relates to Metallurgy is based on information compiled by Mr Mike Miller who is a Member of the Australasian Institute of Mining and Metallurgy, a consultant of Ardea Resources and has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Mr Miller consents to the inclusion in the report of the matters based on this information in the form and context in which it appears.

Appendix 1 – Summary of Information Required according to ASX Listing Rule 5.8.1

8. Highway Mineral Resource Estimation

8.1. Geology and Geological Interpretation

Nickel laterite mineralisation at the Highway deposit is developed from the weathering of Achaean-aged olivine-cumulate ultramafic units within the Walter Williams Formation (**WWF**) with resultant near surface metal enrichment. The mineralisation is usually within 80 metres of surface and can be subdivided based on mineralogical and metallurgical characteristics into upper iron-rich ("Clay Upper") and lower magnesium-rich ("Saprock") materials based on the ratios of iron to magnesium. These Clay and Saprock layers can be further subdivided into additional mineralogy groups or material types based on ratios of the other major grade attributes. The deposits are analogous to many weathered ultramafic-hosted nickel-cobalt deposits both within Australia and world-wide.

The continuity of mineralisation is strongly controlled by variations in the ultramafic protolith, fracturing and palaeo water flow within the ultramafic host rocks. Areas of deep fracturing and water movement within the bedrock typically have higher grade and more extensive mineralisation in the overlying regolith. There is also often a distinctive increase in grade, widths and depth of mineralisation coinciding with olivine mesocumulate facies and increased structural deformation proximal to more competent thinner orthocumulate facies and mafic rocks immediately to the east and west of the WWF. Where the host regolith overlies olivine adcumulate lithologies there is typically an increase in siliceous material coinciding with mostly lower nickel and cobalt grades along the central axis of the WWF except where deeper fracturing occurs along cross cutting structures which often coincides with narrow higher grade nickel and cobalt mineralisation within the adcumulate facies.

Nickel mineralisation domains were interpreted using a nominal 0.25% Ni cut-off grade applied to the drillhole assay data, cognisant of all observed geological influences, incorporating internal dilution where necessary to maintain reasonable 3-D continuity of the domain geometry. The envelopes were extended variable distances laterally and along strike from marginal mineralised drill intersections towards adjacent subgrade or barren drillholes with consideration of the lateral extents evident on the current and adjacent drill hole traverses and trends in the width and thickness of the mineralisation along strike. Wireframe solid models were generated based on the interpreted cross-sectional profiles using an extensive network of tie lines to control the interpreted geometry between sections. Cobalt mineralisation domains were interpreted in a similar manner to the nickel domains using a nominal 0.03% Co cut-off grade and restricted to within the nickel domains. While Mineral Resources were ultimately reported using a 0.5% Ni cut-off grade, the nickel envelopes included lower grade material mostly in saprock which is also often rich in basic silicate and carbonate minerals that could be used as acid neutraliser in the proposed ore processing flowsheet and therefore, was included for consideration in downstream mine planning work.

Wireframe surface models of the following boundaries were generated for domaining of the weathering profile at Highway based on a combination of the drillhole geological logging and assay data:

- Base of pedogenic material rich in calcite and dolomite
- Boundary between transported sediments and underlying insitu regolith
- Boundary between upper iron rich clay and lower magnesium rich saprolite and saprock

A detailed compilation of plans, cross sections and 3-D projections of the geological interpretation accompany the report in Appendix 3.

8.2. Drilling Techniques

A staged series of drilling programs from 2003 to 2008 has generated a substantial database for a total of 828 drillholes at Highway including 785 RC holes for a total of 36,735m of drilling which has mostly focused on resource definition.

Close to 950m of diamond drilling amongst 20 drillholes and over 1,100m of sonic drilling amongst 23 drillholes has been completed for multiple purposes including QAQC verification of the geology and sampling from the RC drilling, collection of samples for bulk density determinations and to source material for metallurgical test work. All the diamond and sonic drill drillholes twinned earlier RC holes chosen to verify the full range of material types observed to occur in the weathering profile at Highway based on the RC drilling. A detailed summary of the drilling subdivided company and drilling method is provided in Table 2-1. To date, 45% of all the RC drilling has been completed by Vale Inco, 43% by Heron Resources and 12% by Helix Resources, while all the diamond drilling and sonic drilling has been completed by Vale Inco.

Approximately 70% of the mineralisation has been drilled on an 80mE by 80mN grid including two 80mE by 80mN areas of 20m by 20m spaced holes, a 20m by 20m area of approximately 5mE by 5mN spaced holes and several drill traverses of 80mE by 120mN spaced holes. Most of the remaining mineralisation has been drilled with 80m spaced holes along drill traverses (E-W) spaced either 160mN or 200mN apart (Figure 2-1).

The mineralisation at Highway has a strong global sub-horizontal orientation. All the drilling at Highway has therefore been vertical and represents the true thickness of the mineralisation.

The majority of the drill hole collars have been surveyed using an RTK DGPS system with either a 3 or 7 digit accuracy. The coordinates are stored in the Ardea exploration database referenced to the MGA Zone 51 Datum GDA94.

8.3. Sampling and Sub-sampling

All RC drilling has been undertaken using a face sampling hammer (bit diameter between 4½ and 5 ¼ inches) with bulk drill samples collected over 1m downhole intervals via a cyclone usually into large plastic bags, or polyweave bags for the minority of wet samples collected during the Vale Inco programmes. All diamond drilling used triple tube core barrels to collect either PQ3 or HQ3 size core. Sonic drill samples were collected as whole core samples either 3.75 or 5.1 inches in diameter of up to 1m lengths in sealed clear plastic wrap. Sonic core of longer run lengths was cut to shorter lengths as it was retrieved from the drill string to facilitate handling of the heavy samples.

Approximately 2.5kg to 3kg subsamples were collected over 1m or 2m sample intervals for most of the RC drilling. The sub-sampling methods employed were as follows:

- Riffle split subsamples collected by Vale Inco over 1m or 2m intervals (43% of the RC drilling).
- Cone split samples collected by Helix and Heron over 1m or 2m intervals (33% of the RC drilling).
- Composite spear or scoop sub-samples from Helix and Heron drilling over mostly 4m or 5m down hole intervals (24% of the RC drilling) in predominantly unmineralized or low grade material grading less than 0.4% Ni.

Mostly PQ3 size core from the initial 7 of the 20 Vale Inco diamond drillholes was halved using a diamond saw when hard or a spatula when soft with half core samples usually over 1m or 1.5m intervals cut in a similar manner, bagged and submitted for head assay analysis. The remaining half core from these holes and whole core from the remaining 13 diamond drillholes (mostly HQ3 size) was used for metallurgical test work.

Whole core from 8 of the 23 sonic holes was mostly cut into 1m long samples and submitted for head grade analysis for comparison with the results for the twinned RC holes. The core from the remaining 15 sonic holes was all used for metallurgical test work.

Subsamples from all the Heron RC drilling were submitted with blanks, standards and duplicate RC subsamples, each at a 1 in 30 frequency for external QAQC monitoring of field sampling errors and laboratory performance. Vale inserted standards and duplicate RC sub-samples for external QAQC monitoring of their drilling programmes at a one in twenty frequency.

It is unknown what ongoing laboratory QAQC performance Helix carried out QAQC monitoring in relation their RC drilling.

8.4. Sample Analysis Methods

Most sub-samples from the Helix, Heron and Vale drilling at Highway have undergone sample preparation and chemical analysis at UltraTrace Laboratories (now Bureau Veritas - **BV**) in Perth. Samples from the remaining 4% of the drilling (all of unmineralized or low-grade material less than 0.5% Ni) from the Heron drilling were analysed at Kalgoorlie Assay Laboratories in Kalgoorlie. Industry standard sample preparation procedures (of the time) were used by both laboratories, typically involving; log samples received (both laboratories), weigh samples as received (BV), dry samples at 105° C (both laboratories), weigh dried samples (BV), jaw crush samples when required e.g., core samples to -3mm; (both laboratories), riffle split RC chips / crushed core samples to produce -3kg subsample for pulverisation (both laboratories).

All samples from the Vale drilling (both diamond and RC) and most from the Heron RC drilling (85% of all the RC drilling) were analysed for Ni, Co, MgO, FeO, Al2O3, SiO2, CaO, Mn, Cr, Cu, Zn and As by UltraTrace using fusion XRF analysis. The Vale samples were also analysed for loss on ignition (LOI) by thermogravimetric analysis.

All samples from the Helix drilling (11% of all the RC drilling) were analysed for Ni, Co, MgO, FeO, Al2O3, CaO, Mn, Cr, Cu, Zn and As by UltraTrace in Perth by four acid digestion (nitric, perchloric, hydrochloric, and hydrofluoric acids) and ICP-OES finish.

Sub-samples from the remaining RC drilling (all by Heron and 4% of total), which are all of unmineralized or low-grade material < 0.5% Ni were analysed for Ni, Co, MgO, FeO, Al2O3, SiO2, CaO, Mn, Cr, Cu, Zn and As by KAL labs in Kalgoorlie by XRF analysis of pressed powder pellets from the sample pulps.

The fusion XRF method is widely accepted as the preferred analytical method for multi-element analysis of nickel laterite samples. Thermo-gravimetric analysis is also the leading method used to determine loss on ignition (LOI). The 4AD ICP-OES analytical method is unable to test for SiO2 and the digestion method often does not fully attack all minerals which can lead to the understating of the true concentration of some elements particularly Al2O3 and Cr. The pressed powder XRF method is designed to be semi-quantitative and typically suffers from poor analytical accuracy for elements that are not well dispersed in the pressed powder pellet.

All of the QAQC data has been statistically assessed and the precision and accuracy of the UltraTrace assay results based on Fusion XRF analysis have been found to be acceptable and suitable for use in resource estimation. As previously noted no QAQC data is available for the 4 acid digest ICP-OES analyses of the samples from the Helix RC drilling. The analytical accuracy of the KAL Labs pressed powder XRF assays is generally unacceptable with significant bias levels evident for all of the assessed elements (up to 8% low for Ni, up to 12% high for Co, from 34% low to 20% high for MgO, from 9% low to 14% high for FeO, from 14% low to 6% high for Al2O3, from 8% low to 18% high for SiO2, up to 39% high for CaO, up to 20% high for Mn, and up to 7% low for Cr).

Bulk density measurements were collected by Vale Inco for 261 samples of diamond and sonic drill core using the Archimedes method or weight divided by volume. Moisture measurements were determined by weighing the samples before and after oven drying. In addition, Vale completed 1,500m of downhole geophysical density logging across 39 drillholes, with 1,200m of logging matched with 971 sample intervals and combined with the bulk density data for the core samples to determine average density values subdivided by mineralised and waste material types. Density measurements (including moisture) were found to be similar between manual density measurement of core samples and the geophysical density measurement subdivided by the Highway material type classification.

92 representative sample pulps from historical Heron RC and Vale Inco diamond drilling to BV for quantitative XRD mineralogy analysis, targeting all the significant mineralisation styles and overburden transported material types identified in the regolith profile at Highway. Part of the BV analysis involved validation of the mineralogy stoichiometry against the multielement geochemistry also determined by BV using fusion XRF analysis.

8.5. Estimation Methodology

Most resource modelling processes were undertaken using Maptek Vulcan software Version 2020.1.

The drillhole assay data for each deposit was assigned coding for regolith, nickel, cobalt, and area domains based on the wireframe solid and surface models from the geological interpretation. Detailed analysis was undertaken of the availability of assay data for input to grade estimation, including the support grade attributes required for material type assignments. While Ni, Co, Mn, MgO, FeO, Al2O3, CaO and Cr assay data were available for most of the drilling, less assay data was available for the following SiO2 and LOI as follows:

- SiO2 available for 85% of the 2m composites within the nickel mineralisation envelope.
- While LOI assay data informs only 48% of the 2m composites within the nickel mineralisation envelop, Ardea has calculated LOI grades samples informing 37% of the composites when there was sufficient assay data for the other grade attributes.

Most of the sub-samples used for resource estimation were collected over either 1m or 2m downhole intervals. The domain coded sub-sample assay data of interest were therefore composited to 2m intervals in preparation for statistical analysis, variography and grade estimation. While Ni and Co are the primary focus of the resource estimate, statistical analysis, variography and grade estimation were also undertaken for Mn, MgO, FeO, Al_2O_3, SiO_2, CaO, Cr, and Loss on Ignition (LOI) which are relevant to assignment of material types and dry bulk density values to the resource models.

Classical statistical analysis for each deposit was undertaken with cell de-clustering applied and scaled to the greatest drillhole spacing of significant coverage at Highway (80mE x 160mN x 2mRL). The data for nickel and all the other grade attributes except cobalt and manganese were subdivided by the clay (high FeO and low MgO) and saprock (low FeO and high MgO) domains. Conversely, the Co and Mn data, which are moderate to strongly correlated were subdivided by inside versus outside the cobalt resource envelopes within the nickel resource envelope(s). Elevated coefficients of variation (CV) greater than 1.0 but less than 2.0 were reported for Al2O3, CaO, and Cr in the saprock domains, and MgO in clay domains, while similar range CV values were reported for Co in the high-Co domains and Mn in the low-Co domains. The highest CVs greater than 2.0 but mostly less than 3.0 were reported for CaO in the clay domains.

Suitable upper and lower cuts were determined for any grade variables showing anomalously high or low outlier grades. The application of the cuts only had local influences on the corresponding grade estimates with no material effects on the domain global mean grades.

Continuity analysis (variography) was undertaken for all grade attributes subdivided by the clay and saprock domains and grouped area domains with similar grade trends and mineralisation characteristics. Co and Mn were subdivided by the high grade and low-grade cobalt and area domains. 3-D variography was generated as semi-variograms normalised to an overall sill of 1.0 based on the non-de-clustered composite grades or normal score transform of the grades for each domain or domain group. The variography was modelled with a nugget effect and up to three spherical structures. The continuity analysis determined that the drillhole spacing within all the deposits is considered sufficient for the estimation of Ni and Co mineral resource grades, and support grade attributes.

A 3-D regular block model was constructed of Highway with nickel, cobalt, regolith (including transported) and area (orientation and data spacing) domain coding assigned based on the geological interpretation. The block model was constructed using regular block dimensions of 10mE by 10mN by 2mRL.

Mineral Resource nickel and cobalt grades were estimated by ordinary kriging into panels with dimensions 40mE x 40mN x 4mRL based on half the dominant drillhole spacing at Highway. The ordinary kriged panel estimation was followed by Local Uniform Conditioning (LUC) to produce final nickel and cobalt resource grade estimates for 10mE by 10mN by 2mRL selective mining unit blocks reflecting recoverable volume and grade estimates expected upon mining based on a 10mE by 10mN by 2mRL grade control spacing.

Validation of the ordinary kriged panel and LUC SMU estimates was undertaken by detailed visual review of the block model estimates relative to the input drillhole composite grade data, global mean grade comparisons between the input composites data and the block model grade estimates and grade-volume curve comparisons between the block model estimates and gaussian Global Change of Support (GCOS) estimates. The validation indicated that the ordinary kriged panel and LUC SMU nickel and cobalt estimates are appropriate in relation to the input composites data.

The supporting grade attributes including, MgO, FeO, Al_2O_3, CaO and Cr with similar drillhole sample assay availability as Ni and Co were estimated by ordinary kriging into 10mE by 10mN by 2mRL size blocks using the same search neighbourhood parameters and domain control used for estimation of nickel grades. Estimation of Mn used the same constraints used for Co (high and low-grade cobalt domains). Visual and global mean grade comparisons between the resultant grade estimates compared to the input composites data subdivided by the estimation domains were considered acceptable.

Ordinary kriging of SiO_2 and LOI grades, was undertaken using larger search neighbourhoods to account for the absence of grade data for 15% of the input composites data. Similar validation processes were completed as for the other support grade attributes followed by adjustment of the initial SiO_2 and LOI grade estimates on a relative ratio basis forcing the sum of all the estimated grade attributes (as oxides) to range between 95% and 105%. This was required for robust application of the material type classification scheme discussed below.

Quantitative XRD mineralogy data for 92 pulps from historical RC and diamond drillholes at Highway was merged with the multi-element geochemical data for the samples, and detailed analysis undertaken of the mineralogy data subdivided by the geological interpretation and a combination of grade and grade ratio thresholds based on the major geochemical attributes in the samples (MgO/FeO, Al_2O3/SiO_2 and $SiO_2/(MgO+FeO+Al_2O_3)$). The analysis resulted in the development of a material type classification scheme based on geological and geochemical classification criteria relating to natural mineral groupings present in the Highway weathering profile. Algorithms were developed in MS Excel and Vulcan block model scripts to assign material type codes to the drillhole samples for control in the statistical analysis of the bulk density data, and to control the assignment of determined bulk density values to the resource model.

Wet and dry bulk density and moisture measurements were determined for a representative suite of 261 diamond and sonic drill core samples from Highway. All the material types (mineralised and waste) in the weathering profile were targeted for density determinations. The measurements were completed either by the Archimedes method or physical measuring of the sample dimensions and weighing the samples, both as recovered containing insitu moisture, and after over drying, with appropriate sealing of samples with wax or vacuum seal to account for pore space.

In addition, vale completed 1,500m of downhole geophysical density logging across 39 drillholes, with 1,200m of logging matched with 971 sample intervals and combined with the bulk density data for the core samples to determine average density values subdivided by mineralised and waste material types.

8.6. Resource Classification

The Mineral Resource Estimate for Highway has been classified in accordance with the JORC Code (2012 Edition) guidelines.

With consideration of all the classification criteria in JORC Table 1 and the dominance of nickel in the overall value of the Highway deposit, slope of regression statistics recorded for the ordinary kriged panel nickel estimates were reviewed and a suitable confidence threshold aligned with that applied to the Goongarrie deposits selected as a guide to subdividing the combined nickel and cobalt estimates for Highway into Indicated and Inferred Mineral Resources. A slope of regression threshold of 0.7 was used to define boundaries between Indicated Resources (> 0.7) and Inferred Resources (< 0.7) within the insitu regolith domains.

Initial resource classification assignments based on slope of regression values applied to the resource model were used to define 3-D envelopes constraining the resource model blocks showing strong continuity of blocks with the same classification assignments and downgrading the confidence of blocks showing poor continuity in terms of the initial classification.

Wireframe solids of the modified resource classification boundaries were used to assign final resource classification codes to all blocks within the nickel mineralisation domains, with all mineralised blocks in transported material classified as Inferred Resources.

It must be emphasised that the resource classification is based on the nickel estimates, which Ardea considers to be equally applicable to the cobalt estimates.

A high-level pit optimisation assessment has also been undertaken on the resource model using appropriate metal pricing, mining and processing costs that demonstrate that the entire MRE reported using a 0.5% Ni cut-off grade is potentially economically viable to mine in the future. This is further discussed in Section 8.8 below.

