ASX AND MEDIA RELEASE
3 OCTOBER 2018

MINERAL RESOURCE AND ORE RESERVE STATEMENT

HIGHLIGHTS

- Ore Reserve unchanged at 680.5 million tonnes (Mt) @ 11.3% heavy mineral (HM)
- Confirms Thunderbird as one of the largest undeveloped zircon-rich HM deposits globally
- Thunderbird Mineral Resource contains 19 Mt of zircon and 62 Mt of ilmenite
- Eneabba Project Mineral Resources upgraded to JORC Code (2012) status
- McCalls Project Mineral Resource contains 67 Mt of chloride grade ilmenite

Sheffield Resources Limited ("Sheffield", "the Company") (ASX: SFX) today announced its annual Statement of Mineral Resources and Ore Reserves, as at 1 October 2018, as the Company transitions its Thunderbird Mineral Sands Project (Thunderbird) in northern Western Australia into development.

This updated Mineral Resource and Ore Reserve Statement is reported in accordance with the guidelines of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves, 2012 Edition[1] and ASX Listing Rules ("JORC Code (2012)"). The statement includes, for the first time, an upgrade of Mineral Resource estimates at the Eneabba and McCalls projects, which are also located in Western Australia, to comply with the requirements of the JORC Code (2012).

The Thunderbird Mineral Resource remains at 3.23 billion tonnes @ 6.9% heavy mineral (HM) above a 3% HM cut-off (Measured, Indicated and Inferred) containing 93 million tonnes of valuable heavy mineral (VHM). The Mineral Resource includes a high-grade component of 1.05 billion tonnes @ 12.2% HM above 7.5% HM cut-off (Measured, Indicated and Inferred) containing 50 million tonnes of VHM (refer to ASX announcement 5 July 2016 for details).

There has been no change to the Thunderbird Ore Reserve of 680.5 million tonnes @ 11.3% HM (Proved and Probable) (refer to ASX announcement 16 March 2017 for details).

The statement includes Mineral Resource estimates for the Yandanooka, Durack, Drummond Crossing, West Mine North and Ellengail HM deposits at the Company's Eneabba Project, which are reported under the JORC Code (2012) for the first time. The statement also includes the maiden Mineral Resource for the Mindarra Springs HM deposit. Appendices 1 and 2 to this statement include important information with regard to these Mineral Resource estimates, as required under the JORC Code (2012).

Sheffield's total in-situ tonnes of valuable heavy mineral contained within all Mineral Resource estimates (Measured and Indicated and Inferred at various cut-offs) now stands at 173 million tonnes including, 23 million tonnes of zircon and 132 million tonnes of ilmenite.

Sheffield's Managing Director Bruce McFadzean said the large, high grade Ore Reserve and growing Mineral Resource inventory demonstrates the global significance and strategic value of the Company's mineral sands assets.

"In terms of confidence, grade and tonnage, the Thunderbird Ore Reserve ranks amongst the top tier of mineral sands Ore Reserves globally, including those associated with operating mines," Mr McFadzean said.

"The strategic value of Thunderbird is further enhanced by its location in one of the world's best mining jurisdictions, close to existing high-quality infrastructure and proximity to Asian markets.

"This updated Mineral Resource and Ore Reserve Statement supports Sheffield's strategy of growing a globally significant Mineral Resource base with a focus on large zircon rich deposits."

[1]Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves, 2012 Edition, sets out minimum standards, recommendations and guidelines for public reporting in Australasia of Exploration Results, Mineral Resources and Ore Reserves authored by the Joint Ore Reserves Committee of The Australian Institute of Mining and Metallurgy, Australian Institute of Geoscientists and the Minerals Council of Australia.

ORE RESERVE AND MINERAL RESOURCE STATEMENT

Sheffield's inventory of Mineral Resource and Ore Reserve comprises;

- Thunderbird Ore Reserve of 680.5 million tonnes @ 11.3% HM (Proved and Probable) (refer to ASX announcement 16 March 2017).
- Thunderbird Mineral Resource of 3.23 billion tonnes @ 6.9% HM above a 3% HM cut-off (Measured, Indicated and Inferred) (refer to ASX announcement 5 July 2016).
- Eneabba Project Mineral Resource of 193.3 million tonnes @ 3.0% HM above a variable HM cut-off (Measured, Indicated and Inferred) (refer to this announcement).
- McCalls Project Mineral Resource of 5.8 billion tonnes @ 1.4% HM above a 1.1% HM cut-off (Indicated and Inferred) (refer to this announcement).

A summary of Sheffield's Mineral Resource and Ore Reserve Inventory as at 1 October 2018 is given below.

SHEFFIELD HM ORE RESERVE

1) DAMPIER PROJECT

SHEFFIELD ORE RESERVE FOR DAMPIER PROJECT AT 01 OCTOBER 2018 (in-situ assemblage)

Summary of Ore Reserve[1,2,3,4]				In-situ Assemblage[5]					
Deposit	Ore Reserve Category	Material Tonnes Millions (Mt)	THM (%)	Zircon (%)	HiTi Leuc (%)	Leuco-xene (%)	Ilmenite (%)	Oversize (%)	Slimes (%)
Thunderbird	Proved	235.8	13.3	1.00	0.29	0.26	3.55	13.7	16.5
	Probable	444.8	10.2	0.80	0.26	0.26	2.85	11.0	15.2
	Total	**680.5**	**11.3**	**0.87**	**0.27**	**0.26**	**3.10**	**12.0**	**15.7**

SHEFFIELD ORE RESERVE FOR DAMPIER PROJECT AT 01 OCTOBER 2018 (HM assemblage)

Summary of Ore Reserve[1,2,3,4]				HM Assemblage[6]					
Deposit	Ore Reserve Category	Material Tonnes Millions (Mt)	THM (%)	Zircon (%)	HiTi Leuc (%)	Leuco-xene (%)	Ilmenite (%)	Oversize (%)	Slimes (%)
Thunderbird	Proved	235.8	13.3	7.5	2.2	1.9	26.7	13.7	16.5
	Probable	444.8	10.2	7.8	2.5	2.6	28.0	11.0	15.2
	Total	**680.5**	**11.3**	**7.7**	**2.4**	**2.3**	**27.4**	**12.0**	**15.7**

Notes:

[1]The Ore Reserve estimate was prepared by Entech Pty Ltd and first disclosed under the JORC Code (2012), refer to ASX announcement 16 March 2017 for further details including Table 1. Ore Reserve is reported to a design overburden surface with appropriate consideration of modifying factors, costs, mineral assemblage, process recoveries and product pricing.

[2]Ore Reserve is a sub-set of Mineral Resource

[3]THM is within the 38µm to 1 mm size fraction and reported as a percentage of the total material, slimes is the -38µm fraction and oversize is the +1mm fraction.

[4]Tonnes and grades have been rounded to reflect the relative accuracy and confidence level of the estimate, thus the sum of columns may not equal.

[5]The in-situ assemblage grade is determined by multiplying the percentage of HM by the percentage of each valuable heavy mineral within the heavy mineral assemblage at the resource block model scale.

[6]Mineral Assemblage is reported as a percentage of HM Grade, it is derived by dividing the in-situ grade by the HM grade.

The Ore Reserve estimate was prepared by Entech Pty Ltd, an experienced and prominent mining engineering consultancy with appropriate mineral sands experience in accordance with the JORC Code (2012 Edition) and announced to the ASX on 16 March 2017. The Ore Reserve is estimated using all available geological and relevant drill hole and assay data, including mineralogical sampling and test work on mineral recoveries and final product qualities. The Company is not aware of any new information or data that materially affects the information included in the Ore Reserve estimate and confirms that all material assumptions and technical parameters underpinning the estimate continue to apply and have not materially changed. The Ore Reserve estimate is based on the current, July 2016 Thunderbird Mineral Resource estimate, announced to the ASX on 5 July 2016. Measured and Indicated Mineral Resources were converted to Proved and Probable Ore Reserves respectively, subject to mine design, modifying factors and economic evaluation.

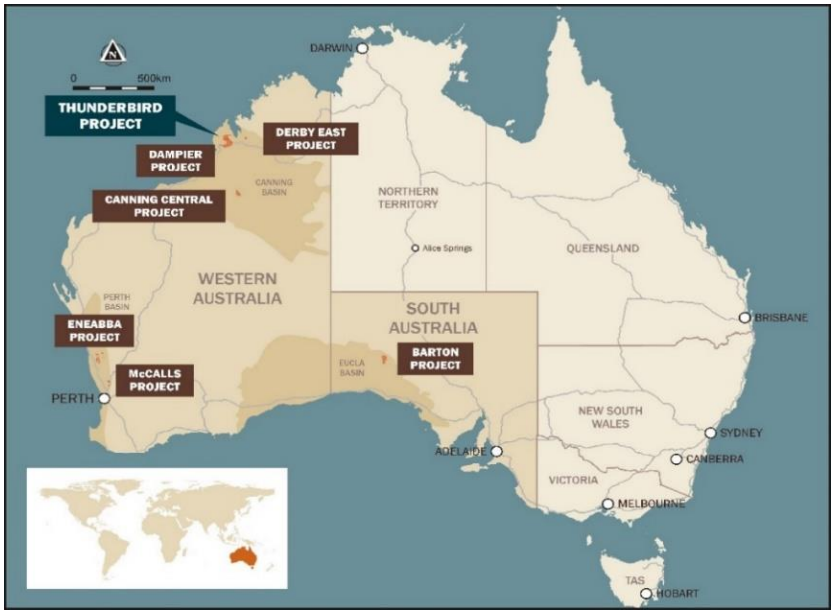

Figure 1: Location of Sheffield's Mineral Sands Projects

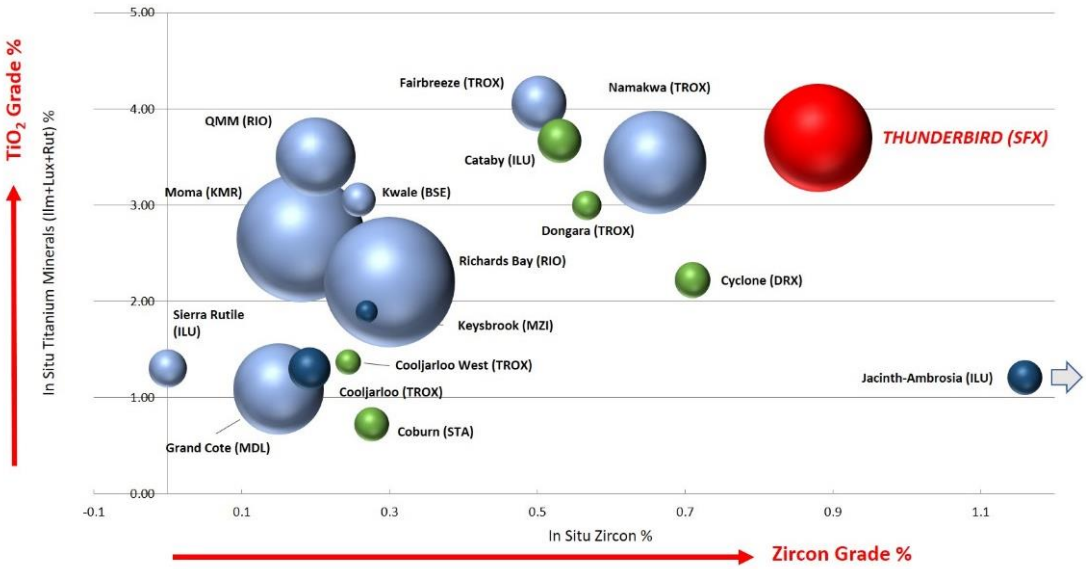

Figure 2: Thunderbird Ore Reserve[1] ranked against published Ore Reserves of current mineral sands operations and projects under investigation globally

[1]Thunderbird Ore Reserve as published on the ASX on 16 March 2017. Thunderbird Ore Reserve ranked against published Ore Reserves of current mineral sands operations and projects under investigation globally. Blue bubbles are operating mines, green bubbles are Ore Reserves reported, but projects are not operating. Light blue bubbles represent operating African mines' Ore Reserves. Bubble size proportional to tonnes of contained VHM. Only Ore Reserves > 1.2Mt contained VHM shown. Data compiled by Sheffield from public sources. This analysis does not illustrate the variance in product value between rutile, leucoxene and ilmenite.

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SHEFFIELD HM MINERAL RESOURCE

1) DAMPIER PROJECT

SHEFFIELD MINERAL RESOURCE FOR DAMPIER PROJECT AT 01 OCTOBER 2018 (in-situ assemblage)

Summary of Mineral Resource[1,2,3]					In-situ Assemblage[5]					
Deposit	Mineral Resource Category	Cut off (THM%)	Material Tonnes Millions (Mt)	THM (%)	Zircon (%)	HiTi Leuc (%)	Leuco-xene (%)	Ilmenite (%)	Oversize (%)	Slimes (%)
Thunderbird	Measured	3.0	510	8.9	0.71	0.20	0.19	2.4	12	18
	Indicated	3.0	2,120	6.6	0.55	0.18	0.20	1.8	9	16
	Inferred	3.0	600	6.3	0.53	0.17	0.20	1.7	8	15
	Total	3.0	3,230	6.9	0.57	0.18	0.20	1.9	9	16
Thunderbird	Measured	7.5	220	14.5	1.07	0.31	0.27	3.9	15	16
	Indicated	7.5	640	11.8	0.90	0.28	0.25	3.3	11	14
	Inferred	7.5	180	10.8	0.87	0.27	0.26	3.0	9	13
	Total	7.5	1,050	12.2	0.93	0.28	0.26	3.3	11	15

SHEFFIELD MINERAL RESOURCES FOR DAMPIER PROJECT AT 01 OCTOBER 2018 (HM assemblage)

Summary of Mineral Resource[1,2,3]					HM Assemblage[4]					
Deposit	Mineral Resource Category	Cut off (THM%)	Material Tonnes Millions (Mt)	THM (%)	Zircon (%)	HiTi Leuc (%)	Leuco-xene (%)	Ilmenite (%)	Oversize (%)	Slimes (%)
Thunderbird	Measured	3.0	510	8.9	8.0	2.3	2.2	27	12	18
	Indicated	3.0	2,120	6.6	8.4	2.7	3.1	28	9	16
	Inferred	3.0	600	6.3	8.4	2.6	3.2	28	8	15
	Total	3.0	3,230	6.9	8.3	2.6	2.9	28	9	16
Thunderbird	Measured	7.5	220	14.5	7.4	2.1	1.9	27	15	16
	Indicated	7.5	640	11.8	7.6	2.4	2.1	28	11	14
	Inferred	7.5	180	10.8	8.0	2.5	2.4	28	9	13
	Total	7.5	1,050	12.2	7.6	2.3	2.1	27	11	15

Notes:

[1]The Mineral Resource estimate was prepared by Optiro Pty Ltd and first disclosed under the JORC Code (2012) refer to ASX announcement 5 July 2016 for further details including Table 1. The Dampier Project Mineral Resources are reported inclusive of (not additional to) Ore Reserves. The Mineral Resource reported above 3% HM cut-off is inclusive of (not additional to) the Mineral Resource reported above 7.5% HM cut-off.

[2] THM is within the 38µm to 1mm size fraction and reported as a percentage of the total material, slimes is the -38µm fraction and oversize is the +1mm fraction.

[3]Tonnes and grades have been rounded to reflect the relative accuracy and confidence level of the estimate, thus the sum of columns may not equal.

[4]Estimates of Mineral Assemblage are presented as percentages of the Heavy Mineral (HM) component of the deposit, as determined by magnetic separation, QEMSCAN and XRF. Magnetic fractions were analysed by QEMSCAN for mineral determination as follows: Ilmenite: 40-70% TiO_2 >90% Liberation; Leucoxene: 70-94% TiO_2 >90% Liberation; High Titanium Leucoxene (HiTi Leucoxene): >94% TiO_2 >90% Liberation; and Zircon: 66.7% ZrO_2+HfO_2 >90% Liberation. The non-magnetic fraction was submitted for XRF analysis and minerals determined as follows: Zircon: ZrO_2+HfO_2/0.667 and High Titanium Leucoxene (HiTi Leucoxene): TiO_2/0.94.

[5]The in-situ assemblage grade is determined by multiplying the percentage of HM by the percentage of each valuable heavy mineral within the heavy mineral assemblage at the resource block model scale.

SHEFFIELD MINERAL RESOURCE FOR THUNDRBIRD PROJECT AT 01 OCTOBER 2018 (in-situ tonnes)

Summary of Mineral Resource[1,2,3]			In-situ Tonnes[4]					
Deposit	Mineral Resource Category	Cut off (THM%)	THM Tonnes Millions (Mt)	Zircon (kt)	HiTi Leuc (kt)	Leuco-xene (kt)	Ilmenite (kt)	Total VHM (kt)
Thunderbird	Measured	3.0	45	3,600	1,000	1,000	12,000	17,700
	Indicated	3.0	140	11,800	3,800	4,300	39,100	59,000
	Inferred	3.0	38	3,200	1,000	1,200	10,500	15,900
	Total	3.0	223	18,600	5,900	6,500	61,700	92,600
Thunderbird	Measured	7.5	32	2,300	700	600	8,400	12,000
	Indicated	7.5	76	5,800	1,800	1,600	21,000	30,200
	Inferred	7.5	20	1,600	500	500	5,600	8,200
	Total	7.5	127	9,700	3,000	2,700	35,000	50,400

Notes:

[1]The Mineral Resource estimate was prepared by Optiro Pty Ltd and first disclosed under the JORC Code (2012) refer to ASX announcement 5 July 2016 for further details including Table 1. The Dampier Project Mineral Resources are reported inclusive of (not additional to) Ore Reserves. The Mineral Resource reported above 3% HM cut-off is inclusive of (not additional to) the Mineral Resource reported above 7.5% HM cut-off.

[2] THM is within the 38µm to 1mm size fraction and reported as a percentage of the total material, slimes is the -38µm fraction and oversize is the +1mm fraction.

[3]Tonnes and grades have been rounded to reflect the relative accuracy and confidence level of the estimate, thus the sum of columns may not equal.

[4]The contained in-situ tonnes for the valuable heavy minerals were derived from information from the Mineral Resource tables

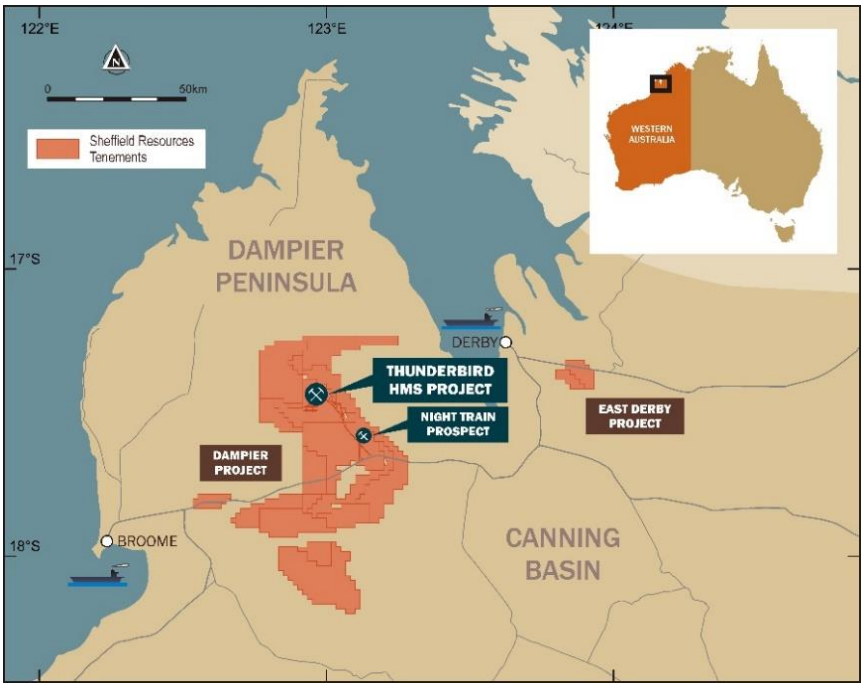

Figure 3: Location of Thunderbird, East Derby and Dampier Mineral Sands Project

Figure 4: Drilling at the Thunderbird Mineral Sands Project

2) ENEABBA PROJECT

SHEFFIELD MINERAL RESOURCES FOR THE ENEABBA PROJECT AT 01 OCTOBER 2018 (in-situ assemblage)

Summary of Mineral Resource[1,2]					In-situ Assemblage[11]					
Deposit	Mineral Resource Category	Cut off (THM %)	Material Tonnes Millions (Mt)	THM (%)	Zircon (%)	Rutile (%)	Leuco-xene (%)	Ilmenite (%)	Oversize (%)	Slimes (%)
Yandanooka[4,6,8]	Measured	1.4	2.6	4.3	0.44	0.09	0.10	3.08	11.3	15
	Indicated	1.4	57.7	3.0	0.37	0.11	0.11	2.08	11.4	15
	Inferred	1.4	0.4	1.5	0.16	0.05	0.07	1.01	21.9	20
	Total	1.4	60.8	3.0	0.37	0.11	0.11	2.11	11.5	15
Durack[4,6,7,8]	Indicated	1.4	20.7	2.9	0.40	0.09	0.11	2.07	14.7	14
	Inferred	1.4	5.6	2.6	0.37	0.07	0.19	1.68	18.3	16
	Total	1.4	26.3	2.8	0.39	0.08	0.13	1.99	15.5	14
Drummond Crossing[3,4, 6,8]	Indicated	1.4	35.5	2.4	0.33	0.24	0.08	1.26	7.7	14
	Inferred	1.4	3.3	2.3	0.26	0.21	0.06	1.31	7.2	12
	Total	1.4	38.8	2.4	0.33	0.24	0.08	1.26	7.7	14
Robbs Cross[5,6,8]	Indicated	1.4	14.0	1.9	0.27	0.24	0.09	0.88	6.2	6
	Inferred	1.4	3.8	2.0	0.29	0.22	0.08	1.02	8.1	6
	Total	1.4	17.8	1.9	0.28	0.23	0.09	0.91	6.6	6
Thomson[5,8,]	Inferred	1.4	26	2.0	0.38	0.28	0.11	0.85	6.9	18
	Total	1.4	26	2.0	0.38	0.28	0.11	0.85	6.9	18
West Mine North[3,4,6,9,]	Indicated	2.0	10.2	7.3	0.43	0.48	0.13	3.51	2.3	11
	Inferred	2.0	1.8	2.7	0.25	0.23	0.06	1.31	3.0	17
	Total	2.0	12.0	6.6	0.40	0.44	0.12	3.18	2.4	12
Ellengail[3,4,9,10]	Indicated	2.0	6.5	5.3	0.53	0.43	0.55	3.49	3.2	15
	Inferred	2.0	5.3	4.1	0.41	0.34	0.35	2.55	2.5	15
	Total	2.0	11.8	4.8	0.47	0.39	0.46	3.07	2.9	15
Total	Measured	1.4	2.6	4.3	0.44	0.09	0.10	3.08	11	15
	Indicated	Various	144.6	3.1	0.37	0.19	0.12	1.92	9	14
	Inferred	Various	46.0	2.4	0.36	0.24	0.14	1.21	8	16
	Total	Various	193.3	3.0	0.36	0.20	0.13	1.77	9	14

[1]The Mineral Resource estimates were prepared by Optiro Pty Ltd and first disclosed under the JORC Code (2012) refer to this ASX announcement and December 2017 Quarterly Activities Report for Robbs Cross and Thomson deposits for further details
[2]All tonnages and grades have been rounded to reflect the relative uncertainty of the estimate, thus the sums of columns may not equal.
[3]THM %: Samples from 1989 and 1996 (Drummond Crossing, Ellengail and West Mine North) were analysed using a -75 µm slimes / +2 mm oversize screen. Separation of HM% was by heavy liquid TBE (density 2.84 g/ml) from the -710µm+75µm fraction.
[4]THM %: RGC samples from 1998 and Iluka samples (Drummond Crossing, Durack, Ellengail, West Mine North and Yandanooka) were analysed using a -53 µm slimes / +2 mm oversize screen. Separation of total HM% was by heavy liquid TBE (density 2.90 g/ml) from the -710µm+53µm fraction.
[5]THM %: Samples from Robbs Cross and Thomson analysed by Diamantina Laboratories in Perth using a -45 µm slimes / +1 mm oversize screen (method DIA_HLS_45µm_1mm). Separation of total HM% was by heavy liquid TBE (density 2.96g/ml) from the -45 µm+1mm fraction.
[6]THM %: Samples from Drummond Crossing, Durack, West Mine North and Yandanooka were analysed by Western Geolabs in Perth using a -53 µm slimes / +1 mm oversize screen. Separation of total HM% was by heavy liquid TBE (density 2.96 g/ml) from the +53µm-1mm fraction.
[7]Reported below an upper cut-off grade of 35% slimes.
[8]Estimates of mineral assemblage are presented as percentages of the total heavy mineral (THM) component of the deposit, as determined by QEMSCAN analysis. For the TiO_2 minerals specific breakpoints are used to distinguish between rutile (>95% TiO_2), leucoxene (85-95% TiO_2) and ilmenite (<55-85% TiO_2).
[9]At West Mine North and Ellengail mineral assemblage data determined by Iluka using Method 4 (HMC is separated into magnetics and non-magnetics) was used with the Sheffield QEMSCAN data
[10]At Ellengail mineral assemblage data determined by Iluka using Method 3 (magnetic separation and XRF analysis) was used with the Sheffield QEMSCAN data and Iluka Method 4 data
[11]The in-situ assemblage grade is determined by multiplying the percentage of HM by the percentage of each valuable heavy mineral within the heavy mineral assemblage at the resource block model scale.

Sheffield Resources LIMITED

SHEFFIELD MINERAL RESOURCE FOR ENEABBA PROJECT AT 01 OCTOBER 2018 (HM assemblage)

Summary of Mineral Resource[1,2]					HM Assemblage[8,9,10]					
Deposit	Mineral Resource Category	Cut off (THM %)	Material Tonnes Millions (Mt)	THM (%)	Zircon (%)	Rutile (%)	Leuco-xene (%)	Ilmenite (%)	Oversize (%)	Slimes (%)
Yandanooka[4,6,8]	Measured	1.4	2.6	4.3	10	2.1	2.3	72	11.3	15
	Indicated	1.4	57.7	3.0	12	3.6	3.7	69	11.4	15
	Inferred	1.4	0.4	1.5	11	3.0	4.4	68	21.9	20
	Total	1.4	60.8	3.0	12	3.5	3.6	70	11.5	15
Durack[4,6,7,8]	Indicated	1.4	20.7	2.9	14	2.9	3.7	71	14.7	14
	Inferred	1.4	5.6	2.6	14	2.6	7.4	64	18.3	16
	Total	1.4	26.3	2.8	14	2.9	4.4	70	15.5	14
Drummond Crossing[3,4, 6,8]	Indicated	1.4	35.5	2.4	14	10.3	3.4	53	7.7	14
	Inferred	1.4	3.3	2.3	11	9.0	2.7	56	7.2	12
	Total	1.4	38.8	2.4	14	10.2	3.4	54	7.7	14
Robbs Cross[5,6,8]	Indicated	1.4	14.0	1.9	15	12.7	5.0	47	6.2	6
	Inferred	1.4	3.8	2.0	14	10.9	4.1	50	8.1	6
	Total	1.4	17.8	1.9	15	12.3	4.8	48	6.6	6
Thomson[5,8,]	Inferred	1.4	26	2.0	19	13.8	5.4	42	6.9	18
	Total	1.4	26	2.0	19	13.8	5.4	42	6.9	18
West Mine North[3,4,6,9,]	Indicated	2.0	10.2	7.3	6	6.5	1.8	48	2.3	11
	Inferred	2.0	1.8	2.7	9	8.6	2.1	50	3.0	17
	Total	2.0	12.0	6.6	6	6.6	1.8	48	2.4	12
Ellengail[3,4,9,10]	Indicated	2.0	6.5	5.3	10	8.0	10.4	66	3.2	15
	Inferred	2.0	5.3	4.1	10	8.2	8.4	62	2.5	15
	Total	2.0	11.8	4.8	10	8.1	9.6	64	2.9	15
Total	Measured	1.4	2.6	4.3	10	2.1	2.3	72	11	15
	Indicated	Various	144.6	3.1	12	6.1	3.9	62	9	14
	Inferred	Various	46.0	2.4	15	10.3	5.8	51	8	16
	Total	Various	193.3	3.0	12	6.8	4.2	60	9	14

[1]The Mineral Resource estimates were prepared by Optiro Pty Ltd and first disclosed under the JORC Code (2012) refer to this ASX announcement and December 2017 Quarterly Activities Report for Robbs Cross and Thomson deposits for further details
[2]All tonnages and grades have been rounded to reflect the relative uncertainty of the estimate, thus the sums of columns may not equal.
[3]THM %: Samples from 1989 and 1996 (Drummond Crossing, Ellengail and West Mine North) were analysed using a -75 µm slimes / +2 mm oversize screen. Separation of HM% was by heavy liquid TBE (density 2.84 g/ml) from the -710µm+75µm fraction.
[4]THM %: RGC samples from 1998 and Iluka samples (Drummond Crossing, Durack, Ellengail, West Mine North and Yandanooka) were analysed using a -53 µm slimes / +2 mm oversize screen. Separation of total HM% was by heavy liquid TBE (density 2.90 g/ml) from the -710µm+53µm fraction.
[5]THM %: Samples from Robbs Cross and Thomson analysed by Diamantina Laboratories in Perth using a -45 µm slimes / +1 mm oversize screen (method DIA_HLS_45µm_1mm). Separation of total HM% was by heavy liquid TBE (density 2.96g/ml) from the -45 µm+1mm fraction.
[6]THM %: Samples from Drummond Crossing, Durack, West Mine North and Yandanooka were analysed by Western Geolabs in Perth using a -53 µm slimes / +1 mm oversize screen. Separation of total HM% was by heavy liquid TBE (density 2.96 g/ml) from the +53µm-1mm fraction.
[7]Reported below an upper cut-off grade of 35% slimes.
[8]Estimates of mineral assemblage are presented as percentages of the total heavy mineral (THM) component of the deposit, as determined by QEMSCAN analysis. For the TiO_2 minerals specific breakpoints are used to distinguish between rutile (>95% TiO_2), leucoxene (85-95% TiO_2) and ilmenite (<55-85% TiO_2).
[9]At West Mine North and Ellengail mineral assemblage data determined by Iluka using Method 4 (HMC is separated into magnetics and non-magnetics) was used with the Sheffield QEMSCAN data
[10]At Ellengail mineral assemblage data determined by Iluka using Method 3 (magnetic separation and XRF analysis) was used with the Sheffield QEMSCAN data and Iluka Method 4 data
[11]The in-situ assemblage grade is determined by multiplying the percentage of HM by the percentage of each valuable heavy mineral within the heavy mineral assemblage at the resource block model scale.

