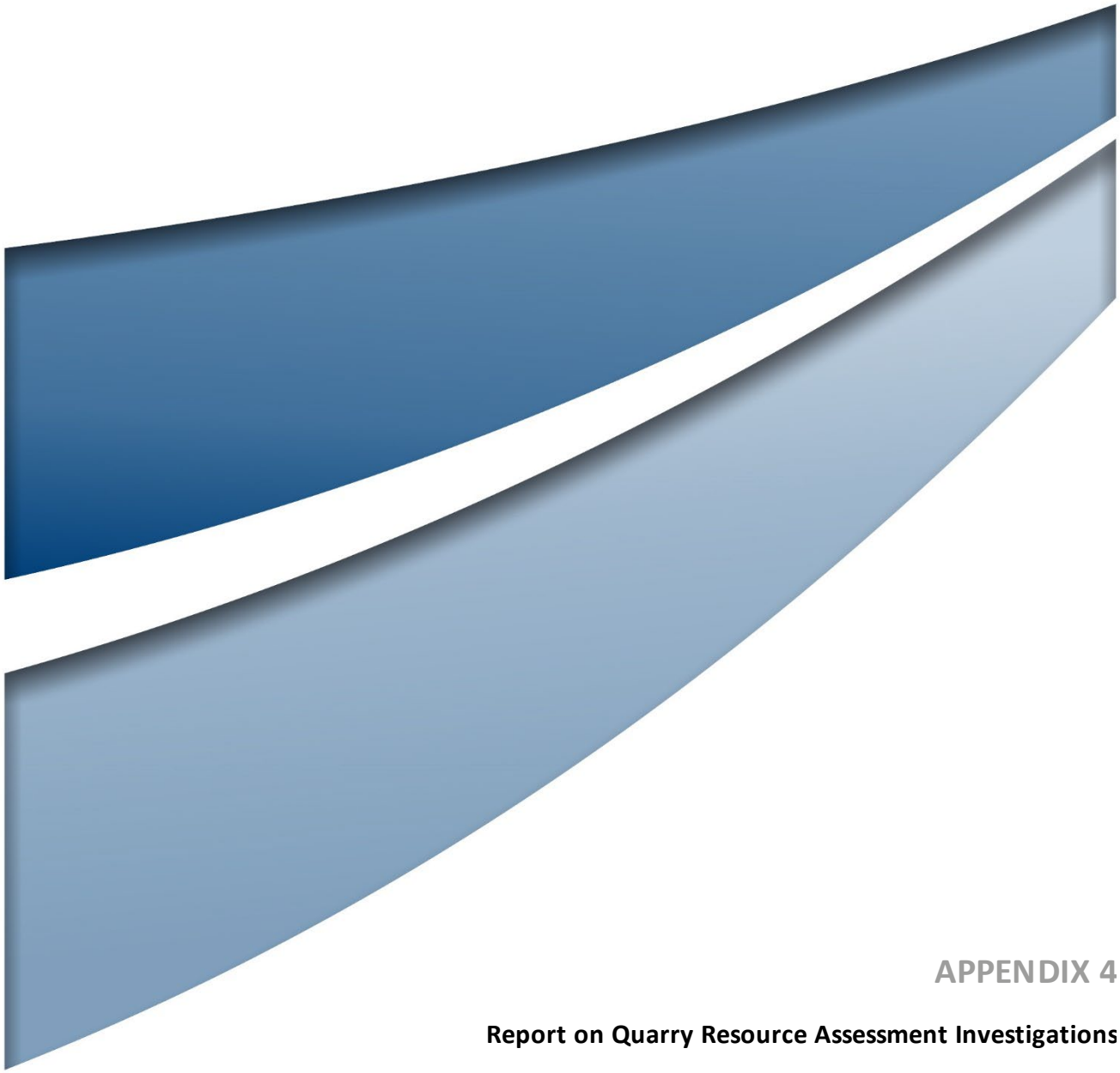