8.7. Cut-off Grade

Cut-off grades 0.25% Ni and 0.03% Co were used to interpret and model nickel and cobalt mineralisation envelopes used to constrain the Highway resource estimate. These thresholds were chosen based on geological observation of the continuity of the nickel and cobalt grades within various regions of the weathering profile that could be of potential economic value to the project.

Mineral Resource reporting has been undertaken using a 0.5% Ni cut-off grade which is the common industry threshold used for resource reporting for typical Nickel Laterite deposits. While cobalt contributes to the project value, the grades and associated value are much less than nickel and therefore are not incorporated into the resource reporting cut-off grade criteria. The 0.5% Ni cut-off has also consistently been used by Heron, Vale Inco and Ardea since 2004 for reporting the overall Mineral Resources in the KNP which have been updated in this report to include the updated resource estimate for the Highway. All the other Mineral Resources within the KNP stated in this report have previously been reported in the public domain.

8.8. Mining and Metallurgical Methods and Parameters and other modifying factors

Open pit mining via conventional dig and haul is assumed for Highway and all the KNP deposits. The need for blasting is likely to be limited to pedogenic calcrete at surface, a layer of indurated ferruginous laterite that often overlies the nickel and cobalt mineralisation and underlying saprock rich in carbonate minerals, dolomite and magnesite, silica, and serpentine, should saprock be mined for use as acid neutralising material for ore processing.

For the purposes of removing unlikely to be economic resources from the resource statement, TME Mine Consulting (**TME**) carried out a pit optimisation for the Highway deposit using a “blue sky” US$27,558 per tonne nickel price (consistent with the price used for similar pit optimisation work as part of the Ardea PFS in 2018, and Heron in 2013 when converting earlier JORC 2004 compliant resource estimates to JORC 2012 compliant estimates). A “blue sky” US$64,485 per tonne cobalt price was also applied in the resource pit optimisation work undertaken by TME. Appropriate mining and processing costs and other costs were also used to complete the resource optimisation work. The entire Highway MRE based on a 0.5% Ni cut-off grade is deemed potentially economic based on the resource optimisation parameters and therefore have been reported as Mineral Resources in this report.

As per the Goongarrie deposits, Highway has been the subject of detailed metallurgical studies. The preferred metallurgical approach is based on an “off-the-shelf” HPAL flow sheet with a particular focus on improving the recovery of reagents during processing to improve unit costs.

Appendix 2 – JORC Code, 2012 Edition, Table 1 report

(Criteria in this section applies to all succeeding sections)

Criteria	JORC Code explanation	Commentary
Sampling techniques	• *Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling.* • *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.* • *Aspects of the determination of mineralisation that are Material to the Public Report.* • *In cases where 'industry standard' work has been done this would be relatively simple (e.g. 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information.*	• Resource definition at Highway has been undertaken mostly using Reverse Circulation (RC) drilling with RC drill samples collected using a face sampling hammer over 1m downhole intervals via cyclone into plastic bags when dry or polyweave bags when wet. Subsamples of significant mineralized material for routine assay analysis were collected by riffle or cone splitting when dry or damp or by spear when wet, over 1m or 2m intervals with the aim of collecting a 2-3kg sub-sample over each down hole sample interval. • Irregularly spaced diamond and sonic drilling has been completed for QAQC verification of the RC drilling, collection of bulk density measurements and acquire material for metallurgical testwork. • All holes are vertical and designed to optimally intersect the sub-horizontal mineralisation. • The diamond drilling collected mostly PQ3 size core for verification of the geology and sampling from the RC drilling, while HQ3 size core was collected for later metallurgical test work. Bulk density measurements were also completed based on samples of diamond and sonic core representative of the mineralised and waste materials in the weathering profile. • Additional material for metallurgical test work, further verification of the RC drilling and collection of additional bulk density measurements was obtained by sonic drilling recovering 3.75 or 5.1 inch diameter core. • 45% of the RC drilling was completed by Vale Inco in 2006 through 2008, 43% by Heron Resources in 2004 and 2005 and the final 12% by Helix Resources in 2003. All the diamond and sonic drilling was completed by Vale Inco in 2006 and 2007. • Downhole geophysical density measurements were also collected for selected Vale Inco RC and sonic drill holes with readings collected at 10cm downhole increment using a gamma-gamma downhole survey tool. This data provided a check against conventional Archimedes bulk density measurements collected by Vale Inco on billets of diamond and sonic drill core.
Drilling techniques	• *Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).*	• RC drilling was performed with a face sampling hammer (bit diameter between 4½ and 5 ¼ inches) and samples were collected via a cyclone into a large plastic bags, or polyweave bags when wet during the Vale Inco RC drilling. • All diamond drilling used triple tube core barrels to collect PQ3 and HQ3 size core. • Sonic drill samples were collected as whole core samples either 3.75 or 5.1 inches diameter of up to 1 metre lengths in sealed clear plastic wrap. Sonic core of longer lengths was cut to shorter lengths as it was retrieved from the drill string to facilitate handling of the heavy samples.
Drill sample recovery	• *Method of recording and assessing core and chip sample recoveries and results assessed.* • *Measures taken to maximise sample recovery and ensure representative nature of the samples.* • *Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.*	• Recovery of the bulk drill samples from the Helix and Heron RC drilling was based on visual estimates (%) while weights of the RC bulk drill samples were measured as a proxy for recovery for the Vale Inco samples. It is understood that a large (but unknown) proportion of the Heron logging recorded recoveries as a percentage of the large plastic bag volume filled with the bulk residue from each 1m sample interval. • RC sample moisture content was also routinely recorded for all the RC drilling. • An average recovery of 34% was recorded for the wet and saturated Helix and Heron samples (7% of samples with ≥ 0.3% Ni) while an average recovery of 49% was recorded for the dry and damp samples (93% of samples with ≥ 0.3% Ni. There appears to be a slight tendency for nickel grades to decrease with increasing moisture content which could potentially reflect loss of high grade fines from saturated samples. There is also a slight tendency for samples with lower recoveries to have higher nickel grades, with around 50% of samples having 60% or less recovery. This is considered most likely to reflect a tendency for reduced sample return in high grade goethitic clays as opposed to any sampling bias. • 1% of the Vale Inco RC samples were logged as wet with these samples on average being 4.6kg lighter than the dry

Criteria	JORC Code explanation	Commentary
		and damp samples. Similar to the Helix and Heron samples, there is tendency for increasing moisture content to be associated with lower nickel grades. Also higher nickel grades tend to associated with lower sample weights most likely reflecting larger proportions of light weight goethitic clays which typically contain higher nickel concentrations compared to other more dense (eg siliceous) material types. • Measures taken to ensure maximum RC sample recoveries included maintaining a clean cyclone and drilling equipment, using water injection at times of reduced air circulation, as well as regular communication with the drillers and slowing drill advance rates when variable to poor ground conditions are encountered. • Core recoveries from the diamond drilling were maximised by reducing drill penetration rates and run lengths in variable or poor ground conditions. The overall core recovery was excellent averaging 93% for Highway. • Recovery from sonic drilling was excellent with very good recoveries experienced in soft goethite clays where water injection was required in RC to facilitate acceptable recoveries.
Logging	• *Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.* • *Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.* • *The total length and percentage of the relevant intersections logged.*	• Visual geological logging of samples from all RC drilling was completed on 1 metre intervals. The logging system was developed by Heron Resources Ltd specifically for the KNP and was designed to facilitate future geo-metallurgical studies. Logging was performed at the time of drilling, and planned drill hole target lengths adjusted by the geologist during drilling. The geologist also oversaw all sampling and drilling practices. All the drilling was supervised by experienced geologists. A small selection of representative chips were also collected for every 1 metre interval and stored in chip-trays for future reference. Only drilling contractors with previous nickel laterite experience and suitable rigs were used. • For DD holes, both visual geological and geotechnical logging were performed on all drill core. Core was also selectively sampled for both geological and metallurgical test work. • Sonic holes were visually geologically logged prior to being sampled for metallurgical test work. • The geological legend used by Heron is a qualitative legend designed to capture the key physical and metallurgical features of the nickel laterite mineralisation. Logging captured the colour, regolith unit and mineralisation style, often accompanied by the logging of protolith, estimated percentage of free silica, texture, grain size and alteration. Most of the logging correlates well with material type predictions from algorithms developed based on XRD mineralogy analyses and corresponding multi-element assay data. • Drilling conducted by Vale Inco and Ardea has been logged in similar detail to Heron's procedures but using slightly modified geological logging legends. There are direct translations between the Vale Inco, Ardea and Heron logging legends.

Sub-sampling techniques and sample preparation	• *If core, whether cut or sawn and whether quarter, half or all core taken.*
	• *If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.*
	• *For all sample types, the nature, quality and appropriateness of the sample preparation technique.*
	• *Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.*
	• *Measures taken to ensure that the sampling is representative of the in-situ material collected, including for instance results for field duplicate/second-half sampling.*
	• *Whether sample sizes are appropriate to the grain size of the material being sampled.*
		• Approximately 2.5kg to 3kg subsamples were collected over 1m or 2m sample intervals for most of the RC drilling. The sub-sampling methods employed were as follows:
		  o Riffle split when dry or spear or scoop subsamples when wet by Vale Inco over 1m or 2m intervals (43% of the RC drilling.
		  o Cone split when dry or scoop subsamples when wet by Helix and Heron over 1m or 2m intervals (33% of the RC drilling.
		  o Composite spear or scoop sub-samples by Helix and Heron over mostly 4m or 5m down hole intervals (24% of the RC drilling) in predominantly unmineralised or low-grade material grading less than 0.4% Ni.
		• The riffle and cone splitting techniques are industry accepted methods for collecting sub-samples for assay analysis and resource estimation in nickel laterite deposits.
		• Ideally, none of the assay data for the composite spear or scoop subsamples over the longer downhole intervals (>2m) should be used for resource estimation. However, these make up a relatively small proportion of the sample assay data (approximately 20% within the resource envelope) and are of mostly of low grade material, and have been included in order to avoid over estimation of nickel grades in lower grade regions inside the resource envelope.
		• Mostly PQ3 size core from the initial 7 of the 20 Vale Inco diamond drillholes was halved using a diamond saw when hard or a spatula when soft with half core samples usually over 1m or 1.5m intervals cut in a similar manner, bagged

Criteria	JORC Code explanation	Commentary
		and submitted for head assay analysis. The remaining half core from these holes and whole from the remaining 13 diamond drillholes (mostly HQ3 size) was used for metallurgical test work. • Whole core from 8 of the 23 sonic holes was mostly cut into 1m long samples and submitted for head grade analysis for comparison with the results for the twinned RC holes. The core from the remaining 15 sonic holes was all used for metallurgical test work. • Most sub-samples from the Helix, Heron and Vale drilling at Highway have undergone sample preparation and chemical analysis at UltraTrace Laboratories (now Bureau Veritas - BV) in Perth. Samples from the remaining 4% of the drilling (all of unmineralized or low grade material less than 0.5% Ni) from the Heron drilling were analysed at Kalgoorlie Assay Laboratories in Kalgoorlie. Industry standard sample preparation procedures were used by both laboratories, typically involving; log samples received (both laboratories), weigh samples as received (BV), dry samples at 105° C (both laboratories), weigh dried samples (BV), jaw crush samples when required e.g., core samples to -3mm; (both laboratories), riffle split RC chips / crushed core samples to produce -3kg subsample for pulverisation (both laboratories.
Quality of assay data and laboratory tests	• *The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.* • *For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.* • *Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.*	• All samples from the Vale drilling (both diamond and RC) and most from the Heron RC drilling (85% of all the RC drilling) were analysed for Ni, Co, MgO, FeO, Al2O3, SiO2, CaO, Mn, Cr, Cu, Zn and As by UltraTrace using fusion XRF analysis. The Vale samples were also analysed for loss on ignition (LOI) by thermogravimetric analysis. • All samples from the Helix drilling (11% of all the RC drilling) were analysed for Ni, Co, MgO, FeO, Al2O3, CaO, Mn, Cr, Cu, Zn and As by UltraTrace in Perth by four acid digestion (initric, perchloric, hydrochloric, and hydrofluoric acids) and ICP-OES finish. • Sub-samples from the remaining RC drilling (all by Heron and 4% of total), which are all of unmineralized or low grade material < 0.5% Ni were analysed for Ni, Co, MgO, FeO, Al2O3, SiO2, CaO, Mn, Cr, Cu, Zn and As by KAL labs in Kalgoorlie by XRF analysis of pressed powder pellets from the sample pulps. • The fusion XRF method is widely accepted as the preferred analytical method for multi-element analysis of nickel laterite samples. Thermo-gravimetric analysis is also the leading method used to determine loss on ignition (LOI). The 4AD ICP-OES analytical method is unable to test for SiO2 and the digestion method often does not fully attack all minerals which can lead to the understating of the true concentration of some elements particularly Al2O3 and Cr. The pressed powder XRF method is designed to be semi-quantitative and typically suffers from poor analytical accuracy for elements that are not well dispersed in the pressed powder pellet. • UltraTrace / BV and KAL Labs routinely inserted analytical blanks, standards and duplicates into client sample batches for laboratory QAQC performance monitoring. • Heron routinely inserted blanks, standards and duplicate RC subsamples, each at a 1 in 30 frequency for external QAQC monitoring of field sampling errors and laboratory performance. • Vale Inco inserted standards and duplicate RC sub-samples for external QAQC monitoring of their drilling programmes at a one in twenty frequency. • All the QAQC data has been statistically assessed and the precision and accuracy of the UltraTrace assay results based on Fusion XRF analysis have been found to be acceptable and suitable for use in resource estimation. As previous noted no QAQC data is available for the 4 acid digest ICP-OES analyses of the samples from the Helix RC drilling. The analytical accuracy of the KAL Labs pressed powder XRF assays is generally unacceptable with significant bias levels evident for all of the assessed elements (up to 8% low for Ni, up to 12% high for Co, from 34% low to 20% high for MgO, from 9% low to 14% high for FeO, from 14% low to 6% high for Al2O3, from 8% low to 18% high for SiO2, up to 39% high for CaO, up to 20% high for Mn, and up to 7% low for Cr. • 92 representative sample pulps from historical Heron RC and Vale Inco diamond drilling to BV for quantitative XRD mineralogy analysis, targeting all the significant mineralisation styles and overburden transported material types identified in the regolith profile at Highway. Part of the BV analysis involved validation of the mineralogy stoichiometry against the multielement geochemistry also determined by BV using fusion XRF analysis.
Verification of sampling	• *The verification of significant intersections by either independent or alternative company*	• The reliability of RC sampling which forms the majority basis of the source data used for resource estimation has been

Criteria	JORC Code explanation	Commentary
and assaying	*personnel.* • *The use of twinned holes.* • *Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.* • *Discuss any adjustment to assay data.*	checked by collecting and statistically assessing the following verification sample datasets: ○ Routine duplicate RC sub-samples and associated multi-element fusion XRF assay data (Ultra Trace Laboratories) for the Heron and Vale / Inco drilling. ○ Vale Inco twinning of 7 Heron RC holes with PQ3 diamond drillholes and multi-element analysis of duplicate splits of 1m half core samples by Ultra Trace labs using the XRF Fusion technique. ○ Vale Inco twinning of 7 Vale Inco RC holes and 1 Heron RC hole with 8 sonic drillholes and multi-element fusion XRF assays of 1m whole core samples ○ Vale Inco RC sample re-splits (Jones riffle) and associated multi-element fusion XRF assay data for Heron RC holes twinned with Vale Inco PQ3 diamond holes. • Comparative statistical analysis of the assay data for the Heron duplicate RC sub-samples has shown acceptable overall precision levels (±3% for Ni, ±5% for Co, ±5% for Mn, ±5% for Cr, ±6% for MgO, ±3% for FeO, ±5% for Al_2O_3 and ±3% for SiO_2) were achieved during the Heron drilling programmes. The assays for the riffle split check samples versus the original cone split / spear samples for the Heron RC holes twinned with Vale Inco diamond holes show very similar average precision values as the Heron duplicate RC subsamples. In addition, there was no evidence of significant bias between the assays for the original Heron versus the Vale Inco check RC sub-samples. • Reasonable levels of overall precision were also achieved during the Vale RC drilling programmes based on statistical analysis of the comparative assay dataset for the Vale duplicate RC sub-samples. • The results from the RC and diamond twin drillhole data comparisons can be summarised as follows: ○ Changes in downhole grade trends (increasing to peaks and decreasing to troughs) are generally more similar in the twin holes that are located closer together compared to those that are located further apart. However, the tenor of grades at comparable trend positions (eg peaks and troughs) can vary widely between the twin hole pairs, even for holes located very close to each other. ○ There is no evidence in the grade profile plots of significant grade bias having occurred as the result of differences in the drilling and/or sampling methods. ○ The overall mean grades of the core sample data are relatively higher than for the RC sample data for Ni (+9%), Co (+11%), MgO (+5%), FeO (+6%), Al_2O_3 (+6%), Mn (+15%) and Cr (+13%), while they are lower than for the RC sample data for SiO_2 (-3%) and CaO (-50%). In absolute values most of the differences are in the FeO (1%) and SiO_2 (1.5%) grades followed by MgO (0.5%). These differences are considered to result from a greater tendency for fines losses during RC drilling as compared with diamond drilling. ○ Chemical variability of the mineralisation over short distances appears to have a significant influence on local grade differences in the twin drill holes. • The results from the RC and sonic twin drillhole data comparisons were similar to the results from RC and diamond twin drillhole comparisons, with assays for elements more commonly associated fines (Ni, Co, FeO, Al_2O_3, and Mn) in goethite, limonite, pyrolusite, and aluminosilicate minerals are sometimes noticeably lower in the RC samples compared to the sonic samples. This could result from the use destructive force and compressed air that may in some instances force fines into the sidewalls of the RC holes. As fines are reduced, the relative percentage of more competent materials (calcrete, carbonates and siliceous material) will increase which is sometimes reflected in corresponding higher SiO_2 and CaO grades in the RC samples compared to the sonic samples. • Despite the evidence for grade differences in some of the twined holes related to the RC drilling process, overall, the RC drilling is still considered to provide samples that adequately represent the true geochemistry of the regolith which are suitable for the purpose of resource estimation. • No adjustments have been made to the assay data.
Location of data points	• *Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.* • *Specification of the grid system used.* • *Quality and adequacy of topographic control.*	• The majority of the drill hole collars have been surveyed using an RTK DGPS system with either a 3 or 7 digit accuracy. The coordinates are stored in the Ardea exploration database referenced to the MGA Zone 51 Datum GDA94. • All the exploration drill holes used for resource estimation are vertical and have not down hole surveyed. However, minimal deviation of vertical RC drill holes is expected due to the sub-horizontal orientation of the mineralisation and the relatively soft nature of host material.