Sheffield Resources LIMITED

SHEFFIELD MINERAL RESOURCE FOR ENEABBA PROJECT AT 01 OCTOBER 2018 (in-situ tonnes)

Summary of Mineral Resource[1,2,3]			In-situ Tonnes					
Deposit	Mineral Resource Category	Cut off (THM%)	THM Tonnes Millions (kt)	Zircon (kt)	Rutile (kt)	Leuco-xene (kt)	Ilmenite (kt)	Total VHM (kt)
Yandanooka[4,6,8]	Measured	1.4	112	12	2	3	81	98
	Indicated	1.4	1,726	212	63	63	1,197	1,535
	Inferred	1.4	7	1	0.2	0.3	4	6
	Total	1.4	1,845	224	65	66	1,283	1,639
Durack[4,6,7,8]	Indicated	1.4	600	82	18	22	429	551
	Inferred	1.4	148	21	4	11	95	130
	Total	1.4	748	104	21	33	523	681
Drummond Crossing[3,4,6,8]	Indicated	1.4	838	118	86	29	447	680
	Inferred	1.4	77	9	7	2	43	61
	Total	1.4	915	127	93	31	490	741
Robbs Cross[5,6,8]	Indicated	1.4	261	38	33	13	123	208
	Inferred	1.4	77	11	8	3	39	61
	Total	1.4	338	50	41	16	162	269
Thomson[5,8,]	Inferred	1.4	516	97	71	28	219	415
	Total	1.4	516	97	71	28	219	415
West Mine North[3,4,6,9,]	Indicated	2.0	748	44	49	13	359	465
	Inferred	2.0	48	5	4	1	24	34
	Total	2.0	796	48	53	14	383	498
Ellengail[3,4,9,10]	Indicated	2.0	346	34	28	36	227	325
	Inferred	2.0	218	22	18	18	136	193
	Total	2.0	565	56	46	54	363	519
Total	Measured	1.4	112	12	2	3	81	98
	Indicated	Various	4,519	529	276	176	2,782	3,764
	Inferred	Various	1,091	165	113	64	559	900
	Total	Various	5,723	705	392	242	3,423	4,762

Notes:

[1]The Mineral Resource estimates were prepared by Optiro Pty Ltd and first disclosed under the JORC Code (2012) refer to this ASX announcement and December 2017 Quarterly Activities Report for Robbs Cross and Thomsondeposits for further details
[2]All tonnages and grades have been rounded to reflect the relative uncertainty of the estimate, thus the sums of columns may not equal.
[3]THM %: Samples from 1989 and 1996 (Drummond Crossing, Ellengail and West Mine North) were analysed using a -75 µm slimes / +2 mm oversize screen. Separation of HM% was by heavy liquid TBE (density 2.84 g/ml) from the -710µm+75µm fraction.
[4]THM %: RGC samples from 1998 and Iluka samples (Drummond Crossing, Durack, Ellengail, West Mine North and Yandanooka) were analysed using a -53 µm slimes / +2 mm oversize screen. Separation of total HM% was by heavy liquid TBE (density 2.90 g/ml) from the -710µm+53µm fraction.
[5]THM %: Samples from Robbs Cross and Thomson analysed by Diamantina Laboratories in Perth using a -45 µm slimes / +1 mm oversize screen (method DIA_HLS_45µm_1mm). Separation of total HM% was by heavy liquid TBE (density 2.96g/ml) from the -45 µm+1mm fraction.
[6]THM %: Samples from Drummond Crossing, Durack, West Mine North and Yandanooka were analysed by Western Geolabs in Perth using a -53 µm slimes / +1 mm oversize screen. Separation of total HM% was by heavy liquid TBE (density 2.96 g/ml) from the +53µm-1mm fraction.
[7]Reported below an upper cut-off grade of 35% slimes.
[8]Estimates of mineral assemblage are presented as percentages of the total heavy mineral (THM) component of the deposit, as determined by QEMSCAN analysis. For the TiO_2 minerals specific breakpoints are used to distinguish between rutile (>95% TiO_2), leucoxene (85-95% TiO_2) and ilmenite (<55-85% TiO_2).
[9]At West Mine North and Ellengail mineral assemblage data determined by Iluka using Method 4 (HMC is separated into magnetics and non-magnetics) was used with the Sheffield QEMSCAN data
[10]At Ellengail mineral assemblage data determined by Iluka using Method 3 (magnetic separation and XRF analysis) was used with the Sheffield QEMSCAN data and Iluka Method 4 data
[11]The in-situ assemblage grade is determined by multiplying the percentage of HM by the percentage of each valuable heavy mineral within the heavy mineral assemblage at the resource block model scale.

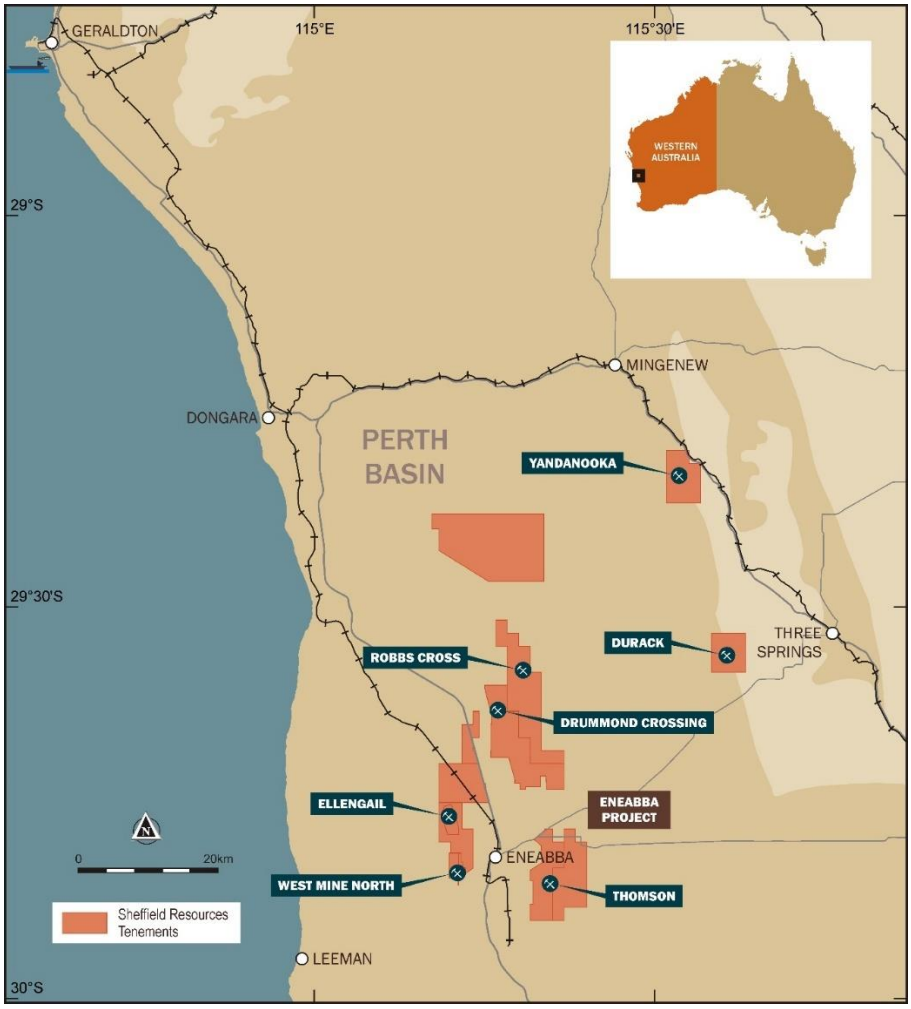

Figure 5: Location of the Eneabba Mineral Sands Project

The Eneabba Mineral Sands Project (Eneabba), located near Geraldton in Western Australia's Mid West region, has a combined Mineral Resource totalling 193 million tonnes @ 3.0% HM (Measured, Indicated and Inferred) containing 4.8 million tonnes of VHM, across seven deposits.

The McCalls Mineral Sand Project (McCalls), located 110km to the north of Perth near the town of Gingin, has a combined Mineral Resource totalling 5.8 billion tonnes @ 1.4% HM (Indicated and Inferred) containing 75 million tonnes of VHM across two deposits. McCalls contains over 67 million tonnes of chloride ilmenite grading 59-66% TiO_2 and is considered a longer-term strategic asset.

Figure 6: Drilling at the Yandanooka Deposit

3) McCALLS PROJECT

SHEFFIELD MINERAL RESOURCES FOR McCALLS PROJECT AT 01 OCTOBER 2018 (in-situ assemblage)

Summary of Mineral Resources[1,2,3,4,7]					In-situ Assemblage[6]					
Deposit	Mineral Resource Category	Cut off (THM%)	Material Tonnes Millions (Mt)	THM (%)	Zircon (%)	Rutile (%)	Leuco-xene (%)	Ilmenite (%)	Oversize (%)	Slimes (%)
McCalls	Indicated	1.1	1,630	1.4	0.07	0.05	0.04	1.10	1.1	21
	Inferred	1.1	1,980	1.2	0.06	0.05	0.04	1.00	1.1	26
	Total	1.1	3,600	1.3	0.07	0.05	0.04	1.05	1.1	24
Mindarra Springs	Inferred	1.1	2,200	1.6	0.07	0.01	0.05	1.32	5.1	20
	Total	1.1	2,200	1.6	0.07	0.01	0.05	1.32	5.1	20
Total	Indicated	1.1	1,630	1.4	0.07	0.05	0.04	1.10	1.1	21
	Inferred	1.1	4,180	1.5	0.07	0.03	0.05	1.17	3.2	23
	Total	1.1	5,800	1.4	0.07	0.03	0.04	1.15	2.6	22

SHEFFIELD MINERAL RESOURCES FOR McCALLS PROJECT AT 01 OCTOBER 2018 (HM assemblage)

Summary of Mineral Resources[1,2,3,4,7]					HM Assemblage[5]					
Deposit	Mineral Resource Category	Cut off (THM%)	Material Tonnes Millions (Mt)	THM (%)	Zircon (%)	Rutile (%)	Leuco-xene (%)	Ilmenite (%)	Oversize (%)	Slimes (%)
McCalls	Indicated	1.1	1,630	1.4	5.2	3.3	2.8	77	1.1	21
	Inferred	1.1	1,980	1.2	5.0	3.8	3.2	81	1.1	26
	Total	1.1	3,600	1.3	5.1	3.6	3.0	79	1.1	24
Mindarra Springs	Inferred	1.1	2,200	1.6	4.2	0.9	3.1	80	5.1	20
	Total	1.1	2,200	1.6	4.2	0.9	3.1	80	5.1	20
Total	Indicated	1.1	1,630	1.4	5.2	3.3	2.8	77	1.1	21
	Inferred	1.1	4,180	1.5	4.5	2.1	3.2	81	3.2	23
	Total	1.1	5,800	1.4	4.7	2.4	3.1	79	2.6	22

SHEFFIELD MINERAL RESOURCES FOR McCALLS PROJECT AT 01 OCTOBER 2018 (in-situ tonnes)

Summary of Mineral Resources[1,2,3,4,7]			In-situ Tonnes					
Deposit	Mineral Resource Category	Cut off (THM%)	THM Tonnes Millions (Mt)	Zircon (kt)	Rutile (kt)	Leuco-xene (kt)	Ilmenite (kt)	Total VHM (kt)
McCalls	Indicated	1.1	23.3	1,210	770	650	17,940	20,570
	Inferred	1.1	24.4	1,210	930	790	19,790	22,720
	Total	1.1	47.7	2,430	1,700	1,430	37,730	43,290
Mindarra Springs	Inferred	1.1	36.3	1,520	320	1,130	29,080	32,050
	Total	1.1	36.3	1,520	320	1,130	29,080	32,050
Total	Indicated	1.1	23.3	1,210	770	650	17,940	20,570
	Inferred	1.1	60.7	2,740	1,250	1,920	48,860	54,770
	Total	1.1	84.0	3,950	2,020	2,570	66,810	75,340

[1]The Mineral Resource estimates were prepared by Optiro Pty Ltd and first disclosed under the JORC Code (2012) refer to this ASX announcement
[2]All tonnages and grades have been rounded to reflect the relative uncertainty of the estimate, thus the sums of columns may not equal.

[3]*THM is within the 45µm to 1mm size fraction and reported as a percentage of the total material, slimes is the -45µm fraction and oversize is the +1mm fraction.*

[4]*Reported below an upper cut-off grade of 35% slimes.*

[5]*Estimates of mineral assemblage (Sheffield) are presented as percentages of the total heavy mineral (THM) component of the deposit, as determined by QEMSCAN analysis. For the TiO_2 minerals specific breakpoints are used to distinguish between rutile (>95% TiO_2), leucoxene (85-95% TiO_2) and ilmenite (<55-85% TiO_2). Estimates of mineral assemblage (BHP) HM assemblage determination was by magnetic separation and observation (grain-counting)*

[6]*The in-situ assemblage grade is determined by multiplying the percentage of HM by the percentage of each valuable heavy mineral within the heavy mineral assemblage at the resource block model scale.*

[7]*Excludes Mineral Resources within the Mogumber Nature Reserve*

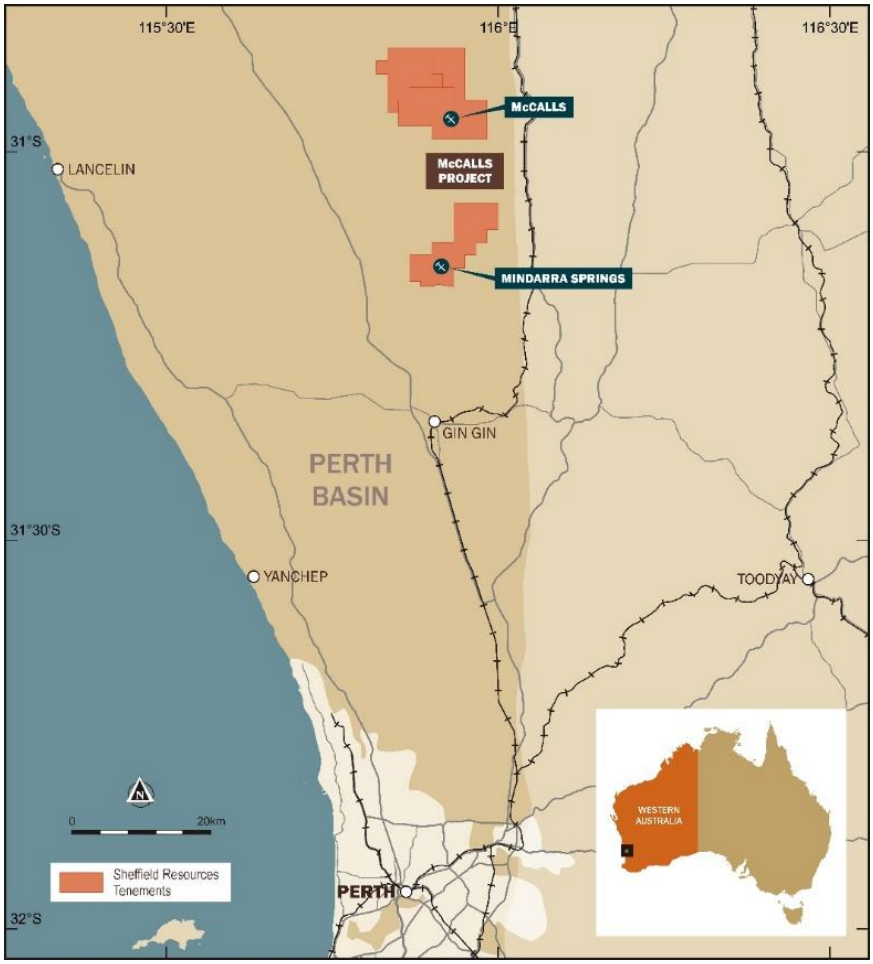

Figure 7: Location of the McCalls Mineral Sands Project

Figure 8: McCalls HM deposit - photo of wet shaking table (left) and photomicrograph of HM (right)

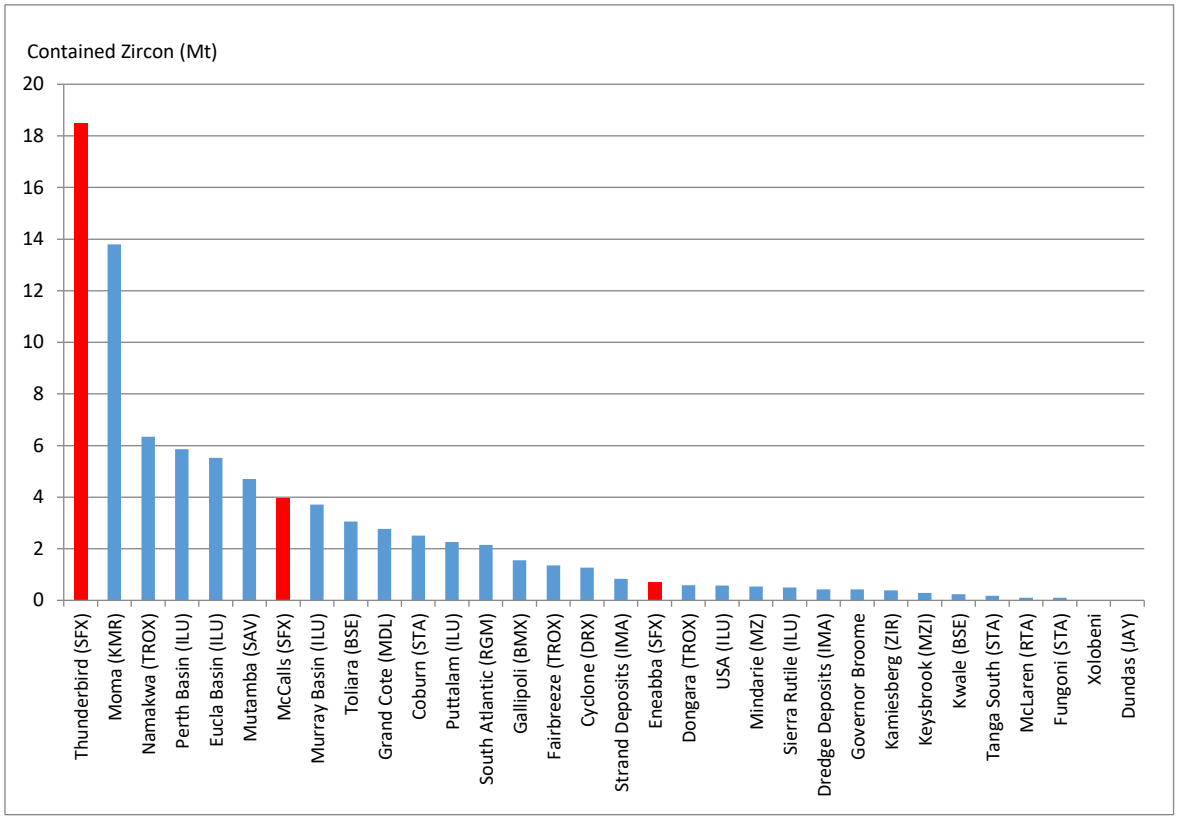

Figure 9: Sheffield Mineral Resources[1] by project displayed as contained zircon ranked against contained zircon within Mineral Resources of significant mineral sands operations and projects under investigation globally

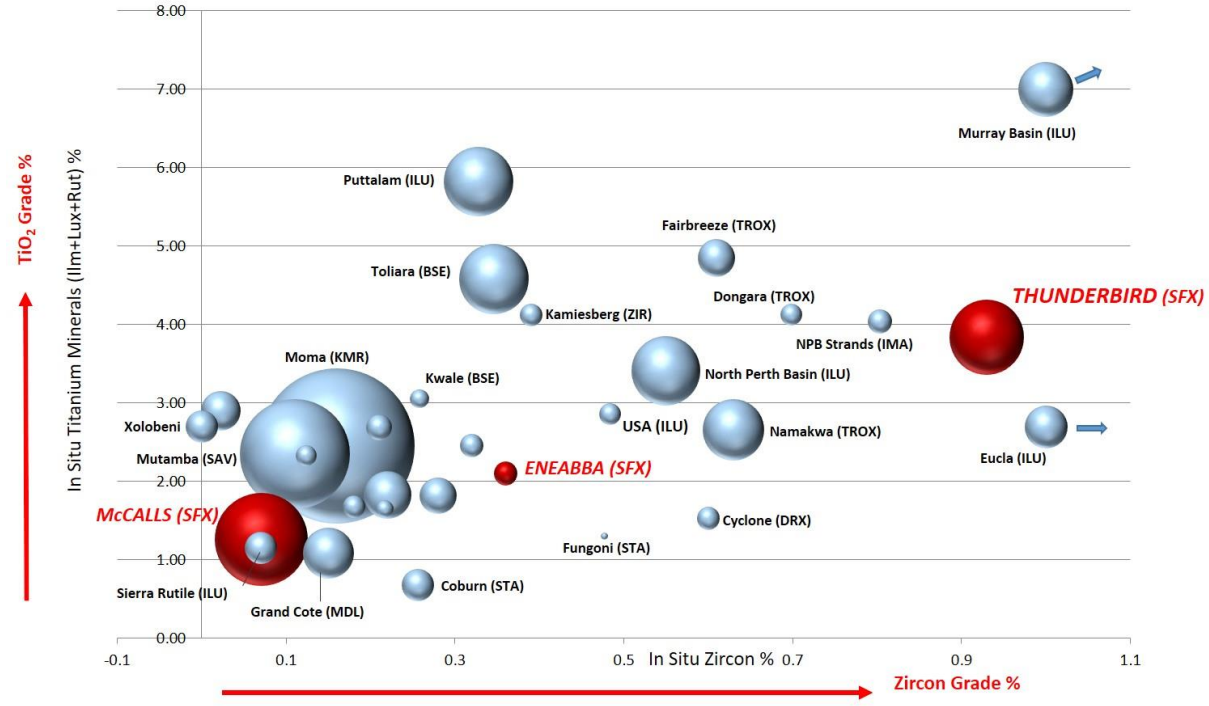

Figure 10: Sheffield Mineral Resources[1] ranked against published Mineral Resources of current mineral sands operations and projects under investigation globally

[1]Sheffield's Mineral Resources are published in this Ore Reserve and Mineral Resource Statement. Sheffield Mineral Resource ranked against Mineral Resources of current mineral sands operations and projects under investigation globally. Red bubbles are Sheffield's Mineral Resources. Bubble size proportional to tonnes of contained VHM. Data compiled by Sheffield from public sources. This analysis does not illustrate the variance in product value between rutile, leucoxene and ilmenite. Some Mineral Resources are excluded due to lack of JORC compliant or detailed reporting.

GOVERNANCE AND INTERNAL CONTROLS

Mineral Resource and Ore Reserve are compiled by qualified Sheffield personnel and/or independent consultants following industry standard methodology and techniques. The underlying data, methodology, techniques and assumptions on which estimates are prepared are subject to internal peer review by senior Company personnel, as is JORC compliance. Where deemed necessary or appropriate, estimates are reviewed by independent consultants. Competent Persons named by the Company are members of the Australasian Institute of Mining and Metallurgy and/or the Australian Institute of Geoscientists and qualify as Competent Persons as defined in the JORC Code 2012.

COMPETENT PERSONS AND COMPLIANCE STATEMENTS

The information in this report that relates to Exploration Results is based on information compiled by Mr David Archer, a Competent Person who is a Member of Australian Institute of Geoscientists (AIG). Mr Archer is a full-time employee of Sheffield Resources Ltd and has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr Archer consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

The Company's Ore Reserves and Mineral Resources Statement is based on information first reported in previous ASX announcements by the Company. These announcements are listed below and are available to view on Sheffield's website www.sheffieldresources.com.au. Mineral Resources and Ore Reserves reported for the Dampier Project and Mineral Resources reported for the Eneabba and McCalls Projects, are prepared and disclosed under the JORC Code 2012. The Company confirms that it is not aware of any new information or data that materially affects the information included in the relevant original market announcements and that all material assumptions and technical parameters underpinning the estimates in the relevant original market announcement continue to apply and have not materially changed.

The information in this report that relates to the estimation of the Ore Reserve is based on information compiled by Mr Per Scrimshaw, a Competent Person who is a Member of the Australasian Institute of Mining and Metallurgy. Mr Scrimshaw is employed by Entech Pty Ltd and has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr Scrimshaw consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

The information in this report that relates to the estimation of the Mineral Resources is based on information compiled by Mrs Christine Standing, a Competent Person who is a Member of the Australian Institute of Geoscientists (AIG) and the Australasian Institute of Mining and Metallurgy (AusIMM). Mrs Standing is a full-time employee of Optiro Pty Ltd and has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which she 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'. Mrs Standing consents to the inclusion in this report of the matters based on her information in the form and context in which it appears.

The information in this report that relates to the Thunderbird Mineral Resource is based on information compiled under the guidance of Mr Mark Teakle, a Competent Person who is a Member of the Australian Institute of Geoscientists (AIG) and the Australasian Institute of Mining and Metallurgy (AusIMM). Mr Teakle is a full-time employee of Sheffield Resources Ltd and has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr Teakle consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

The Competent Persons for reporting of Mineral Resources and Ore Reserves in the relevant original market announcements are listed below. The Company confirms that the form and context in which the Competent Persons' findings are presented have not been materially modified from the relevant original market announcement.

Ore Reserves and Mineral Resources prepared and first disclosed under the JORC Code 2012):

Item	Report title	Report Date	Competent Person(s)
Thunderbird Ore Reserve	Thunderbird Ore Reserve Update	16 March 2017	P. Scrimshaw
Thunderbird Mineral Resource	Sheffield Doubles Measured Mineral Resource At Thunderbird	5 July 2016	M. Teakle, C. Standing
Robbs Cross Mineral Resource	Quarterly Activities Report For The Period Ended 31 December 2017	25 January 2017	C. Standing
Thomson Mineral Resource	Quarterly Activities Report For The Period Ended 31 December 2017	25 January 2017	C. Standing
Yandanooka Mineral Resource	This announcement	This announcement	C. Standing
Durack Mineral Resource	This announcement	This announcement	C. Standing
Drummond Crossing Mineral Resource	This announcement	This announcement	C. Standing

West Mine North Mineral Resource	This announcement	This announcement	C. Standing
Ellengail Mineral Resource	This announcement	This announcement	C. Standing
McCalls Mineral Resource	This announcement	This announcement	C. Standing
Mindarra Springs Mineral Resource	This announcement	This announcement	C. Standing

Item	Name	Company	Professional Affiliation
Exploration Results	Mr David Archer	Sheffield Resources	MAIG
Mineral Resource Reporting	Mr Mark Teakle	Sheffield Resources	MAIG, MAusIMM
Mineral Resource Estimation	Mrs Christine Standing	Optiro	MAIG, MAusIMM
Ore Reserve	Mr Per Scrimshaw	Entech	MAusIMM

SUPPORTING INFORMATION REQUIRED UNDER ASX LISTING RULES, CHAPTER 5

The supporting information below is required, under Chapter 5 of the ASX Listing Rules, to be included in market announcements reporting estimates of Mineral Resources and Ore Reserves.