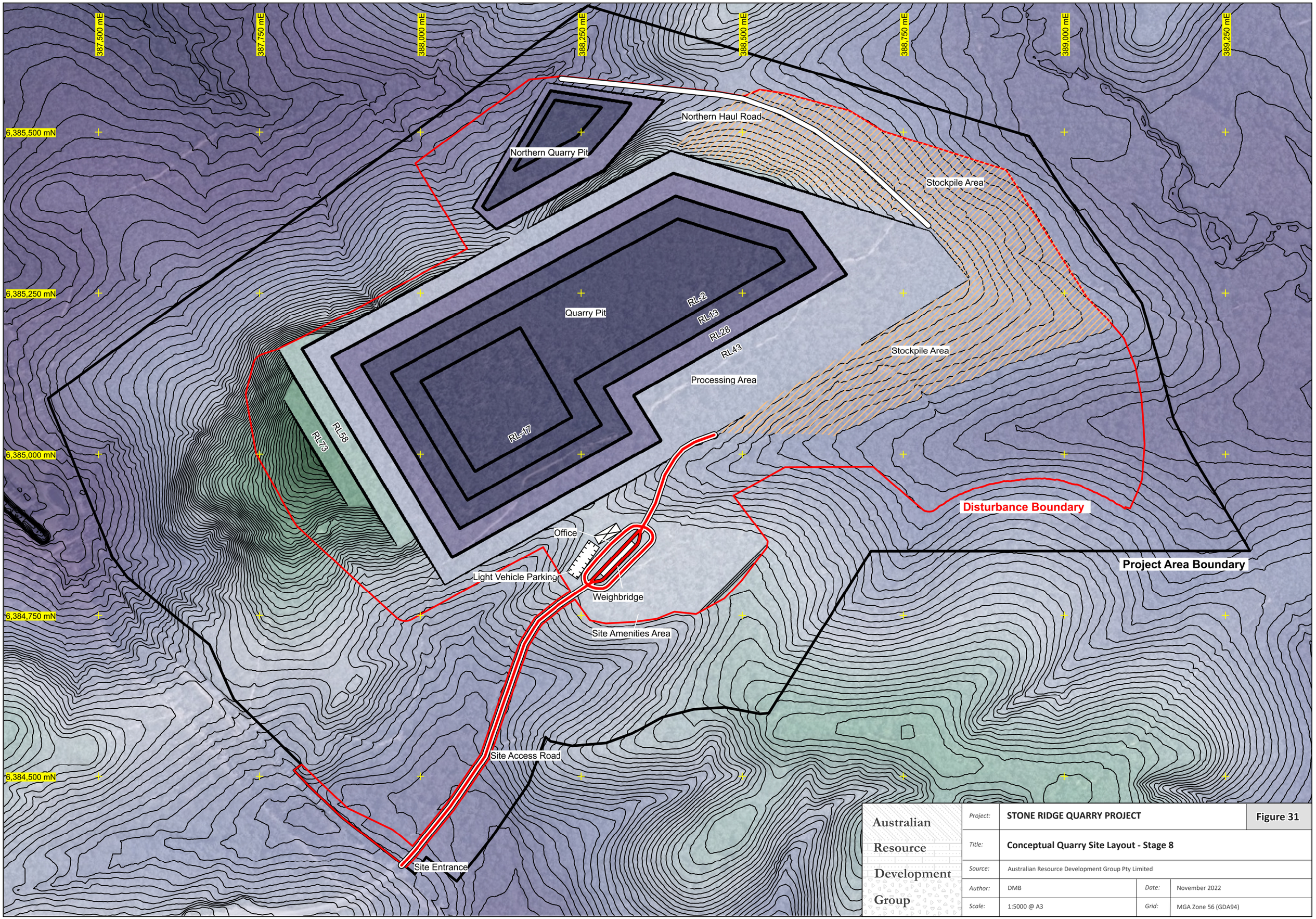