Criteria	JORC Code explanation	Commentary
		• The surface topography over the deposit has been modelled based on drill hole collars supplemented by a 50mE by 50mN grid of points derived from photogrammetry around the periphery of the deposit. The accuracy of the resultant topography model is considered acceptable for mine planning purposes.
Data spacing and distribution	• *Data spacing for reporting of Exploration Results.* • *Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.* • *Whether sample compositing has been applied.*	• Approximately 70% of the mineralisation has been drilled mostly on an 80mE by 80m grid but includes two 80mE by 80mN areas of 20m by 20m spaced holes, a 20m by 20m area of approximately 5mE by 5mN spaced holes and several drill traverses of 80mE by 120mN spaced holes. Most of the remaining mineralisation has drilled with 80m spaced holes along drill traverses (E-W) spaced either 160mN or 200mN apart. • All assay data for the RC drilling was composited over 2m downhole intervals to match the longest of the most common sample intervals (1m or 2m) prior to resource estimation. • Studies of the spatial continuity of nickel and cobalt grades at Highway have determined that the drill spacing is sufficient to define Indicated and Inferred resources at the deposit.
Orientation of data in relation to geological structure	• *Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.* • *If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.*	• Most of the drill holes are vertical and give true width of the regolith layers and mineralisation. • On a local scale there is some variability due to sub-vertical to vertical structures which may not be picked up with the vertical drilling. This local variability is not considered to be significant but may have local effects on mining and scheduling later in the project life, particularly mineralisation along more deeply weathered narrow structures that may enable localised deeper pit developments along such structures.
Sample security	• *The measures taken to ensure sample security.*	• Most of the exploration samples from Highway were collected and accounted for by Heron and Vale Inco employees during drilling. All sub-samples in calico bags were packaged into large plastic bags and closed with cable ties. Samples were transported to Kalgoorlie from site by relevant employees in sealed bulka bags. • Consignments were transported to Ultratrace Laboratories in Perth by reputable commercial transport companies. All samples were transported with a manifest of sample numbers and a sample submission form containing laboratory instructions. Any discrepancies between sample submissions and samples received were routinely followed up and accounted for.

Audits or reviews	• *The results of any Audits or reviews of sampling techniques and data.*	• Heron periodically conducted internal reviews of sampling techniques relating to resultant exploration datasets, and larger scale reviews capturing the data from multiple drilling programmes within the KNP.
		• Ardea's recent review of the exploration data for Highway checked the following:
		  • Unsurveyed drill hole collars (0).
		  • Drill Holes with overlapping sample or logging intervals (0%).
		  • Gaps in downhole sample and logging intervals (42).
		  • Drill Holes with no logging or assay data (1 Helix Resources RC hole).
		  • Sample or logging intervals beyond end of hole depths (0%).
		  • Samples intervals with no assay data (95 of 25,235)
		  • Assay grade ranges.
		  • Collar coordinate ranges
		  • Valid hole orientation data (All vertical).
		• All the exploration and corresponding QAQC data were reviewed and assessed again by Vale Inco in 2008, Heron in 2009 and Ardea in 2020. Vale Inco, Heron and Ardea all concluded that the quality of the data was suitable for use in resource estimation studies.

Section 2 – Reporting of Exploration Results

(Criteria listed in the preceding section also apply to this section.)

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	• *Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.* • *The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.*	• All Mineral Resources reported in this report occur within tenement holdings 100% owned by Ardea Resources.
Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties.*	• Nickel laterite mineralisation in the southern third to half the 5.7km strike extents of the Highway deposit was initially drilled by Helix Resources in 2003 with vertical RC holes on a 40mE by 200mN grid. A total of 4,389m of RC drilling was completed amongst 108 RC holes. • In 2004 and 2005, Heron extended the initial Helix drill section lines to the edges of the Walter Williams formation with RC holes at 80mE intervals and extended the RC drilling coverage to the north with holes on a combination of 80mE by 80mN and 80mE by 160mN grid spacings. Heron completed a total of 333 holes for a total of 15,749m of RC drilling. • Upon the forming of a joint venture between Heron and Vale Inco in 2005, Vale completed 944m of diamond drilling across 21 PQ3 and HQ3 holes at Highway in 2006. The drilling twinned various Heron RC holes spread geographically across the deposit to assess the reliability (QAQC) of the geology and sampling data from the Heron and Helix RC drilling and to collect samples for bulk density determinations and material for metallurgical test work. • Vale Inco subsequently completed 16,597m of infill RC drilling amongst 344 holes at Highway in 2007 and 2008 resulting in an 80mE x 80mN dominant drill spacing across the deposit. • Vale Inco also completed 1,109m of sonic drilling across 23 holes to collect additional samples for verification of the historical RC drilling, samples for bulk density determinations and additional material for metallurgical test work. • All the exploration datasets collected by previous explorers have been assessed by Ardea technical staff and most of the data has found to be suitable for use in resource estimation.
Geology	• *Deposit type, geological setting and style of mineralisation.*	• The nickel laterite mineralisation at Highway is developed from the weathering and near surface enrichment of Achaean-aged olivine-cumulate ultramafic units within the Walter Williams Formation. The mineralisation is usually within 80 metres of surface and can be further sub divided on mineralogical and metallurgical characteristics into upper iron-rich material and lower magnesium-rich material based on the ratios of iron to magnesium. Highway and the other KNP deposits analogous to many weathered ultramafic-hosted nickel-cobalt deposits both within Australia and world-wide. • The continuity of mineralisation is strongly controlled by bed rock alteration and paleo water flow within the ultramafic host rocks. Areas of deep fracturing and water movement within the bedrock typically have higher grade and more extensive mineralisation in the overlying regolith. In the proximity of geological contacts between the ultramafic hosts and surrounding mafic and felsic lithologies there is often a distinctive increase in grade and widths of mineralisation, often coinciding with meso-cumulate facies and increased structural deformation proximal to more competent thinner ortho-cumulate facies and mafic rocks immediately to the east and west of the WWF. Where the host regolith overlies olivine ad-cumulate lithologies there is an increase in siliceous material with lower nickel and cobalt grades and a loss of the high magnesium mineralisation horizon. Furthermore, in areas where the host ultramafic is altered to talc, or talc-carbonate lithologies there is often little to no development of nickel mineralisation in the regolith. These areas typically occur along shears, and sheared contacts within the bedrock. • Frequent northwest trending and lesser northeast trending fault structures are evident cross cutting the WWF along the strike length of the Highway deposit based on a combination of aeromagnetic and the drilling data. Differential

Criteria	JORC Code explanation	Commentary
		movement along these structures, particularly those with relatively minor apparent offsets in the contacts between the host WWF and adjacent lithological units appears to have provided a structural network interacting with stratigraphic based ultramafic lithology variations for ground water movement giving rise to the extensive nickel laterite mineralisation present at Highway and the Goongarrie deposits. • I thin veneer of pedogenic calcrete, soil transported colluvial material overlies the Highway deposit.

Drill hole Information	• *A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes:*
	  • *easting and northing of the drill hole collar*
	  • *elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar*
	  • *dip and azimuth of the hole*
	  • *down hole length and interception depth*
	  • *hole length.*
		• Data from hundreds of drillholes with significant intersections have been used to generate the updated resource estimates for the Highway deposit. Most of the drilling is vertical and represents the true thickness of the sub-horizontal mineralisation. Representative cross sections through the Highway deposit are presented in Appendix 3.
		• All the exploration drilling activities undertaken at Highway and representative results for 'Material' drillholes have previously been reported to the public by Heron and Ardea.

Data aggregation methods	• *In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.* • *Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.* • *The assumptions used for any reporting of metal equivalent values should be clearly stated.*	• Most drill hole samples have been collected over 1m or 2m down hole intervals. Assay compositing completed for each deposit in preparation for statistical analysis and grade estimation was conducted using length weighted averaging of the input assay data by corresponding sample lengths. A 2 compositing length was used aligned with the longest dominant sampling interval used for drill sub-sample collection. • No metal equivalent calculations have been used in this assessment.
Relationship between mineralisation widths and intercept lengths	• *These relationships are particularly important in the reporting of Exploration Results.* • *If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.* • *If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known').*	• The mineralisation at Highway has a strong global sub-horizontal orientation. All of the drill holes focused on the nickel – cobalt laterite mineralisation at Highway are therefore vertical and represent the true thickness of the mineralisation.
Diagrams	• *Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.*	• No new discoveries of nickel laterite mineralisation or cobalt rich areas are presented in this report.
Balanced reporting	• *Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.*	• The updated resource estimate for Highway is reported using several lower nickel cut-off grades in order to provide explanation of variations in tonnage as a function of grade and the corresponding 3-D continuity of the lower and higher grade mineralisation.
Other substantive exploration data	• *Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.*	• Not applicable to this report.
Further work	• *The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).* • *Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.*	• No further drilling is currently planned to further evaluate the nickel laterite resources at Highway. However, further diamond drilling is planned for the near future to collect for bench scale metallurgical test work.

Section 3 – Estimation and Reporting of Mineral Resources

(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

Criteria	JORC Code explanation	Commentary
Database integrity	• *Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes.* • *Data validation procedures used.*	• Heron, Vale Inco and Ardea have employed robust procedures for the collection of and storage of sample data. This includes auto-validation of sample data on entry, cross checking of sample batches between the laboratory and the database and regular auditing of samples during the exploration phase. • Sample numbers were both recorded manually and entered automatically. Discrepancies within batches (samples were batched daily) were field checked at the time of data entry, and resampled if errors could not be resolved after field inspection. • Data validation procedures include digital validation of the database on entry (no acceptance of overlapping intervals, duplicate hole and sample ID, incorrect legend information, out of range assay results, incorrect pattern of QAQC in sampling stream, failed QAQC, missing assays, samples and geological logging). • At the time of resource modelling all data has been visually checked on screen, and manually validated against field notes. Any changes to the database were verified by field checks.
Site visits	• *Comment on any site visits undertaken by the Competent Person and the outcome of those visits.* • *If no site visits have been undertaken indicate why this is the case.*	• The Competent Person, James Ridley has conducted numerous visits to the Highway deposit areas as a Senior Resource Geologist in full time employment with Heron from 2004 to 2011 and Ardea from 2017 to present, and a secondee to Vale Inco from 2005 to 2007. The drilling, sampling and geological practices used for data collection were standardised. RC drilling was generally effective, although minor localised issues with sampling accuracy of wet puggy clays were encountered. Overall procedures were consistent and the results from the RC drilling were found to be valid based on comparisons with the results of verification diamond drilling. • No comment can be made on the validity of historic work by Helix in 2003, except to say that subsequent infill RC drilling by Heron and Vale Inco have broadly similar results to the Helix data.
Geological interpretation	• *Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.* • *Nature of the data used and of any assumptions made.* • *The effect, if any, of alternative interpretations on Mineral Resource estimation.* • *The use of geology in guiding and controlling Mineral Resource estimation.* • *The factors affecting continuity both of grade and geology.*	• There is a strong correlation in the geology between adjacent drill holes at the Highway deposit. There is also a strong global correlation between the weathering profile, lithology and mineralisation intensity. On a local scale the changes in the weathering profile is often discrete, but of a complex geometry influenced to a large degree by faulting and fracturing in the ultramafic protolith. • Nickel and cobalt mineralisation domains were interpreted in cross section using a combination of assay data and observed geological logging data. The outlines were extended variable distances laterally from marginal mineralised drill intersections to adjacent subgrade or barren drillholes with consideration of the lateral extents evident on the current and adjacent drill hole traverses. Typically, the outlines were tapered to a degree reflecting how thick the subgrade intersection was in the adjacent drillhole or an extension tapering to zero thickness where there was little to no grade anomaly in the adjacent hole but truncated vertically before reaching the barren hole. Outlines on sections where the mineralisation fails to continue on an adjacent section were terminated halfway to the adjacent drill traverse, often with a thinner outline reflecting an interpreted thinning of the mineralisation considering the tenor of any anomalous grades in the drilling on the adjacent drill traverse. Outlines based on mineralised drill intersections on the final drill traverse where no further drilling has been completed along strike were typically projected either 80m or 160m north or south depending on the tenor and thickness of the mineralised drill intersections on these 'end' drill traverses. The resulting outlines were then used to create wireframe solids of the mineralised domains to constrain resource estimation. • Nickel envelopes were defined using a notional 0.25% Ni cut-off grade applied to the drillhole assay data incorporating internal dilution where necessary to maintain reasonable 3-D continuity of the mineralised domain geometry. While Mineral Resources were ultimately reported using a 0.5% Ni cut-off grade, the nickel envelopes included lower grade material, primarily in saprock, which is often rich in carbonate minerals that could be used as acid neutraliser in the

Criteria	JORC Code explanation	Commentary
		proposed ore processing flowsheet. This would enable recovery of additional nickel metal (as a credit) to the metal recovered from the plant ore feed stock. • Cobalt envelopes were defined using a notional 0.03% Co cut-off grade applied to the drillhole assay data, also incorporating internal dilution where necessary to maintain reasonable 3-D continuity of the mineralised domain geometry as well as being constrained within the nickel envelopes. These envelopes were used to subdivide the nickel domains cobalt rich and cobalt poor domains. • The mineralisation envelopes were subdivided into area domains where there was either changes in the dominant local drillhole spacing or trend in the nickel and cobalt mineralisation based on the interpreted orientation of the host protolith and structures influencing variations in both the tenor of grades and depth of the regolith profile. • A combination of geological logging and assay data was used to sub divide the mineralisation into high-iron (goethite rich) domains of more intensely weathered insitu material, and underlying high-magnesium (saprock) mineralisation within the mineralised domains. These were interpreted as cross sectional profiles from which a 'top of saprock' wireframe surface model was generated. • The interface between insitu nickel bearing clays derived from ultramafic protolith, and overlying transported sediments comprised of colluvium and pedogenic surficial material has also been modelled based on a combination drill hole geological logging and assay data. Occasionally elevated nickel and cobalt grades in the transported material are interpreted to be colluvial material derived from nickel laterite mineralisation. The base of transported sediments was also interpreted as cross-sectional profiles from which a wireframe surface model was generated. • The base of near surface calcrete / pedogenic sediments rich in carbonate minerals was modelled to constrain estimation of carbonate mineral quantities for consideration as acid neutraliser in the proposed ore processing flowsheet in future mining studies. A threshold of 5% CaO+MgO (equating to a minimum of 10% contained carbonate mineralogy), elevated Loss On Ignition (LOI) assays and drill hole logging data was used to interpret cross sectional profiles from which a wireframe surface model was generated. • The entire geological modelling process involved a thorough analysis of the complex relationships between the ultramafic protolith, structure, variations in the nature of the overlying regolith, and more recent weathering processes responsible for the deposition of overlying transported sediments and the composition of these sediments as a potential to add value in the development of the KNP. The Competent Person has over 10 years of experience in resource estimation focused on nickel laterite deposits with much of this experience focused on building a detailed understanding of the geology, mineralogy and geochemistry of the KNP deposits. The CP considers the updated geological interpretation for the Highway deposit to be robust and to provide suitable constraints for resource estimation accounting for variations in the complexity of the geology and minimising the potential for any bias in the interpretation by incorporating subgrade drill intercepts and sample intervals into the resource envelopes where the local drillhole spacing is too broad to assume connectivity of higher grades.
Dimensions	• *The extent and variability of the Mineral Resource expressed as length (along strike or otherwise), plan width, and depth below surface to the upper and lower limits of the Mineral Resource.*	• The nickel mineralisation at Highway occurs within a single zone that extends over a strike length of 5.7km, averages approximately 50m thick and is 1200m wide at the south end, gradually tapering to 300m wide at the north end. • Overburden comprised of a combination of transported sediments and indurated ferruginous laterite averages 8-10m thick over most of the deposit.

Estimation and modelling techniques	• *The nature and appropriateness of the estimation technique(s) applied and key assumptions, including treatment of extreme grade values, domaining, interpolation parameters and maximum distance of extrapolation from data points. If a computer assisted estimation method was chosen include a description of computer software and parameters used.*
	• *The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.*
	• *The assumptions made regarding recovery of by-products.*
	• *Estimation of deleterious elements or other non-grade variables of economic significance (e.g.*
		• Most resource modelling processes were undertaken using Maptek Vulcan software Version 2020.1.
		• The drillhole assay data for each deposit was domain coded using the wireframe solid and surface models generated from the geological interpretation. Regolith, nickel, cobalt and area domain codes were assigned.
		• Detailed analysis was undertaken of the availability of assay data for the grade attributes considered important for grade estimation, particularly, Ni, Co, MgO, FeO, Al2O3, SiO2, CaO, Mn, Cr and LOI. While Ni, Co, Mn, MgO, FeO, Al2O3, CaO and Cr assay data are available for most of the drillhole samples within the modelled nickel mineralisation domain(s) used to constrain the resource estimates, assay data for:
		  ○ SiO2 data are available for only 85% of the 2m composites within the nickel mineralisation envelope
		  ○ LOI data are available for only 45% of the 2m composites within the nickel mineralisation envelope(s).