Section 1, Section 2, Section 3 and Section 4 of JORC Table 1 can be found in Appendices 1 and 2.

PREVIOUSLY REPORTED INFORMATION

This report includes information that relates to Exploration Results, Mineral Resources and Ore Reserves prepared and first disclosed under the JORC Code 2012 and a Bankable Feasibility Study. The information was extracted from the Company's previous ASX announcements as follows:

- Thomson and Robbs Cross Mineral Resources: "QUARTERLY ACTIVITIES REPORT FOR THE PERIOD ENDED 31 DECEMBER 2017" 30 January, 2018
- Thunderbird Ore Reserve: *"THUNDERBIRD ORE RESERVE UPDATE"* 16 March, 2017
- Thunderbird Bankable Feasibility Study: *"THUNDERBIRD BFS DELIVERS OUTSTANDING RESULTS"* 24 March, 2017
- McCalls Mineral Resource: *"QUARTERLY ACTIVITIES REPORT FOR THE PERIOD ENDED 30 JUNE 2016"* 25 July 2016.
- Thunderbird Mineral Resource: *"SHEFFIELD DOUBLES MEASURED MINERAL RESOURCE AT THUNDERBIRD"* 5 July, 2016
- Robbs Cross and Thomson Discovery: *"NEXT GENERATION OF MINERAL SANDS DISCOVERIES AT ENEABBA"* 23 July, 2015.

These announcements are available to view on Sheffield's website www.sheffieldresources.com.au.

The Company confirms that it is not aware of any new information or data that materially affects the information included in the relevant market announcements and, in the case of estimates of Mineral Resources, Ore Reserves and the Bankable Feasibility Study, that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Persons' findings are presented have not been materially modified from the relevant original market announcements.

FORWARD LOOKING AND CAUTIONARY STATEMENTS

The contents of this report reflect various technical and economic conditions at the time of writing. Given the nature of the resources industry, these conditions can change significantly over relatively short periods of time. Consequently, actual results may vary from those contained in this report.

Some statements in this report regarding estimates or future events are forward-looking statements. They include indications of, and guidance on, future earnings, cash flow, costs and financial performance. Forward-looking statements include, but are not limited to, statements preceded by words such as "planned", "expected", "projected", "estimated", "may", "scheduled", "intends", "anticipates", "believes", "potential", "predict", "foresee", "proposed", "aim", "target", "opportunity", "could", "nominal", "conceptual" and similar expressions. Forward-looking statements, opinions and estimates included in this report are based on assumptions and contingencies which are subject to change without notice, as are statements about market and industry trends, which are based on interpretations of current market conditions. Forward-looking statements are provided as a general guide only and should not be relied on as a guarantee of future performance. Forward-looking statements may be affected by a range of variables that could cause actual results to differ from estimated results and may cause the Company's actual performance and financial results in future periods to materially differ from any projections of future performance or results expressed or implied by such forward-looking statements. So there can be no assurance that actual outcomes will not materially differ from these forward-looking statements.

ENDS

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ABOUT SHEFFIELD RESOURCES

Sheffield Resources Limited is focused on developing its 100% owned, world class Thunderbird Mineral Sands Project, located in north-west Western Australia. Sheffield continues to also assess other regional exploration opportunities.

THUNDERBIRD MINERAL SANDS PROJECT

Thunderbird is one of the largest and highest grade mineral sands discoveries in the last 30 years.

Sheffield's Bankable Feasibility Study shows Thunderbird is a technically low risk, modest capex project that generates strong cash margins from globally significant levels of production over an exceptionally long mine life of 42 years.

Thunderbird will generate a high-quality suite of mineral sands products with specifications suited to market requirements. These products include Premium Zircon suitable for the ceramic sector and LTR Ilmenite which will be one of the highest-grade sulfate feedstocks available globally.

Thunderbird is located in one of the world's most attractive mining investment jurisdictions and is well placed to deliver long term, secure supply of high quality products to a range of potential customers.

The Company is targeting initial production in 2020. The initial planned production profile is aligned with expected emerging supply gaps in global mineral sands markets.

ASX Code:	SFX	Market Capitalisation:	A$264m
Issued shares:	229.8m	Cash (unaudited, 30 June 2018):	A$23.1m

APPENDIX 1

Summary of information to support the Eneabba Project Mineral Resource estimates and JORC Code 2012 edition Table 1 Reports

This update for the Eneabba Project is reported in accordance with the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves' (JORC Code) and ASX Listing Rules and provides a summary of information and JORC Code Table 1 commentary to support Sheffield's Mineral Resource estimates for the Eneabba Project within the Mid-west region of the Perth Basin, Western Australia. The Eneabba Project comprises seven mineral sands deposits: Drummond Crossing, Durack, Ellengail, Robbs Cross, Thomson, West Mine North and Yandanooka. The Eneabba Project is located near existing mineral sands operations and a network of highways and railway lines connecting to the Geraldton and Fremantle/Kwinana ports and is about 220km north of Perth.

The Mineral Resource inventory attributable to the Eneabba Project as at 1 October 2018, reported by JORC Code classification and above a cut-off grades of 1.4% total heavy minerals (THM) (Drummond Crossing, Durack, Robbs Cross, Thomson and Yandanooka) and 2.0% HM (Ellengail and West Mine North) and below a cut-off grade of 35% slimes (Durack and West Mine North) is presented in Table 1.1

Table 1.1 Eneabba Project Mineral Resource summary as at 1 October 2018

	Cut-off	Mineral Resources				Valuable HM grade (in-situ)				
Resource Category	THM %	Material (Mt)	THM %	SL %	OS %	Zircon %	Rutile %	Leucoxene %	Ilmenite %	Total VHM %
Measured	1.4	2.6	4.3	15	11	0.44	0.09	0.10	3.08	3.70
Indicated	Various	144.6	3.1	14	9	0.37	0.19	0.12	1.92	2.60
Inferred	Various	46.0	2.4	16	8	0.36	0.24	0.14	1.21	1.96
Total	**Various**	**193.3**	**3.0**	**14**	**9**	**0.36**	**0.20**	**0.13**	**1.77**	**2.46**

	In-situ	Mineral assemblage (% of THM)				Contained valuable HM				
Resource Category	THM (kt)	Zircon %	Rutile %	Leucoxene %	Ilmenite %	Zircon (kt)	Rutile (kt)	Leucoxene (kt)	Ilmenite (kt)	Total VHM (kt)
Measured	112	10	2.1	2.3	72	12	2	3	81	98
Indicated	4,519	12	6.1	3.9	62	529	276	176	2,782	3,764
Inferred	1,091	15	10.3	5.8	51	165	113	64	559	900
Total	**5,723**	**12**	**6.8**	**4.2**	**60**	**705**	**392**	**242**	**3,423**	**4,762**

Notes: 1. The in-situ grade is determined by multiplying the percentage of THM by the percentage of each valuable heavy mineral within the heavy mineral assemblage at the resource block model scale.
2. Tonnes and grades have been rounded to reflect the relative accuracy and confidence level of the estimate, thus the sum of columns may not equal.

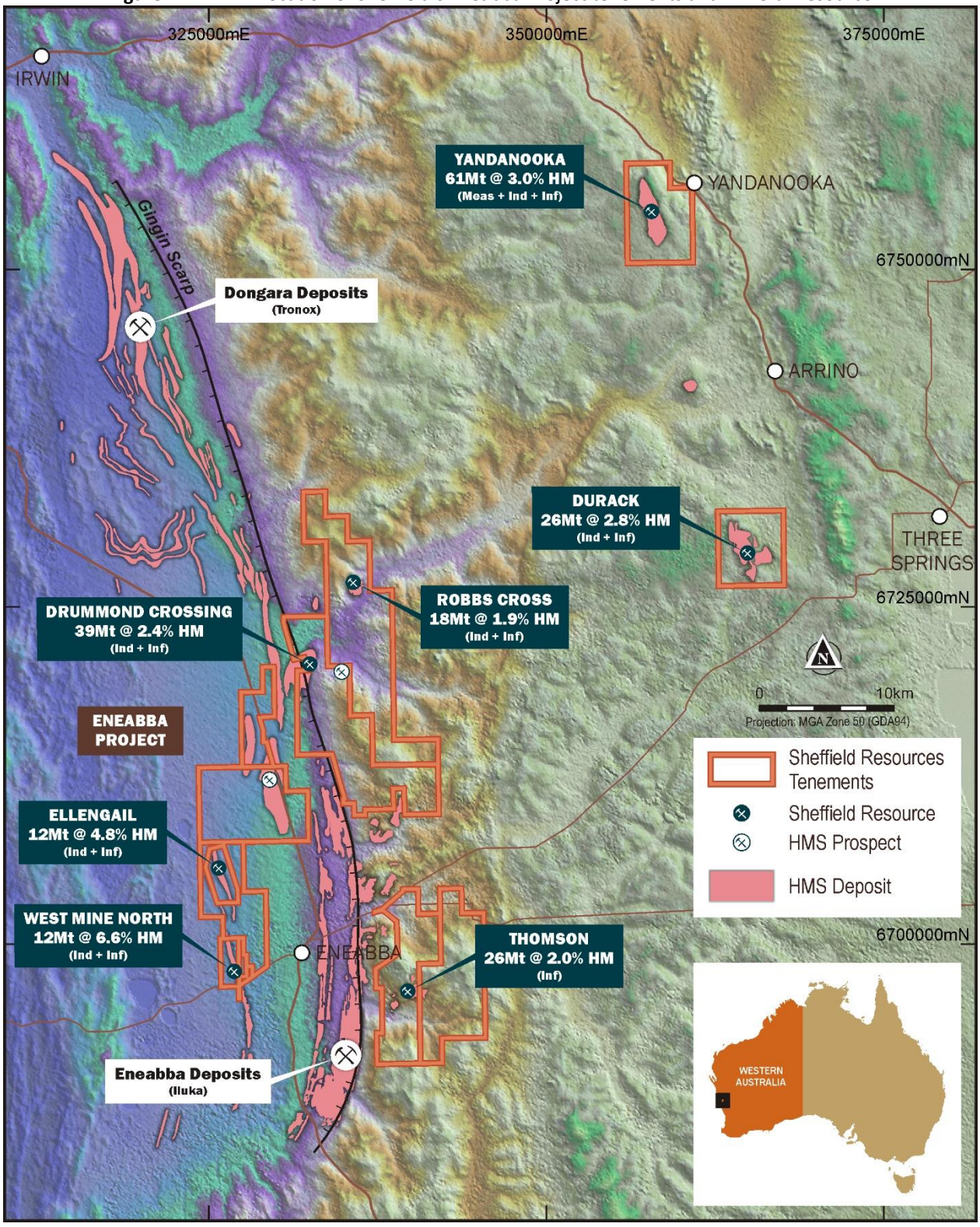
Ownership/Tenure

A summary of Sheffield's current tenement holding in the Eneabba region which hosts the Eneabba Project Mineral Resources is included as Table 1.2 and displayed in Figure 1.1. The tenements are 100% owned by Sheffield Resources Ltd.

Table 1.2 Eneabba Project tenement summary

Deposit	Licence	Status	Grant date	Expiry date	Area (km²)
Drummond Crossing	E70/3814	Granted	10/11/2010	09/11/2020	78.8
Durack	E70/3762	Granted	05/05/2011	04/05/2021	26.9
Ellengail	R70/035	Granted	01/08/2007	31/07/2019	6.9
Robbs Cross	E70/4292	Granted	05/10/2012	04/10/2022	125.4
Thomson	E70/4190	Granted	27/06/2012	26/06/2022	60.8
	E70/4747	Granted	27/10/2016	26/10/2021	44.7
West Mine North	M70/872	Granted	07/04/1997	06/04/2039	0.7
	M70/965	Granted	23/01/1997	21/01/2023	4.9
	M70/1153	Granted	04/03/2004	03/03/2025	1.3
Yandanooka	E70/3813	Granted	10/11/2010	09/11/2020	44.9

Figure 1.1 Location of Sheffield's Eneabba Project tenements and Mineral Resource

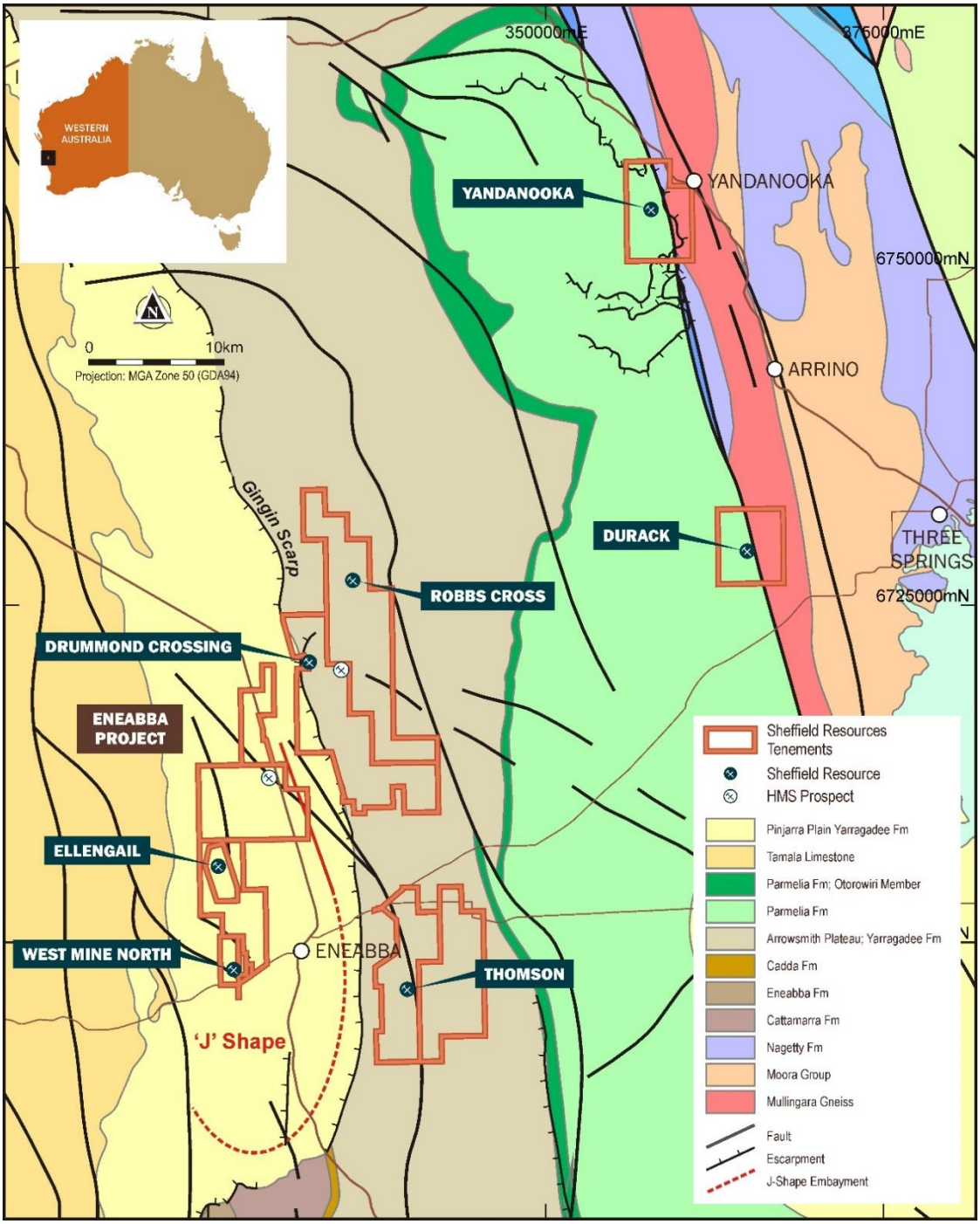


Deposit geology and interpretation

Sheffield's Eneabba Project is hosted within the North Perth Basin. The Gingin Scarp is a remnant feature of a marine incursion which resulted in the reworking of older rocks and ended in the deposition of heavy mineral sand enriched beach placers within Cainozoic sediments (Figure 1.2). The heavy mineral concentrations at Drummond Crossing, Durack, Ellengail, West Mine North and Yandanooka are interpreted to be dunal-style accumulations deposited on a plateau formed by an Eocene-aged paleo-shoreline. The West Mine North and

Ellengail deposits include strandline mineralisation and there is a small component of fluviatile sediments at Thomson.

Figure 1.2 Regional GSWA geology of the Eneabba Project area



A combination of geology and grade were used to interpret the mineralisation and geological domains. Data distributions were examined using cumulative probability plots and show that the heavy mineral (HM) grades selected by Sheffield for interpretation of the mineralisation correspond to grade inflections. Mineralised domains were defined at Drummond Crossing, Durack and Yandanooka using a nominal cut-off grade of 0.7% HM; at West Mine North using a nominal cut-off grade of 0.8% HM; and Ellengail, Robbs Cross and Thomson using a nominal cut-off grade of 0.9% HM. Additional higher grade domains were defined at Durack (>1.9% HM), Ellengail (>2% HM), West Mine North (>2.5% HM) and Yandanooka (>3% HM).

Geological interpretation included modelling of rock domains (including laterite, intervals with high induration or sediments with high oversize contents) at Drummond Crossing, Durack, Ellengail, West Mine North and Yandanooka. Horizons with high slimes contents were interpreted as separate domains at Durack (>35% slimes), Thomson (>34% slimes) and Yandanooka (>20% slimes).

Statistical analysis, including boundary analysis, was used to verify the mineralisation and geological domains. The dimensions of the mineralisation used for the resource estimates are listed in Table 1.3 and representative drill sections are included in Figure 1.3 to Figure 1.9.

Table 1.3 Dimensions of Mineral Resources

Deposit		Strike length (m)	Across strike width (m)	Average thickness (m)	Depth (m)
Drummond Crossing		4,000	up to 2,300	8	Surface to 30
Durack		5,000	up to 1,500	6	Surface to 16.5
Ellengail		3,200	up to 1,400	7	Surface to 25
Robbs Cross		1,800	up to 1,500	9	Surface to 30
Thomson	dunal	1,600	up to 1,100	9	Surface to 22.5
	fluviatile	3,300	up to 4,000	12	Surface to 31.5
West Mine North	strandline	4,000	up to 270	19	1 to 49.5
	dunal	4,000	up to 2,300	8	13.5 to 48
Yandanooka		6,000	2,000	7	Surface to 24

Figure 1.3: Drummond Crossing - cross-section along 6,720,220mN of interpreted domains and drill holes

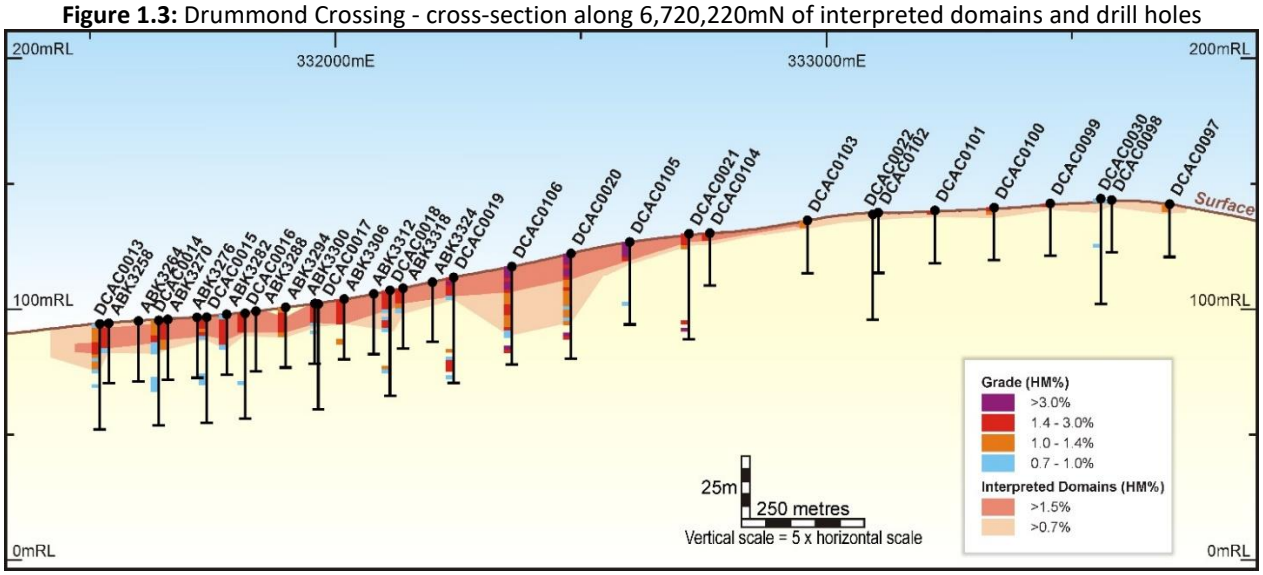


Figure 1.4: Durack - cross-section along 6,729,200mN of interpreted domains and drill holes

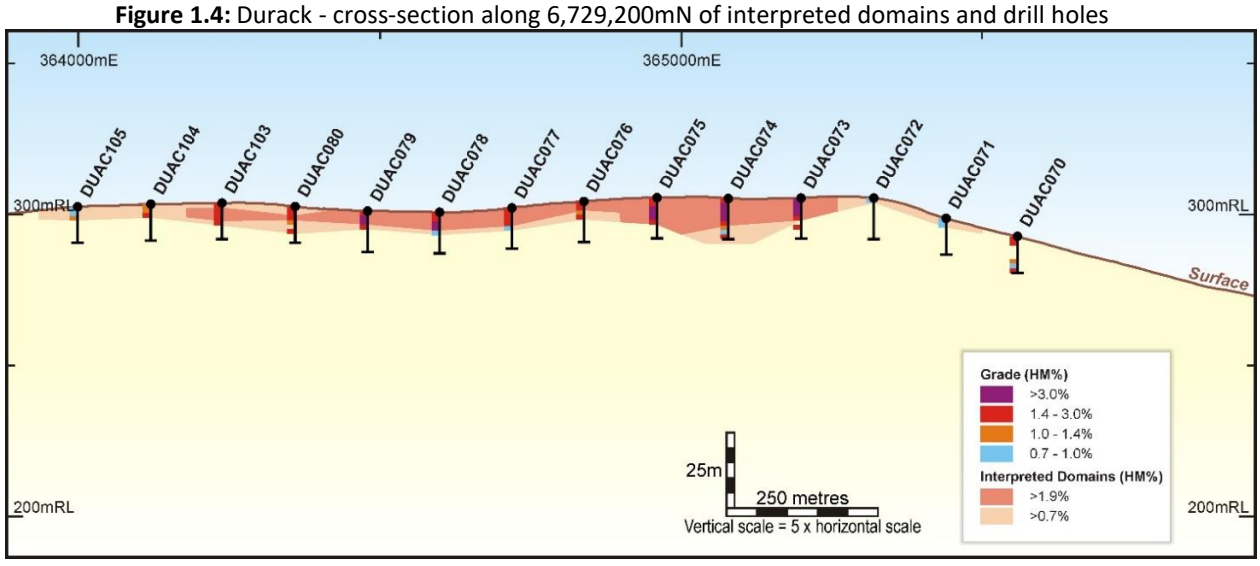


Figure 1.5: Ellengail - cross-section 6,705,040mN of interpreted domains and drill holes

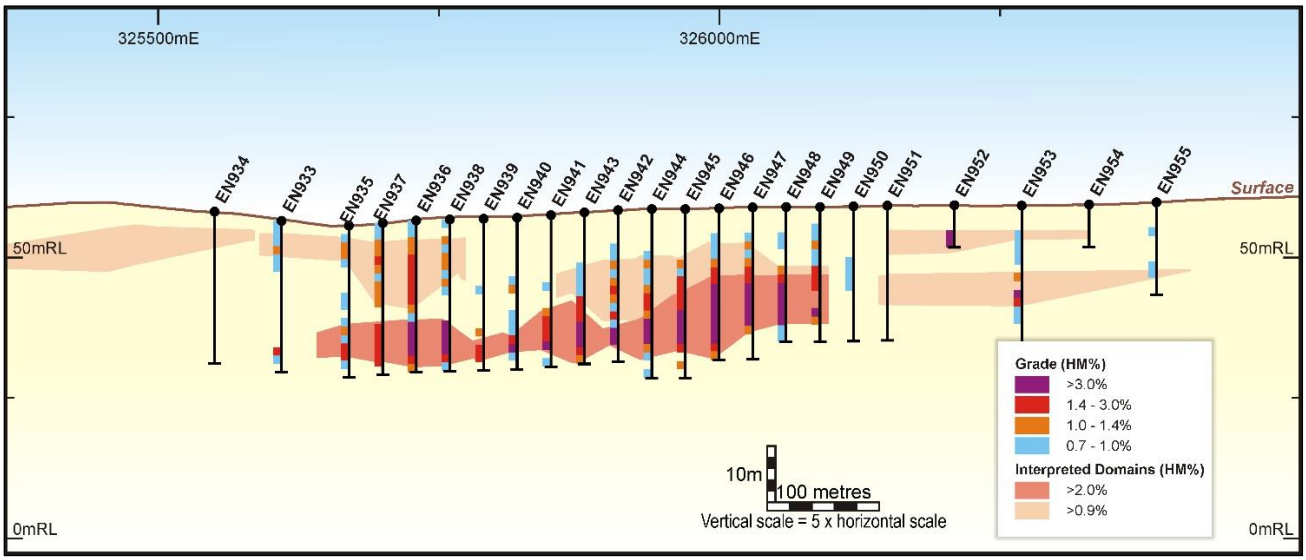


Figure 1.6: Robbs Cross – cross-section 6,726,850mN of interpreted domains and drill holes

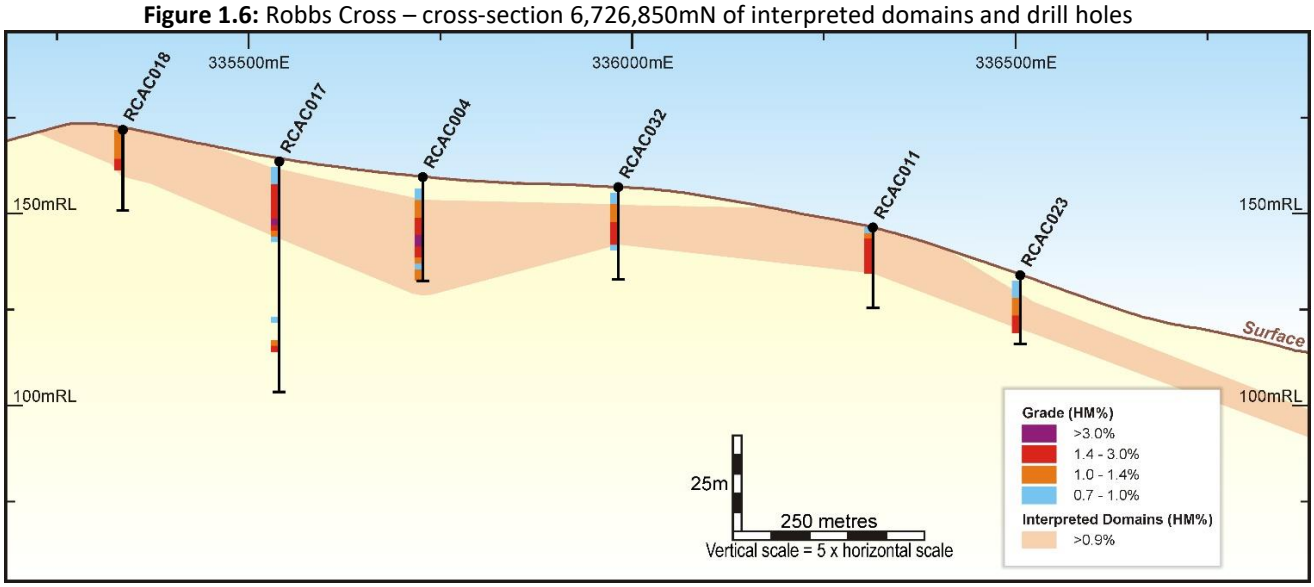


Figure 1.7: Thomson - cross-section 6,696,325mN of interpreted domains and drill holes