APPENDIX 4

Report on Quarry Resource Assessment Investigations



Australian Resource Development Group	Project:	STONE RIDGE QUARRY PROJECT	Figure 31
	Title:	Conceptual Quarry Site Layout - Stage 8	
	Source:	Australian Resource Development Group Pty Limited	
	Author: DMB	Date: November 2022	
	Scale: 1:5000 @ A3	Grid: MGA Zone 56 (GDA94)	

387,500 mE
387,750 mE
388,000 mE
388,250 mE
388,500 mE
388,750 mE
389,000 mE
389,250 mE
6,385,500 mN
6,385,250 mN
6,385,000 mN
6,384,750 mN
6,384,500 mN
Northern Haul Road
Northern Quarry Pit
Stockpile Area
Quarry Pit
RL-2
RL13
RL28
RL43
Stockpile Area
Processing Area
RL-17
RL58
RL73
Disturbance Boundary
Office
Light Vehicle Parking
Weighbridge
Site Amenities Area
Project Area Boundary
Site Access Road
Site Entrance

Australian Resource Development Group	Project:	STONE RIDGE QUARRY PROJECT	Figure 32
	Title:	Conceptual Quarry Site Layout - Stage 9	
	Source:	Australian Resource Development Group Pty Limited	
	Author:	DMB	Date: November 2022
	Scale:	1:5000 @ A3	Grid: MGA Zone 56 (GDA94)

9.2 Extraction Volumes

Table 9-2 presents the material volume / tonnage schedule for the conceptual development sequence presented in **Figures 23-32.**

Stage 0 of the conceptual development sequence relates to site establishment works (*i.e.* creation of access road, office and weighbridge area, etc) and would require approximately 228 kt of topsoil and overburden to be removed. Topsoil would be stockpiled for future remediation works, whereas overburden would be eithers stockpiled or used for the creation of onsite tracks and works areas.

Development of the Main Pit would require the staged stripping and stockpiling of approximately 240 kt of topsoil and overburden over the 30-year life of the operation in order to provide access to approximately 47.34 Mt of rhyodacite (primary raw feed). At an estimated production yield of 90 %, rhyodacite extracted from the Main Pit would produce approximately 42.6 Mt of saleable quarry products.

Development of the North Pit would require the staged stripping and stockpiling of approximately 20 kt of topsoil and overburden to provide access to approximately 1.67 Mt of dacite (primary raw feed). At an estimated production yield of 90 %, dacite extracted from the North Pit would produce approximately 1.5 Mt of saleable quarry products.

TABLE 9-2 - Material Volume / Tonnage Schedule for Conceptual Staged Quarry Development Sequence

			TOTAL MATERIAL					
Operational Stage	Indicative Operational Years *	EIS Assessment Stage	Volume (m^3)	Tonnes	Cumulative Volume (m^3)	Cumulative Tonnes	Primary Raw Feed Tonnes	Topsoil / Overburden Tonnes
0		0	113,734	227,468	113,734	227,468	-	227,468
1	1-2	1	784,406	2,010,232	898,140	2,237,700	1,912,821	97,411
2	2-4		1,165,565	3,021,008	2,063,705	5,258,708	2,989,471	31,537
3	4-5	3	1,078,964	2,799,793	3,142,669	8,058,501	2,781,415	18,378
4	5-7		850,659	2,204,712	3,993,328	10,263,213	2,181,373	23,339
5	7-10	5	2,160,639	5,608,813	6,153,967	15,872,025	5,579,317	29,496
6	10-16		3,370,702	8,755,111	9,524,669	24,627,137	8,726,065	29,046
7	16-22	7	3,871,341	10,058,699	13,396,010	34,685,836	10,036,073	22,626
8	22-27		2,848,803	7,400,311	16,244,813	42,086,146	7,378,387	21,924
9	27-30	9	2,862,881	7,439,084	19,107,694	49,525,230	7,424,396	14,688
			19,107,694	**49,525,230**	**19,107,694**	**49,525,230**	**49,009,317**	**515,913**