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	sulphur for acid mine drainage characterisation). • *In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.* • *Any assumptions behind modelling of selective mining units.* • *Any assumptions about correlation between variables.* • *Description of how the geological interpretation was used to control the resource estimates.* • *Discussion of basis for using or not using grade cutting or capping.* • *The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.*	However, LOI grades were calculated for additional 40% of the composites for which there was sufficient assay data for the dominant grade attributes, including Ni, Co, MgO, FeO, Al2O3, SiO2, CaO, Mn and Cr, as well as K2O and NaCl when available. Calculated LOI values were checked against real LOI assays when available and found to be in reasonable agreement. • Analysis of the drillhole sub-sample interval- lengths indicated that sub-samples for 80% of the drilling to be used for resource estimation have been collected over 1m or 2m downhole intervals. • Based on the drill sub-sample length analysis, the domain coded sub-sample assay data were composited to 2m intervals in preparation for statistical analysis, variography and grade estimation. While Ni and Co are the primary focus of the resource estimate, statistical analysis, variography and grade estimation were also undertaken for FeO, MgO, Al2O3, SiO2, CaO, Mn, Cr, and Loss On Ignition (LOI) which are relevant to assignment of geo-metallurgical material types and dry bulk density values to the resource model. • Classical statistical analysis was undertaken based on the 2m composite grade data for each deposit using Phinar Supervisor V software (2008). Cell declustering weights were applied to the composite grade data based on cell dimensions of 80mE by 160mN by 2mRL. Tabulated descriptive statistics, histograms and probability plots were compiled based on the declustered data for each grade attribute within the combined nickel resource envelope(s) for each deposit. The data for nickel and all the other grade attributes except cobalt and manganese were subdivided by the clay (high FeO & low MgO) and saprock (low FeO & high MgO) domains. The composite Co and Mn grade data, which are typically moderate to strongly correlated were subdivided by inside versus outside the combined cobalt resource envelopes, within the nickel resource envelope(s) for each deposit. Elevated coefficients of variation (CV) greater than 1 but less than 2.0 were reported for Al2O3, CaO, and Cr in the saprock domains, and MgO in clay domains, while similar range CV values were reported for Co in the high-Co domains and Mn in the low Co domains. The highest CVs greater than 2.0 but less than 3.1 were reported for CaO in the clay domains. • Suitable upper and lower cuts were determined in relation to any grade variables showing anomalously high or low outlier grades relative to the dominant grade characteristics for each sample population. However, application of the cuts only had local influences on the corresponding grade estimates, with no material effects on the global mean grades of the domains. No upper cuts were assigned to the grade data for the pedogenic carbonate domain. • Continuity analysis (variography) was undertaken for all grade attributes using Phinar Supervisor V software (2008) based on the cut composite grade datasets with the attributes excluding Co and Mn subdivided by the clay, saprock and estimation area domains, while Co and Mn were subdivided by the estimation area, high grade and low-grade cobalt domains. Experimental 3-D variography was generated as semi-variograms normalised to an overall sill of 1.0 based on non-declustered composite grades or normal score transform of the grades for each domain or domain group, depending on the degree of skew in the histogram distribution of grades. The variography was modelled with a nugget effect and up to three spherical structures. Low relative nugget effects, typically less than 10% of the overall variance for Ni and less than 20% of the variance for Co (often 10% or less) were modelled for the Highway deposit domains. Relative nuggets less than 10% and often less than 5% of the overall variance for most of the other grade attributes were also modelled for the various domains. Approximately 60% to 75% of the spatial variance in the Ni and Co is dominated by a short-range structure with ranges often approximating the dominant relatively closer drillhole spacing in the domain. However, overall ranges in at least several multiples of the average drillhole spacing are evident for most of the grade variables in most of the domains. The drillhole spacing at Highway is considered sufficient for the estimation of Ni and Co mineral resource grades, and support grade attributes. • A 3-D regular block model was constructed of the Highway deposit with nickel, cobalt, regolith (including transported) and area (orientation and data spacing) domain coding assigned based on the geological interpretation. The block model was constructed using regular block dimensions of 10mE by 10mN by 2mRL. • All variables necessary to record grade estimates for all chemical attributes of interest and accompanying estimation statistics, various geochemical ratios, geo-metallurgical material type assignments, dry bulk density assignments, and resource classification coding were incorporated into the block model. • The normalised variogram model parameters (nugget and sill values) for Ni and Co in all domains were converted on

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		a ratio basis to 'true' variance values with the overall sill based on the variance of the declustered Ni and Co data for each domain or domain group. • Mineral Resource nickel and cobalt grades were estimated by ordinary kriging into panels with dimensions 40mE by 40mN x 4mRL based on half the dominant 80mE by 80mN drillhole spacing at Highway. The ordinary kriged panel estimation was followed by local uniform conditioning (LUC) to produce final nickel and cobalt resource grade estimates for 10mE by 10mN by 2mRL selective mining unit blocks reflecting the volumes and grades predicted to be recoverable upon mining based on a 10mE by 10mN by 2mRL grade control spacing. Gaussian anamorphosis modelling of the Ni and Co grade distributions was undertaken using 40 hermite polynomials based on the declustered datasets subdivided by the clay and saprock domains for nickel, and the high- and low-grade cobalt domains for cobalt. Validations indicated robust transformations. • Back transform grade distribution modelling for each domain or domain group was undertaken using linear modelling typically between the 10th and 90th percentiles (+/- 5%) of the domain cumulative grade distributions, and power modelling of the lower tail and hyperbolic modelling of the upper tail using an application developed in MS Excel. • Ordinary kriging of panel Ni and Co grades, and LUC estimation of SMU block grades for each domain or domain group was completed in a single pass estimation process using the LUC executable in Maptek Vulcan software version 2020.1. Sample search neighbourhoods for kriging were based on domain orientations determined from the variography with a large vertical search used, often equal to the semi-major axis search (horizontal - normal to strike) to enable composites from shallow drillholes that intersect relatively shallow poorly developed regolith and lower nickel grades to be selected for grade estimation along the margins of much deeper well developed regolith and higher grade material intersected in adjacent drillholes. This is an important consideration that results in the estimation of a lower grades along the margins of abruptly thicker and deeper high-grade mineralisation along fault related fracture zones of more favourable ultramafic protolith, the grades of which may otherwise, be over-estimated if only based on higher grade samples in drillholes that test the deeper mineralisation. • To account for variations in the drillhole spacing, which often systematically changes between regions of higher and lower grade mineralisation, the ellipsoidal search neighbourhood for each estimation domain was divided into octants with a maximum of 4 composites selected from any one octant, and usually, a minimum of 8 and a maximum of 24 composites used to estimate each panel. In addition, the maximum number of composites selected from each drillhole was restricted to 4. • Hard boundaries between the clay and saprock domains were used for the estimation of nickel grades and similarly between the high- and low-grade cobalt domains when estimating cobalt grades. However, soft boundaries with no restrictions other than the search neighbourhood parameters noted above were used between the mineralisation orientation / drillhole spacing (area) domains within the clay and saprock domains. • Validation of the ordinary kriged panel and LUC SMU estimates was undertaken by detailed visual review of the block model estimates relative to the input drillhole composite grade data, global mean grade comparisons between the input composites data and the block model grade estimates subdivided by the estimation domains, and grade-volume curve comparisons between the block model estimates and gaussian global change of support (GSOS) data generated for the panel and SMU dimensions subdivided by the clay and saprock domains and the deposit area domains based on the de-clustered composite grade datasets. The validation indicated that the ordinary kriged panel and LUC SMU nickel and cobalt estimates are with acceptable ranges considering the influences of soft estimation boundaries between adjacent area domains, the large vertical sample searches and geostatistical considerations, particularly, Information Effect (relating to the local exploration drillhole spacing). • Most of the support grade attributes including, MgO, FeO, Al_2O_3, CaO and Cr with similar drillhole sample assay availability as Ni and Co were estimated by ordinary kriging into 10mE by 10mN by 2mRL size using the same search neighbourhood parameters and domain control used for estimation of nickel grades (primarily the clay and saprock domains), while estimation of Mn used the same constraints based on the high and low grade cobalt domains) While the block size is much smaller than would ordinarily be acceptable for resource grade estimation within most of the domains, the estimation strategy was to produce grade estimates for a block size where changes in the dominant local

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		material types (based on relationships between the multielement geochemistry and dominant mineral occurrences) are less sensitive to the accuracy of local block estimates and appear to be better represented based on small block estimates that better reflect undulations in weathering profile between the drillholes. Visual and global mean grade comparisons between the resultant grade estimates compared to the input composites data subdivided by the estimation domains were considered acceptable. • Ordinary kriging of SiO2 and LOI grades was undertaken using larger search neighbourhoods to account for a lack of grade data for 15% of the input samples, after calculating LOI grades for 40% of the sample population. The ordinary kriged block model estimates were checked against the input composites data and grade totals were calculated based on the sum of the estimated grade attributes converted to oxides. Adjusted SiO2 and LOI grades were then calculated for any blocks with grade totals less than 95% or greater than 105%, based on the assumption that such deviations result from the lack of SiO2 and LOI grade data for 15% of the input sample population. The grade adjustments were based on the ratios between the initial ordinary kriged SiO2 and LOI estimates and the difference between the initial calculated grade totals from 95% when less than 95%, or from 105% when greater than 105%. Allowance was also made for differing distances to the nearest sample informing the initial SiO2 and LOI estimates for a block. Relatively greater adjustments were made to grades where the closest sample was located further away compared to the samples with grade data available for the other grade attributes. • Quantitative XRD mineralogy data for 92 representative sample pulps from 5 RC holes and 1 diamond hole was merged with the multi-element geochemical data for the samples, and detailed analysis undertaken of the mineralogy data subdivided by the geological interpretation and a combination of grade and grade ratio thresholds based on the major geochemical attributes in the source samples (MgO/FeO, Al2O3/SiO2 and SiO2/(MgO+FeO+Al2O3). • The analysis of the joint XRD and geochemical datasets resulted in the development of a material type classification scheme for Highway based on geological and geochemical classification criteria that relate to natural mineral groupings present in the weathering profile. Algorithms were developed in MS Excel and Vulcan block model scripts to assign material type codes to the drillhole samples for control in the statistical analysis of the bulk density data, and the block models to control the assignment of determined bulk density values to the models and provide material type coding relevant to downstream mining studies.
Moisture	• *Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.*	• All tonnages from the Highway resource model are reported as dry tonnes. Wet and dry bulk density and moisture measurements were determined for a comprehensive suite of diamond and sonic drill core samples from Highway. • Density measurements including moisture were initially collected using the Archimedes method with the samples sealed in wax or a vacuum bag prior to weighing submerged in water. The wax was then removed and the sample re weighed before and after over drying. • Sample volumes were calculated based on the sample dimensions (length and diameter) measured for each sample. The moisture content of each sample was determined by weighing the sample when wet (as recovered from the drillhole) and then weighing it again after thorough oven drying and calculation of moisture by (wet_wt – dry_wt) / wet_wt * 100. Wet and dry bulk density measurements were determined by dividing the respective sample weight by the volume determined based on the core sample dimension measurements.
Cut-off parameters	• *The basis of the adopted cut-off grade(s) or quality parameters applied.*	• 0.25% Ni and 0.03% Co cut-off grades were used to interpret and model nickel and cobalt mineralisation envelopes used to constrain the Highway resource estimate. Both the 0.25% Ni and 0.03% Co cut-off grades were chosen based on geological observation of the continuity of the nickel and cobalt grades within various regions of the weathering profile that could be of potential economic value to the project. There is potential for significant nickel credits from saprock material rich in dolomite and magnesite (carbonate minerals) at Highway, typically containing an average of 0.25% Ni that could be used as neutraliser in the proposed pressure acid leach processing flow sheet and contribute additional nickel production. • Mineral Resource reporting has been undertaken using a 0.5% Ni cut-off grade which is a common threshold used for resource reporting for typical Nickel Laterite deposits. While cobalt contributes to the project value, the grades and associated value are much less than nickel and therefore are not incorporated into the resource reporting cut-off grade

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		criteria. The 0.5% Ni cut-off has also consistently been used for by Heron and Ardea for reporting the overall Mineral Resources in the KNP which have been updated in this report to include the update resource estimate for Highway. All the other Mineral Resources stated in this report have previously been reported to the public.
Mining factors or assumptions	• *Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is* • *always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining* • *methods, but the assumptions made regarding mining methods and* • *parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.*	• Open pit mining via conventional dig and haul is assumed for the Highway deposit. The need for blasting is likely to be limited to pedogenic calcrete at surface, a layer of indurated ferruginous laterite that often overlies the nickel and cobalt mineralisation, and underlying saprock rich in serpentine and the carbonate minerals dolomite and magnesite, should saprock be mined for use as acid neutralising material for ore processing. • For the purposes of removing unlikely to be economic resources from the resource statement, TME Mine Consulting (TME) carried out a pit optimization for Highway using a US$27,558 per tonne nickel price (consistent with the price used for similar pit optimisation work as part of the Ardea PFS in 2018, and Heron in 2013 when converting earlier JORC 2004 compliant resource estimates to JORC 2012 compliant estimates. A US$64,485 per tonne cobalt price was also applied in the resource pit optimisation undertaken by TME. Estimated mining and processing costs, along with royalty and recovery factors were also updated by TME for this process. The evaluation was carried out on the LUC estimated nickel and cobalt grades only in the Highway resource model. The other assumptions used in the TME resource pit optimisation study were: Pit slope of 55 degrees, 0.5% Ni resource cut-off grade, 0% ore dilution and 100% ore recovery, Mining costs of AU$7.70 to AU$7.81 per bcm, Processing costs of AU$125/t plus AU$6.72 haulage from Highway to a proposed processing plant at Goongarrie South, Process recovery of 94.5% for Ni and 95.5% for Co, Ni and Co sales terms of 110% (for sulphate products), Selling costs of AU$132/t of sulphate product, AUD:USD exchange rate of 0.75 and 2.5% royalty on metal sales. • All the Highway resource model blocks based on a 0.5% Ni cut-off were deemed economic based on the resource optimisation parameters and therefore have been reported as Mineral Resources in this report.
Metallurgical factors or assumptions	• *The basis for assumptions or predictions regarding metallurgical amenability. It is always necessary as part of the process of determining* • *reasonable prospects for eventual economic extraction to consider potential* • *metallurgical methods, but the assumptions regarding metallurgical treatment processes and parameters made when reporting Mineral Resources may not always be rigorous. Where this is the case, this should* • *be reported with an explanation of the basis of the metallurgical* • *assumptions made.*	• The Goongarrie and Highway deposits have been the subject of detailed metallurgical studies. • The current focus of studies into a preferred metallurgical approach is on high pressure acid leaching methods with a particular focus on improving the recovery of reagents during processing to improve unit costs.
Environmental factors or assumptions	• *Assumptions made regarding possible waste and process residue disposal options. It is always necessary as part of the process of determining* • *reasonable prospects for eventual economic extraction to consider the* • *potential environmental impacts of the mining and processing operation. While at this stage the determination of potential environmental impacts, particularly for a greenfields project, may not always be well advanced, the status of early consideration of these potential environmental impacts should be reported. Where these aspects have not been considered this should be reported with an explanation of the environmental assumptions made.*	• It is expected that waste rock material will largely be disposed of inside previously completed pits during the life of mine. Tailings disposal will consist of a mixture of conventional tailings dams and disposal in mined out pits. As all of the material mined will be of an oxidised nature and as such there is not expected to any acid generating minerals in the waste rock material. The processed tailings will need to be neutralised or recovered from the tailings stream prior to disposal in waste storage facilities. The expected landforms at the conclusion of the project will be of similar profile to the current land forms. • Environmental studies for the project have been started with base line surveys for flora and fauna. However, as the final process route is currently subject to research, the final environmental plans are yet to be developed. It is reasonable, given the existing nickel laterite operations in WA, that all environmental issues can be resolved and it will be possible to mine the resources within current environmental guidelines.
Bulk density	• *Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of* • *the samples.* • *The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc), moisture and differences between rock and*	• Wet and dry bulk density and moisture measurements were determined for a representative suite of 261 diamond and sonic drill core samples from Highway. All the material types (mineralised and waste) in the weathering profile were targeted for density determinations. • Wet density values of the Vale Inco diamond and sonic core samples were measured using the Archimedes method including either coating the samples with wax or vacuum sealing them in plastic bags prior to weighing them submerged in water. Wet sample weights were recorded pre-wax coating or vacuum sealing, after coating or sealing, and after

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	alteration zones within the deposit. • *Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.*	removal of the coating or sealing (after weighing submerged in water). The samples were thoroughly oven dried after removing the coating or sealing, and subsequently reweighed to determine the dry sample weight and moisture content. The dry bulk density was then calculated by multiplying the wet density by (1 – moisture) with percentage moisture in the wet sample expressed as a proportion value between 0 and 1. • Vale Inco also completed 1500m of downhole geophysical density logging across 39 sonic and RC drillholes, with 1200m of logging matched with 971 sample intervals and combined with the bulk density data for the core samples to determine average density values subdivided by mineralised and waste material types. • The manually determined bulk density and moisture data for the core samples and 1m composites of the geophysical density data were merged with the corresponding assay data (if available) for the samples or sample intervals and material types assigned based on the geochemical criteria derived from the analysis of the XRD mineralogy data. The holes drilled primarily to collect bulk material for metallurgical testwork and therefore no detailed downhole sampling and assaying undertaken, typically twinned earlier Heron RC holes. If assay data for sufficient grade attributes (including SiO2 and CaO) were available for the twinned RC hole, material type assignments were calculated and assigned to the same downhole interval in the more recent sonic hole for which downhole geophysical density logging had been undertaken. Assays were available for all the grade attributes required to calculate material type assignments for the 261 manual bulk density measurements and 971 sample intervals coinciding with downhole geophysical density logging. • Average wet and dry bulk density and moisture were calculated subdivided by the material type classification scheme based on the density and moisture measurements of the core samples. • Composites of the long and short spaced geophysical density data (matching the corresponding downhole subsample intervals and assay data) were assessed in a similar manner subdivided by the respective material type classification schemes. The long space density averages were found to reconcile closely with the wet density averages based on the manual measurements and therefore, were treated as the preferred geophysical wet density average values. This is well justified as the short space geophysical density values are highly susceptible to low bias in drillholes with significant variations in diameter over short downhole intervals, which is expected within the very soft earthy goethite rich material and local variations in material type hardness within the weathering profile. • Given the close overall agreement between the wet density averages based on the manual density measurements of core samples and geophysical density measurements, the average moisture values determined based on the core samples subdivided by the material type classification were used to convert the average wet bulk density values based on the geophysical density dataset, to dry bulk density values and weighted average dry bulk density values were calculated based on a combination manual and geophysical bulk density datasets subdivided by the material type classification scheme. • The resulting average dry density values range from 1.4 t/m3 to 2.1 t/m3 and were assigned to the resource model for Highway. • The magnitude and variation of the average dry bulk density values are aligned with expectations of the variations in bulk density observed in the core samples collected from the extensive diamond and sonic drilling completed at Highway.
Classification	• *The basis for the classification of the Mineral Resources into varying confidence categories.* • *Whether appropriate account has been taken of all relevant factors (i.e. relative confidence in tonnage/grade estimations, reliability of input data,* • *confidence in continuity of geology and metal values, quality, quantity and* • *distribution of the data).* • *Whether the result appropriately reflects the Competent Person's view of* • *the deposit.*	• Classification of the Mineral Resources at Highway has been undertaken using the same approach used for the Goongarrie deposits with detailed consideration of the following: ○ The quality of all the historical and more recent exploration data available for the project. ○ The weathering and geochemical processes resulting in the regolith that hosts the nickel, cobalt and scandium mineralisation, variations within the insitu regolith profile due to variations in the ultramafic protolith and the fault and shear structures that pass through it, and the presence and distribution of transported materials (mainly colluvial sediments, and pedogenic soils and calcrete) that often overlie the insitu regolith. ○ The continuity of nickel and cobalt grades within the regolith profile. There is robust continuity of nickel grades at Highway using a 0.5% Ni cut-off grade while selective mining of higher grade material using cut-off grades