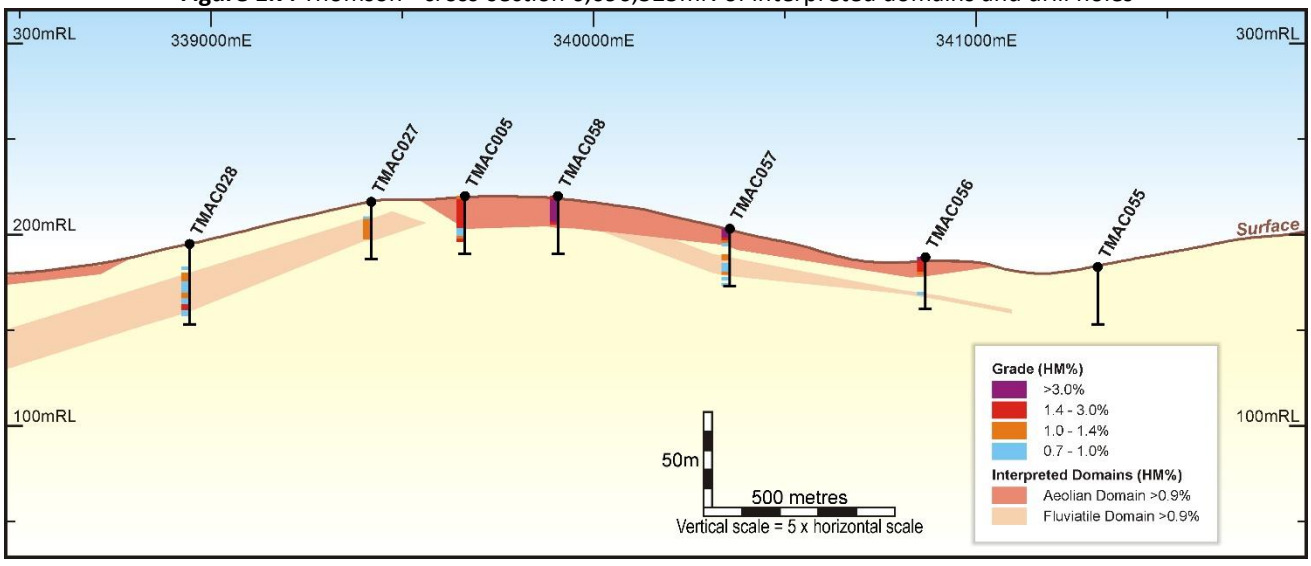


Figure 1.8: West Mine North - cross-section 6,698,300mN of interpreted domains and drill holes

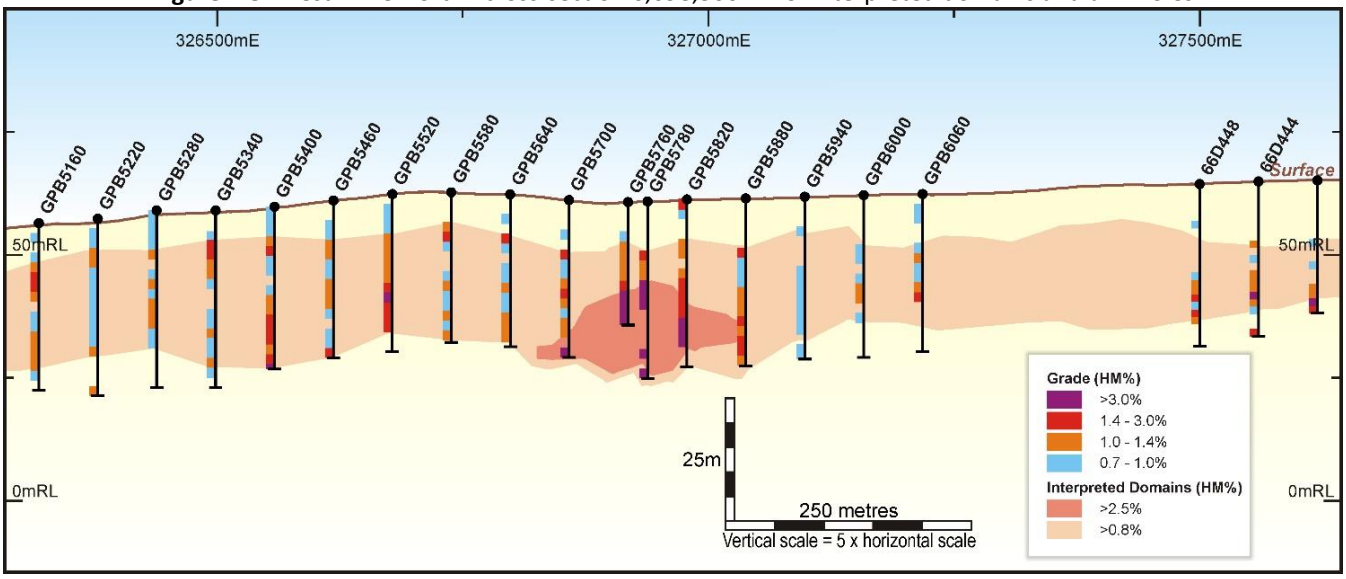
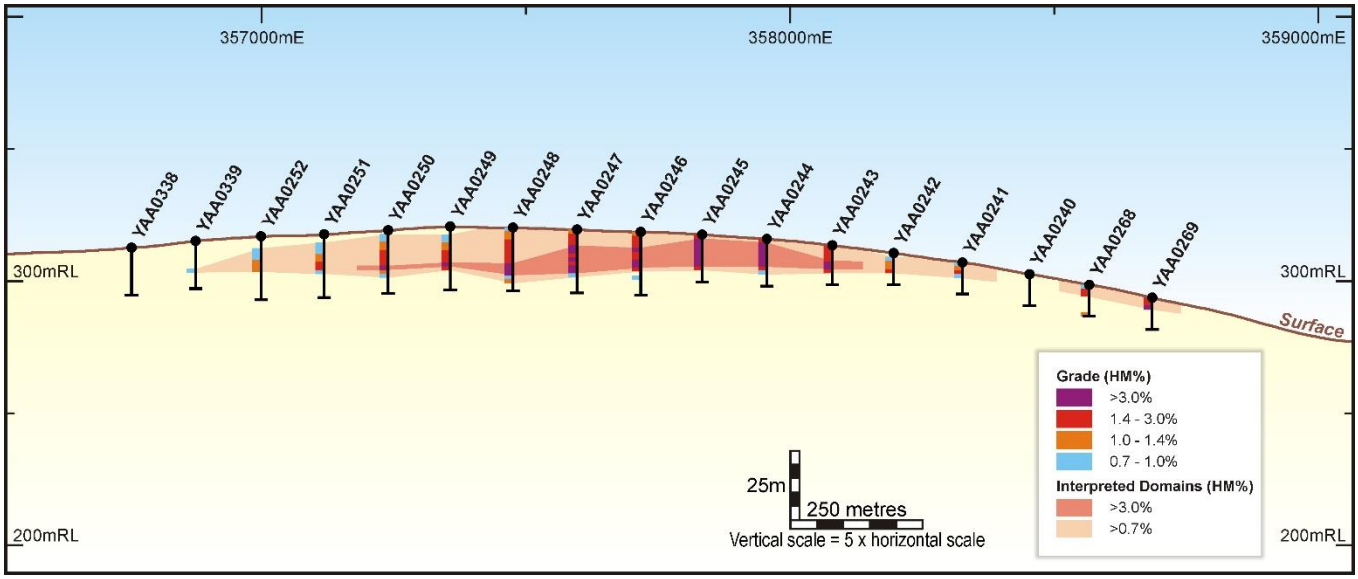


Figure 1.9: Yandanooka - cross-section along 6,755,000mN of interpreted domains and drill holes



Drilling and sampling techniques

The Eneabba Project region (including the Drummond Crossing, Durack, Ellengail, West Mine North and Yandanooka deposits) was first explored for heavy mineral sands by Renison Goldfields Consolidated Limited (RGC) during the late 1980s and 1990s and by Iluka Resources Limited (Iluka) between 2000 and 2006. Sheffield discovered the Robbs Cross and Thomson HM deposits in 2015. Sheffield completed various phases of drilling at each deposit, apart from Ellengail, and combined this data with historic data for each Mineral Resource estimate. Sheffield's drilling was by aircore, collecting 1-3 kg samples at nominal 1.5m intervals down-hole.

All drilling data was used for geological interpretation and all assay data (except for the Iluka data at Durack, where the Sheffield drill holes twinned the Iluka holes) was used for estimation. A summary of the drilling carried out on each deposit and used for Mineral Resource estimation is included in Table 1.4 (Note: In the following tables SFX refers to Sheffield Resources).

Table 1.4: Summary of drilling for each deposit supporting the Eneabba Project Mineral Resources

Deposit	Company (year)	Number of drill holes	Metres drilled	Number of HM assays	Spacing
Drummond Crossing	RGC (1989-1998)	154	4,222	1,511	Overall spacing of 120mE by 400mN
	Iluka (2000)	10	186	124	
	SFX (2011-2012)	135	4,063	2,704	
	Total	299	8,471	4,467	
Durack	Iluka (2005)	175	1,583	1,080	400mE by 1,800mN 120mE by 400mN
	SFX (2012)	161	2,214.5	1,475	
	Total	336	3,797.5	2,555	
Ellengail	RGC (1988-1998)	109	3,019	1,412	Overall spacing of 60mE by 200mN with some infill to 30mE
	Iluka (2000-2002)	162	3,608	1,888	
	Total	271	6,627	3,300	
Robbs Cross	SFX (2015-2017)	52	1,167	778	200mE by 200mN to 300mE by 400mN
	Total	52	1,167	778	
Thomson	SFX (2015-2017)	58	1,707	1,137	450mE by 450mN to 700mE by 570mN
	Total	58	1,707	1,137	
West Mine North	RGC (1987-1996)	389	15,522.4	9,496	Overall spacing of 30mE by 50mN Lines at 200mN spacing in northern area of deposit
	Iluka (2004-2005)	148	5,247.5	1,535	
	SFX (2011	90	3,395.0	2,264	
	Total	388	24,164.9	13,295	
Yandanooka	Iluka (2004-2006)	119	1,791	708	Overall spacing of 120mE by 300mN Single 'cross' at 20mE by 125mN
	SFX (2011-2012)	393	7,074	4,719	
	Total	512	8,895	5,424	

Survey

Drill holes were located using the MGA94, Zone 50 coordinate system. Collar locations of the Sheffield drill holes at Durack, West Mine North and Yandanooka were located by registered surveyors Heyhoe Surveys Pty Ltd using RTK-GPS. Collar locations of the Sheffield drill holes at Drummond Crossing, Robbs Cross and Thomson were located using a Garmin hand-held GPS, with an expected horizontal accuracy of +/- 5m. Collar locations of the Iluka drill holes at Durack and Yandanooka were located using a hand-held GPS. The methods used to locate the RGC and Iluka drill holes at Drummond Crossing, Ellengail and Yandanooka were not recorded in historic reports and are therefore not known.

Digital elevation models (DEM) were obtained by Sheffield from Landgate (Western Australian Government lands department), with an accuracy of +/- 1.5m, for the Eneabba Project tenement areas. The drill hole collar data was projected to the DEM surfaces to determine the collar elevations and the DEMs were used to constrain the resource models to below the topographical surface.

Geological logging

The Sheffield drill holes were logged in their entirety by Sheffield geologists. The drill samples were washed and panned, then geologically logged on site in 1.5m intervals. The primary, secondary and oversize lithology, qualitative hardness, grain size, rounding, sorting, washability, colour and sample quality are logged. Total HM, slimes and oversize contents were visually estimated for checking with assay data and the depth to water table was recorded.

Iluka logged lithology, grain size, colour, second lithology, sorting, hardness, visual estimates of total HM and some visual estimates of slimes. RGC logged grain size, oversize, sorting, hardness and also colour in 1997 and visual estimates of total HM in 1998.

Sample analysis

Total heavy mineral, slimes and oversize determination was by screen, weight and heavy liquid separation. The analysis process involved desliming and removal of oversize material. The heavy minerals within the remaining sand fraction were separated using a heavy liquid to determine the heavy mineral content.

Samples from Robbs Cross and Thomson were analysed by Diamantina Laboratories in Perth using a -45µm slimes / +1mm oversize screen (method DIA_HLS_45µm_1mm). Separation of total HM% was by heavy liquid TBE (density 2.96g/ml) from the +45µm-1mm fraction.

Samples from Sheffield's drill holes at Drummond Crossing, Durack, West Mine North and Yandanooka were analysed by Western Geolabs in Perth using a -53µm slimes / +1 mm oversize screen. Separation of total HM% was by heavy liquid TBE (density 2.96 g/ml) from the +53µm-1mm fraction.

Samples from the RGC and Iluka drill holes were analysed at RGC and Iluka's Narngulu laboratory at Geraldton, Western Australia. Samples from 1989 and 1996 (Drummond Crossing, Ellengail and West Mine North) were analysed using a -75µm screen for slimes, a +2mm screen for oversize and a -710µm screen for the sand fraction. Separation of HM% was by heavy liquid TBE (density 2.84 g/ml) from the -710µm+75µm fraction. RGC samples from 1998 and Iluka samples (Drummond Crossing, Durack, Ellengail, West Mine North and Yandanooka) were analysed using a -53µm screen for slimes, a +2mm screen for oversize and a -710µm screen for the sand fraction. Separation of total HM% was by heavy liquid TBE (density 2.90g/ml) from the-710µm+53µm fraction.

A summary of the sample analysis methods for HM, slimes and oversize is included in Table 1.5.

Table 1.5: Summary of sample analysis methods for HM, slimes and oversize

Deposit	Company (year)	Assay Laboratory	Size fraction
Drummond Crossing	RGC (1989-1990)	Narngulu	-75µm slimes, +2mm oversize, HM in -710µm+75µm fraction
	RGC (1998)	Narngulu	-53µm slimes, +2mm oversize, HM in -710µm+53µm fraction
	Iluka (2000)	Narngulu	-53µm slimes, +2mm oversize, HM in -710µm+53µm fraction
	SFX (2011-2012)	Western Geolabs	-53µm slimes, +1mm oversize, HM in +53µm-1mm fraction
Durack	Iluka (2005)	Narngulu	-53µm slimes, +2mm oversize, HM in -710µm+53µm fraction
	SFX (2012)	Western Geolabs	-53µm slimes, +1mm oversize, HM in +53µm-1mm fraction
Ellengail	RGC (1988-1998)	Narngulu	-75µm slimes, +2mm oversize, HM in -710µm+75µm fraction
	Iluka (2000-2002)	Narngulu	-53µm slimes, +2mm oversize, HM in -710µm+53µm fraction
Robbs Cross	SFX (2015-2017)	Diamantina and	-45µm slimes, +1mm oversize, HM in +45µm-1mm fraction
Thomson	SFX (2015-2017)	Diamantina	-45µm slimes, +1mm oversize, HM in +45µm-1mm fraction
West Mine North	RGC (1987-1996)	Narngulu	-75µm slimes, +2mm oversize, HM in -710µm+75µm fraction
	Iluka (2004-2005)	Narngulu	-53µm slimes, +2mm oversize, HM in -710µm+53µm fraction
	SFX (2011	Western Geolabs	-53µm slimes, +1mm oversize, HM in -710µm+53µm fraction
Yandanooka	Iluka (2004-2006)	Narngulu	-53µm slimes, +2mm oversize, HM in -710µm+53µm fraction
	SFX (2011-2012)	Western Geolabs	-53µm slimes, +1mm oversize, HM in +53µm-1mm fraction

Sheffield prepared composite samples of the heavy mineral concentrates (HMC) from its drill hole samples for all of the Eneabba deposits, except Ellengail. The composite samples were selected to represent the mineralised domains identified at each of the deposits. The mineral assemblage was analysed using Quantitative Evaluation of Minerals by Scanning electron microscopy (QEMSCAN™) by Bureau Veritas Mineral Laboratories to determine the percentage of ilmenite, leucoxene, rutile and zircon within the total HM fraction. For Drummond Crossing, Durack, Robbs Cross, Thomson and Yandanooka, the following breakpoints were used to distinguish between the TiO_2 minerals: rutile (>95% TiO_2), leucoxene (85-95% TiO_2) and ilmenite (<55-85% TiO_2).

At West Mine North the mineral assemblage used for resource estimation was from 12 composites analysed by QEMSCAN and 83 composites analysed by Iluka using their internal "Method 4 Eneabba Grouping" (Method 4). For Method 4, the HMC is separated into magnetic and non-magnetic fractions. The non-magnetic fraction is separated using heavy liquid TMF (Clerici's solution) to -3.79 (kyanite), -4.05 (non-magnetic leucoxene), +4.05 (rutile, zircon and baryte) and +4.38 (quality zircon). The magnetic fraction is separated into -3.85 (rock, staurolite and others), +3.85 (ilmenite and garnet) and +4.05 (ilmenite, monazite, zircon and garnet). The breakpoints for the QEMSCAN data were calibrated with the mineral assemblage data determined using Method 4. For the QEMSCAN data the application of breakpoints to distinguish between rutile (>95% TiO_2), leucoxene (70-95% TiO_2) and ilmenite (<55-70% TiO_2) were found to equate to the TiO_2 mineral distributions determined by Method 4.

At Ellengail the data from QEMSCAN and Iluka's internal "Method 3" were used for resource estimation of the two central domains (strandline and overlying dunal sediments). Mineral assemblage values were assigned to three of the dunal domains using Method 3 and Method 4 data. Method 3 passes the concentrate over a permroll magnet at 500, 400, 350, 300 and 270 rpm. Half of each fraction is combined for size analysis and electrostatic separation and XRF analysis of each fraction is used to determine chemical compositions and inferred mineral species. For the QEMSCAN data the application of breakpoints to distinguish between rutile (>95% TiO_2), leucoxene (75-95% TiO_2) and ilmenite (<75% TiO_2) were found to equate to the TiO_2 mineral distributions determined by Method 3.

Table 1.6: Summary of mineral assemblage data used for resource estimation

Deposit	Company	Number composites	Number of drill holes	Total sample length (m)	Method
Drummond Crossing	SFX	17	27	223.5	QEMSCAN
Durack	SFX	13	25	187.5	QEMSCAN
Ellengail	Iluka	17	64	549.5	Method 3 and 4
	SFX	3	5	76.5	QEMSCAN
Robbs Cross	SFX	7	20	183.0	QEMSCAN
Thomson	SFX	8	21	187.5	QEMSCAN
West Mine North	Iluka	83	117	2,534.5	Iluka Method 4
	SFX	12	16	214.5	QEMSCAN
Yandanooka	SFX	25	54	373.5	QEMSCAN

QAQC and data quality

Quality assurance and quality control (QAQC) data is not available for the historical RGC and Iluka drilling.

QAQC procedures for Sheffield's drilling programmes included the insertion of field standards (including blank material) and field duplicates at the drill site. Blank material was locally sourced or commercially available builder's sand. The standard material is not certified and is locally sourced and was used primarily to identify analytical trends or bias over time.

No trends or bias were noted for the analysis of the blank and standard material. Overall results indicate that analysis of HM by the duplicate samples had moderate to good correlation with the original samples.

The assay data are considered to have sufficient quality for the purpose of estimation and reporting of Mineral Resources.

Table 1.7: Summary of QAQC sample submission rates

Deposit	Standards (including blanks)	Field duplicates
Drummond Crossing	1 in 19	1 in 37
Durack	1 in 37	1 in 37
Robbs Cross	1 in 20	1 in 40
Thomson	1 in 20	1 in 40
West Mine North	1 in 19	1 in 37
Yandanooka	1 in 38	1 in 38

Density

Bulk density was determined using a proprietary formula supplied by the leading global mineral sands consultancy TZ Minerals International (TZMI). The formula is based on heavy mineral and slimes percentage concentrations and includes assumptions about both packing content and mineral densities. All tonnages for the Mineral Resource estimates are expressed on a dry tonnage basis.

Data analysis

Data analysis and estimation was undertaken by Optiro using Snowden Supervisor and Datamine software. At Durack, Robbs Cross and Thomson the data used for resource estimation has all been taken over intervals of 1.5m. Within the interpreted mineralised domains the majority of the assay data from the other deposits is from intervals of 1.5m (Drummond Crossing – 80%, Ellengail – 94%, West Mine North – 83% and Yandanooka – 74%). Drill samples were composited to 1.5m down hole intervals for data analysis and grade estimation.

A number of high grade outliers are present and top-cut grades (cap grades) were selected by examining histograms, log probability plots, population disintegration and population statistics before and after top-cutting (mainly the mean and coefficient of variation). Top-cut grades were applied to the following:

- HM - Durack, Ellengail, West Mine North and Yandanooka
- Slimes - Drummond Crossing, Durack, Ellengail, Robbs Cross, Thomson, West Mine North and Yandanooka
- Oversize - Drummond Crossing, Durack, Ellengail, Robbs Cross, Thomson and West Mine North.

Variogram analysis was undertaken to determine the HM, slimes and oversize continuity within the mineralised horizons and the horizontal continuity ranges for the mineral assemblage components. Kriging neighbourhood analysis was undertaken to determine the block size and the kriging parameters.

Mineral Resource estimation

The resource models were developed for the Eneabba deposits by Optiro using Datamine software. Parent blocks were used for grade estimation and sub-cells were used to more accurately represent the geometry and volumes of the geological and mineralisation horizons (Table 1.8).

Table1.8: Block sizes used for grade estimation and volume control

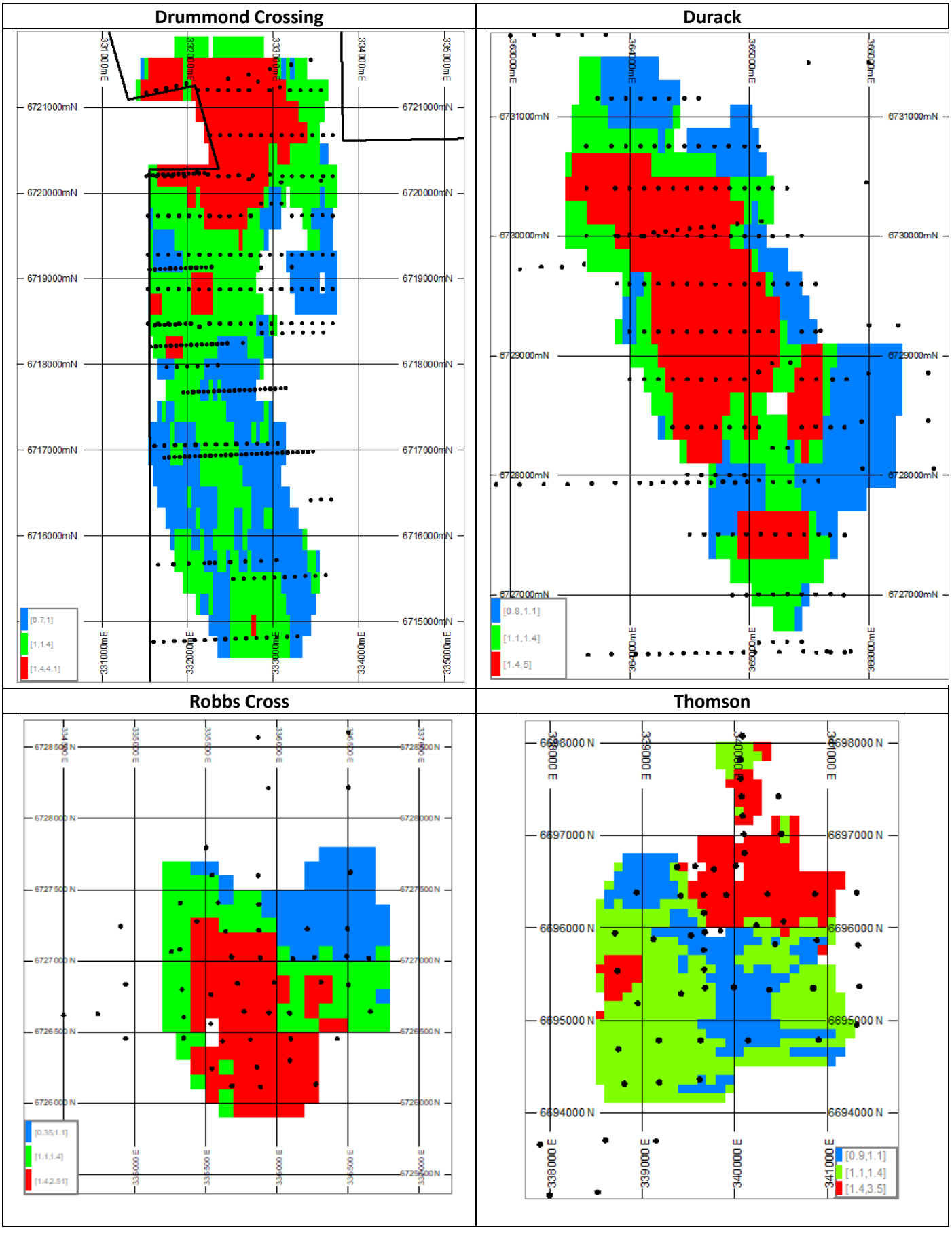
Deposit	Parent block size			Sub-cell size		
	X	Y	Z	X	Y	Z
Drummond Crossing	50mE	250mN	1.5mRL	10mE	50mN	0.5mRL
Durack	60mE	200mN	1.5mRL	12mE	40mN	0.5mRL
Ellengail	20mE	100mN	1.5mRL	5mE	20mN	0.5mRL
Robbs Cross	100mE	100mN	3mRL	20mE	20mN	1mRL
Thomson	100mE	100mN	3mRL	20mE	20mN	1mRL
West Mine North	15mE	25mN	1.5mRL	3mE	5mN	0.5mRL
Yandanooka	50mE	200mN	1.5mRL	10mE	40mN	0.5mRL

HM, slimes and oversize block grades were estimated using ordinary kriging techniques with appropriate top-cuts applied to the HM, slimes and oversize data and search ellipses oriented within the plane of the mineralisation. Inverse distance (cubed) was used to estimate the percentage of ilmenite, leucoxene, rutile and zircon. Plans of the HM grade averaged over the entire thickness of the deposits are included in Figure 1.9.

The block models were validated by:

- visual comparison of the drill holes and blocks
- statistical comparison of the mean input grade (top-cut and declustered) with the estimated block grade
- examining trend plots of the input data and estimated block grades.

Figure 1.9: Plans of Mineral Resources coloured by average HM (green and red are above reporting cut-off grade)



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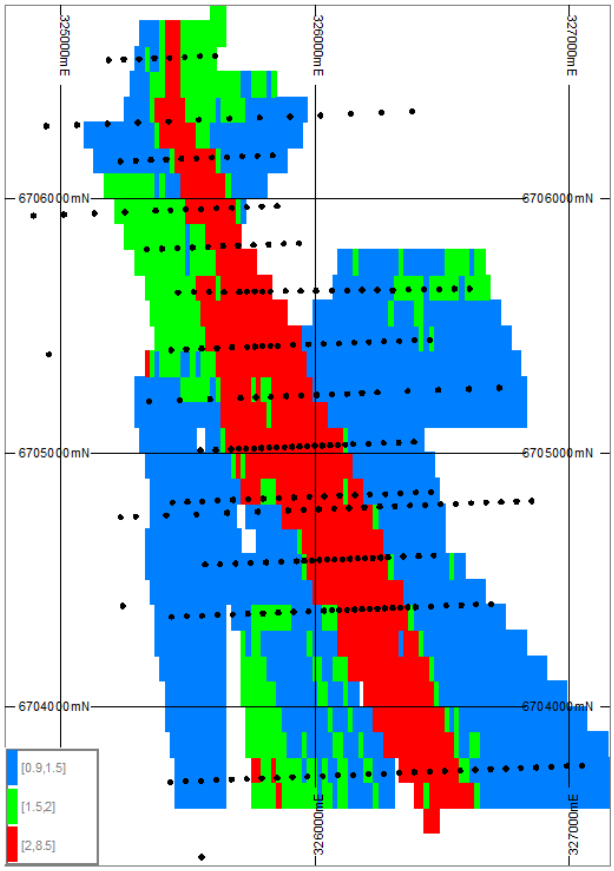
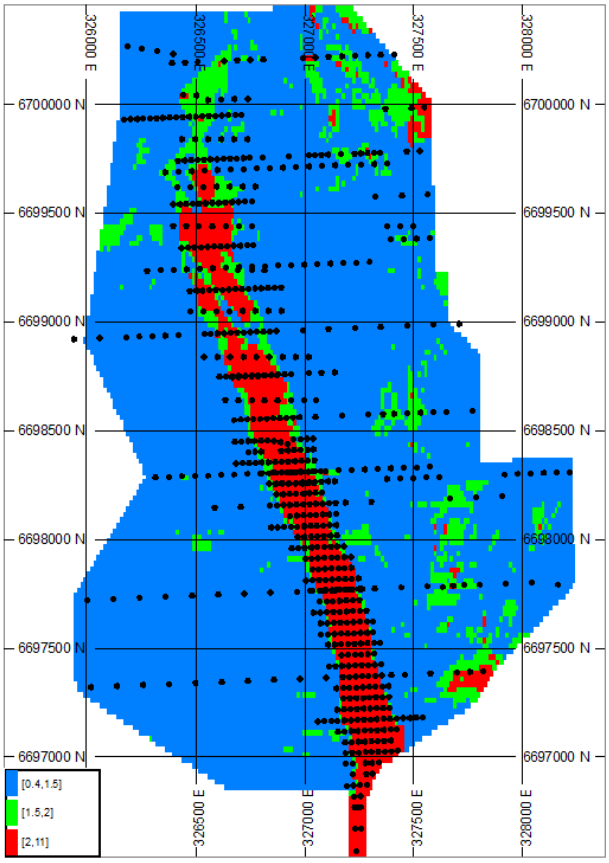
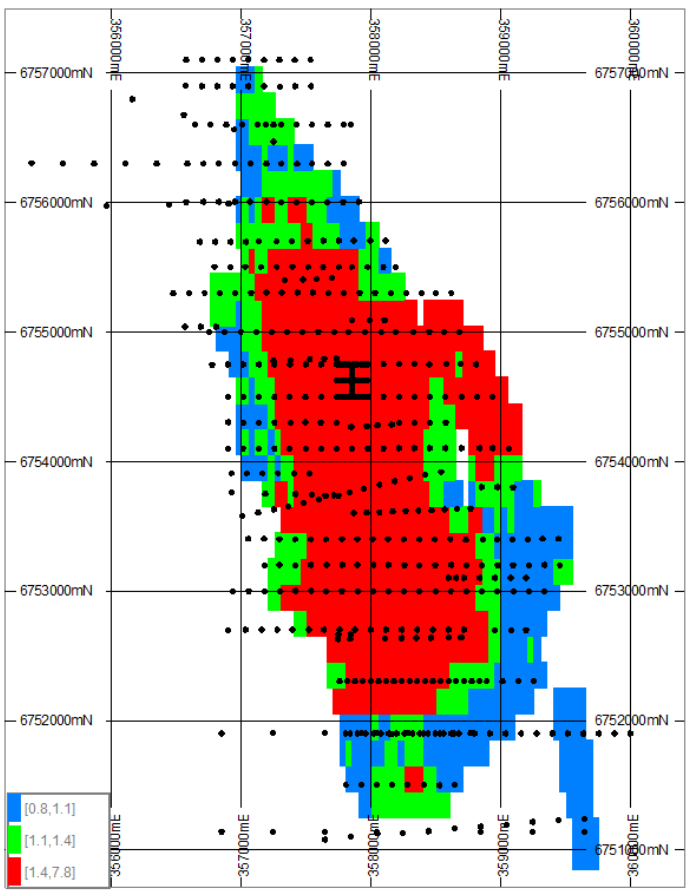
Ellengail



West Mine North



Yandanooka



Mineral Resource classification

The Mineral Resource estimates have been classified on the basis of confidence in geological and grade continuity and taking into account data quality (historical nature and lack of QAQC data for some drilling data), different grain size fractions used for analysis (at Drummond Crossing and West Mine North), data density and confidence in estimation of heavy mineral content and mineral assemblage.