			MAIN PIT						
			Total Pit Shell		Primary Raw Feed		Topsoil / Overburden		
Operational Stage	Indicative Operational Years *	EIS Assessment Stage	Volume (m^3)	Tonnes #	Volume (m^3)	Tonnes #	Stripping Area (m^2)	Volume (m^3)	Tonnes #
0		0	-	-	-	-	-	-	-
1	1-2	1	731,908	1,883,809	699,988	1,819,969	106,400	31,920	63,840
2	2-4		1,090,588	2,827,666	1,077,484	2,801,458	43,680	13,104	26,208
3	4-5	3	966,151	2,508,313	960,019	2,496,049	20,440	6,132	12,264
4	5-7		771,331	1,999,650	761,647	1,980,282	32,280	9,684	19,368
5	7-10	5	1,900,940	4,933,595	1,886,192	4,904,099	49,160	14,748	29,496
6	10-16		3,283,693	8,528,888	3,269,170	8,499,842	48,410	14,523	29,046
7	16-22	7	3,871,341	10,058,699	3,860,028	10,036,073	37,710	11,313	22,626
8	22-27		2,848,803	7,400,311	2,837,841	7,378,387	36,540	10,962	21,924
9	27-30	9	2,862,881	7,439,084	2,855,537	7,424,396	24,480	7,344	14,688
			18,327,636	**47,580,016**	**18,207,906**	**47,340,556**	**399,100**	**119,730**	**239,460**

			NW PIT						
			Total Pit Shell		Primary Raw Feed		Topsoil / Overburden		
Operational Stage	Indicative Operational Years *	EIS Assessment Stage	Volume (m^3)	Tonnes #	Volume (m^3)	Tonnes #	Stripping Area (m^2)	Volume (m^3)	Tonnes #
0		0	-	-	-	-	-	-	-
1	1-2	1	37,993	97,413	35,712	92,852	7,602	2,281	4,561
2	2-4		74,977	193,341	72,312	188,012	8,882	2,665	5,329
3	4-5	3	112,813	291,480	109,756	285,366	10,190	3,057	6,114
4	5-7		79,328	205,062	77,343	201,091	6,618	1,985	3,971
5	7-10	5	259,699	675,217	259,699	675,217	-	-	-
6	10-16		87,009	226,223	87,009	226,223	-	-	-
7	16-22	7	-	-	-	-	-	-	-
8	22-27		-	-	-	-	-	-	-
9	27-30	9	-	-	-	-	-	-	-
			651,819	**1,688,737**	**641,831**	**1,668,762**	**33,292**	**9,988**	**19,975**

			EXTERNAL TO PITS						
			Total Pit Shell		Primary Raw Feed		Topsoil / Overburden		
Operational Stage	Indicative Operational Years *	EIS Assessment Stage	Volume (m^3)	Tonnes #	Volume (m^3)	Tonnes #	Stripping Area (m2)	Volume (m^3)	Tonnes #
0		0	-	-	-	-	148,700	113,734	227,468
1	1-2	1	-	-	-	-	48,350	14,505	29,010
2	2-4		-	-	-	-	-	-	-
3	4-5	3	-	-	-	-	-	-	-
4	5-7		-	-	-	-	-	-	-
5	7-10	5	-	-	-	-	-	-	-
6	10-16		-	-	-	-	-	-	-
7	16-22	7	-	-	-	-	-	-	-
8	22-27		-	-	-	-	-	-	-
9	27-30	9	-	-	-	-	-	-	-
			-	-	-	-	**197,050**	**128,239**	**256,478**

10. RESOURCE ESTIMATION

10.1 Introduction

The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (the 'JORC Code') provides minimum standards, recommendations and guidelines to ensure *Transparency*, *Materiality* and *Competence* in the Public Reporting in Australasia of Exploration Results, Mineral Resources and Ore Reserves. The first edition of the JORC Code was released in 1989 by the Joint Ore Reserves Committee ('JORC'), with the current edition (2012) fully in effect since December 2013. The Code has been adopted by The Australasian Institute of Mining and Metallurgy (The AusIMM) and the Australian Institute of Geoscientists (AIG) and is binding on members of those organisations. It is endorsed by the Minerals Council of Australia and the Financial Services Institute of Australasia as a contribution to good practice. The Code has also been adopted by and included in the listing rules of the Australian Securities Exchange (ASX) and the New Zealand Stock Exchange (NZX).