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		as high as 0.8% Ni to 1.0% Ni also appears to be entirely plausible in the more extensively weathered Clay Upper region of the regolith profile. Conversely, underlying nickel bearing saprock appears more likely to be considered as a lower grade bulk mining target, or a source of carbonate rich material for acid neutralisation in the proposed pressure acid leaching ore processing flowsheet for the project. o Confidence in the interpretation and modelling of 3-D geological boundaries used to constrain the resource estimates is high and well supported with drilling. o Detailed geostatistical estimation quality statistics were recorded in relation to the ordinary kriging estimation of panel grades which form the basis of the recoverable nickel and cobalt resource grade estimates based on local uniform conditioning (LUC). Classification of the Mineral Resources at Highway was ultimately based on 'slope of regression' statistics reflecting measures of accuracy of the panel estimates relative to predictions of the true panel grades. The specific criteria based on these measures is discussed in more detail below. o A comprehensive understanding of local mineral assemblages in the weathering profile based on a combination of multi-element geochemistry and mineralogy data. Distinct mineral assemblages that occur locally within different regions of the weathering profile have been classified as a range of material types based on relationships identified between the mineralogy and multi-element geochemical attributes that have been estimated into the resource model. The material type classification scheme is broadly confirmed by the initial geological logging of the samples and therefore provide a framework of material type assignments in the Highway (and Goongarrie) resource models that would otherwise be extremely difficult to define as individual domains suitable for constraining resource estimation. Importantly, the material types are transitional depending on variations in the concentrations of the various grade attributes and therefore the smoothing of grades within a framework of larger estimations domains does not necessarily negate the reliability of the resulting material type assignments based on the multi-element geochemistry estimated in the resource block models. o Bulk density assignments based on the material type classification schemes make sense. Typically higher average densities have been determined for material types high in free silica (amorphous quartz) and carbonate minerals, while lower densities have been determined for material types containing higher concentrations of kaolinite and earthy goethite. Variations in the transported material types which are often more dense due to iron and silica induration have also been accounted for in the bulk density assignments. • With consideration of all the comments noted above and the dominance of nickel in the overall value of the KNP deposits, slope of regression and kriging efficiency statistics recorded for the ordinary kriged panel nickel estimates were reviewed and suitable confidence thresholds selected as a guide to subdividing the combined nickel and cobalt estimates for Highway into Indicated and Inferred Mineral Resources. A slope of regression threshold of 0.7 was used to define boundaries between Indicated Resources ($\geq$ 0.7) and Inferred Resources (< 0.7) within the insitu regolith domains. Initial resource classification assignments based on these criteria were applied to the resource model and used as a basis for defining 3-D envelopes constraining the resource model blocks showing strong continuity of blocks with the same classification assignments and downgrading the confidence of blocks showing poor continuity in terms of the initial classification. Wireframe solids of the modified resource classification boundaries were used to assign final resource classification codes to all blocks within the nickel mineralisation domains, with any mineralised blocks in transported material classified as Inferred Resources. • While the Mineral Resource classification criteria is primarily based on relative levels of confidence in the nickel grade estimates, cobalt resources have been reported based on the same criteria, given that they make up a relatively small proportion of the project value. • The CP, Mr James Ridley, considers the resource classification applied to the Highway resource model to reflect appropriate confidence in the input exploration data, geological interpretation and resource grade and tonnage estimates.
Audits or reviews	• *The results of any Audits or reviews of Mineral Resource estimates.*	• In December 2020, Ardea commissioned consultants, Optiro Pty Ltd, to undertake a high-level independent review of Ardea's new resource estimate for the KNP Goongarrie South deposit to provide comment on the exploration input

Criteria	JORC Code explanation	Commentary
		data, resource modelling processes and resource estimation results for the largest of the Goongarrie deposits. The MRE update for Highway has been completed by Ardea using the same resource modelling and MRE classification processes used for the Goongarrie deposits in earlier this year. • Optiro concluded there are no material issues with the Goongarrie South Mineral Resource Estimate and while they identified areas for improvement, these should not prevent reporting of the Mineral Resource estimates prepared by Ardea to the Market. • The new MRE for Highway based on a 0.5% Ni cut-off grade reports a higher global tonnage of 92Mt (+5 Mt), higher global nickel grade of 0.69% (+0.03% Ni) and an increase in the Indicated Resource (+17% relative tonnage) compared to the previous MRE for Highway reported by Heron in 2013. The increases in tonnage and grade result from Ardea using the recoverable resource estimation method, LUC, which provides an estimate of the resources expected to be recovered upon mining using a minimum mining selectivity of 10mE by 10mN by 2mRL size blocks. This allows for greater discrimination between ore and waste compared to the resource estimate reported by Heron in 2013 which was based on ordinary kriging for 40mE by 80mN by 4mRL size blocks. The LUC method utilises the well understood principal of volume / variance effect that reflects a larger range of grades (higher and lower) relating to locally smaller unit volumes compared to lesser grade ranges relating to larger unit volumes estimated by ordinary kriging. • Optiro also endorsed Ardea's approach to resource classification using definitive criteria based on geostatistical measures of estimation quality based on the ordinary kriged panel estimates for nickel that inform the LUC estimate.
Discussion of relative accuracy/ confidence	• *Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure* • *deemed appropriate by the Competent Person. For example, the* • *application of statistical or geostatistical procedures to quantify the relative accuracy of the resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.* • *The statement should specify whether it relates to global or local estimates,* • *and, if local, state the relevant tonnages, which should be relevant to* • *technical and economic evaluation. Documentation should include assumptions made and the procedures used.* • *These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.*	• The classification of Mineral Resources at Highway is based on consistent criteria used for the Goongarrie deposits earlier in 2021 based the slope of regression (a geostatistical measure of estimation confidence) for the ordinary kriging of panel nickel grades that inform the recoverable resource estimates for nickel based on LUC. A slope of regression threshold of 0.7 was used to guide definition of the Indicated Resource at Highway which is a similar threshold used throughout the mining industry for the definition of Indicated Mineral Resources. • This approach to the classification of Highway Mineral Resources is considered appropriate by the CP and has recently been endorsed by consultants on behalf of Ardea in a high-level review of Ardea's resource estimate for GS completed earlier in 2021.

Appendix 3 – Plans, Cross sections and 3-D Projections supporting Highway Resource Estimate

LEGEND

Geological Interpretation

- Red line: Nickel mineralisation envelope
- Blue line: Cobalt mineralisation envelope
- Brown line: Surface topography
- Pink line: Base of calcrete
- Orange line: Base of transported sediments
- Light blue line: Top of saprock

Drill hole Traces

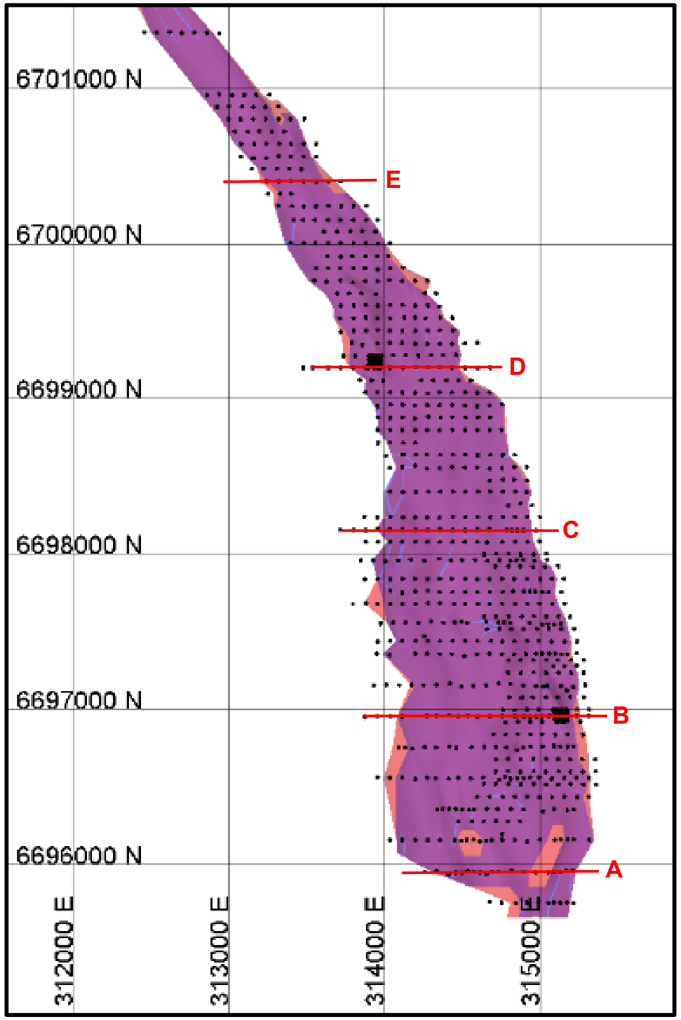
MgO %

-99.000 <=	grey	< 0.000
0.000 <=	blue	< 3.000
3.000 <=	light blue	< 5.000
5.000 <=	green	< 10.000
10.000 <=	yellow	< 15.000
15.000 <=	orange	< 20.000
20.000 <=	red	< 30.000
30.000 <=	magenta	< 99.000

Plan

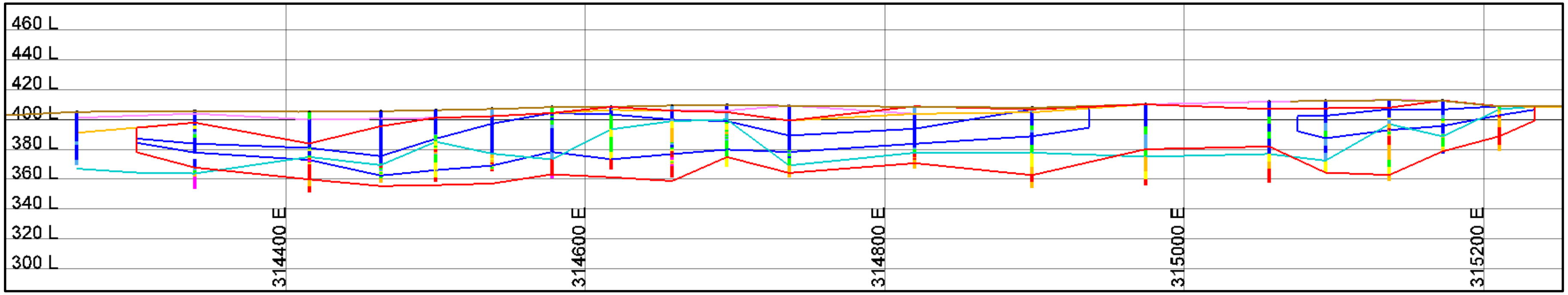
- Pink: Nickel mineralisation envelope >>
- Purple: Cobalt mineralisation envelope >>

Cross Section Locations

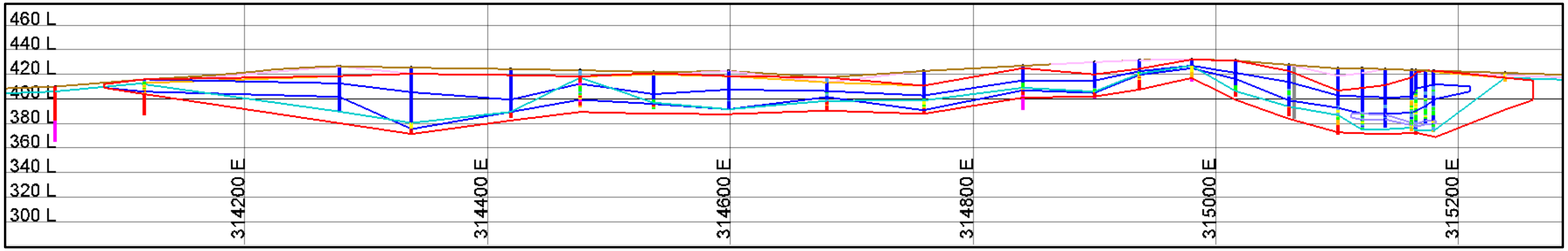


Geological Interpretation

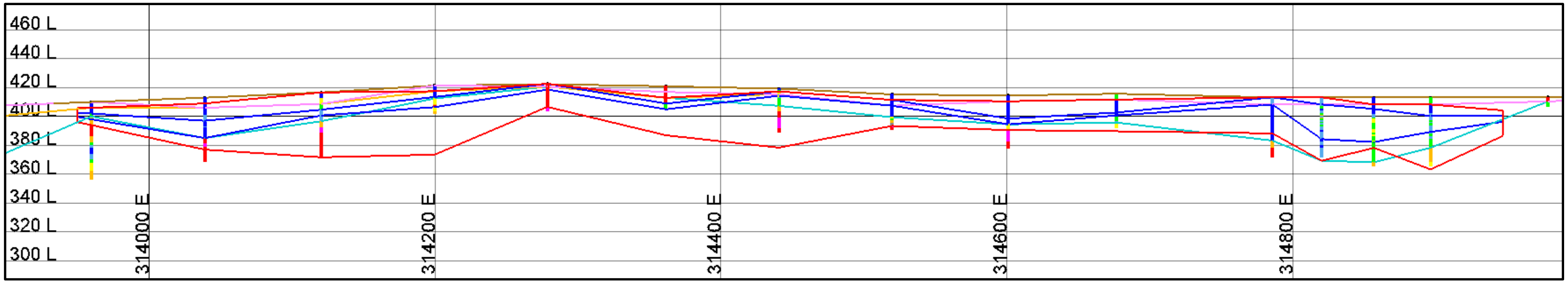
6695960N (Section A)



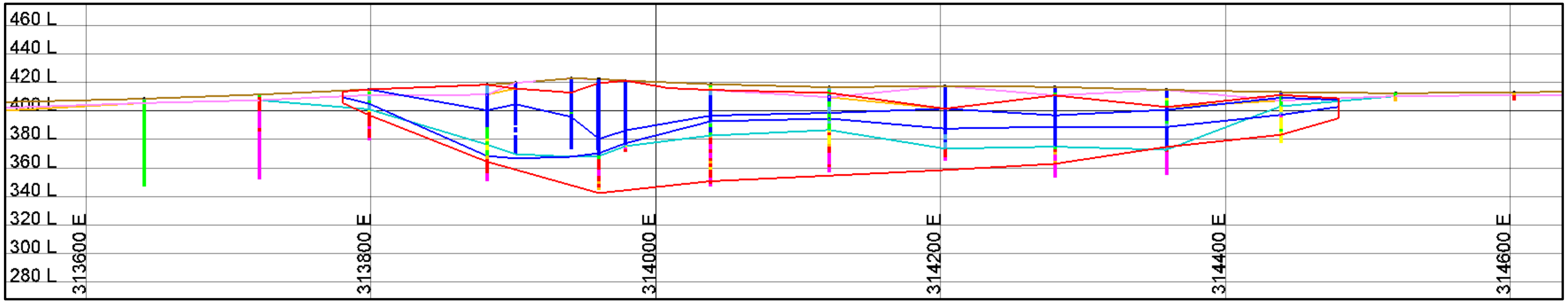
6696960N (Section B)



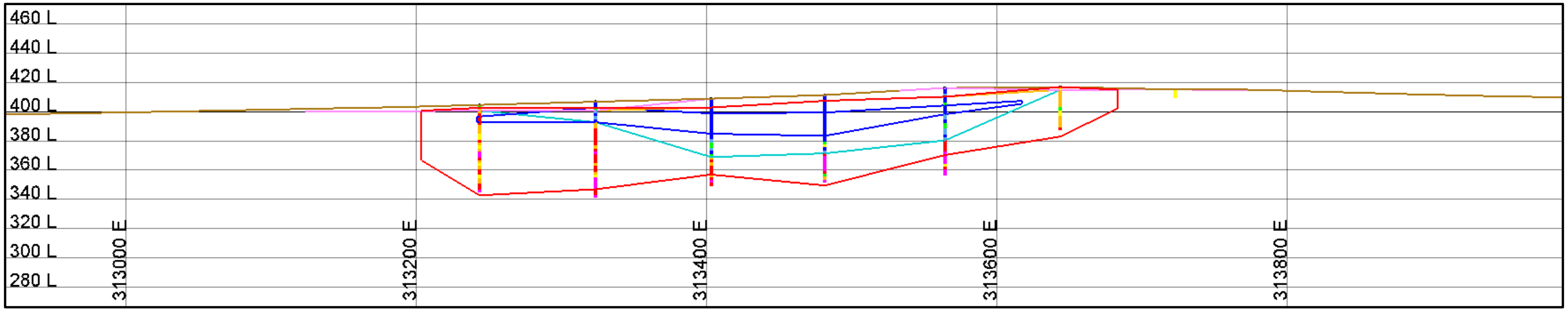
6698160N (Section C)

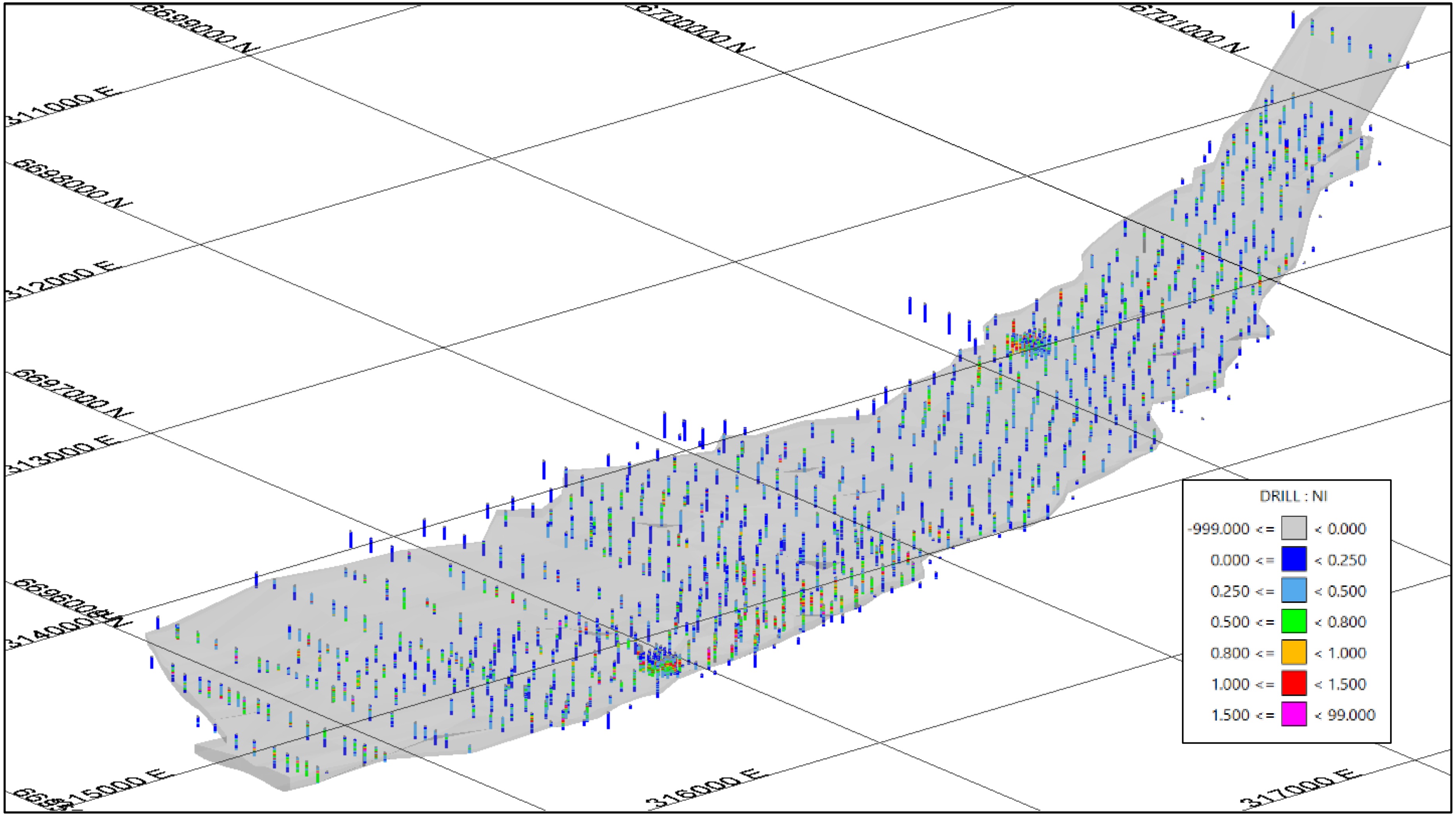


6699200N (Section D)