Drummond Crossing

- Indicated Mineral Resource - where drill sections are up to 500m apart and where there is sufficient mineral assemblage data.
- Inferred Mineral Resource - where the drill sections are spaced at 500m to 600m and there is limited mineral assemblage data.

Durack

- Indicated Mineral Resource - where drilling is at a spacing of approximately 120mE by 40mN or closer and there is sufficient mineral assemblage data.
- Inferred Mineral Resource - where the drill spacing is up to 500mE by 500mN or where there is limited mineral assemblage data.

Ellengail

- Indicated Mineral Resource - within the central strandline and dunal domains where the drill section spacing is up to 200m and there is sufficient mineral assemblage data.
- Inferred Mineral Resource - within the central strandline and dunal domains where the drill section spacing more than 200m and there is limited mineral assemblage data, and within the surrounding dunal sediments.

Robbs Cross

- Indicated Mineral Resource - where drilling is generally at a spacing of approximately 200m to 300m.
- Inferred Mineral Resource - around the margins of Indicated Mineral Resources, where the drill spacing is at approximately 400m.

Thomson

- Inferred Mineral Resource - where the drill spacing is at or less than 700m.

West Mine North

- Indicated Mineral Resource - where drill sections are at a spacing of up to 200m.
- Inferred Mineral Resource - where the drill sections are up to 800m apart.

Yandanooka

- Measured Mineral Resource - in the centre of the deposit where there is close spaced drilling at a nominal spacing of 20mE by 125mN.
- Indicated Mineral Resource - where drilling is on sections spaced at approximately 200m to 300m or closer.
- Inferred Mineral Resource - within the southern area where the drilling is on sections spaced at around 400m to 800m and mineral assemblage data has been extrapolated.

The assigned classification of Measured, Indicated and Inferred at the Eneabba deposits reflects the Competent Person's assessment of the accuracy and confidence levels in the Mineral Resource estimate.

Mineral Resource statement

The Mineral Resource estimates have been classified and reported in accordance with the guidelines of the JORC Code (2012 edition). Sheffield selected cut-off grades to represent the resources that may be considered for eventual economic extraction criteria and the Mineral Resource at Drummond Crossing, Durack, Robbs Cross, Thomson and Yandanooka were reported above a total HM cut-off grade of 1.4% and the Mineral Resource at Ellengail and West Mine North were reported above a cut-off grade of 2.0% total HM. The Mineral Resource at Durack and West Mine North were also reported below a cut-off grade of 35% slimes. This was not applied to the other deposits as the slimes contents within the defined Mineral Resources are less than 35%.

The mineralisation at Drummond Crossing extends beyond Sheffield's tenement and the entire extent of the data and interpretation was included in the estimation process. The reported Mineral Resource is only that part within Sheffield's tenement.

In determining the criteria for reasonable prospects for eventual economic extraction, potential mining methods considered are wet dredge mining or dry dozer-trap operations, similar to those commonly and currently in use in HM mining operations both in Australia and globally. It is considered that the deposits that form Sheffield's Eneabba Project have a reasonable prospect of eventual economic extraction when considered in the context of the deposit location and existing infrastructure and taking into consideration the depth, thickness and grades of the deposit. Sheffield's strategy is to accumulate deposits within the Eneabba region capable of supporting a sequential mining operation with a flexible mobile plant.

Table 1.9: Eneabba Project Mineral Resource as at 1 October 2018

Deposit	Resource Category	Cut-off	Mineral Resources				Valuable HM grade (in-situ)				
		THM %	Material (Mt)	THM %	SL %	OS %	Zircon %	Rutile %	Leucoxene %	Ilmenite %	Total VHM %
Drummond Crossing	Indicated	1.4	35.5	2.4	14	7.7	0.33	0.24	0.08	1.26	1.92
	Inferred	1.4	3.3	2.3	12	7.2	0.26	0.21	0.06	1.31	1.85
	Total	**1.4**	**38.8**	**2.4**	**14**	**7.7**	**0.33**	**0.24**	**0.08**	**1.26**	**1.91**
Durack	Indicated	1.4	20.7	2.9	14	14.7	0.40	0.09	0.11	2.07	2.67
	Inferred	1.4	5.6	2.6	16	18.3	0.37	0.07	0.19	1.68	2.32
	Total	**1.4**	**26.3**	**2.8**	**14**	**15.5**	**0.39**	**0.08**	**0.13**	**1.99**	**2.59**
Ellengail	Indicated	2.0	6.5	5.3	15	3.2	0.53	0.43	0.55	3.49	5.00
	Inferred	2.0	5.3	4.1	15	2.5	0.41	0.34	0.35	2.55	3.63
	Total	**2.0**	**11.8**	**4.8**	**15**	**2.9**	**0.47**	**0.39**	**0.46**	**3.07**	**4.38**
Robbs Cross	Indicated	1.4	14.0	1.9	6	6.2	0.27	0.24	0.09	0.88	1.48
	Inferred	1.4	3.8	2.0	6	8.1	0.29	0.22	0.08	1.02	1.61
	Total	**1.4**	**17.8**	**1.9**	**6**	**6.6**	**0.28**	**0.23**	**0.09**	**0.91**	**1.51**
Thomson	Inferred	1.4	25.7	2.0	18	6.9	0.38	0.28	0.11	0.85	1.61
	Total	**1.4**	**25.7**	**2.0**	**18**	**6.9**	**0.38**	**0.28**	**0.11**	**0.85**	**1.61**
West Mine North	Indicated	2.0	10.2	7.3	11	2.3	0.43	0.48	0.13	3.51	4.55
	Inferred	2.0	1.8	2.7	17	3.0	0.25	0.23	0.06	1.31	1.85
	Total	**2.0**	**12.0**	**6.6**	**12**	**2.4**	**0.40**	**0.44**	**0.12**	**3.18**	**4.14**
Yandanooka	Measured	1.4	2.6	4.3	15	11.3	0.44	0.09	0.10	3.08	3.70
	Indicated	1.4	57.7	3.0	15	11.4	0.37	0.11	0.11	2.08	2.66
	Inferred	1.4	0.4	1.5	20	21.9	0.16	0.05	0.07	1.01	1.28
	Total	**1.4**	**60.8**	**3.0**	**15**	**11.5**	**0.37**	**0.11**	**0.11**	**2.11**	**2.70**
Total	Measured	1.4	2.6	4.3	15	11	0.44	0.09	0.10	3.08	3.70
	Indicated	Various	144.6	3.1	14	9	0.37	0.19	0.12	1.92	2.60
	Inferred	Various	46.0	2.4	16	8	0.36	0.24	0.14	1.21	1.96
	Total	**Various**	**193.3**	**3.0**	**14**	**9**	**0.36**	**0.20**	**0.13**	**1.77**	**2.46**

All tonnages and grades have been rounded to reflect the relative uncertainty of the estimate, thus the sums of columns may not equal.

Deposit	Resource Category	In-situ THM (kt)	Mineral assemblage (% of THM)				Contained valuable HM				
			Zircon %	Rutile %	Leucoxene %	Ilmenite %	Zircon (kt)	Rutile (kt)	Leucoxene (kt)	Ilmenite (kt)	Total VHM (kt)
Drummond Crossing	Indicated	838	14	10.3	3.4	53	118	86	29	447	680
	Inferred	77	11	9.0	2.7	56	9	7	2	43	61
	Total	**915**	**14**	**10.2**	**3.4**	**54**	**127**	**93**	**31**	**490**	**741**
Durack	Indicated	600	14	2.9	3.7	71	82	18	22	429	551
	Inferred	148	14	2.6	7.4	64	21	4	11	95	130
	Total	**748**	**14**	**2.9**	**4.4**	**70**	**104**	**21**	**33**	**523**	**681**
Ellengail	Indicated	346	10	8.0	10.4	66	34	28	36	227	325
	Inferred	218	10	8.2	8.4	62	22	18	18	136	193
	Total	**565**	**10**	**8.1**	**9.6**	**64**	**56**	**46**	**54**	**363**	**519**
Robbs Cross	Indicated	261	15	12.7	5.0	47	38	33	13	123	208
	Inferred	77	14	10.9	4.1	50	11	8	3	39	61
	Total	**338**	**15**	**12.3**	**4.8**	**48**	**50**	**41**	**16**	**162**	**269**
Thomson	Inferred	516	19	13.8	5.4	42	97	71	28	219	415
	Total	**516**	**19**	**13.8**	**5.4**	**42**	**97**	**71**	**28**	**219**	**415**
West Mine North	Indicated	748	6	6.5	1.8	48	44	49	13	359	465
	Inferred	48	9	8.6	2.1	50	5	4	1	24	34
	Total	**796**	**6**	**6.6**	**1.8**	**48**	**48**	**53**	**14**	**383**	**498**
Yandanooka	Measured	112	10	2.1	2.3	72	12	2	3	81	98
	Indicated	1,726	12	3.6	3.7	69	212	63	63	1,197	1,535
	Inferred	7	11	3.0	4.4	68	1	0.2	0.3	4	6
	Total	**1,845**	**12**	**3.5**	**3.6**	**70**	**224**	**65**	**66**	**1,283**	**1,639**
Total	Measured	112	10	2.1	2.3	72	12	2	3	81	98
	Indicated	4,519	12	6.1	3.9	62	529	276	176	2,782	3,764
	Inferred	1,091	15	10.3	5.8	51	165	113	64	559	900
	Total	**5,723**	**12**	**6.8**	**4.2**	**60**	**705**	**392**	**242**	**3,423**	**4,762**

All tonnages and grades have been rounded to reflect the relative uncertainty of the estimate, thus the sums of columns may not equal.

The table below summarises the assessment and reporting criteria used for the Eneabba Project Mineral Resource estimates at the Drummond Crossing, Durack, Ellengail, Robbs Cross, Thomson, West Mine North and Yandanooka deposits and reflects the guidelines in Table 1 of *The Australasian Code for the Reporting of Exploration Results, Mineral Resources and Ore Reserves* (the JORC Code, 2012).

SECTION 1 SAMPLING TECHNIQUES AND DATA

Criteria	JORC Code explanation	Commentary
Sampling techniques	• *Nature and quality of sampling.* • *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.* • *In cases where 'industry standard' work has been done this would be relatively simple (eg '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 (eg submarine nodules) may warrant disclosure of detailed information.*	• Data is from drilling by RGC, Iluka and Sheffield. • Aircore was used for all drilling which is industry standard for mineral sands deposits. • NQ (70mm) diameter aircore drilling was used by Sheffield to collect rotary split 1-3kg samples at 1.5m intervals down-hole. • Split technique and sample size for historic holes is not known. • Iluka collected 1.5m aircore sample intervals. • RGC collected 1.5m or 2m aircore sample intervals. • See below for sample and assay QAQC procedures and analysis.
Drilling techniques	• *Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg 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).*	• Sheffield used an aircore system using a blade (face sampling) drill bit, NQ size. • System used is an industry standard for mineral sands deposits. • Iluka and RGC used aircore methods. Details of drilling are not known for all of the holes.
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.*	• Sheffield drilling used a rotary splitter to collect a 1-3 kg sub-sample from 1.5m intervals. • Sample weight was recorded at the laboratory. • Duplicate samples for Sheffield drill holes were collected at the drill site (see below) to enable analysis of data precision. • Sample condition of Sheffield holes (wet to dry and good to poor qualitative recovery) was logged at the drill site. Analysis shows no material bias in the differing sample conditions logged. • Record of sample condition has not been stated in the historic logs. • The sample quality is considered appropriate for the Mineral Resource estimation and classification applied.
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.*	RGC • Logged grain size, oversize, sorting, hardness and also colour in 1997 and visual estimates of HM in 1998. Iluka • Logged lithology, grain size, colour, second lithology, sorting, hardness, visual estimates of HM and some visual estimates of slimes. Sheffield • Every sample was washed and panned, then geologically logged on-site in 1.5m intervals. • Primary, secondary and oversize lithology, qualitative hardness, grain size, rounding, sorting, and washability, visual estimates of HM%, SL% and OS%, and depth to water table recorded. • Heavy mineral sachets were examined under a microscope following heavy medium separation by laboratory and assessed

Criteria	JORC Code explanation	Commentary
		as to whether sand or from rock. • The entire length of the drill hole is logged; minimum (nominal) interval length is 1.5m. • Logging is suitable such that interpretations of grade and deposit geology can be used to support the Mineral Resource estimation and classification applied.
Sub-sampling techniques and sample preparation	• *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.*	**HM%, SL% OS% Determination** Sheffield • A 1-3kg sample was collected at 1.5m intervals in numbered bags at the drill site via rotary splitter at the cyclone discharge point. • The 1-3kg sample is sub-sampled via a rotary splitter to approx. 200g for analysis. • The 200g ample is soaked overnight in water then screened and weighed. • Samples submitted to an external laboratory for heavy liquid separation (HLS) determination of weight per cent heavy mineral (HM%), slimes (SL%) and oversize (OS%) at a screen split of -53µm, +53µm and +1mm for Drummond Crossing, West Mine North, Durack and Yandanooka. • Samples submitted to an external laboratory for heavy liquid separation (HLS) determination of weight per cent heavy mineral (HM%), slimes (SL%) and oversize (OS%) at a screen split of -45µm, +45µm and +1mm Robbs Cross and Thomson • Laboratory provides a sachet containing the heavy mineral concentrate (HMC) for each sample – this was used in HM assemblage determination (see below). • Duplicate samples (field duplicates) collected at drill site. • Reference blank (builders sand) and standard samples material samples inserted at site. • Visual estimates of HM%, SL% and OS% logged at the drill site are compared against laboratory results to identify any significant errors. • Spacing of duplicate, standard, blank and laboratory repeat samples for Sheffield drilling are designed to identify sample misplacement or misallocation during sample collection and laboratory analysis. • Results from the analysis of field duplicate samples and laboratory repeats for the Sheffield data are sufficient to show the data has acceptable precision and indicate that the sub-sampling and sample preparation techniques are appropriate for the deposit style and the Mineral Resource estimation and classification applied. Iluka and RGC • Assayed at Iluka and RGC's Narngulu Laboratory • QAQC procedures not known. **HM Assemblage Determination** Sheffield • Heavy mineral concentrate (HMC) from individual samples is combined according to total HM grade and weight into (nominal) >20g composite samples for HM assemblage determination. • Weighed HMC composite is split via a micro-riffle to ensure HM%, SL% and OS% of the final composite sample can be correctly calculated. • HM assemblage determination was by QEMSCAN™ to determine the component mineralogy. This method has rigorous (laboratory) internal quality control measures and is considered sufficient to show the data has acceptable precision, indicating the sub-sampling and sample preparation techniques are appropriate for the deposit style and the Mineral Resource

<table>
<tr><th>Criteria</th><th>JORC Code explanation</th><th>Commentary</th></tr>
<tr><td></td><td></td><td>estimation and classification applied.
Iluka and RGC
• QAQC procedures not known
Lack of information about historical data is considered for resource classification.</td></tr>
<tr><td>Quality of assay data and laboratory tests</td><td>• The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.
• Nature of quality control procedures adopted (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.</td><td><u>HM%, SL% and OS% Determination</u>
• Assay and laboratory procedures are industry standard, although method specifics and heavy liquid composition can vary.
RGC and Iluka
• QAQC data and procedures used by RGC and Iluka are not known. Lack of information about historical data is considered for resource classification.
• Analysed at RGC and Iluka's Narngulu laboratory at Geraldton, Western Australia.
• Samples from 1989 and 1996 (Drummond Crossing, Ellengail and West Mine North) were analysed using a -75µm slimes / +2mm oversize screen. Separation of HM% was by heavy liquid TBE (density 2.84 g/ml) from the -710µm+75µm fraction.
• RGC samples from 1998 and Iluka samples (Drummond Crossing, Durack, Ellengail, West Mine North and Yandanooka) were analysed using a -53µm slimes / +2mm oversize screen. Separation of total HM% was by heavy liquid TBE (density 2.90 g/ml) from the -710µm+53µm fraction.
Sheffield
• Samples from Robbs Cross and Thomson analysed by Diamantina Laboratories in Perth using a -45µm slimes / +1mm oversize screen (method DIA_HLS_45µm_1mm). Separation of total HM% was by heavy liquid TBE (density 2.96g/ml) from the -45µm+1mm fraction.
• Samples from Drummond Crossing, Durack, West Mine North and Yandanooka were analysed by Western Geolabs in Perth using a -53µm slimes / +1mm oversize screen. Separation of total HM% was by heavy liquid TBE (density 2.96 g/ml) from the +53µm-1mm fraction.
• The methods produce a total grade as weight per cent of the primary sample.
• Methods do not determine the relative amounts of valuable (saleable or marketable) and non-valuable heavy mineral species. See below for details of HM assemblage determination.
• Duplicates, reference field blank material and standard samples inserted at the drill site.
Insertion rates are as follows:
<table>
<tr><th>Deposit</th><th>Standards (including blanks)</th><th>Field duplicates</th></tr>
<tr><td>Drummond Crossing</td><td>1 in 19</td><td>1 in 37</td></tr>
<tr><td>Durack</td><td>1 in 37</td><td>1 in 37</td></tr>
<tr><td>Robbs Cross</td><td>1 in 20</td><td>1 in 40</td></tr>
<tr><td>Thomson</td><td>1 in 20</td><td>1 in 40</td></tr>
<tr><td>West Mine North</td><td>1 in 19</td><td>1 in 37</td></tr>
<tr><td>Yandanooka</td><td>1 in 38</td><td>1 in 38</td></tr>
</table>
• Reference blanks are examined for performance over time and within laboratory batches. Batches or sub-batches are re-analysed if unacceptable QAQC data are returned.
• Analysis of reference blanks and laboratory standards, repeats show the Sheffield data to be of acceptable accuracy and precision for the Mineral Resource estimation and classification applied.

<u>HM Assemblage Determination</u></td></tr>
</table>

Criteria	JORC Code explanation	Commentary
		Iluka • At West Mine North and Ellengail mineral assemblage data determined by Iluka using Method 4 (HMC is separated into magnetics and non-magnetics) was used with the Sheffield QEMSCAN data. • At Ellengail mineral assemblage data determined by Iluka using Method 3 (magnetic separation and XRF analysis) was used with the Sheffield QEMSCAN data and Iluka Method 4 data. Sheffield • HM assemblage was determined from Sheffield drill holes. • Heavy mineral concentrate (HMC) from individual samples is combined according to total HM grade and weight into (nominal) >20g composite samples for HM assemblage determination. • Weighed HMC is split via a micro-riffle to ensure HM%, SL% and OS% of the final homogenised composite sample can be correctly calculated. • HM assemblage determination was by the QEMSCAN™ process which uses observed mass and chemistry to classify particles according to their average chemistry, and then report mineral abundance by % mass. • For the TiO_2 minerals specific breakpoints are used. For Drummond Crossing, Durack, Robbs Cross, Thomson and Yandanooka the following were used: rutile >95% TiO_2, leucoxene 85-95% TiO_2) and ilmenite <55-85% TiO_2. • For West Mine North the QEMSCAN data was calibrated with the Method 4 data and following were used: rutile >95% TiO_2, leucoxene 70-95% TiO_2) and ilmenite <55-70% TiO_2. • For Ellengail the QEMSCAN data was calibrated with the Method 3 data and following were used: rutile >95% TiO_2, leucoxene 75-95% TiO_2) and ilmenite <55-75% TiO_2. • Reference material is not used. Other measures of accuracy and the method design are considered sufficient to establish acceptable accuracy of the data for the Mineral Resource estimation and classification applied.
Verification of sampling and assaying	• *The verification of significant intersections by either independent or alternative company 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.*	• Iluka and RGC data was provided from the Iluka database upon acquisition of the tenements. Where available historic WAMEX Department of Mines and Petroleum annual reports were used for validation of the historic drill hole data. • Sheffield data was logged electronically using "validation at point of entry" systems prior to storage in the Company's drill hole database, which is managed by Company personnel and an external consultancy. • Documentation related to data custody and validation is maintained by the Company. • A copy ("snapshot") of the Mineral Resource database is retained separately from the primary drill hole database. • All drill holes were included in the from the drill database, with non-excluded due to poor data or lack of sample. • The verification and treatment of the data is considered sufficient for the Mineral Resource estimation and classification applied.
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.*	• Drill holes were surveyed in MGA94, Zone 50. • Collar locations of the Sheffield drill holes at Durack, West Mine North and Yandanooka were surveyed by registered surveyors Heyhoe Surveys Pty Ltd using RTK-GPS. • Collar locations of the Sheffield drill holes at Drummond Crossing, Robbs Cross and Thomson were surveyed using a Garmin hand-held GPS, with an expected horizontal accuracy of +/- 5m.

<table>
<tr><th>Criteria</th><th>JORC Code explanation</th><th>Commentary</th></tr>
<tr><td></td><td></td><td>

Collar locations of the Iluka drill holes at Durack and Yandanooka were surveyed using a hand-held GPS.
The survey method used to locate the RGC and Iluka drill holes at Drummond Crossing, Ellengail and Yandanooka and was not recorded in the database and is not known.
Digital elevation models (DEM) were obtained by Sheffield from Landgate, with an accuracy of +/- 1.5m, for the Eneabba Project tenement areas. The drill hole collar data was projected to the DEM surfaces to determine the collar elevations and the DEMs were used to constrain the resource models to below the topographical surface.
The quality and accuracy of the topographic control is considered sufficient for the Mineral Resource estimation and classification applied

</td></tr>
<tr><td>Data spacing and distribution</td><td>

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.

</td><td>

Drill hole spacing is as follows:

<table>
<tr><th>Deposit</th><th>Spacing</th></tr>
<tr><td>Drummond Crossing</td><td>Overall spacing of 120 mE by 400 mN</td></tr>
<tr><td>Durack</td><td>400 mE by 1,800 mN to
120 mE by 400 mN</td></tr>
<tr><td>Ellengail</td><td>Overall spacing of 60 mE by 200 mN with some infill to 30 mE</td></tr>
<tr><td>Robbs Cross</td><td>200 mE by 200 mN to
300 mE by 400 mN</td></tr>
<tr><td>Thomson</td><td>450 mE by 450 mN to
700 mE by 570 mN</td></tr>
<tr><td>West Mine North</td><td>Overall spacing of 30 mE by 50 mN
Lines at 200 mN spacing in northern area of deposit</td></tr>
<tr><td>Yandanooka</td><td>Overall spacing of 120 mE by 300mN
Single ‘cross’ at 20 mE by 125 mN</td></tr>
</table>

Number of drill hole, metre of drilling and HM analyses are as follows:

<table>
<tr><th>Deposit</th><th>Company (year)</th><th>Number of drillholes</th><th>Metres drilled</th><th>Number of HM assays</th></tr>
<tr><td rowspan="4">Drummond Crossing</td><td>RGC (1989-1998)</td><td>154</td><td>4,222</td><td>1,511</td></tr>
<tr><td>Iluka (2000)</td><td>10</td><td>186</td><td>124</td></tr>
<tr><td>SFX (2011-2012)</td><td>135</td><td>4,063</td><td>2,704</td></tr>
<tr><td>Total</td><td>299</td><td>8,471</td><td>4,467</td></tr>
<tr><td rowspan="3">Durack</td><td>Iluka (2005)</td><td>175</td><td>1,583</td><td>1,080</td></tr>
<tr><td>SFX (2012)</td><td>161</td><td>2,214.5</td><td>1,475</td></tr>
<tr><td>Total</td><td>336</td><td>3,797.5</td><td>2,555</td></tr>
<tr><td rowspan="3">Ellengail</td><td>RGC (1988-1998)</td><td>109</td><td>3,019</td><td>1,412</td></tr>
<tr><td>Iluka (2000-2002)</td><td>162</td><td>3,608</td><td>1,888</td></tr>
<tr><td>Total</td><td>271</td><td>6,627</td><td>3,300</td></tr>
<tr><td rowspan="2">Robbs Cross</td><td>SFX (2015-2017)</td><td>52</td><td>1,167</td><td>778</td></tr>
<tr><td>Total</td><td>52</td><td>1,167</td><td>778</td></tr>
<tr><td rowspan="2">Thomson</td><td>SFX (2015-2017)</td><td>58</td><td>1,707</td><td>1,137</td></tr>
<tr><td>Total</td><td>58</td><td>1,707</td><td>1,137</td></tr>
<tr><td rowspan="4">West Mine North</td><td>RGC (1987-1996)</td><td>389</td><td>15,522.4</td><td>9,496</td></tr>
<tr><td>Iluka (2004-2005)</td><td>148</td><td>5,247.5</td><td>1,535</td></tr>
<tr><td>SFX (2011</td><td>90</td><td>3,395.0</td><td>2,264</td></tr>
<tr><td>Total</td><td>388</td><td>24,164.9</td><td>13,295</td></tr>
<tr><td rowspan="3">Yandanooka</td><td>Iluka (2004-2006)</td><td>119</td><td>1,791</td><td>708</td></tr>
<tr><td>SFX (2011-2012)</td><td>393</td><td>7,074</td><td>4,719</td></tr>
<tr><td>Total</td><td>512</td><td>8,895</td><td>5,424</td></tr>
</table>

Samples for HM assemblage determination are composited on intervals according to a combination of grade and geology appropriate to reflect resource estimation domains. Samples have been composited from individual holes or, where not possible based on geological and grade constraints, are selected from holes that are proximal.
Samples and mineral assemblage methodology are as follows:

</td></tr>
</table>

Criteria	JORC Code explanation	Commentary
		<table><tr><th>Deposit</th><th>Number composites</th><th>Number drillholes</th><th>Total sample length (m)</th><th>Method</th></tr><tr><td>Drummond Crossing</td><td>17</td><td>27</td><td>223.5</td><td>QEMSCAN</td></tr><tr><td>Durack</td><td>13</td><td>25</td><td>187.5</td><td>QEMSCAN</td></tr><tr><td>Ellengail</td><td>17 3</td><td>64 5</td><td>549.5 76.5</td><td>Method 3 and 4 QEMSCAN</td></tr><tr><td>Robbs Cross</td><td>7</td><td>20</td><td>183.0</td><td>QEMSCAN</td></tr><tr><td>Thomson</td><td>8</td><td>21</td><td>187.5</td><td>QEMSCAN</td></tr><tr><td>West Mine North</td><td>83 12</td><td>117 16</td><td>2,534.5 214.5</td><td>Iluka Method 4 QEMSCAN</td></tr><tr><td>Yandanooka</td><td>25</td><td>54</td><td>373.5</td><td>QEMSCAN</td></tr></table> • The data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource estimation and classification applied.
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.*	• All drilling is vertical making it normal to the horizontal orientation of geology and mineralisation.
Sample security	• *The measures taken to ensure sample security.*	• Sample security is not considered a significant risk given the location of the deposit and bulk-nature of mineralisation. • Nevertheless, the use of recognised transport providers, sample dispatch procedures directly from the field to the laboratory, and the large number of samples are considered sufficient to ensure appropriate sample security.
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	• All data has been validated by at least two Company geologists and was reviewed by the Competent Person for the Mineral Resource estimate.