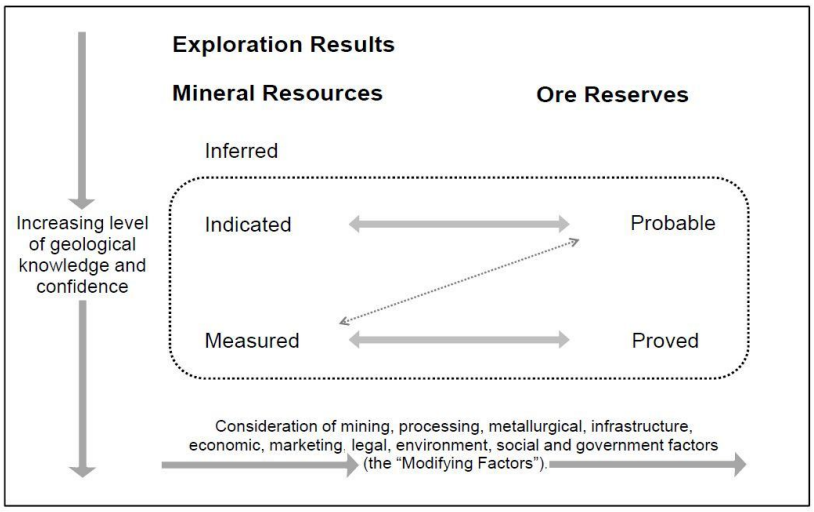
The minimum standards, recommendations and guidelines defined by the JORC Code for the reporting of Mineral Resources and Ore Reserves are directly relevant to the reporting of aggregate Resources and Reserves, irrespective of whether public reporting of those reserves and resources is required. The Code is also accepted best-practice for the reporting of all solid minerals and industrial mineral deposits, including aggregate reserves and resources.

Competence as presented in the JORC Code, requires that the Report be based on work that is the responsibility of suitably qualified and experienced persons who are subject to an enforceable professional code of ethics (the Competent Person).

Table 4.4 sets out the JORC framework for classifying reserve and resource tonnage estimates to reflect different levels of geological confidence and different degrees of technical and economic evaluation. Mineral Resources can be estimated on the basis of geoscientific information with some input from other disciplines. Ore Reserves, which are a modified sub-set of the Indicated and Measured Mineral Resources (shown within the dashed outline in **Table 4.4**, require consideration of the Modifying Factors affecting extraction, and should in most instances be estimated with input from a range of disciplines. 'Modifying Factors' are considerations used to convert Mineral Resources to Ore Reserves. These include, but are not restricted to, mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social and governmental factors.

Measured Mineral Resources may be converted to either Proved Ore Reserves or Probable Ore Reserves. The Competent Person may convert Measured Mineral Resources to Probable Ore Reserves because of uncertainties associated with some or all of the Modifying Factors which are taken into account in the conversion from Mineral Resources to Ore Reserves. This relationship is shown by the broken arrow in ***Table 4-4***. Although the trend of the broken arrow includes a vertical component, it does not, in this instance, imply a reduction in the level of geological knowledge or confidence. In such a situation these Modifying Factors should be fully explained.

Table 4-4 – General relationship between Exploration Results, Mineral Resources and Ore Reserves



A **'Mineral Resource'** is a concentration or occurrence of solid material of economic interest in or on the Earth's crust in such form, grade (or quality), and quantity that there are reasonable prospects for eventual economic extraction. The location, quantity, grade (or quality), continuity and other geological characteristics of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge, including sampling. Mineral Resources are sub-divided, in order of increasing geological confidence, into Inferred, Indicated and Measured categories.