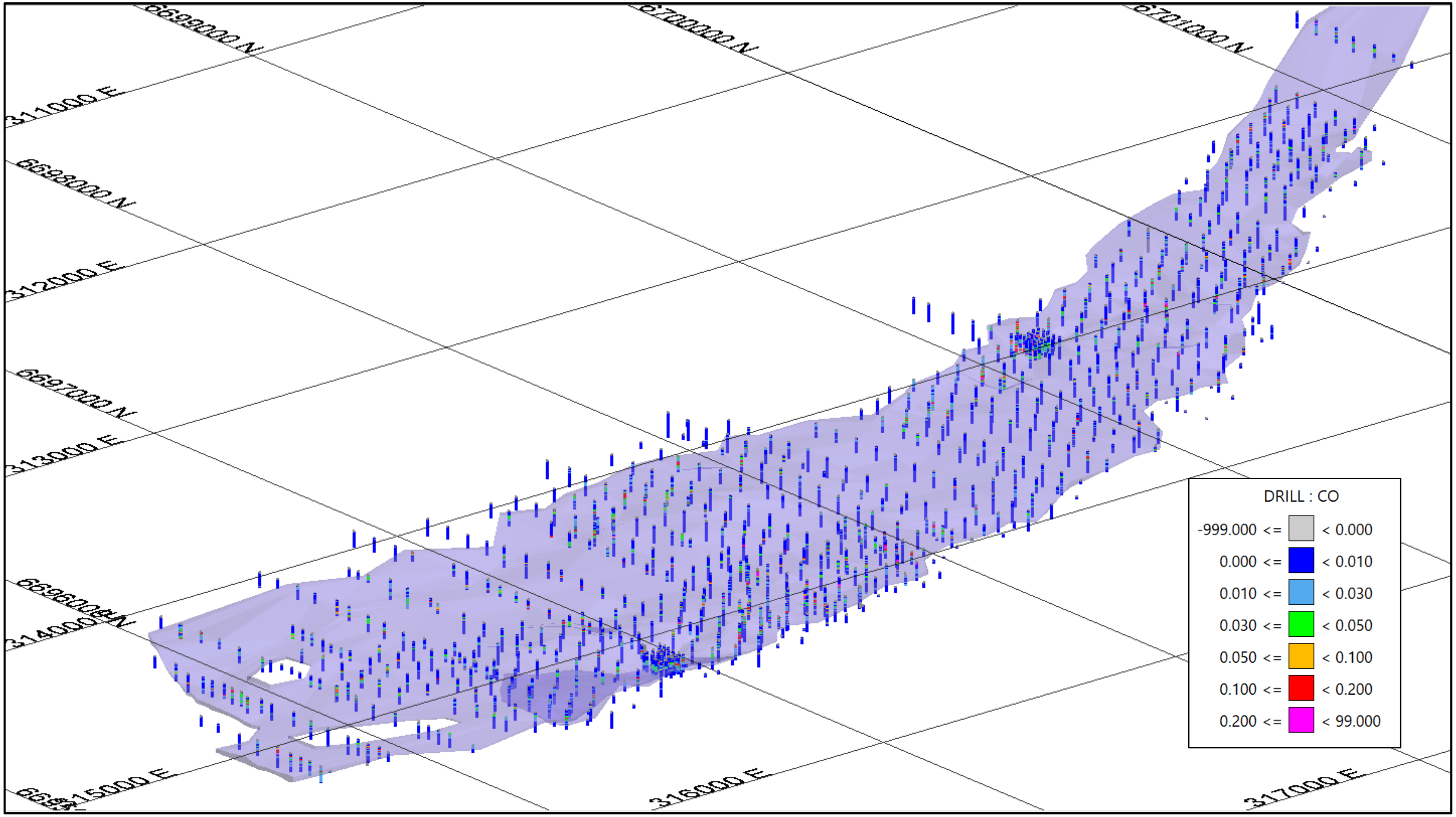


6700400N (Section E)

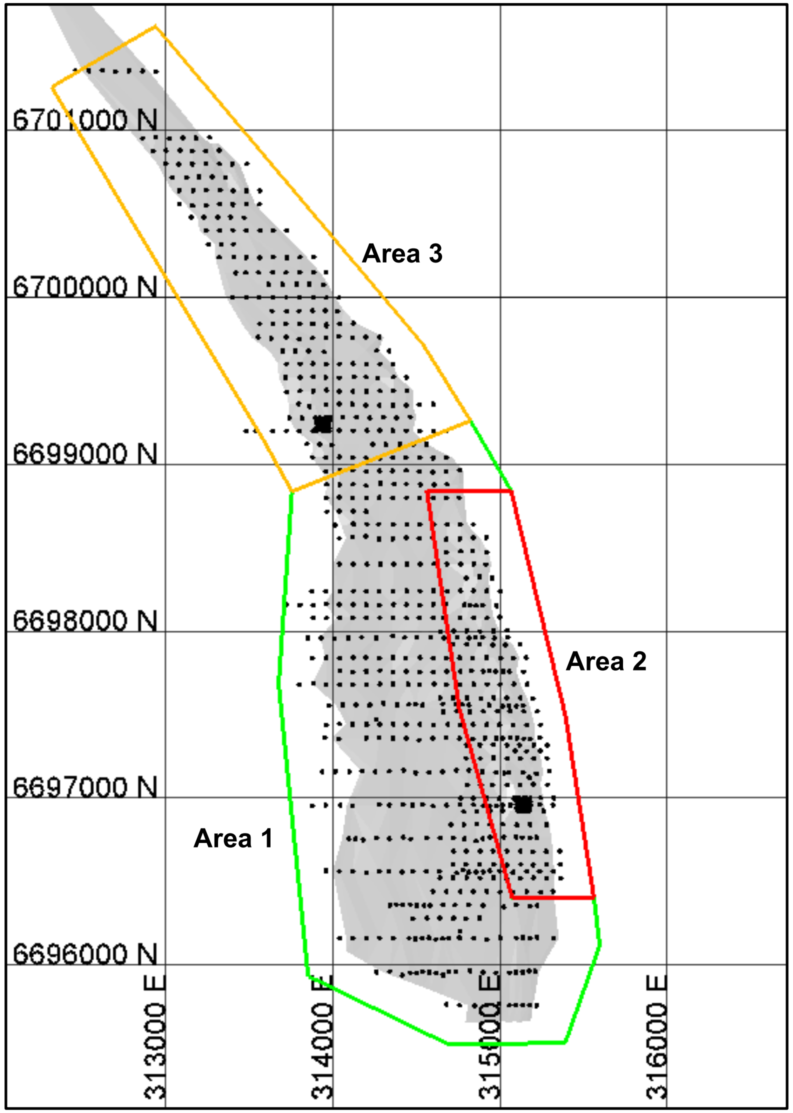




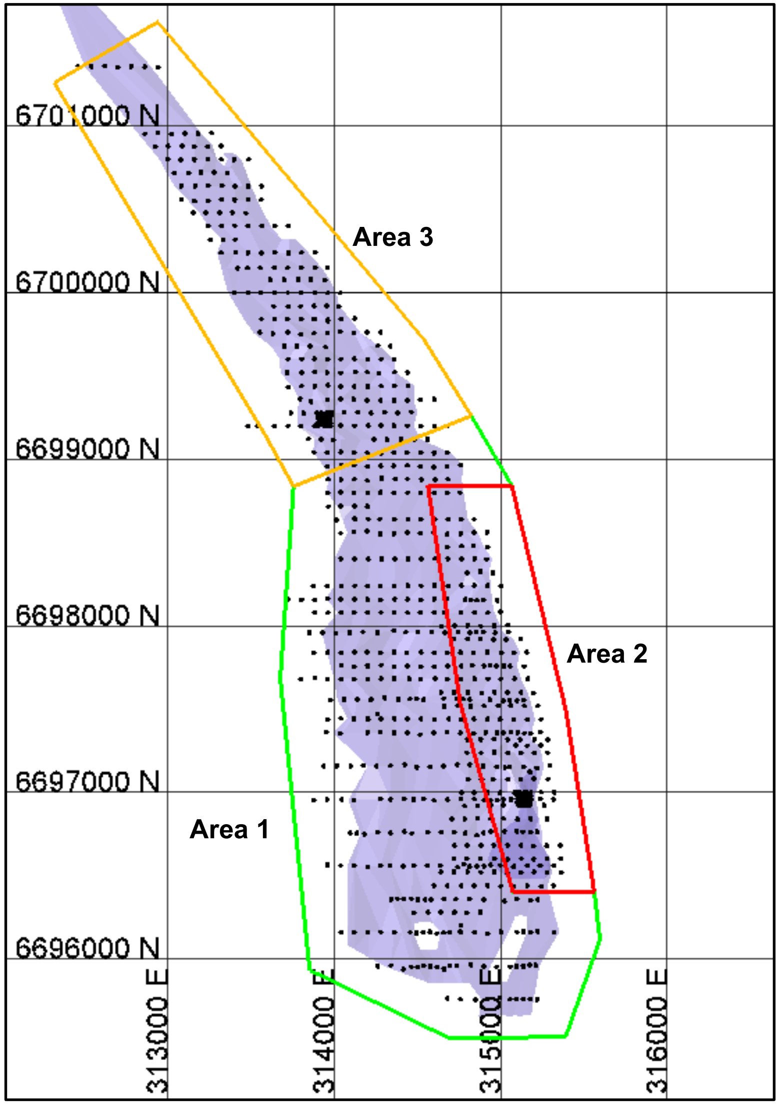
3-D view looking -20° towards azimuth of 310° showing wireframe solid model of nickel mineralisation extents based on a notional 0.25% Ni cut-off grade



3-D view looking -20° towards azimuth of 310° showing wireframe solid models of cobalt mineralisation extents based on a notional 0.03% Co cut-off grade



Estimation area domains overlying nickel resource envelope



Estimation area domains overlying cobalt resource envelopes

LEGEND

Geological Interpretation

- Nickel mineralisation envelope (red line)
- Cobalt mineralisation envelope (blue line)
- Surface topography (brown line)
- Base of calcrete (pink line)
- Base of transported sediments (orange line)
- Top of saprock (cyan line)

Drill hole Traces & Block Model

Upper Section (Ni%)

-999.000 <=	grey	< 0.000
0.000 <=	blue	< 0.250
0.250 <=	light blue	< 0.500
0.500 <=	green	< 0.800
0.800 <=	orange	< 1.000
1.000 <=	red	< 1.500
1.500 <=	magenta	< 99.000

Drill hole Traces & Block Model

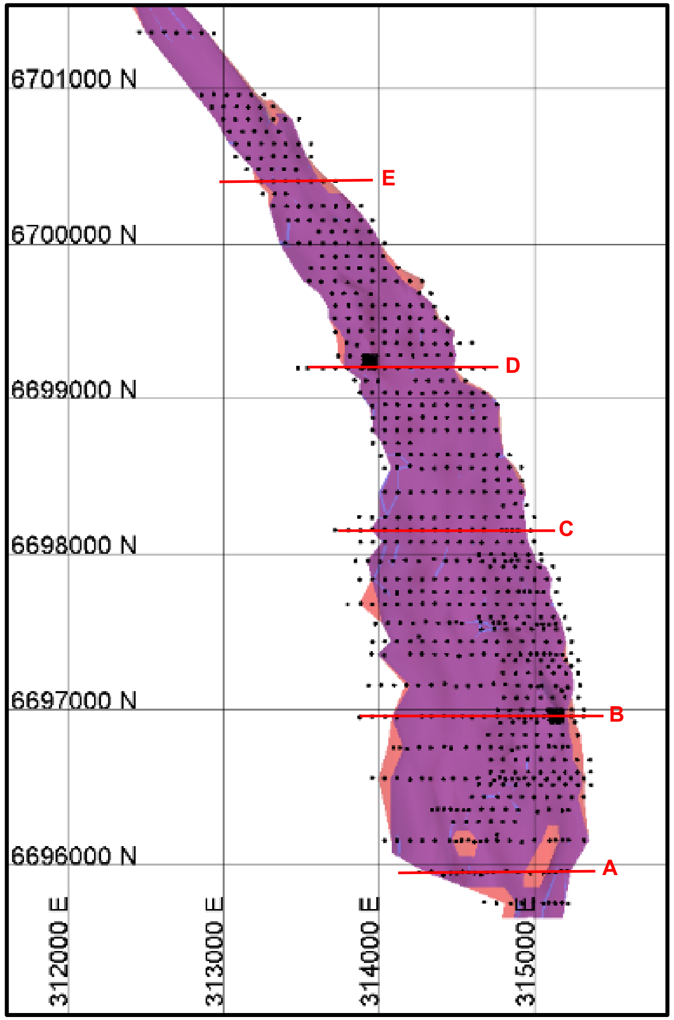
Middle Section (Co%)

-999.000 <=	grey	< 0.000
0.000 <=	blue	< 0.010
0.010 <=	light blue	< 0.030
0.030 <=	green	< 0.050
0.050 <=	orange	< 0.100
0.100 <=	red	< 0.200
0.200 <=	magenta	< 99.000

Lower Section
(Material Type)

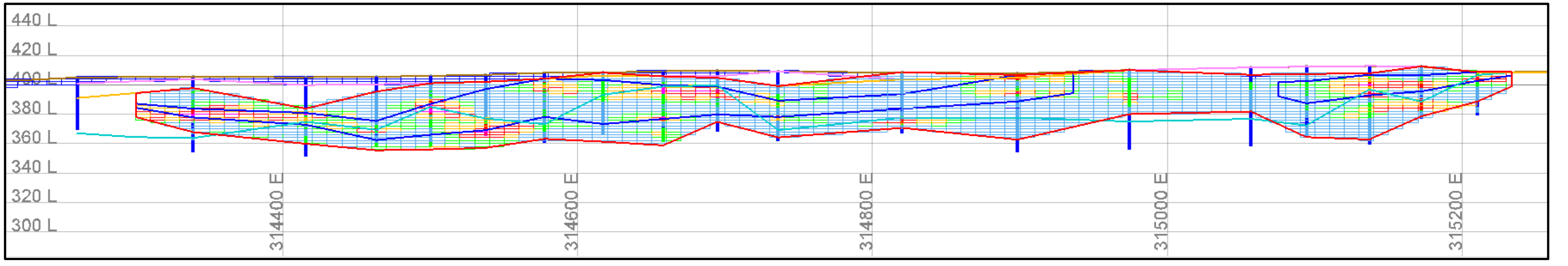
PSQ	CUGK*	SRSE
PSQB	CUGF	SRSB
PCF	CUGFZ	SREB
PCFB	CUSF*	SRBS
ALB	CUGFB	SRBE
ALQK		SRGR
ACKS		SREF
ACKG		
ALKFS		
LAFKH		

Cross Section Locations

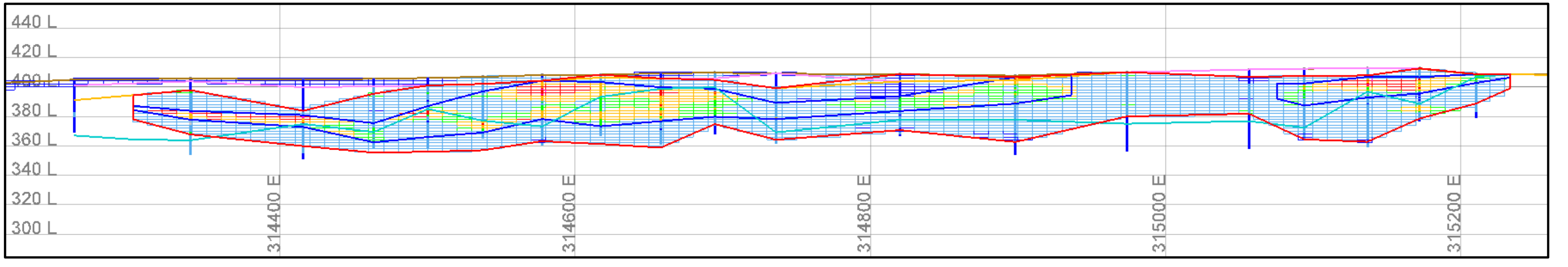


6695960N (Section A)