SECTION 2 REPORTING OF EXPLORATION RESULTS

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.*	• Mineral Resources are entirely within 100% Sheffield Resources held tenements. <table><tr><th>Deposit</th><th>Licence</th><th>Status</th><th>Grant date</th><th>Expiry date</th></tr><tr><td>Drummond Crossing</td><td>E70/3814</td><td>Granted</td><td>10/11/2010</td><td>09/11/2020</td></tr><tr><td>Durack</td><td>E70/3762</td><td>Granted</td><td>05/05/2011</td><td>04/05/2021</td></tr><tr><td>Ellengail</td><td>R70/035</td><td>Granted</td><td>01/08/2007</td><td>31/07/2019</td></tr><tr><td>Robbs Cross</td><td>E70/4292</td><td>Granted</td><td>05/10/2012</td><td>04/10/2022</td></tr><tr><td>Thomson</td><td>E70/4190 E70/4747</td><td>Granted Granted</td><td>27/06/2012 27/10/2016</td><td>26/06/2022 26/10/2021</td></tr><tr><td>West Mine North</td><td>M70/872 M70/965 M70/1153</td><td>Granted Granted Granted</td><td>07/04/1997 23/01/1997 04/03/2004</td><td>06/04/2039 21/01/2023 03/03/2025</td></tr><tr><td>Yandanooka</td><td>E70/3813</td><td>Granted</td><td>10/11/2010</td><td>09/11/2020</td></tr></table> • Sheffield's Eneabba Project is centred along the Brand Highway in the Midwest region of Western Australia. • There are no known or expected impediments to obtaining a licence to operate in the area. • Sheffield has been operating successfully in the region for more than 7 years.
Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties.*	• Sheffield purchased the Drummond Crossing, Durack, Ellengail, West Mine North and Yandanooka deposits with historic drill data undertaken by RGC in the 1980s and 1990s and by Iluka in the 2000s. • Historic drilling activities are listed elsewhere within JORC 2012 Table 1.
Geology	• *Deposit type, geological setting and style of mineralisation.*	• Sheffield's Eneabba Project forms part of the Swan Coastal Plain bounded to the east by the Gingin Scarp within the Northern Perth Basin. The Gingin Scarp is a remnant feature of the

Criteria	JORC Code explanation	Commentary
		marine incursion which resulted in the reworking of older rocks and ended in the deposition of heavy mineral sand enriched beach placers within Cainozoic sediments. Heavy mineral sand mining is prolific within the Swan Coastal Plain sediments. • Heavy mineral sands are the product of Cainozoic coastal placer deposits formed as a result of a marine transgression. Eustatic change in sea level has resulted in the prospective stratigraphy being situated between 280mRL and 300mRL. Heavy mineral sands are interpreted to be a dunal-style accumulations deposited on a plateau formed by an Eocene-aged paleo-shoreline at Drummond Crossing, Durack, Ellengail, West Mine North and Yandanooka. The West Mine North and Ellengail deposits include strandline mineralisation. • Robbs Cross and Thomson are in newly interpreted heavy mineral trap sites located to the north of Eneabba and to east of the Gingin Scarp and adjacent to westerly to south-westerly trending paleo-drainage. Thomson includes mineralisation within fluviatile sediments. • Sheffield is exploring for Cainozoic heavy mineral sands associated with strandlines and re-worked aeolian dunal occurrences that have stripped lighter material and enabled heavy mineral accumulations.

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 drillholes:*
	  • easting and northing of the drillhole collar
	  • elevation or RL (elevation above sea level in metres) of the drillhole collar
	  • dip and azimuth of the hole
	  • down hole length and interception depth
	  • hole length.
		• Information relating to the number of drill holes, assayed samples, location accuracy, orientation etc. is included in this table.
		• Diagrams in the announcement show the location of and distribution of drill holes in relation to the Mineral Resources.

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.*	• Not relevant – exploration results are not being reported; Mineral Resources have been defined
Relationship between mineralisation widths and intercept lengths	• *If the geometry of the mineralisation with respect to the drillhole 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').*	• Mineralisation and stratigraphy is assumed to be sub-horizontal, flat lying and therefore vertical drill holes are approximate to true thickness. • Exploration results are not being reported; Mineral Resources have been defined.
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.*	• Plans and cross sections are included in the announcement.
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*	• Not relevant – exploration results are not being reported; Mineral Resources have been defined.

Criteria	JORC Code explanation	Commentary
	practiced to avoid misleading reporting of Exploration Results.	
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.*	• Where relevant this information has been included or referred to elsewhere in this Table.
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).*	• At this stage no additional exploration work is planned.

SECTION 3 ESTIMATION AND REPORTING OF MINERAL RESOURCES

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.*	• Drill hole data was extracted directly from the Company's drill hole database which includes internal data validation protocols. • Validation of the exported data was confirmed using mining software (Micromine) validation protocols, and visually in plan and section views. • Compilation of data external to the drill database (e.g. HM assemblage source data) was cross-checked manually, and through statistical comparison. • A copy ("snapshot") of the Mineral Resource database is retained separately to the primary drill hole database. • Data was further validated by Optiro upon receipt, and prior to use in the estimation.
Site visits	• *Comment on any site visits undertaken by the Competent Person and the outcome of those visits.*	• Senior Sheffield personnel have visited the deposits that make up Sheffield's Eneabba Project. • Mrs Standing has not visited the deposits that make up Sheffield's Eneabba Project, but has visited mineral sands deposits within the Eneabba region. • Where material, information relating to observations from these visits has been included in this announcement.
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.*	• Geological interpretation included modelling of rock domains (including laterite, intervals with high induration or sediments with high oversize contents) at Drummond Crossing, Durack, Ellengail, West Mine North and Yandanooka. Horizons with high slimes contents were interpreted as separate domains at Durack (>35%), Thomson (>34%) and Yandanooka (>20%). • Microscope analysis was used to assess shape and composition of the heavy minerals. • Mineralised domains were defined at Drummond Crossing, Durack and Yandanooka using a nominal cut-off grade of 0.7% HM; at West Mine North using a nominal cut-off grade of 0.8% HM; and Ellengail, Robbs Cross and Thomson using a nominal cut-off grade of 0.9% HM. Additional higher grade domains were defined at Durack (>1.9% HM), Ellengail (>2% HM), West Mine North (>2.5% HM) and at Yandanooka (>3% HM). • The confidence in the geological interpretation is reflected by the assigned resource classification.
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*	• Extend of Mineral Resource:

<table>
<tr><th>Criteria</th><th>JORC Code explanation</th><th>Commentary</th></tr>
<tr><td></td><td>and lower limits of the Mineral Resource.</td><td>
<table>
<tr><th>Deposit</th><th>Strike length (m)</th><th>Across strike width (m)</th><th>Average thickness (m)</th><th>Depth (m)</th></tr>
<tr><td>Drummond Crossing</td><td>4,000</td><td>up to 2,300</td><td>8</td><td>Surface to 30</td></tr>
<tr><td>Durack</td><td>5,000</td><td>up to 1,500</td><td>6</td><td>Surface to 16.5</td></tr>
<tr><td>Ellengail</td><td>3,200</td><td>up to 1,400</td><td>7</td><td>Surface to 25</td></tr>
<tr><td>Robbs Cross</td><td>1,800</td><td>up to 1,500</td><td>9</td><td>Surface to 30</td></tr>
<tr><td>Thomson-dunal</td><td>1,600</td><td>up to 1,100</td><td>9</td><td>Surface to 22.5</td></tr>
<tr><td>Thomson-fluviatile</td><td>3,300</td><td>up to 4,000</td><td>12</td><td>Surface to 31.5</td></tr>
<tr><td>West Mine North - strandline</td><td>4,000</td><td>up to 270</td><td>19</td><td>1 to 49.5</td></tr>
<tr><td>West Mine North-dunal</td><td>4,000</td><td>up to 2,300</td><td>8</td><td>13.5 to 48</td></tr>
<tr><td>Yandanooka</td><td>6,000</td><td>2,000</td><td>7</td><td>Surface to 24</td></tr>
</table>
</td></tr>
<tr><td>Estimation and modelling techniques</td><td>

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. 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.

</td><td>

Total HM, slimes and oversize quantities were estimated using ordinary kriging (OK) into parent blocks. For Drummond Crossing, Durack, Ellengail and West Mine North the parent blocks have a height of 1.5mRL and the following X and y dimensions: Drummond crossing - 50mE by 250 mN; Durack - 60mE by 200mN; Ellengail - 20mE by 100mN; West Mine North - 15mE by 25mN and Yandanooka - 50mE by 200mN. At Robbs Cross and Thomson a parent block of 100mE by 100mN by 3mRL was used.
Zircon, rutile, leucoxene, and ilmenite percentages were estimated using inverse distance (ID) cubed into the parent blocks.
Block dimensions were selected from kriging neighbourhood analysis and reflect the variability of the deposit and the model's practicality for future mine planning.
Sub-cells with a minimum dimension of a fifth of the parent X and Y dimensions and a third of the block height were used to represent volume. For the definition of the topographical surface and soil horizon (of 15cm) sub-celling was reduced to 0.15mRL.
Average drill spacing is as follows:

<table>
<tr><th>Deposit</th><th>Spacing</th></tr>
<tr><td>Drummond Crossing</td><td>Overall spacing of 120 mE by 400 mN</td></tr>
<tr><td>Durack</td><td>120 mE by 400 mN to 400 mE by 1,800 mN</td></tr>
<tr><td>Ellengail</td><td>Overall spacing of 60 mE by 200 mN
with some infill to 30 mE</td></tr>
<tr><td>Robbs Cross</td><td>200 mE by 200 mN to 300 mE by 400 mN</td></tr>
<tr><td>Thomson</td><td>450 mE by 450 mN to 700 mE by 570 mN</td></tr>
<tr><td>West Mine North</td><td>Overall spacing of 30 mE by 50 mN
Lines at 200 mN spacing in northern area of deposit</td></tr>
<tr><td>Yandanooka</td><td>Overall spacing of 120 mE by 300mN
Single 'cross' at 20 mE by 125 mN</td></tr>
</table>

Data analysis and estimation was undertaken using Snowden Supervisor and Datamine software.
Within the interpreted mineralised domains the majority of the assay data from the other deposits is from intervals of 1.5m (Drummond Crossing – 80%, Ellengail – 94%, West Mine North – 83% and Yandanooka – 74%). Drill samples were composited to 1.5m down hole intervals for estimation.
Wireframe interpretations of mineralisation were made by Sheffield based on geological logging and heavy mineral content. Mineralised domains were defined at Drummond Crossing, Durack and Yandanooka using a nominal cut-off grade of 0.7% HM; at West Mine North using a nominal cut-off grade of 0.8% HM; and Ellengail, Robbs Cross and Thomson using a nominal cut-off grade of 0.9% HM. Additional higher grade domains were defined at Durack (>1.9% HM), Ellengail (>2% HM), West Mine North (>2.5% HM) and at Yandanooka (>3% HM).
Optiro assessed the robustness of the domains by critically examining the geological interpretation and by using a variety of measures, including statistical and geostatistical analysis. The mineralised domains are considered geologically robust in the context of the resource classification applied to the estimate.

</td></tr>
</table>

Criteria	JORC Code explanation	Commentary

		• All variables were estimated separately and independently.
		• Top-cuts (grade capping) was applied to:
		  ○ HM - Durack, Ellengail, West Mine North and Yandanooka
		  ○ Slimes - Drummond Crossing, Durack, Ellengail, Robbs Cross, Thomson, West Mine North and Yandanooka
		  ○ Oversize - Drummond Crossing, Durack, Ellengail, Robbs Cross, Thomson and West Mine North.
		The top-cut levels were determined using a combination of top-cut analysis tools, including grade histograms, log probability plots and the coefficient of variation.
		• Variogram analysis was undertaken to determine the kriging estimation parameters used for OK estimation of HM, slimes and oversize. HM mineralisation continuity is:
		  ○ Drummond Crossing - along strike range of 955m and across strike range of 200m within the lower grade domain and along strike range of 820m and across strike range of 365m within the higher grade domain.
		  ○ Durack - along strike range of 1,420m and across strike range of 240m within the lower grade domain and along strike range of 1,350m and across strike range of 365m within the higher grade domain.
		  ○ Ellengail - along strike range of 950m and across strike range of 520m within the dunal sediments and along strike range of 565m and across strike range of 75m within the central strandline.
		  ○ Robbs Cross - along strike range of 475m and across strike range of 345m.
		  ○ Thomson - along strike range of 680m to 890m and across strike range of 365m to 570m
		  ○ At West Mine North - along strike range of 1,300m and across strike range of 230m within the strandline mineralisation and along strike range of 1,590m and across strike range of 230m within the dunal sediments.
		  ○ At Yandanooka - along strike range of 1,025m and across strike range of 300m within the lower grade domain and along strike range of 750m and across strike range of 52m within the higher grade domain.
		• Kriging neighbourhood analysis was performed in order to determine the block size, sample numbers and discretisation levels.
		• A maximum extrapolation distances of approximately 150m was applied at Ellengail and Yandanooka and 200m was applied at Drummond Crossing, Durack, Robbs Cross, Thomson and West Mine North.
		• Three estimation passes were used for HM; the first search was based upon the variogram ranges; the second search was two times the initial search and the third search was up to six times the initial search, with reduced sample numbers required for the second and third search pass estimation. The majority of blocks (Drummond Crossing 89%, Durack 72%, Ellengail 91%, Robbs Cross 77%, West Mine North 99% and Yandanooka 92%) were estimated in the first search pass. At Thomson 23% were estimated in the first search pass and 46% in the second search pass.
		• The HM, slimes and oversize estimated block model grades were visually validated against the input drill hole data and comparisons were carried out against the declustered drill hole data and by northing, easting and elevation slices.
		• The mineral assemblage estimated block model grades were visually validated against the input drill hole data and comparisons were carried out against the drill hole data and by

Criteria	JORC Code explanation	Commentary
		northing and easting slices. • A Mineral Resource for Drummond Crossing was estimated by QG Australia Pty Ltd (QG) in 2012 and reported in 2015. The 2018 Inferred Resource has been extended further south and has increased the overall tonnes by 14%. The average grade has decreased from 2.1% HM in the 2015 model to 1.9% in the 2018 model and the overall contained HM has increased by 4%. • A Mineral Resource for Durack was estimated by QG in 2013. This is not materially different to that reported in 2018. The tonnage for a 0.9% cut-off grade is slightly higher (by 7%), which is within the Inferred Resource. • A Mineral Resource for Ellengail was estimated by QG in 2012. At a cut-off grade of 0.9% HM the 2018 model has a higher tonnage (by 12%) and a lower estimated HM content for an overall increase in contained HM of 7%. The 2012 Mineral Resource was classified as Inferred, mainly due to the scarcity of the mineral assemblage data. The 2018 Mineral Resource used the QEMSCAN data and Method 3 Iluka data to estimate the mineral assemblage and thus includes resources classified as Indicated. • A Mineral Resource for West Mine North was estimated by QG in 2012 and was classified in accordance with JORC Code 2004. This included Measured and Indicated Resources. The 2018 Mineral Resource is classified as Indicated, at best, due to the historical nature of the majority (86%) of the drilling data and the mineral assemblage data (79%), the bias in the data resulting from the different grain sizes used for analysis and the lack of QAQC data within the southern area (drilled by RGC and Iluka). The Indicated Resources estimated in 2018 and reported above a cut-off grade of 0.9% HM are not materially different to the combined Measured and Indicated Resources estimated in 2012 above a cut-off grade of 0.9% HM (2% more tonnes at a slightly lower average HM grade: 2.7% HM in 2018 and 2.8% HM in 2.01). • A Mineral Resource for Yandanooka was estimated in 2013 by QG. This is not materially different to that reported in 2018. The tonnage for a 0.9% cut-off grade is slightly lower (by 2%) and the HM grade is slightly higher (by 0.1% HM). Sheffield made small adjustments to wireframes used to constrain the resource estimate. • Mineral Resource have not been previously estimated for Robbs Cross and Thomson: in 2017 maiden resources, as included in this announcement, were estimated.
Moisture	• *Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.*	• Tonnages are estimated on a dry basis
Cut-off parameters	• *The basis of the adopted cut-off grade(s) or quality parameters applied.*	• The Mineral Resource estimates have been reported above a cut-off grade of 1.4% total HM (Drummond Crossing, Durack, Robbs Cross, Thomson and Yandanooka) and 2.0% total HM (Ellengail and West Mine North) and below a cut-off grade of 35% slimes (Durack and West Mine North) to represent the resource that may be extracted under current market conditions. • These parameters have been selected by Sheffield in consultation with Optiro based on current experience and preliminary economic assessments carried out by Sheffield for HM deposits elsewhere in Western Australia. They represent that proportion of the deposit considered to have reasonable prospects of eventual economic extraction.

Criteria	JORC Code explanation	Commentary
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.*	• In determining the criteria for reasonable prospects for eventual economic extraction, potential mining methods considered are wet, dredge mining or dry dozer-trap operations, similar to those commonly and currently in use in HM mining operations both in Australia and globally. • The thickness, areal extent, and continuous nature of the mineralisation at the deposits that make up the Eneabba Project are such that non-selective bulk mining methods can be appropriately considered. • These assumptions were also considered when determining resource block sizes and resource classification. • On the basis of these assumptions, the Company considers there are no mining factors which are likely to affect the assumption that the deposit has reasonable prospects for eventual economic extraction.
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.*	Drummond Crossing • In 2014 characterisation testwork was undertaken by Robbins Metallurgical and it was concluded that the Drummond Crossing heavy mineral concentrations are amenable to typical mineral sands processing methodologies using standard mineral sands separation equipment. • The produced titanium products (secondary ilmenite, HiTi, rutile) are of acceptable quality. • Overall zircon recovery is calculated at 35.7%, and rutile and leucoxene recoveries into rutile product and HiTi product is calculated as 86% and 33%. Durack • In 2014 a bulk sample was assembled from drill samples (150kg) for characterisation testwork. This concluded that Durack HM is amenable to typical mineral sands processing methodologies using standard mineral sands separation equipment. Ellengail • Investigations by Iluka reported that only limited amounts of ilmenite sampled from Ellengail were considered suitable for synthetic rutile production. • Ilmenite and rutile sizing was found to be finer than that being processed at the time by Iluka at the Eneabba plant, leading Iluka to conclude that the material, if mined, would require blending. Robbs Cross and Thomson • Sheffield has not conducted mineral characterisation testwork on samples from Robbs Cross or Thomson. To date, the Company considers there are no metallurgical factors which are likely to significantly affect the assumption that the deposits have reasonable prospects for eventual economic extraction West Mine North • Metallurgical scoping testwork completed by Robbins Metallurgical. This produced primary and secondary ilmenite products are of typical chloride grade ilmenite quality. • Based on grade data and recovery data it can be concluded that material from West Mine North when processed will produce products of high quality. Yandanooka • In 2012 an 8 tonne sample was produced for Process Flow Diagram development by Robbins Metallurgical. • Results indicate that the HM is amenable to typical mineral sands processing methodologies using standard mineral sands separation equipment. To date, Sheffield considers there are no metallurgical factors which are likely to significantly affect the assumption that the deposits within the Eneabba Project have reasonable prospects for eventual

Criteria	JORC Code explanation	Commentary
		economic extraction
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.*	• There are no known environmental impediments to the Project's viability from the currently available data.
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 alteration zones within the deposit.* • *Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.*	• No direct measurements of bulk density have been taken. • Bulk density is assumed from an industry-standard formula which accounts for the total HM and slimes content of sand deposits. The resultant values are considered to be consistent with observations of the material compared with other similar HM deposits with known bulk density values. • A recommendation for future work is that confirmatory bulk density information is acquired.
Classification	• *The basis for the classification of the Mineral Resources into varying confidence categories.* • *Whether appropriate account has been taken of all relevant factors (ie 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.*	• The Mineral Resource estimates has been classified according to the guidelines of the JORC Code (2012), into Measured, Indicated and Inferred Resources taking into account geological and grade continuity and taking into account data quality (historical nature and lack of QAQC data for some drilling data), different grain size fractions used for analysis (at Drummond Crossing and West Mine North), data density and confidence in estimation of heavy mineral content and mineral assemblage. • In plan, polygons were used to define zones of different classification. Drummond Crossing ○ Indicated Mineral Resources - where drill sections are up to 500m apart and where there is sufficient mineral assemblage data. ○ Inferred Mineral Resources - where the drill sections are spaced at 500m to 600m and there is limited mineral assemblage data. Durack ○ Indicated Mineral Resources - where drilling is at a spacing of approximately 120mE by 40mN or closer and there is sufficient mineral assemblage data. ○ Inferred Mineral Resources - where the drill spacing is up to 500mE by 500mN or where there is limited mineral assemblage data. Ellengail ○ Indicated Mineral Resources - within the central strandline and dunal domains where the drill section spacing is up to 200m and there is sufficient mineral assemblage data. ○ Inferred Mineral Resources - within the central strandline and dunal domains where the drill section spacing more than 200m and there is limited mineral assemblage data, and within the surrounding dunal sediments. Robbs Cross ○ Indicated Mineral Resources - where drilling is generally at a spacing of approximately 200m to 300m. ○ Inferred Mineral Resources - around the margins of Indicated Mineral Resources, where the drill spacing is at approximately

Criteria	JORC Code explanation	Commentary
		400m. Thomson ○ Inferred Mineral Resources - where the drill spacing is at or less than 700m. West Mine North ○ Indicated Mineral Resources - where drill sections are at a spacing of up to 200m. ○ Inferred Mineral Resources - where the drill sections are up to 800m apart. Yandanooka ○ Measured Mineral Resources - in the centre of the deposit where there is close spaced drilling at a nominal spacing of 20mE by 125mN. ○ Indicated Mineral Resources - where drilling is on sections spaced at approximately 200m to 300m or closer. ○ Inferred Mineral Resources - within the southern area where the drilling is on sections spaced at around 400m to 800m and mineral assemblage data has been extrapolated. • The assigned classifications of Measured, Indicated and Inferred reflects the Competent Person's assessment of the accuracy and confidence levels in the Mineral Resource estimates.
Audits or reviews	• *The results of any audits or reviews of Mineral Resource estimates.*	• The Mineral Resources have been reviewed internally as part of normal validation processes by Optiro. • No external audit or review of the current Mineral Resource has been conducted.
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.* • *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 assigned classifications of Measured, Indicated and Inferred reflects the Competent Person's assessment of the accuracy and confidence levels in the Mineral Resource estimates. • The estimates are suitable for input into long term planning studies. • No production has occurred from the deposits.

APPENDIX 2

Summary of information to support the McCalls Project Mineral Resource estimates and JORC Code 2012 edition Table 1 Reports

This update for the McCalls Project is reported in accordance with the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves' (JORC Code) and ASX Listing Rules and provides a summary of information and JORC Code Table 1 commentary to support Sheffield's Mineral Resource estimates for the McCalls Project deposits within the Mid-west region of the Perth Basin, Western Australia. The McCalls Project contains two mineral sands deposits, McCalls and Mindarra Springs, located approximately 110km north of Perth (Figure 2.1).

The Mineral Resource inventory attributable to the McCalls Project as at 1 October 2018, reported above a cut-off grade of 1.1% total heavy minerals and below a cut-off grade of 35% slimes and by JORC Code classification is presented in Table 2.1.

Table: 2.1 McCalls Project Mineral Resource summary as at 1 October 2018

	Cut-off	Mineral Resources				Valuable HM grade (in-situ)				
Resource Category	THM %	Material (Mt)	THM %	SL %	OS %	Zircon %	Rutile %	Leucoxene %	Ilmenite %	Total VHM %
Indicated	1.1	1,630	1.4	21	1.1	0.07	0.05	0.04	1.10	1.27
Inferred	1.1	4,180	1.5	23	3.2	0.07	0.03	0.05	1.17	1.31
Total	**1.1**	**5,800**	**1.4**	**22**	**2.6**	**0.07**	**0.03**	**0.04**	**1.15**	**1.30**

	In-situ	Mineral assemblage (% of THM)				Contained valuable HM				
Resource Category	THM (Mt)	Zircon %	Rutile %	Leucoxene %	Ilmenite %	Zircon (kt)	Rutile (kt)	Leucoxene (kt)	Ilmenite (kt)	Total VHM (kt)
Indicated	23.3	5.2	3.3	2.8	77	1,210	770	650	17,940	20,570
Inferred	60.7	4.5	2.1	3.2	81	2,740	1,250	1,920	48,860	54,770
Total	**84.0**	**4.7**	**2.4**	**3.1**	**79**	**3,950**	**2,020**	**2,570**	**66,800**	**75,340**

Notes: 1. The in-situ grade is determined by multiplying the percentage of THM by the percentage of each valuable heavy mineral within the heavy mineral assemblage at the resource block model scale.
2. Tonnes and grades have been rounded to reflect the relative accuracy and confidence level of the estimate, thus the sum of columns may not equal.

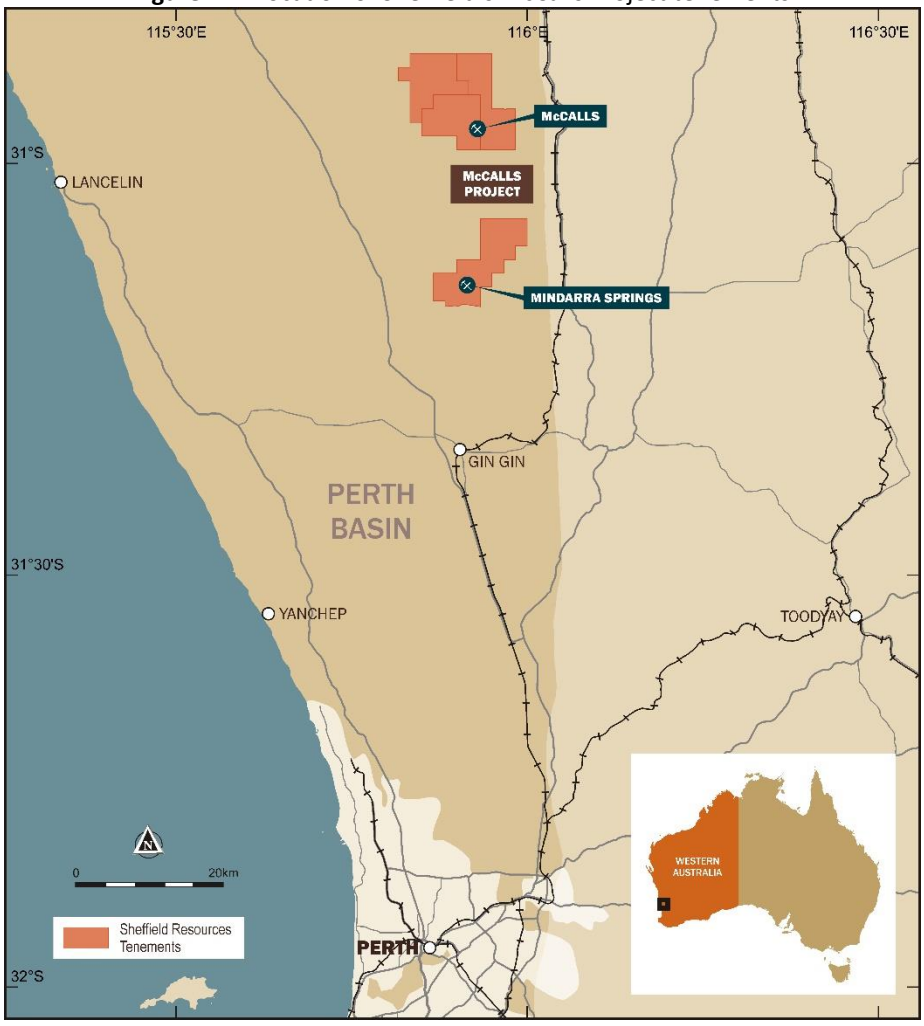
Ownership/Tenure

A summary of Sheffield's current tenement holding in the Mid-west region which hosts the McCalls Project Mineral Resources is included as Table 2.2 and displayed in Figure 2.1. The tenements are 100% owned by Sheffield Resources Ltd.

Table 2.2: McCalls Project tenement summary

Deposit	Licence	Status	Grant date	Expiry date	Area (km²)
McCalls	E70/3929	Granted	26/10/2011	25/10/2021	47.1
	E70/3967	Granted	10/11/2010	09/11/2020	52.9
	E70/4922	Granted	05/07/2017	04/07/2022	50.0
Mindarra Springs	E70/4584	Granted	01/04/2014	31/03/2019	73.7

Figure: 2.1 Location of Sheffield's McCalls Project tenements



Deposit geology and interpretation

Sheffield's McCalls and Mindarra Springs deposits are within the North Perth Basin. The Perth Basin is a north to north-northwest-trending sedimentary basin that extends approximately 1,000km along the southwestern margin of the Australian continent and which averages 65km in width. The McCalls and Mindarra Springs deposits are hosted within unconsolidated Cainozoic sediments of the Coolyena Group that overlie Cretaceous sedimentary rocks of the Dandaragan Trough (Figure 2.2). The depositional environment of the mineralisation at the McCalls deposit is interpreted as estuarine-lagoon and the mineralisation at Mindarra Springs is interpreted as estuarine.