- An **'Inferred Mineral Resource'** is that part of a Mineral Resource for which quantity and grade (or quality) are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological and grade (or quality) continuity. It is based on exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes. An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to an Ore Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.
- An **'Indicated Mineral Resource'** is that part of a Mineral Resource for which quantity, grade (or quality), densities, shape and physical characteristics are estimated with sufficient confidence to allow the application of Modifying Factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit. Geological evidence is derived from adequately detailed and reliable exploration, sampling and testing gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes, and is sufficient to assume geological and grade (or quality) continuity between points of observation where data and samples are gathered. An Indicated Mineral Resource has a lower level of confidence than that applying to a Measured Mineral Resource and may only be converted to a Probable Ore Reserve.
- A **'Measured Mineral Resource'** is that part of a Mineral Resource for which quantity, grade (or quality), densities, shape, and physical characteristics are estimated with confidence sufficient to allow the application of Modifying Factors to support detailed mine planning and final evaluation of the economic viability of the deposit. Geological evidence is derived from detailed and reliable exploration, sampling and testing gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes, and is sufficient to confirm

geological and grade (or quality) continuity between points of observation where data and samples are gathered. A Measured Mineral Resource has a higher level of confidence than that applying to either an Indicated Mineral Resource or an Inferred Mineral Resource. It may be converted to a Proved Ore Reserve or under certain circumstances to a Probable Ore Reserve.

An **'Ore Reserve'** is the economically mineable part of a Measured and/or Indicated Mineral Resource. It includes diluting materials and allowances for losses, which may occur when the material is mined or extracted and is defined by studies at Pre-Feasibility or Feasibility level as appropriate that include application of Modifying Factors. Such studies demonstrate that, at the time of reporting, extraction could reasonably be justified. The reference point at which Reserves are defined, usually the point where the ore is delivered to the processing plant, must be stated. It is important that, in all situations where the reference point is different, such as for a saleable product, a clarifying statement is included to ensure that the reader is fully informed as to what is being reported.

- A **'Probable Ore Reserve'** is the economically mineable part of an Indicated, and in some circumstances, a Measured Mineral Resource. The confidence in the Modifying Factors applying to a Probable Ore Reserve is lower than that applying to a Proved Ore Reserve.
- A **'Proved Ore Reserve'** is the economically mineable part of a Measured Mineral Resource. A Proved Ore Reserve implies a high degree of confidence in the Modifying Factors.

10.2 Project Area Resource Estimation

ARDG's resource assessment program has confirmed the geological, structural and rock quality characteristics of the rhyodacite and dacite to a high level of confidence and predictability. Critically, detailed geotechnical testing has confirmed that with the exception of overburden and topsoil, all other materials extracted from within the Stage 9 footprint of conceptual quarry development (refer **Section 9**) could be processed by a future quarry operation to produce a wide range of quarry products required by the Lower Hunter, Central Coast and Greater Sydney construction materials markets.

Accordingly, with exception of overburden and topsoil, all other materials extracted from within the Stage 9 footprint of conceptual quarry development are classified as a Measured Resource. Given that the main rhyodacite resource extends to depth below, and along strike of the proposed Stage 9 footprint, significant additional Indicated Resources exist within the Project Area. The Measured and Indicated Resource figures determined by ARDG for the Project Area are summarized below.

Measured Resources

- Rhyodacite: of 47.3 Mt (constrained by Stage 9 pit shell, Main Pit)
- Dacite: 1.67 Mt (constrained by Stage 6 pit shell, North Pit)
- Total Measured Resources: 48.97 Mt

Indicated Resources

- Rhyodacite and Dacite: 87 Mt (constrained by conceptual pit design to RL-62m AHD).

Should State Significant Planning approval be obtained for the Stone Ridge Quarry, the Measured and Indicated Resources quoted above would convert to Proved and Probable Reserves, respectively.