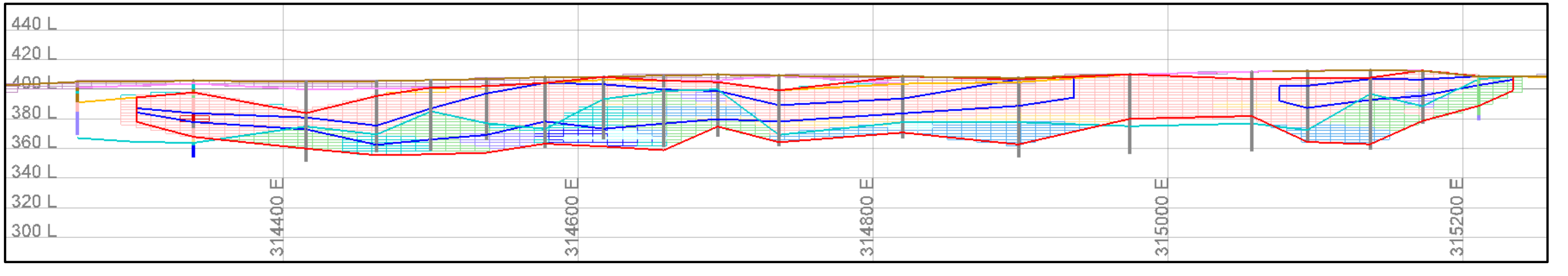
Block model LUC nickel estimates



Block model LUC cobalt estimates

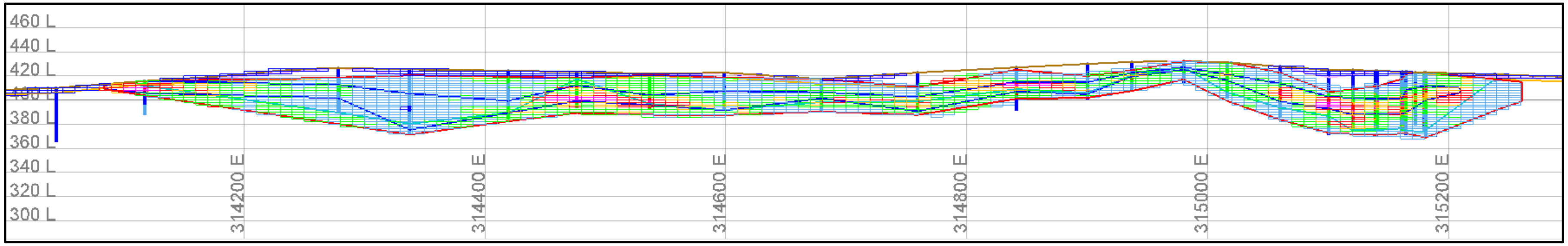


Block model material type assignments

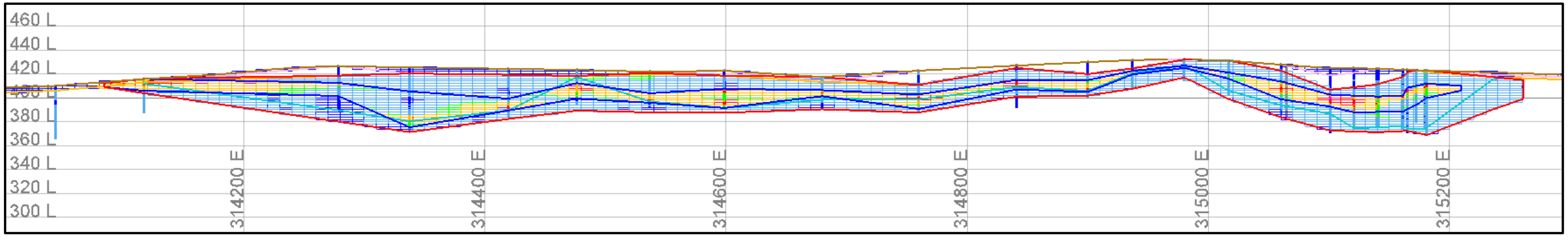


6696960N (Section B)

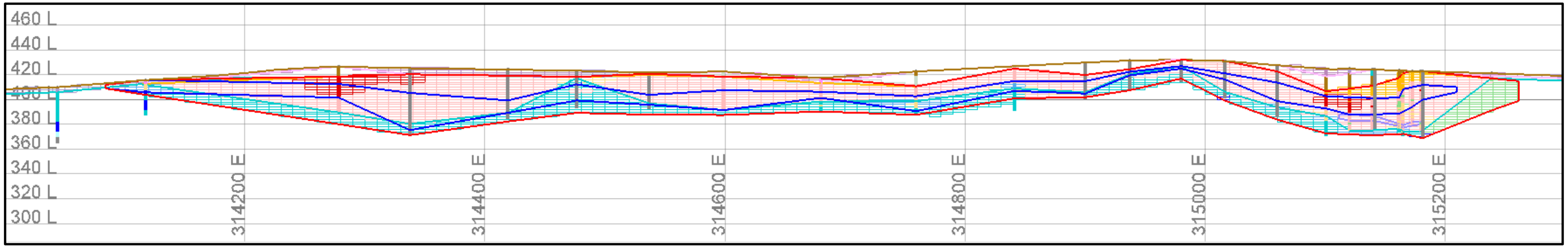
Block model LUC nickel estimates



Block model LUC cobalt estimates

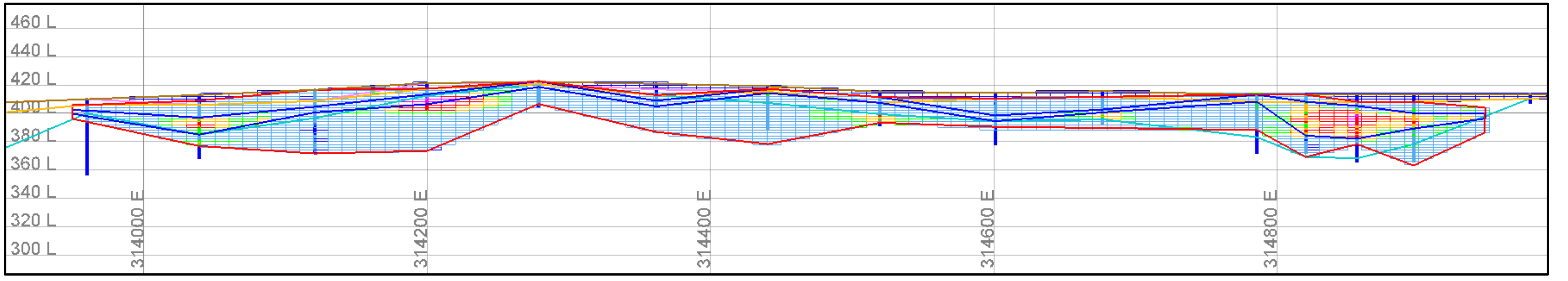


Block model material type assignments

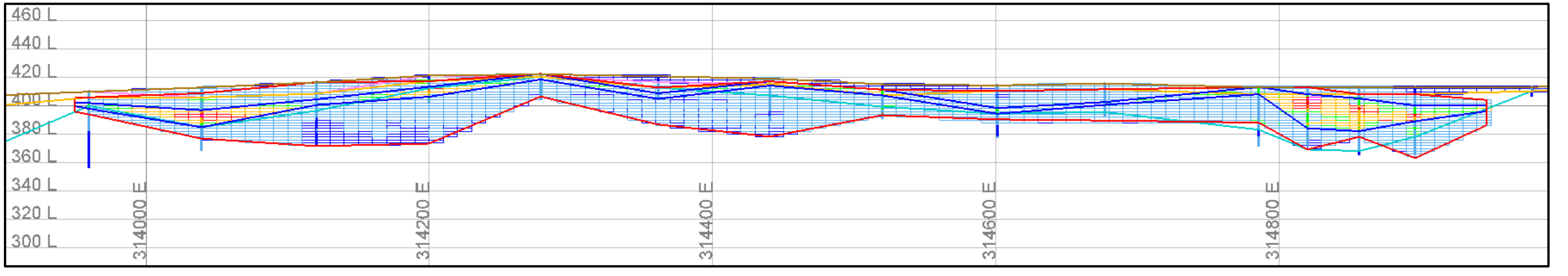


6698160N (Section C)

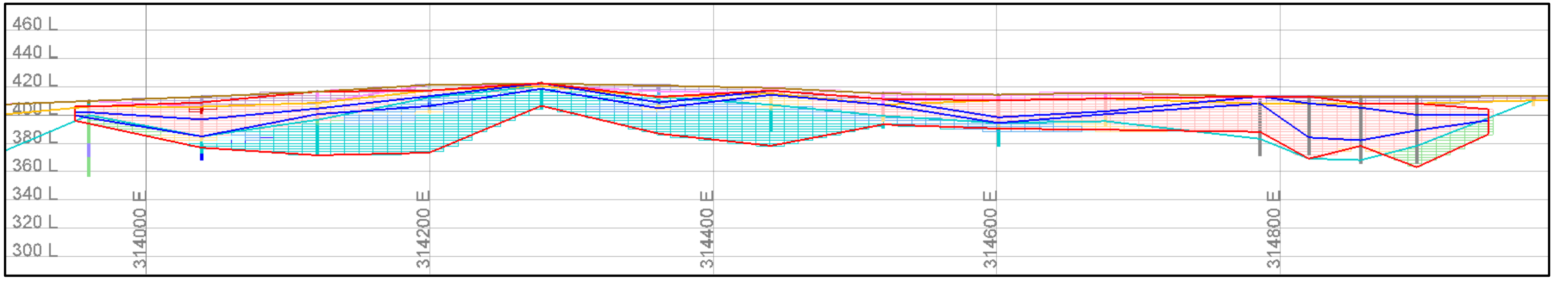
Block model LUC nickel estimates



Block model LUC cobalt estimates

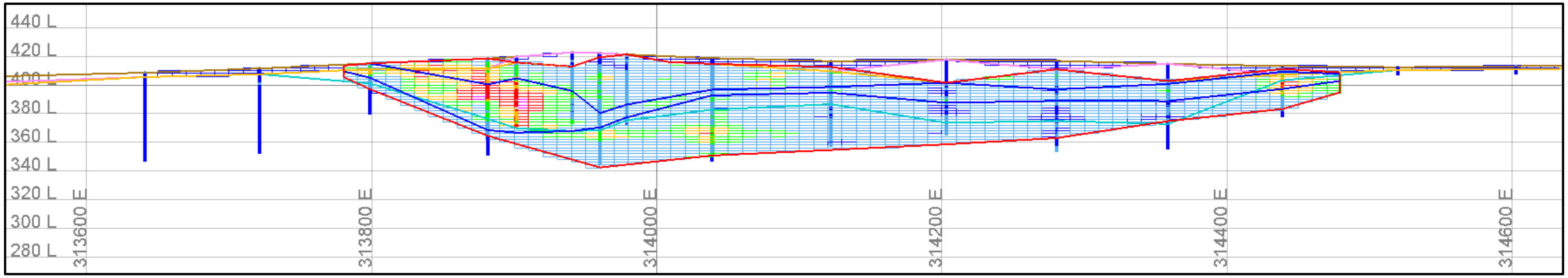


Block model material type assignments

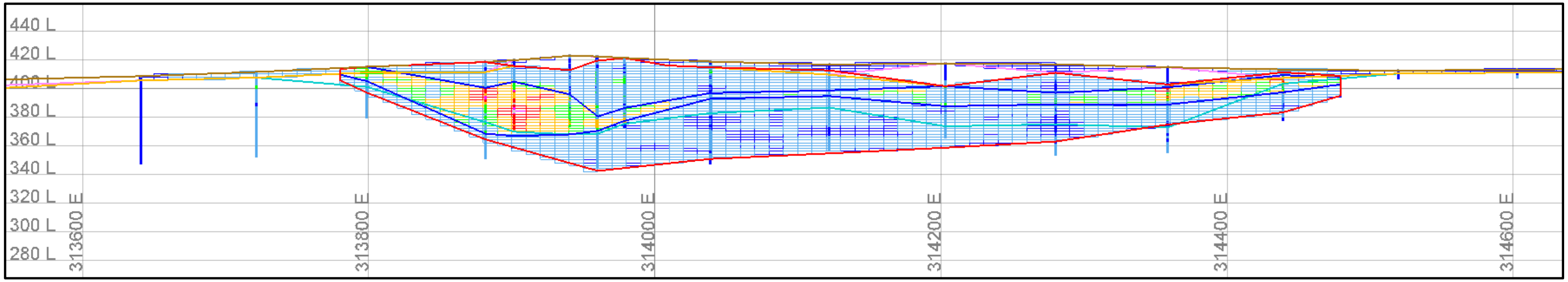


6699200N (Section D)

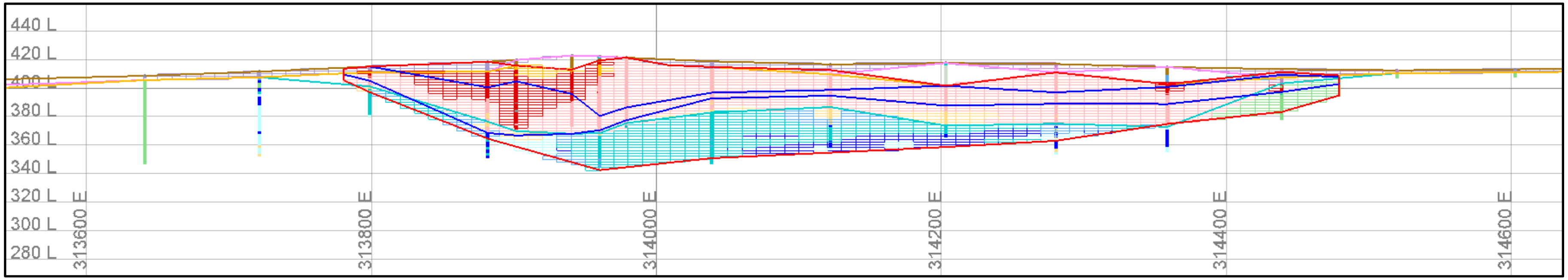
Block model LUC nickel estimates



Block model LUC cobalt estimates

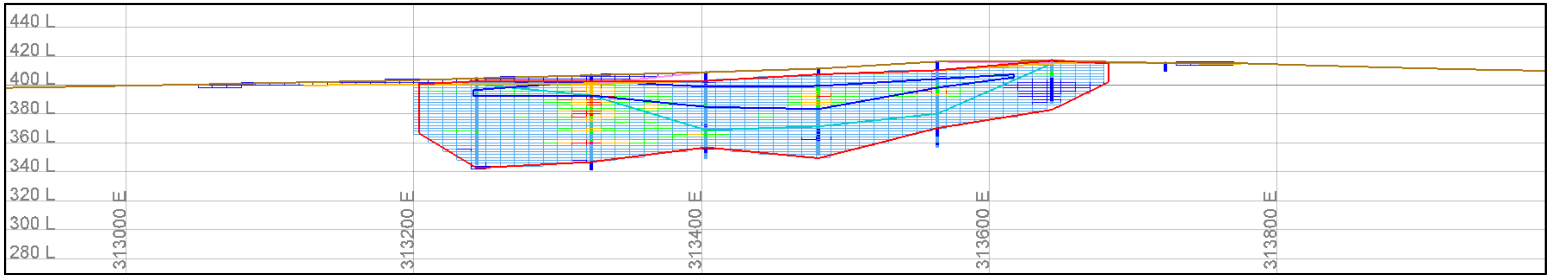


Block model material type assignments

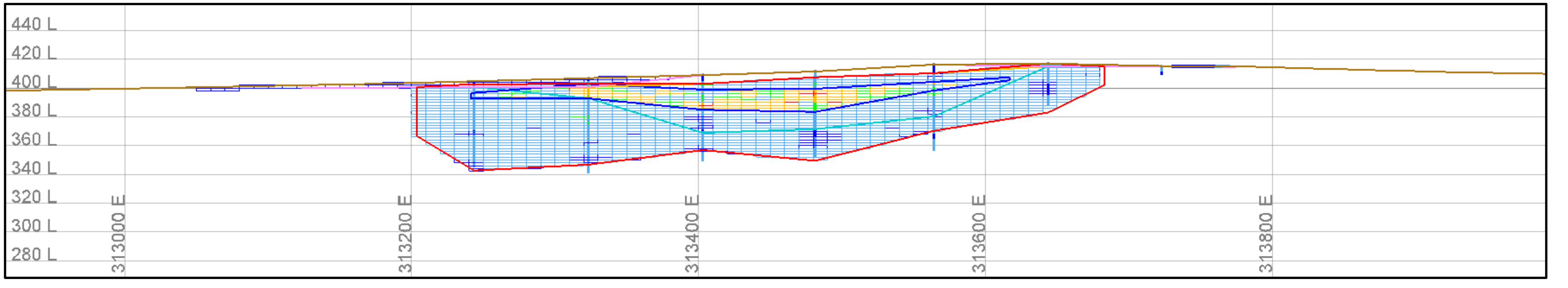


6700400N (Section E)