At McCalls heavy mineral concentrations within Sheffield's tenement are over an area of up to 14km east-west and up to 12km north-south. Mineralisation occurs from surface to depths of up to 96m, with an average thickness of 28m. At Mindarra Springs, heavy mineral concentrations within Sheffield's tenement are over an area of 6.5km east-west by 12km north-south. Mineralisation occurs from surface to depths of up to 22.5m, with an average thickness of 19m.

A combination of geology and grade were used to interpret the mineralisation and geological domains. The mineralised domains are based on a nominal cut-off grade of approximately 0.7% THM. For McCalls the geological interpretation included modelling of a layer of induration that occurs from surface to an average depth of 3.6m and sediments with high slimes content (>35%) as two separate domains. At Mindarra Springs the interpretation excluded intervals that were logged as having rock, that were identified by logged lithology, oversize content, or lateritic content. Representative cross-sections are included in Figure 2.3 and Figure 2.4.

Figure 2.2: Regional GSWA geology of the McCalls Project area

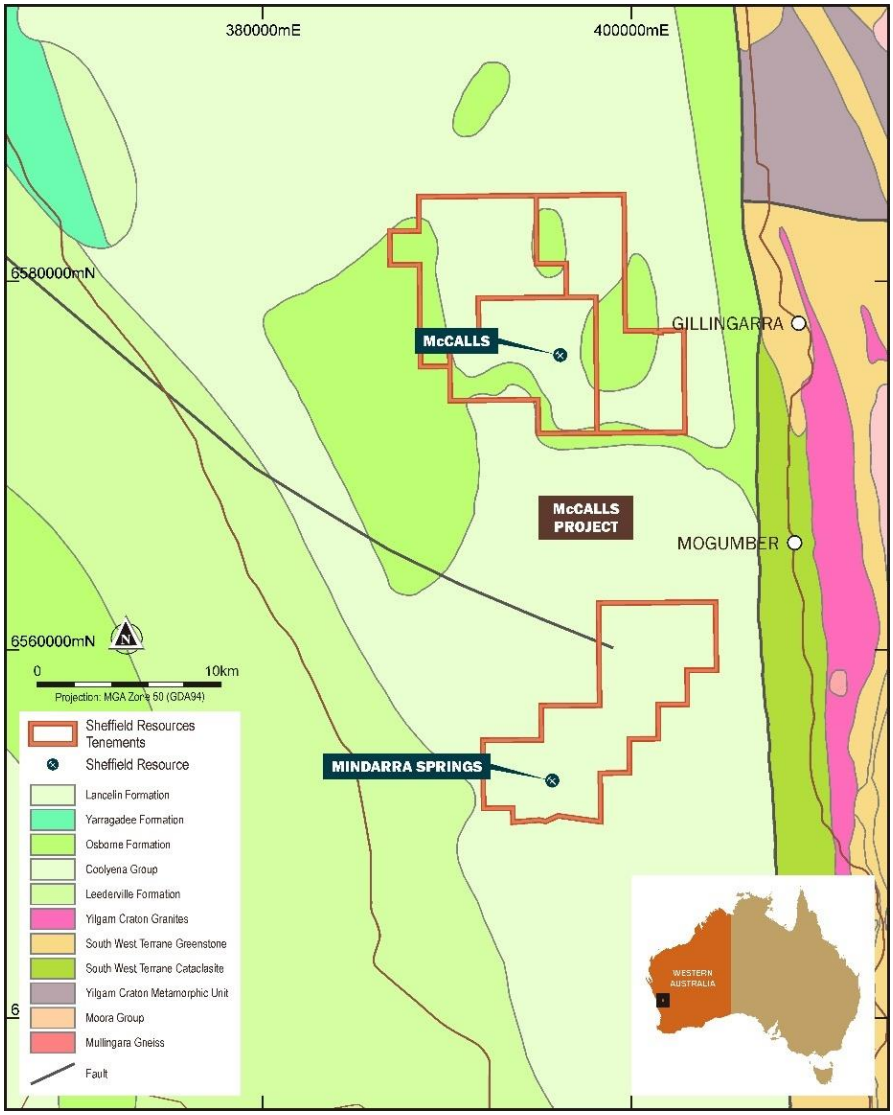


Figure 2.3: McCalls - cross-section along 397,100mE of interpreted domains and drill holes coloured by THM grade

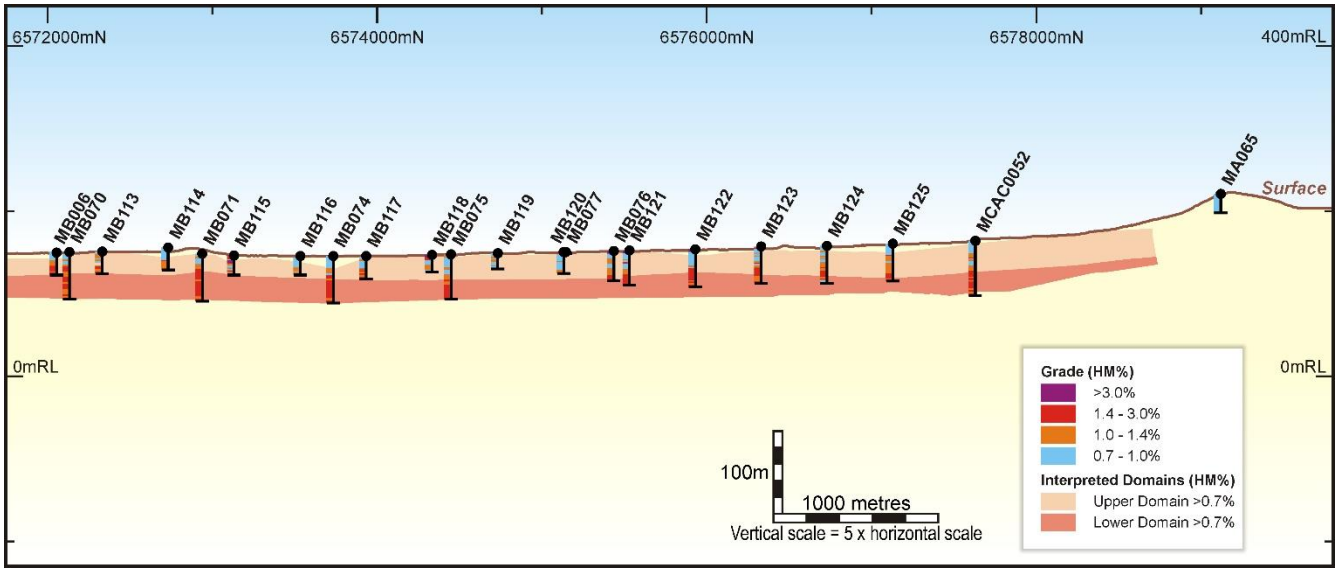
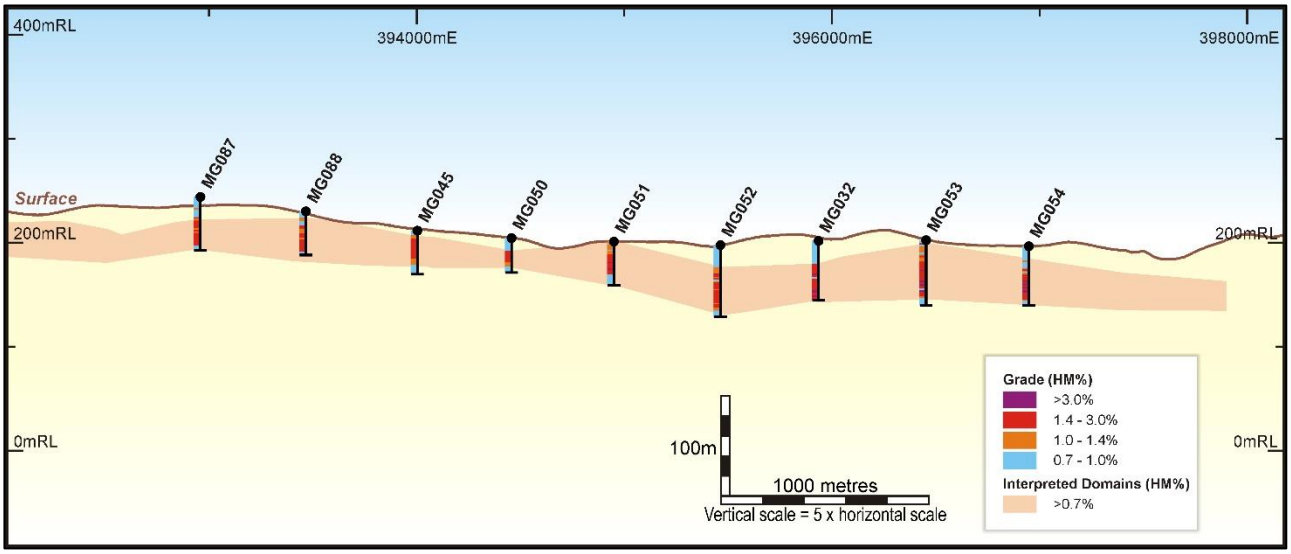


Figure 2.4: Mindarra Springs - cross-section along 6,553,070mN of interpreted mineralisation and drill holes coloured by THM grade



Drilling and sampling techniques

BHP Minerals Limited (BHP) explored the McCalls region, including the McCalls and Mindarra Springs deposits, from 1989 to 1995. Sheffield completed several phases of drilling at McCalls between 2011 and 2013 and at Mindarra Springs in 2015. Both BHP and Sheffield used aircore drilling to collect 1-3kg samples at 1.5m intervals down-hole and both data sets were used for geological interpretation and resource estimation. A summary of the drilling carried out on each deposit and used for Mineral Resource estimation is included in Table 2.3. (Note: in the following tables SFX refers to Sheffield Resources Ltd).

Table 2.3 Summary of drilling for each deposit supporting the McCalls Project Mineral Resource

Deposit	Company (year)	Number of drill holes	Metres drilled	Number of HM assays	Spacing
McCalls	BHP (1990s)	272	8,376.5	3,707	400m by 800m to 1,000m by 1,000m
	SFX (2011-12)	101	6,076.0	4,050	100m by 100m to 800m by 800m
	Total	373	14,452.5	7,757	
Mindarra Springs	BHP (1990s)	273	10,371.0	5,886	500m by 500m to 2,000m by 2,000m
	SFX (2015)	6	219.0	146	One line of holes at 450m to 600m spacing
	Total	379	10,590	6,032	

Survey

Drill holes were located using the MGA94, Zone 50 coordinate system. Historic BHP drill holes were not surveyed, with only planned coordinates reported and used. Collar locations for the Sheffield drill holes at McCalls (except one hole) were surveyed by registered surveyors Heyhoe Surveys Pty Ltd using RTK-GPS. At Mindarra Springs the six Sheffield drill hole collar locations were surveyed by Sheffield employees using a handheld Garmin GPS system with expected accuracy of +/- 5m horizontal.

Digital elevation models (DEM) were obtained by Sheffield from Landgate (Western Australia Government land department), with an accuracy of +/- 1.5m for the McCalls and Mindarra Springs tenement areas. The drill hole collar data was projected to the DEM surfaces to determine the collar elevations and the DEMs were used to constrain the resource models to below the topographical surface.

Geological logging

The BHP drill logs contain lithology, colour, grain size and sorting and some drill hole logs included qualitative hardness and visual estimates of total HM and slimes. For the Sheffield drill holes the samples were washed and panned, then geologically logged on site in 1.5m intervals, by Sheffield geologists. All samples were logged for lithology, shade and colour, grain size, stratigraphy and after 2012 the sample logging included oversize lithology, rounding and qualitative hardness and visual estimates of total HM and oversize.

Sampling analyses

Total heavy mineral, slimes and oversize determination was by screen, weight and heavy liquid separation. The analysis process involved desliming and removal of oversize material. The heavy minerals within the remaining sand fraction were separated using a heavy liquid to determine the heavy mineral content.

Samples from the Sheffield Mindarra Springs 2015 and the McCalls 2011 drill holes were analysed at Diamantina Laboratories and the 2012 samples were analysed at Western Geolabs, in Perth Western Australia. All Sheffield samples were analysed using -45µm slimes / +1mm oversize screens. Separation of HM was by heavy liquid TBE (density 2.96g/ml) from the +45µm-1mm fraction.

Samples from the BHP drill holes were analysed at BHP's Belmont laboratory, Western Australia. Samples were analysed using a -45µm slimes / +1mm oversize screen. Separation of HM was by TBE (density 2.9g/ml) from the +45µm-1mm fraction.

Heavy mineral concentrates from Sheffield drill samples were grouped from similar geological domains to form composite samples which were subjected to analysis to determine the mineral assemblage. The mineral assemblage of the McCalls resource was determined using QEMSCAN analysis of 28 composite samples of heavy mineral concentrate (HMC) collected from 30 drill holes (sampling from a total of 1,066.5m of downhole intervals). The mineral assemblage of the Mindarra Springs resource was determined from the historic analysis by BHP (magnetic separation and grain-counting) of 44 composite samples of HMC collected from 44 drill holes (sampling from a total of 683m of downhole intervals) and one composite sample from two Sheffield drill holes analysed using QEMSCAN.

QAQC and data quality

QAQC data is not available for the BHP drilling. QAQC procedures for Sheffield's drilling programmes included the insertion of a blank sample and field duplicates at the drill site (each at a rate of 1 in every 40 samples). In addition, 56 samples from McCalls that were analysed by Diamantina were also analysed by WGL. The six Sheffield drill holes twinned the historic BHP drill holes.

No trends or bias were noted for the analysis of the blank and standard material. Overall results indicate that analysis of HM by the duplicate samples had moderate to good correlation with the original samples.

The assay data are considered to have sufficient quality for the purpose of estimation and reporting of Mineral Resource.

Density

Bulk density was determined using a proprietary formula supplied by the leading global mineral sands consultancy TZ Minerals International (TZMI). The formula is based on heavy mineral and slimes percentage concentrations and includes assumptions about both packing content and mineral densities. All tonnages for the Mineral Resource estimates are expressed on a dry tonnage basis.

Data analysis

Data analysis and estimation was undertaken using Snowden Supervisor and Datamine software.

At McCalls over 87% of the samples have been taken over intervals of 1.5m and at Mindarra Springs almost 93% of the samples have been taken over intervals of 1.5m. The data was composited to 1.5m intervals within the mineralised domains. Top-cut (cap) grades were applied to the HM, slimes and oversize at McCalls and to the slimes and oversize at Mindarra Springs.

Variogram analysis was undertaken to determine the HM, slimes and oversize continuity within the mineralised horizons and the horizontal continuity ranges for the mineral assemblage components. Kriging neighbourhood analysis was undertaken to determine the block size and the kriging parameters.

Mineral Resource estimation

The resource models were developed for the McCalls and Mindarra Springs deposits by Optiro using Datamine software. Parent blocks were used for grade estimation and sub-cells were used to more accurately represent the geometry and volumes of the geological and mineralisation horizons (Table 2.4).

Table 2.4: Block sizes used for grade estimation and volume control

Deposit	Parent block size			Sub-cell size		
	X	Y	Z	X	Y	Z
McCalls	400mE	200mN	1.5mRL	40mE	20mN	0.5mRL
Mindarra Springs	200mE	200mN	1.5mRL	25mE	25mN	0.5mRL

HM, slimes and oversize block grades were estimated using ordinary kriging techniques with appropriate top-cuts applied to the HM, slimes and oversize data and search ellipses oriented within the plane of the mineralisation. Inverse distance (cubed) was used to estimate the percentage of ilmenite, leucoxene, rutile and zircon. Plans of the HM grade averaged over the entire thickness of the deposits are included as Figure 2.5 and Figure 2.6.

The block models were validated by:

- visual comparison of the drill holes and blocks
- statistical comparison of the mean input grade (top-cut and declustered) with the estimated block grade
- examining trend plots of the input data and estimated block grades.

Figure 2.5: Plan of the McCalls Mineral Resource coloured by average HM (Exploration Licences – black outline, Mogumber Aboriginal Reserve – green outline)

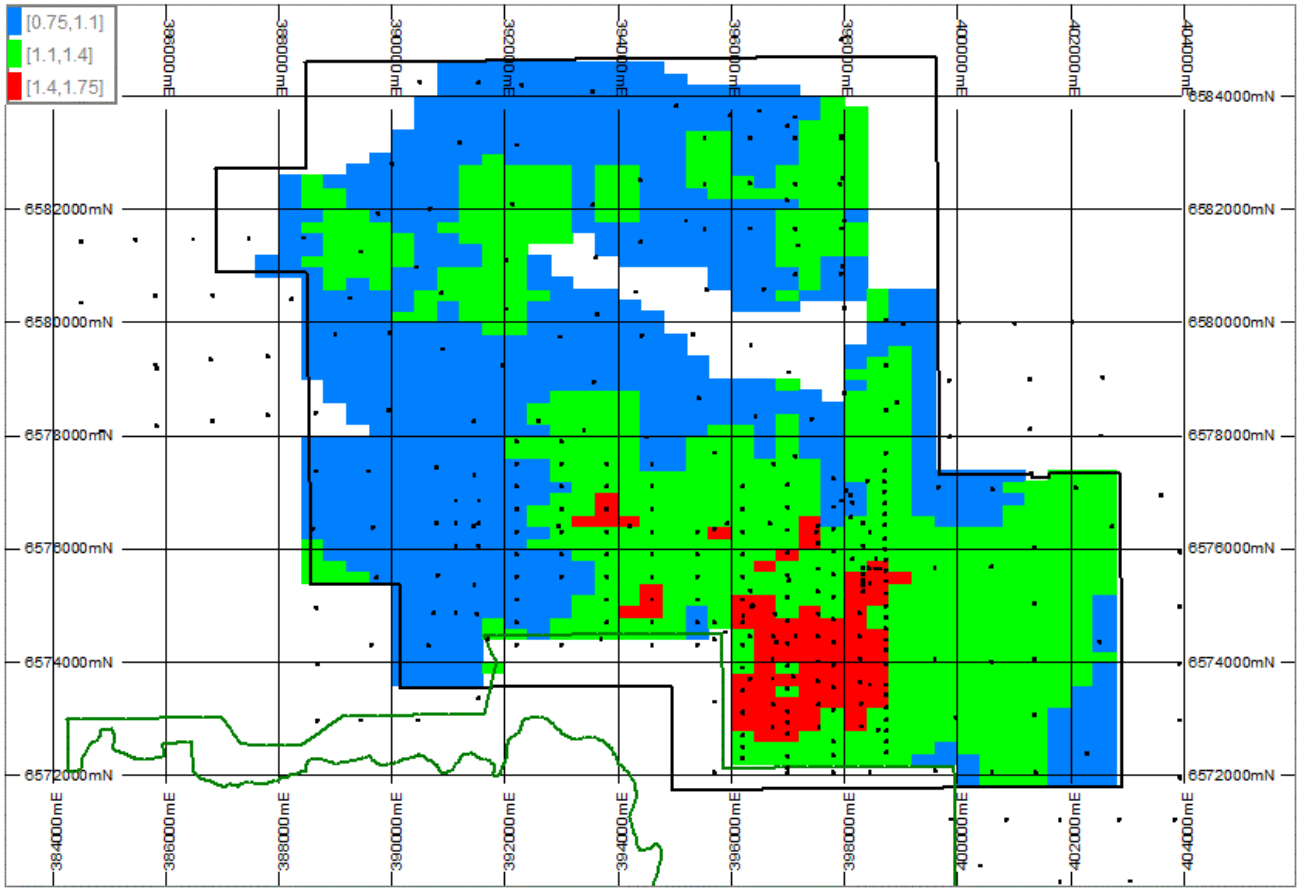
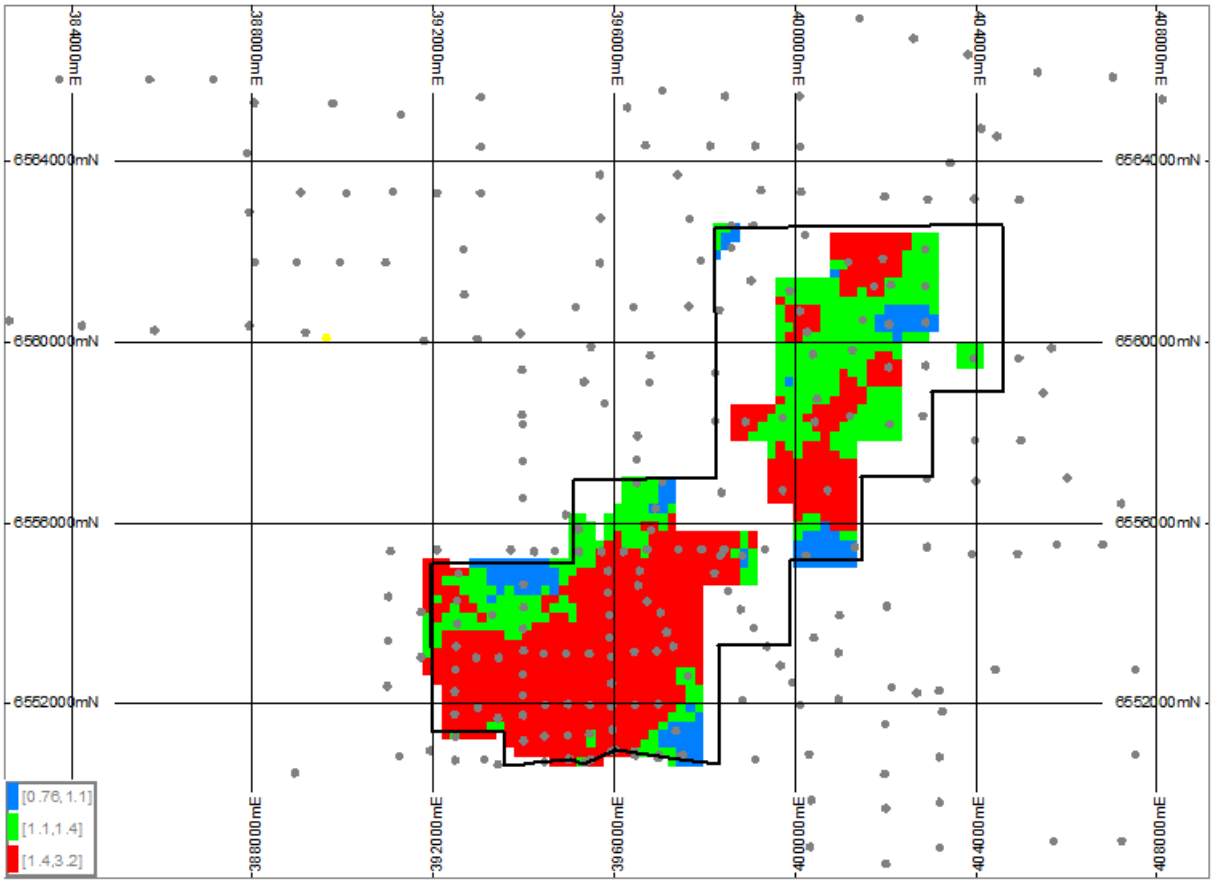


Figure 2.6: Plan of the Mindarra Springs Mineral Resource coloured by average HM (Exploration Licence – black outline)



Mineral Resource classification

The Mineral Resources within Sheffield's tenements have been classified on the basis of confidence in geological and grade continuity and taking into account data quality (in particular the historical nature of the BHP data), data density and confidence in estimation of heavy mineral content, and the location of the mineral assemblage data. In addition, metallurgical testwork results have been considered for the McCalls deposit.

At the McCalls deposit Indicated Mineral Resources have been defined where the Sheffield drilling is at a spacing of 400mE by 400mN or closer and there is mineral assemblage data and Inferred Mineral Resources are defined where the drill spacing is up to 1,000mE by 1,000mN and where mineral assemblage data has been extrapolated. At the Mindarra Springs deposit the Mineral Resource is classified as Inferred due to the historical BHP data and the wide spaced drilling.

The assigned classification of Indicated and Inferred at the McCalls deposit and of Inferred at the Mindarra Springs deposit reflects the Competent Person's assessment of the accuracy and confidence levels in the Mineral Resource estimate.

Mineral Resource statement

The Mineral Resource estimates have been classified and reported in accordance with the guidelines of the JORC Code (2012 edition) and are reported above a cut-off grade of 1.1% total heavy minerals and below a cut-off grade of 35% slimes (Table 2.5). The THM% is the total heavy minerals from within the-1mm+45µm fraction and is reported as a percentage of the total material.

The mineralisation at the McCalls and Mindarra Springs deposits extends beyond Sheffield's tenements and the entire extent of the data and interpretation was included in the estimation process. The reported Mineral Resources have been screened to within Sheffield's tenements and the McCalls Mineral Resource estimate excludes the area within the Mogumber Aboriginal Reserve.

In determining the criteria for reasonable prospects for eventual economic extraction, potential mining methods considered are wet, dredge mining or dry dozer-trap operations, similar to those commonly and currently in use in HM mining operations both in Australia and globally. Sheffield considers that the McCalls and Mindarra Springs deposits have a reasonable prospect of eventual economic when considered in the context of the deposit location and existing infrastructure and taking into consideration the depth, thickness and grades of the deposit.

Table 2.5: McCalls Project Mineral Resource as at 1 October 2018

Deposit	Resource Category	Cut-off	Mineral Resources				Valuable HM grade (in-situ)				
		THM %	Material (Mt)	THM %	SL %	OS %	Zircon %	Rutile %	Leucoxene %	Ilmenite %	Total VHM %
McCalls	Indicated	1.1	1,630	1.4	21	1.1	0.07	0.05	0.04	1.10	1.27
	Inferred	1.1	1,980	1.2	26	1.1	0.06	0.05	0.04	1.00	1.15
	Total	**1.1**	**3,600**	**1.3**	**24**	**1.1**	**0.07**	**0.05**	**0.04**	**1.05**	**1.20**
Mindarra Springs	Inferred	1.1	2,200	1.6	20	5.1	0.07	0.01	0.05	1.32	1.46
	Total	**1.1**	**2,200**	**1.6**	**20**	**5.1**	**0.07**	**0.01**	**0.05**	**1.32**	**1.46**
Total	Indicated	1.1	1,630	1.4	21	1.1	0.07	0.05	0.04	1.10	1.27
	Inferred	1.1	4,180	1.5	23	3.2	0.07	0.03	0.05	1.17	1.31
	Total	**1.1**	**5,800**	**1.4**	**22**	**2.6**	**0.07**	**0.03**	**0.04**	**1.15**	**1.30**

All tonnages and grades have been rounded to reflect the relative uncertainty of the estimate, thus the sums of columns may not equal.

Deposit	Resource Category	In-situ THM (Mt)	Mineral assemblage (% of THM)				Contained valuable HM				
			Zircon %	Rutile %	Leucoxene %	Ilmenite %	Zircon (kt)	Rutile (kt)	Leucoxene (kt)	Ilmenite (kt)	Total VHM (kt)
McCalls	Indicated	23.3	5.2	3.3	2.8	77	1,210	770	650	17,940	20,570
	Inferred	24.4	5.0	3.8	3.2	81	1,210	930	790	19,790	22,720
	Total	**47.7**	**5.1**	**3.6**	**3.0**	**79**	**2,430**	**1,700**	**1,430**	**37,730**	**43,290**
Mindarra Springs	Inferred	36.3	4.2	0.9	3.1	80	1,520	320	1,130	29,080	32,050
	Total	**36.3**	**4.2**	**0.9**	**3.1**	**80**	**1,520**	**320**	**1,130**	**29,080**	**32,050**
Total	Indicated	23.3	5.2	3.3	2.8	77	1,210	770	650	17,940	20,570
	Inferred	60.7	4.5	2.1	3.2	81	2,740	1,250	1,920	48,860	54,770
	Total	**84.0**	**4.7**	**2.4**	**3.1**	**79**	**3,950**	**2,020**	**2,570**	**66,810**	**75,340**

All tonnages and grades have been rounded to reflect the relative uncertainty of the estimate, thus the sums of columns may not equal.

The table below summarises the assessment and reporting criteria used for the McCalls Project Mineral Resource estimates for the McCalls and Mindarra Springs deposits and reflects the guidelines in Table 1 of *The Australasian Code for the Reporting of Exploration Results, Mineral Resources and Ore Reserves* (the JORC Code, 2012).