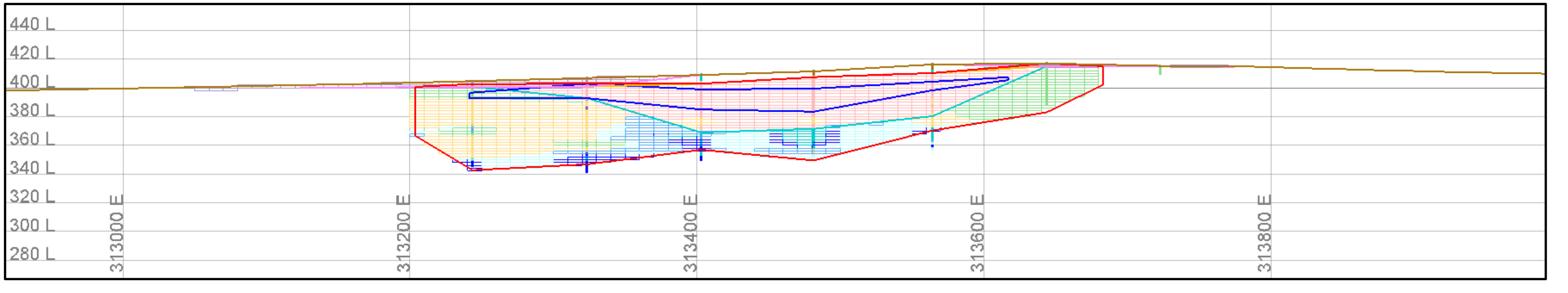
Block model LUC nickel estimates

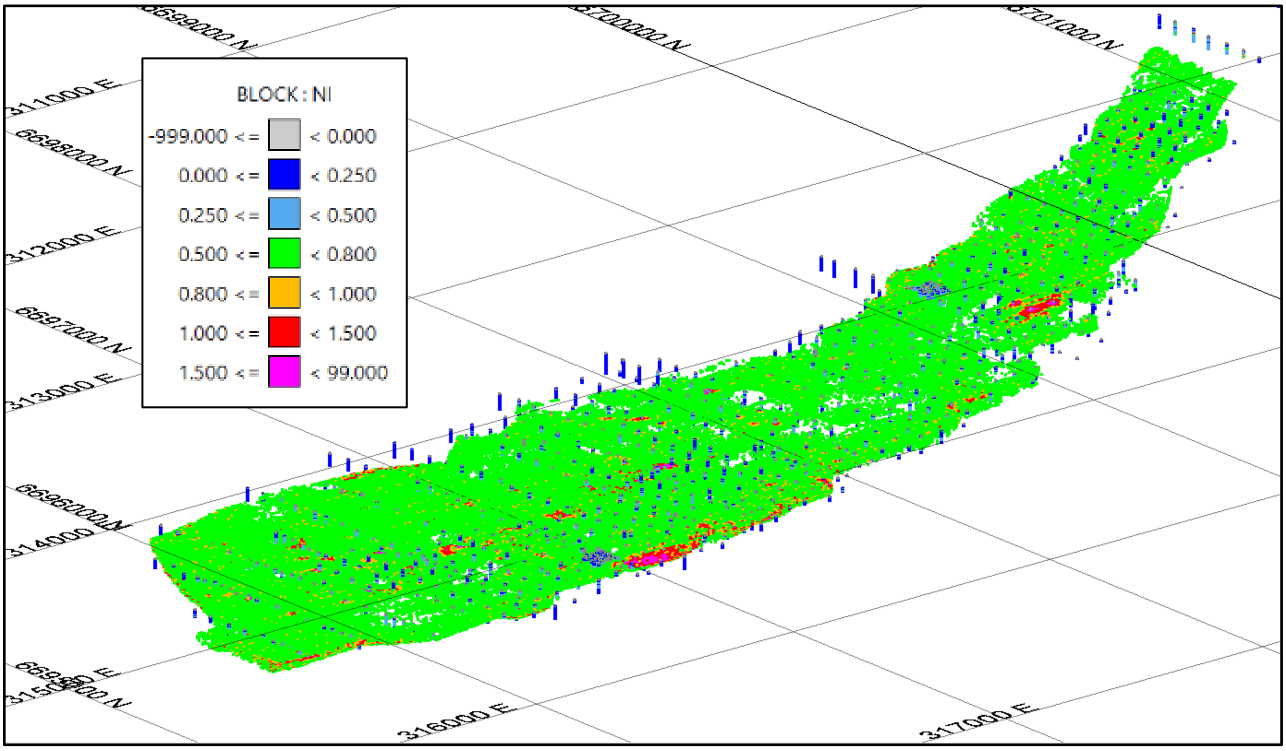


Block model LUC cobalt estimates

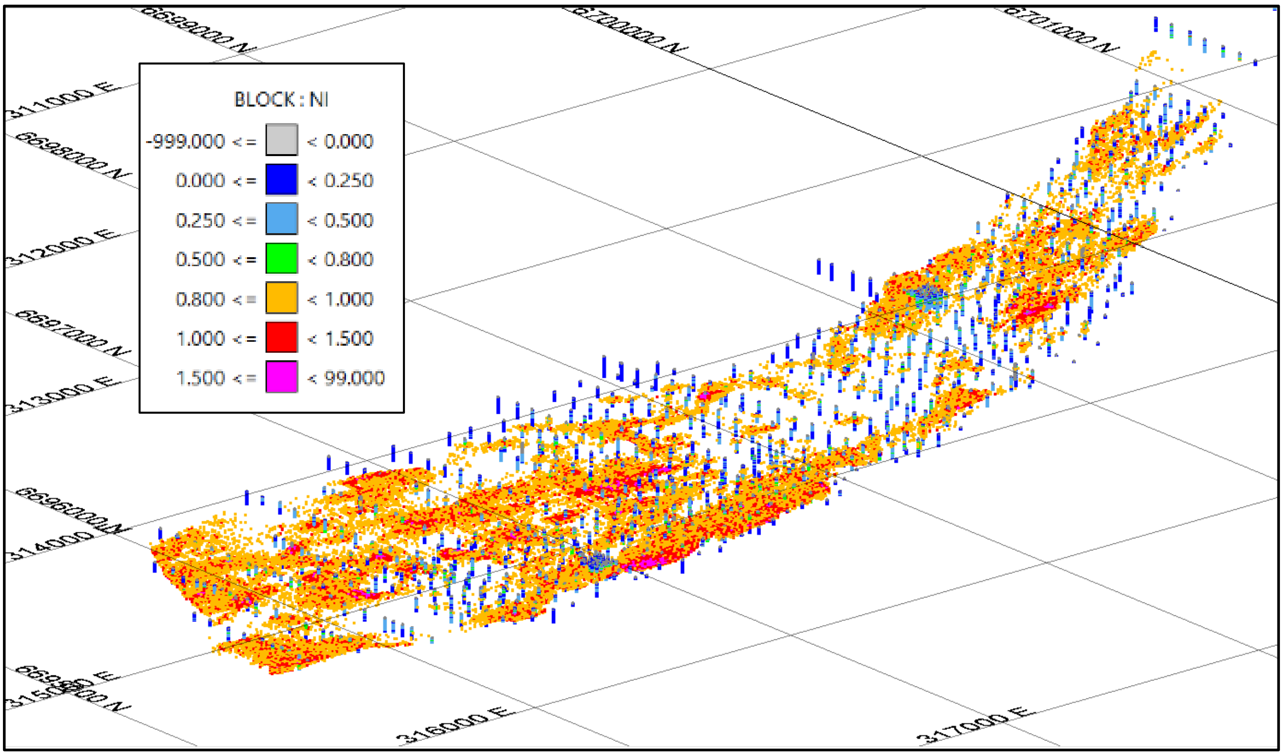


Block model material type assignments

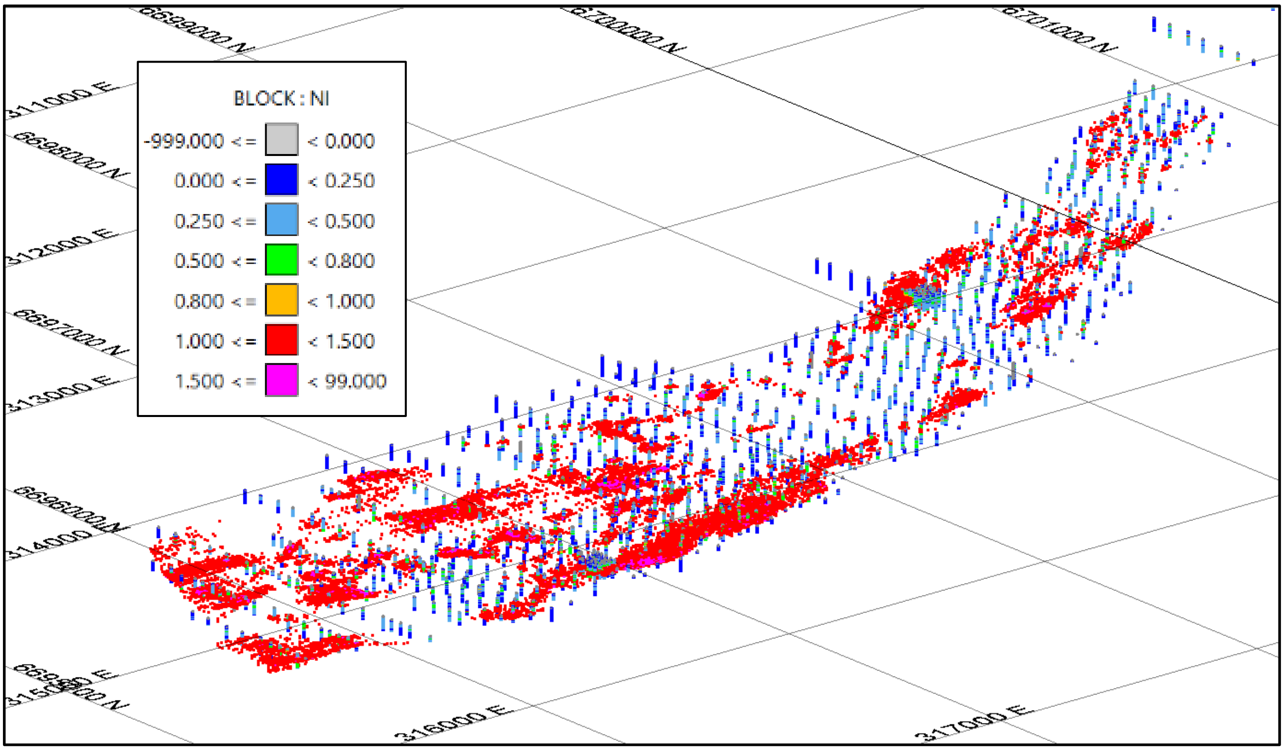




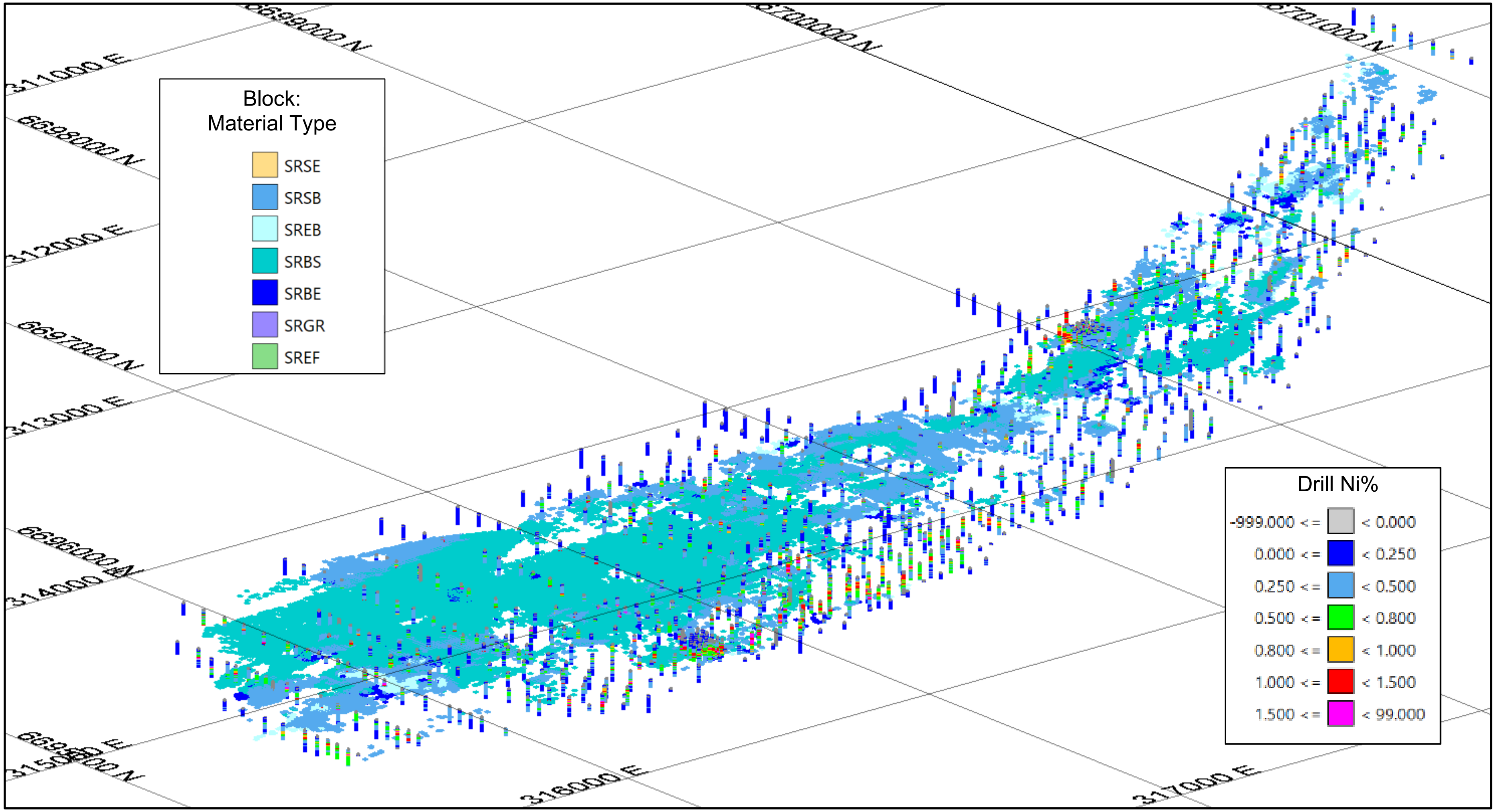
3D view looking -20° towards azimuth of 310° showing continuity of MRE block model blocks ≥ 0.5% Ni versus drillhole traces colour coded by Ni % (same as block legend)



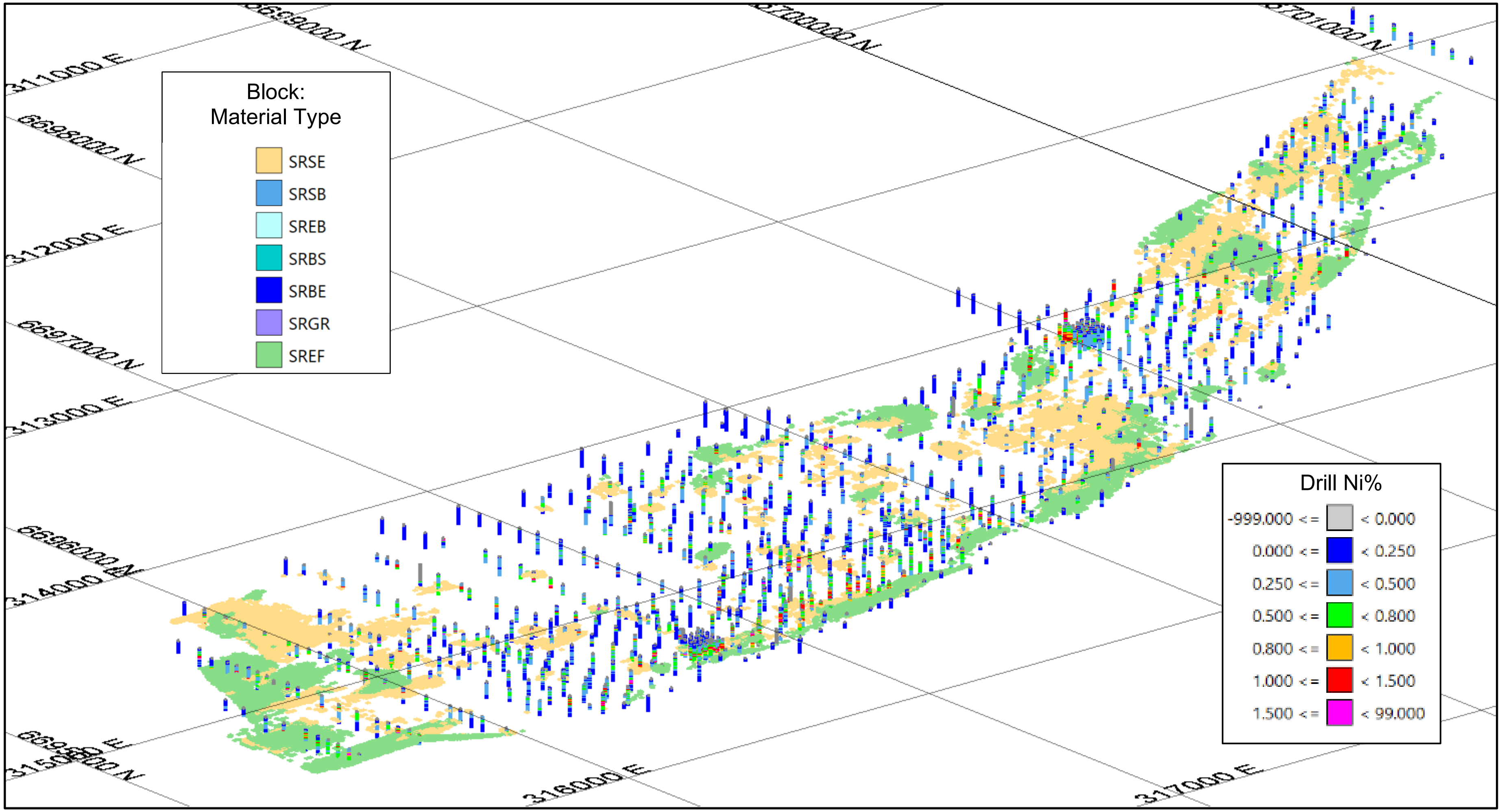
3D view looking -20° towards azimuth of 310° showing continuity of MRE block model blocks ≥ 0.8% Ni versus drillhole traces colour coded by Ni % (same as block legend)



3D view looking -20° towards azimuth of 310° showing continuity of MRE block model blocks ≥ 1.0% Ni versus drillhole traces colour coded by Ni % (same as block legend)



Isometric view towards azimuth of 310 showing carbonate bearing saprock resource model blocks above a 0.5% Ni cutoff. Drillhole traces are colour coded by nickel grades.



Isometric view towards azimuth of 310 showing serpentine, silica and nontronite rich resource model blocks (with little to no carbonate) above a 0.5% Ni cutoff. Drillhole traces are colour coded by nickel grades

Appendix 4 – Drill collar locations and assay data, indicative scandium & REEs

Rare Earth Element Drill Collars - Projection: GDA94 MGA Zone 51

Hole_ID	Northing	Easting	Elevation	Declination	Azimuth
HWRC0066	6,698,558	314,516	419	-90	-
HWRC0268	6,699,440	314,281	426	-90	-
HWRC0295	6,699,040	313,958	415	-90	-

Rare Earth Element Drill Assay Suite

Hole_ID	mFrom	mTo	mWidth	Ni %	Co %	Mn %	Sc ppm	Al %	Fe %	LOI %	Si %	Y ppm	Ce ppm	Dy ppm	Gd ppm	La ppm	Nd ppm	Pr ppm	Sm ppm	Yb ppm
HWRC0066	0	1	1	0.80	0.057	0.05	12	3.7	6.0	NR	28.2	51	308	13	20	280	201	59	29	4
HWRC0066	1	2	1	0.99	0.074	0.04	7	1.9	3.3	NR	17.0	53	31	8	10	58	50	13	10	4
HWRC0066	2	3	1	0.62	0.042	0.05	10	2.5	5.8	NR	32.8	22	38	4	4	28	25	7	5	2
HWRC0268	4	6	2	2.40	0.224	0.12	100	2.7	6.9	13.7	26.6	250	1230	75	101	901	685	193	127	26
HWRC0295	58	60	2	0.56	0.150	1.42	11	5.8	40.3	11.3	6.1	13	55	3	4	25	24	7	5	2
HWRC0295	60	62	2	0.66	0.411	4.11	7	7.2	28.5	12.5	7.8	15	52	4	5	40	32	9	6	2
HWRC0295	62	64	2	0.30	0.064	0.32	6	8.2	27.6	11.0	9.1	9	24	2	3	19	17	5	3	1
HWRC0295	64	66	2	0.36	0.171	1.18	5	9.6	18.0	11.0	10.8	9	42	2	3	33	24	7	4	1
HWRC0295	66	68	2	0.30	0.089	0.86	5	9.4	21.6	11.2	10.3	10	28	2	3	26	22	6	4	1
HWRC0295	68	70	2	0.34	0.054	0.35	4	7.5	30.8	11.6	8.5	18	230	4	8	137	89	27	13	2
HWRC0295	70	72	2	0.44	0.117	1.10	3	5.6	36.7	11.6	6.3	20	212	5	8	132	87	26	13	2
HWRC0295	72	74	2	0.69	0.701	8.67	3	7.2	17.5	12.7	8.2	43	311	11	17	279	181	54	27	4
HWRC0295	74	76	2	0.58	0.530	5.67	4	8.9	15.1	12.2	9.7	45	596	12	22	393	261	79	37	4
HWRC0295	76	78	2	0.45	0.363	3.73	3	9.6	13.7	12.6	10.5	26	240	7	11	170	116	35	17	2