SECTION 1 SAMPLING TECHNIQUES AND DATA

Criteria	JORC Code explanation	Commentary
Sampling techniques	• *Nature and quality of sampling.* • *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.* • *In cases where 'industry standard' work has been done this would be relatively simple (eg '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 (eg submarine nodules) may warrant disclosure of detailed information.*	• The Mineral Resource estimates for the McCalls Project deposits (McCalls and Mindarra Springs) use historic data from historic BHP Minerals Ltd (BHP) drilling in the 1990s and drilling by Sheffield in 2011-2012 (McCalls) and 2015 (Mindarra Springs). • All drilling was by aircore. • Mineral sands industry-standard drilling and sampling techniques employed. BHP • Historic data reported in mineral exploration reports by BHP- Minerals circa 1990s captured digitally by Sheffield. • NQ diameter aircore drilling used to collect 1kg samples at 1.5m intervals down-hole. • Rotary splitter used. • QAQC data not available. Sheffield • NQ (70mm) diameter aircore drilling used to collect a sample of 1-3kg at 1.5m intervals down-hole. • See below for sample and assay QAQC procedures and analysis. • McCalls - Sheffield drilled 41.7% of (101) holes for 6,076m, of which 11.8% of (30) holes for 1,713m were drilled in 2011 and 29.9% (71) holes for 4,363m were drilled in 2012. BHP drilling in 1991 accounts for 58.3% of (276) holes for 8,496.5m. • Mindarra Springs - BHP drilled 273 (10,371m) of the 279 holes used in the Mineral Resource estimate. Sheffield drilled 6 holes (219m).
Drilling techniques	• *Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg 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).*	BHP • Historic data reported in mineral exploration reports by BHP circa 1990s. • NQ diameter aircore. Sheffield • Aircore system using a blade (face sampling) drill bit, NQ size. • System used is an industry standard for mineral sands deposits.
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.*	BHP • Historic data reported in mineral exploration reports by BHP circa 1990s. • No record of drill sample recovery. • Sample condition and qualitative recovery was not logged for historic BHP holes. • Use of rotary splitter was reported and given drilling method and Sheffield's own experience in the region, it can be reasonably assumed that sample recovery and quality was sufficient. Sheffield • Sheffield used a rotary splitter beneath the cyclone to collect a 1-3 kg sub-sample from 1.5m intervals. • Sample weight is recorded at the laboratory.

Criteria	JORC Code explanation	Commentary
		• Duplicate samples for Sheffield holes are collected at the drill site (see below) to enable analysis of data precision. • Sample condition (wet to dry and good to poor qualitative recovery) is logged at the drill site. Analysis shows no material bias in the differing sample conditions logged. • At McCalls three bulk samples were collected by Sheffield for characterisation work by CPG Resources. Further testing was carried out by Robbins Metallurgical to assess processing of upper and lower zone material. • The sample quality is considered appropriate for the Mineral Resource estimation and classification applied.
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.*	BHP • Historic data reported in mineral exploration reports by BHP Minerals circa 1990s. • Each drill sample was washed and panned, then geologically logged recording colour, grainsize, rounding, hardness and sorting and visual estimates of total HM% and SL%. • The entire length of the drill hole was logged; minimum (nominal) interval length is 1.5m. Sheffield • Every drill sample is washed and panned, then geologically logged on-site in 1.5m intervals. • 2011 - recorded lithology, shade and colour, grainsize, stratigraphy. • 2012 and 2015 - recorded primary and oversize lithology, shade and colour, qualitative hardness, rounding grainsize, visual estimates of total HM% and OS%. • Heavy mineral sachets were physically examined under a microscope following heavy medium separation by laboratory and assessed to whether sand or from rock. • The entire length of the drill hole is logged; minimum (nominal) interval length is 1.5m. • Logging is suitable such that interpretations of grade and deposit geology can be used to support the Mineral Resource estimation and classification applied.
Sub-sampling techniques and sample preparation	• *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.*	BHP • A 1 kg sample was collected at 1.5m intervals at the drill site via a rotary splitter. • Samples were analysed at BHP's laboratory in Perth for heavy liquid separation (HLS) determination of weight per cent heavy mineral (HM%), slimes (SL%) and oversize (OS%). • The 1 kg drill sample was sub-sampled via a (unspecified) splitter to approx. 500 g for analysis. • The 500g sub-sample was then screened and deslimed at +1mm (OS) and -45µm (SL) and fractions weighed. • The sand material (-1mm / +45 µm) was then split to approx. 200g and centrifuged in TBE (SG 2.9g/cc) for HM determination. Sheffield • Duplicate samples (field duplicates) collected at drill site and reference standard (including blank) material samples inserted. • Samples submitted to an external laboratory for heavy liquid separation (HLS) determination of weight per

Criteria	JORC Code explanation	Commentary
		cent heavy mineral (HM%), slimes (SL%) and oversize (OS%) at a screen split of -45µm, +45µm and +1mm. • Total HM determination TBE 2.96 g/ml bromoform separation. Diamantina (McCalls 2011 samples and Mindarra Springs 2015 samples) ○ The 1-3 kg drill sample is sub-sampled via a rotary splitter to approx. 200 g for analysis. ○ The 200 g sub-sample is soaked overnight in water then screened and weighed. ○ HM%, SL% and OS% calculated as percentage of total sample weight (see below). ○ Laboratory repeats are conducted 1 in 18 samples. Western Geolabs (McCalls 2012) ○ The 1-3 kg drill sample is sub-sampled via a rotary splitter 100 g to 120 g for analysis. ○ The sub-sample is soaked overnight in water then screened and weighed. ○ HM%, SL% and OS% calculated as percentage of total sample weight (see below). ○ Laboratory repeats are conducted 1 in every 19 samples. • Laboratory provides a sachet containing the heavy mineral concentrate (HMC) for each sample – this is used in HM assemblage determination (see below). • Visual estimates of HM%, SL% and OS% logged at the drill site are compared against laboratory results to identify any significant errors. • Spacing of duplicate, standard, blank and laboratory repeat samples for Sheffield holes are designed to identify sample misplacement or misallocation during sample collection and laboratory analysis. • Results from the analysis of field duplicate samples and laboratory repeats for the Sheffield data are sufficient to show the data has acceptable precision and indicate that the sub-sampling and sample preparation techniques are appropriate for the deposit style and the Mineral Resource estimation and classification applied. <u>HM Assemblage Determination</u> BHP • Selected heavy mineral concentrate (HMC) from individual samples were composited for selected drill holes for HM assemblage determination. • HM assemblage determination was by magnetic separation and observation (grain-counting). Sheffield • HMC from individual samples is combined according to HM grade and weight into (nominal) >20 g composite samples for HM assemblage determination. • Weighed HMC composite is split via a micro-riffle to ensure HM%, SL% and OS% of the final composite sample can be correctly calculated. • HM assemblage determination was by QEMSCAN™ to determine the component mineralogy. This method has rigorous (laboratory) internal quality control measures and is considered sufficient to show the data has acceptable precision, indicating the sub-sampling and sample preparation techniques are appropriate for the deposit style and the Mineral Resource estimation and classification applied.

Criteria	JORC Code explanation	Commentary
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.* • *Nature of quality control procedures adopted (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.*	• Assay and laboratory procedures are industry standard, although method specifics and heavy liquid composition can vary. BHP • Data reported in mineral exploration reports by BHP circa 1990s. • Assay and laboratory procedures used are industry standard. • SL% was determined using a -45µm screen. • OS% was determined using a +1mm screen. • Total HM% was determined using heavy liquid TBE (2.9g/ml). • The method produces a total grade as weight per cent of the primary sample. • HM assemblage determination was by magnetic separation and observation (grain-counting). • No record of assay QAQC is reported. Sheffield • SL% was determined using a -45 µm screen. • OS% was determined using a +1 mm screen. • Total HM% was determined using heavy liquid TBE 2.96 g/ml. • The method produces a total grade as weight per cent of the primary sample. • Reference blank material samples inserted at the drill site. Reference blanks are examined for performance over time and within laboratory batches. Batches or sub-batches are re-analysed if unacceptable QAQC data are returned. • McCalls – an additional 56 umpire samples from the 2012 drilling programme were assayed (original laboratory Western Geolabs, umpire laboratory – Diamantina). • In total QAQC samples represent 12% of the Sheffield McCalls data and 10% of the Sheffield Mindarra Springs data. • Analysis of reference blanks and laboratory standards, repeats show the data to be of acceptable accuracy and precision for the Mineral Resource estimation and classification applied. • HMC from individual samples is combined according to HM grade and weight into (nominal) >20 g composite samples for HM assemblage determination. • Weighed HMC is split via a micro-riffle to ensure HM%, SL% and OS% of the final homogenised composite sample can be correctly calculated. • HM assemblage determination was by the QEMSCAN™ process which uses observed mass and chemistry to classify particles according to their average chemistry, and then report mineral abundance by % mass. • For the TiO_2 minerals specific breakpoints are used to distinguish between rutile (>95% TiO_2), leucoxene (85-95% TiO_2) and ilmenite (<55-85% TiO_2). • Reference material for QEMSCAN analysis is not used. Other measures of accuracy and the method design are considered sufficient to establish acceptable accuracy of the data for the Mineral Resource estimation and classification applied.

Criteria	JORC Code explanation	Commentary
Verification of sampling and assaying	• *The verification of significant intersections by either independent or alternative company 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.*	BHP • Historic data reported in mineral exploration (DMIRS WAMEX) reports by BHP circa 1990s captured digitally by Sheffield. • Accuracy of data entry was confirmed via several validation protocols both manual and electronic. Sheffield • Data was logged electronically using "validation at point of entry" systems prior to storage in the Company's drill hole database, which is managed by Company personnel and an external consultancy. • Documentation related to data custody and validation is maintained by the Company. • A copy ("snapshot") of the Mineral Resource database is retained separately from the primary drill hole database. • All drill holes were included in the drill database. • At Mindarra Springs, 6 of the Sheffield drill holes twinned the BHP drill holes. Statistical comparison of the data indicates no bias and the Sheffield data has verified the historic BHP data. • The verification and treatment of the data is considered sufficient for the Mineral Resource estimation and classification applied.
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.*	• Coordinate system is MGA Zone 50 (GDA94). • BHP original plan location was in AMG84 zone 50 and was converted to MGA Zone 50 by Sheffield. • BHP drill hole collar locations were digitised from maps supplied with historic exploration reports. These were not surveyed. • McCalls - 100 Sheffield drill holes collar locations were surveyed by registered surveyors Heyhoe Surveys Pty Ltd using RTK-GPS. One Sheffield drill hole MCAC009 has a planned location as it was not surveyed. • Mindarra Springs - the 6 Sheffield drill hole collar locations were surveyed by Sheffield employees using a handheld Garmin GPS system with expected accuracy of +/- 5m horizontal. • Drill hole collar elevations for the McCalls and Mindarra Springs resource models were determined by projection of surveyed drill hole collars to a regional (Landgate) SRTM Digital Elevation Model (DEM) for both Sheffield and BHP drill collars. • The Mineral Resource estimates used the DEMs as surface topography. The DEMs provide a consistent spatial topography over the project area. • The quality and accuracy of the topographic control is considered sufficient for the Mineral Resource estimation and classification applied
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.*	McCalls • Sheffield drill holes are located in E70/3929 (36 holes) and E70/3967 (65 holes). • BHP holes are located in E70/3929 (123 holes), E70/4922 (43 holes) and E70/3967 (43 holes). BHP also drilled 67 holes outside the current Sheffield tenure. • Sheffield drill hole spacing of 100m by 100m, up to a spacing of 800m by 800m. BHP drill hole spacing of 400m by 800m, up to a spacing of 1,000m by 1,000m. • The drill database used in the resource estimate comprises 377 holes, totalling 14,572.5 m, with 8,239

Criteria	JORC Code explanation	Commentary
		samples assayed. 101 holes totalling 6,076m for 4,376 assays (inc QAQC) have been drilled by Sheffield, 276 holes totalling 8,496.5m for 3,863 assays by BHP. • Samples for HM assemblage determination are composited on intervals according to a combination of grade and geology appropriate to reflect resource estimation domains. Samples have been composited from individual holes or, where not possible based on geological and grade constraints, are selected from holes that are proximal. • 28 composites from 30 holes were produced from Sheffield drill holes. Four composites from 2011 split by Diamantina using 8 holes and 24 composites from Western Geolabs from 22 holes in 2012. • The data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource estimation and classification applied. Mindarra Springs • BHP drilling was restricted to public access roads and farm tracks. The majority of holes are spaced at between 2km and 500m. Drill hole samples were collected at 1m intervals downhole. • The six Sheffield drill holes are in E70/4584 at a spacing of 450m to 600m along the southern edge of tenement. • Samples for HM assemblage determination are composited on intervals according to a combination of grade and geology appropriate to reflect resource estimation domains. • The data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource estimation and classification applied.
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.*	• All drilling is vertical making it normal to the horizontal orientation of geology and mineralisation.
Sample security	• *The measures taken to ensure sample security.*	• Sample security is not considered a significant risk given the location of the deposit and bulk-nature of mineralisation. • Nevertheless, the use of recognised transport providers, sample dispatch procedures directly from the field to the laboratory, and the large number of samples are considered sufficient to ensure appropriate sample security.
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	• All data has been validated by at least two Company geologists and was reviewed by the Competent Person for the Mineral Resource estimate.

SECTION 2 REPORTING OF EXPLORATION RESULTS

Criteria	JORC Code explanation	Commentary
Mineral tenement and	• *Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures,*	• Mineral Resources are within 100% Sheffield Resources held Exploration Licences. • McCalls - E70/3929 granted on the 26/10/2011 and is

Criteria	JORC Code explanation	Commentary
land tenure status	*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.*	due to expire on the 25/10/2021; E70/3967 granted on the 10/11/2010 and due to expire on the 09/11/2020; and E70/4922 granted on the 05/07/2017 and due to expire on the 04/07/2022. • The reported Mineral Resource at McCalls excludes the Mogumber Aboriginal Reserve area. • Mindarra Springs - E70/4584 was granted on 01/04/2014 and is due to expire on 31/03/2019. • These Exploration Licences are within Sheffield's McCalls Project and are centred along the Brand Highway in the Midwest region of Western Australia. • There are no known or expected impediments to obtaining a licence to operate in the area. • Sheffield has been operating successfully in the region for 7 years.
Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties.*	• The McCalls and Mindarra Springs HMS deposits were discovered by BHP in the early 1990s following reconnaissance drilling programmes. • The Mineral Resources are estimated from drilling information reported by BHP and Sheffield. • The BHP drilling extends beyond Sheffield's tenements and all data was used for interpretation and grade estimation. • Historic drilling activities are listed elsewhere within JORC 2012 Table 1.
Geology	• *Deposit type, geological setting and style of mineralisation.*	• The McCalls heavy mineral sands project is hosted within unconsolidated Cainozoic sediments covering Cretaceous sedimentary rocks of the Dandaragan Trough. The Dandaragan Trough is a half-graben formed within the Proterozoic siliciclastic sedimentary rocks of the North Perth Basin. The Perth Basin is a major sedimentary basin bounded to the east by the Darling Fault which separates the Archaean cratonic rocks of the Yilgarn Block from the sediments of the Perth Basin. • Surficial geology is predominantly undifferentiated Cainozoic laterite, lateritic sands and sands of alluvial, colluvial and aeolian nature, with patchy Holocene lagoonal and swamp deposits. • Mineralisation occurs as broad, flat and extensive concentration of heavy minerals within fine sands and a relatively high clay (slimes) component. McCalls • The HM grades throughout the deposit display a degree of stratification and this feature, together with the consistent fine grainsize, good rounding and good sorting throughout, suggests an estuarine-lagoonal origin to the deposit. • Four key domains were defined for use in the estimate as follows: ○ An upper, extensive but discontinuous domain of indurated material with logged lateritic material and/or a high OS component (>10%) at, or close to, the surface. ○ An upper clayey-sand HM domain, lighter in colour, based on a nominal cut-off of 0.7% HM. ○ A lower sandy-clay HM domain, based on a nominal cut-off of 0.7% HM. This domain is significantly less extensive than the upper HM domain and often darker in colour due to carbonaceous and sulphide material and higher clay content. ○ A high slimes domain based on a nominal cut-off

Criteria	JORC Code explanation	Commentary
		grade of 35% slimes. • The depositional environment of both the upper and lower domains is interpreted as estuarine-lagoonal. The difference in environment between the upper and lower domains may be a factor of oxidation and reduction above and below a palaeo-water table, or it may represent the preservation of an organic-rich sediment unit (lower domain) by a rapid influx of sediment into an estuarine environment. The upper and lower domains are also reflected in the heavy mineral assemblage, with a relative increase in the valuable heavy minerals (VHM) zircon, rutile, leucoxene and ilmenite in the upper domain. This difference is due to an increase in non-VHM in the lower domain (pyrite), with the proportions of each VHM to total VHM similar in both domains. Mindarra Springs • The size of the deposit and character of the heavy mineral, are indicative of deposition in a low-energy, estuarine environment.
Drillhole Information	• *A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drillholes:* • easting and northing of the drillhole collar • elevation or RL (elevation above sea level in metres) of the drillhole collar • dip and azimuth of the hole • down hole length and interception depth • hole length.	• Information relating to the number of drill holes, assayed samples, location accuracy, orientation etc. is included in this table. • Diagrams in the announcement show the location of and distribution of drill holes in relation to the Mineral Resources.
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.*	• Not relevant – exploration results are not being reported; Mineral Resources have been defined.
Relationship between mineralisation widths and intercept lengths	• *If the geometry of the mineralisation with respect to the drillhole 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').*	• Mineralisation and stratigraphy is assumed to be sub-horizontal, flat lying and therefore vertical drill holes are approximate to true thickness. • Exploration results are not being reported; Mineral Resources have been defined.
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.*	• Plans and cross sections are included in the announcement.
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.*	• Not relevant – exploration results are not being reported; Mineral Resources have been defined.
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*	• Where relevant this information has been included or referred to elsewhere in this Table.

Criteria	JORC Code explanation	Commentary
	characteristics; potential deleterious or contaminating substances.	
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).*	• At this stage no additional exploration work is planned.

SECTION 3 ESTIMATION AND REPORTING OF MINERAL RESOURCES

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.*	• Drill hole data was extracted directly from the Company's drill hole database which includes internal data validation protocols. • Validation of the exported data was confirmed using mining software (Micromine) validation protocols, and visually in plan and section views. • Compilation of data external to the drill database (e.g. HM assemblage source data) was cross-checked manually, and through statistical comparison. • A copy ("snapshot") of the Mineral Resource database is retained separately to the primary drill hole database. • Data was further validated by Optiro upon receipt, and prior to use in the estimation.
Site visits	• *Comment on any site visits undertaken by the Competent Person and the outcome of those visits.*	• Senior Sheffield geology personal have visited both McCalls and Mindarra Springs. • Mrs Standing has not visited the McCalls or the Mindarra Springs sites, but has visited mineral sands deposits within the Mid-west region of the Perth Basin. • Where material, information relating to observations from these visits has been included in this announcement.
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.*	McCalls • The indurated (rock) and mineralised domains were interpreted on a cross-sectional basis by Sheffield using Micromine software based on the logging and grade information according to the deposit geology described above. These interpretations were used by Optiro to revise the sectional interpretation and to 'snap' to drill hole intersections using Datamine software. These sectional interpretations were wireframed. • An upper clayey-sand HM domain, lighter in colour, based on a nominal cut-off of 0.7% HM and an increase in VHMs relative to the lower HM domain was interpreted. • A lower sandy-clay HM domain, significantly less extensive than the upper HM domain and often darker in colour due to carbonaceous and sulphide material and higher clay content; and with a decrease in VHMs relative to the upper HM domain was interpreted. • The high slimes domain was interpreted using a nominal cut-off grade of 35% slimes. Mindarra Springs • Mineralisation was interpreted on a cross-sectional basis and wireframed by Sheffield using Micromine software based on the logging and grade information according to the deposit geology described above. • Domains were assessed using microscope analysis to examine the shape and composition of the heavy mineral. • The mineralised domain was interpreted at a nominal >0.7 HM cut-off with a minimum width of 3m. • Interpretation excluded intervals with high

Criteria	JORC Code explanation	Commentary
		concentrations of rock or non-valuable heavy minerals. McCalls and Mindarra Springs • The confidence in the geological interpretation is reflected by the assigned resource classification.
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.*	McCalls • The McCalls deposit covers an area of up to 14km east-west and up to 12km north-south. • Mineralisation occurs from surface to depths of up to 96m, with an average thickness of 28m. Mindarra Springs • The Mindarra Springs deposit covers an area of up to 6.5km east-west by 12km north-south. • Mineralisation occurs from surface to depths of up to 22.5m, with an average thickness of 19m. The average overburden thickness is 7.6m.
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. 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.*	• Total HM, slimes and oversize quantities were estimated using ordinary kriging (OK) into blocks of 400mE by 200mN by 1.5mRL at McCalls and 200mE by 200mN by 1.5mRL at Mindarra Springs. Zircon, rutile, leucoxene and ilmenite percentages were estimated using inverse distance (cubed) into the parent blocks. • Block dimensions were selected from kriging neighbourhood analysis and reflect the variability of the deposit and the model's practicality for future mine planning. • Sub-cells to a minimum dimension of 40mE by 20mN by 0.5mRL at McCalls and 25mE by 25mN by 0.5mRL at Mindarra Springs were used to represent volume. For the definition of the topographical surface and soil horizon (of 15cm) the vertical sub-celling was reduced to 0.15mRL. McCalls ○ Sheffield drill hole spacing of 100m by 100m, up to a spacing of 800m by 800m. BHP drill hole spacing of 400m by 800m, up to a spacing of 1,000m by 1,000m. The majority of the drilling is at a spacing of 400mE by 200mN. ○ A maximum extrapolation distance of 400m was applied. Mindarra Springs ○ The historic BHP drilling was restricted to public access roads and farm tracks. The majority of holes are spaced at between 2,000m and 500m. The six Sheffield holes are along one section at a spacing of 450m to 600m. ○ A maximum extrapolation distance of 300m was applied. • Data analysis and estimation was undertaken using Snowden Supervisor and Datamine software. • Over 87% of the samples at McCalls and almost 93% of the samples at Mindarra Springs used for the resource estimate have been taken over intervals of 1.5m. The data was composited to 1.5m intervals for analysis and resource estimation. • Wireframe interpretations of mineralisation were made based on geological logging and HM content, using a threshold of ~0.7% HM to define the mineralised horizons at McCalls and Mindarra Springs. • Optiro assessed the robustness of the domains by critically examining the geological interpretation and by using a variety of measures, including statistical and

Criteria	JORC Code explanation	Commentary

		geostatistical analysis. The mineralised domains are considered geologically robust in the context of the resource classification applied to the estimate.
		• All variables were estimated separately and independently.
		• Grade capping was applied to HM% at McCalls and to SL% and OS% at McCalls and Mindarra Springs. The top-cut levels were determined using a combination of top-cut analysis tools, including grade histograms, log probability plots and the coefficient of variation.
		• Variogram analysis was undertaken to determine the kriging estimation parameters used for OK estimation of total HM, slimes and oversize.
		  ○ At McCalls the HM mineralisation continuity was interpreted from variogram analyses to have an along strike range of 2,150m and an across strike range of 1,600m within the upper domain and an along strike range of 1,450m and an across strike range of 810m within the lower domain.
		  ○ At Mindarra Springs the HM mineralisation continuity was interpreted from variogram analyses to have an along strike range of 670m and an across strike range of 400m.
		• Kriging neighbourhood analysis was performed in order to determine the block size, sample numbers and discretisation levels.
		• McCalls - two estimation passes were used for HM; the first search was based upon the variogram ranges; the second search was two times the initial search. The second search had reduced sample numbers required for estimation. The majority of blocks (over 99%) were estimated in the first pass.
		• Mindarra Springs – three estimation passes were used for HM; the first search was based upon the variogram ranges; the second search was two times the initial search and the third search was six times the initial search. The second search and third searches had reduced sample numbers required for estimation. Almost 32% of the HM block grades were estimated in the first search, 65% in the second search and the remaining 3% in the third search pass.
		• The HM, slimes and oversize estimated block model grades were visually validated against the input drill hole data and comparisons were carried out against the declustered drill hole data and by northing, easting and elevation slices.
		• The VHM estimated block model grades were visually validated against the input drill hole data and comparisons were carried out against the drill hole data and by northing and easting slices.
		• The Mineral Resource was estimated for McCalls by QG Australia Pty Ltd in 2016. The total tonnage of the 2018 model is 1% less than the 2016 model and the HM grade of the 2018 model (1.3% HM) is 5% lower than the 2016 model (1.4% HM). In addition, only Inferred Resources have been defined for the 2018 model within the area tested only by historical drilling.
		• A Mineral Resource has not been previously estimated for Mindarra Springs.

Moisture	• *Whether the tonnages are estimated on a dry basis or with natural moisture, and the method*	• Tonnages are estimated on a dry basis.

Criteria	JORC Code explanation	Commentary
	of determination of the moisture content.	
Cut-off parameters	• *The basis of the adopted cut-off grade(s) or quality parameters applied.*	• The Mineral Resource has been reported within Sheffield's tenements. McCalls is reported within E70/3929, E70/3967 and E70/4922 and excludes the Mogumber Aboriginal Reserve area. Mindarra Springs is reported within E70/4584. • The Mineral Resource estimates for the McCalls and Mindarra Springs deposits have been reported above a cut-off grade of 1.1% total HM, to represent the resource that may be extracted under current market conditions. An upper cut-off grade of 35% slimes has also been applied. • These parameters have been selected by Sheffield in consultation with Optiro based on current experience and preliminary economic assessments carried out by Sheffield for HM deposits elsewhere in Western Australia. They represent that proportion of the deposit considered to have reasonable prospects of eventual economic extraction.
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.*	• In determining the criteria for reasonable prospects for eventual economic extraction, potential mining methods considered are wet, dredge mining or dry dozer-trap operations, similar to those commonly and currently in use in HM mining operations both in Australia and globally. • The thickness, areal extent, and continuous nature of the mineralisation at McCalls and Mindarra Springs are such that non-selective bulk mining methods can be appropriately considered. • These assumptions were also considered when determining resource block sizes, and resource classification. • On the basis of these assumptions, the Company considers there are no mining factors which are likely to affect the assumption that the deposits have reasonable prospects for eventual economic extraction.
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.*	• Sheffield has conducted scoping-level mineral characterisation testwork on samples from McCalls. It is assumed that the mineralisation at Mindarra Springs is similar. • These studies have identified Ilmenite characterisation studies conducted on a single sample composited from Sheffield's drilling produced concentrates containing between 59% and 66% TiO_2, indicating potential suitability for chloride-route or synthetic rutile processing. The work also demonstrated the heavy mineral has properties well suited to conventional mineral processing methods. • On the basis of these studies, the Company considers there are no metallurgical factors which are likely to significantly affect the assumption that the deposits have reasonable prospects for eventual economic extraction.
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.*	• The Company has completed a scoping-level environmental review of the McCalls project area in 2011. • Sheffield considers there are no environmental factors which are likely to affect the assumption that the McCalls and Mindarra Springs deposits have reasonable prospects for eventual economic extraction.
Bulk density	• *Whether assumed or determined. If assumed, the basis for the assumptions. If determined,*	• No direct measurements of bulk density have been taken.

Criteria	JORC Code explanation	Commentary
	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 alteration zones within the deposit.* • *Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.*	• Bulk density is assumed from an industry-standard formula which accounts for the HM and slimes content of sand deposits. The resultant values are considered to be consistent with observations of the material compared with other similar HM deposits with known bulk density values. • A recommendation for future work is that confirmatory bulk density information is acquired.
Classification	• *The basis for the classification of the Mineral Resources into varying confidence categories.* • *Whether appropriate account has been taken of all relevant factors (ie 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.*	• The estimate has been classified according to the guidelines of the JORC Code (2012) taking into account of confidence in geological and grade continuity and taking into account data quality (in particular the historical nature of the BHP data), data density and confidence in estimation of heavy mineral content, and the location of the mineral assemblage data. • The assigned classification of Indicated and Inferred reflects the Competent Person's assessment of the accuracy and confidence levels in the Mineral Resource estimate. McCalls • In plan, a polygon was used to define the areas of Indicated and Inferred Mineral Resources. • Indicated Mineral Resources have been defined where the Sheffield drilling is at a spacing of 400mE by 400mN or closer and there is mineral assemblage data. • Inferred Mineral Resources are defined where the drill spacing is up to 1,000mE by 1,000mN and where no mineral assemblage data has been extrapolated. Mindarra Springs • Mineral Resources are classified as Inferred. Data is from historical drilling at a spacing of 500mE by 500mN to 2,000mE by 2,000mN.
Audits or reviews	• *The results of any audits or reviews of Mineral Resource estimates.*	• The Mineral Resource has been reviewed internally as part of normal validation processes by Optiro. • No external audit or review of the current Mineral Resource has been conducted.
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.* • *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 assigned classification of Indicated and Inferred at McCalls and of Inferred at Mindarra Springs reflects the Competent Person's assessment of the accuracy and confidence levels in the Mineral Resource estimate. • The estimate is suitable for input into long term planning studies. • No production has occurred from the deposit.