

## **MINBOS TO PURSUE YELLOW PHOSPHORUS CRITICAL MINERALS POTENTIAL AS PART OF STAGE 2 EXPANSION**

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### **Highlights**

- Following strong expressions of interest from international investors, Minbos is investigating the feasibility of pursuing the production of Yellow Phosphorus, also known as P4, from both its existing phosphate resource at the Cácata mine in Angola and new licences under application.
- In order to double the capacity of the beneficiation plant for this Stage 2 expansion, should it prove feasible, Minbos has estimated the additional CAPEX to be only \$US1.7-3.3M.
- The Company believes Angola, with its cheap electricity prices and economic free zone, presents a compelling opportunity for P4 production.
- Minbos has also submitted applications to secure prospecting licences in Angola that have known phosphate occurrences that, with further work, may supplement this Stage 2 expansion opportunity.

### **Background**

- P4 is produced by the reduction of phosphate rock, with silica, coke, and electricity.
- P4 is required to produce specialist phosphorus chemicals needed by a very wide range of high-value end-uses, including electronics, fire safety, batteries, industrial water and process treatment, technical plastics, pharmaceuticals, lubricants, and metal treatments.
- P4 is used to produce lithium hexafluorophosphate (LiPF<sub>6</sub>), the electrolyte used in today's lithium-ion batteries which can only be produced from P4-derivatives.

- A large range of Chinese and European industrial sectors are dependent on P4 which, in addition to Phosphate Rock, is currently on the EU Critical and Raw Materials List<sup>1</sup>.
- Europe has no P4 production and is 100% dependent on imports, with existing production highly dependent on variable factors such as local electricity prices, export policies or up-and downstream integration.
- The cost estimate to double the capacity of the beneficiation plant as part of Phase 2 considers supplier prices for equipment and mechanical installation received by EPC as part of the Phase 1 construction cost with typical engineering factoring utilised for those elements not yet clarified in Phase 1.

### **Minbos CEO Lindsay Reed commented:**

*“The P4 strategy allows us to explore the utilisation of medium grade Phosphate Rock with a high silica content unsuitable for the fertilizer market, and outside of our existing mine plan, and combine it with cheap electricity in Angola to supply a critical mineral in the battery materials supply chain.*

*Being able to increase production from the existing mine and beneficiation plant, with minimal additional investment, would lower the cost of Phosphate Rock production for both the fertilizer and P4 markets.”*

### **Next Steps**

- The Company is currently undertaking a desk top study to determine the viability of the Stage 2 strategy, including the mining of medium grade Phosphate Rock from the Cácata mine in Angola and new licences currently under application, together with suitability for setting up a P4 production facility in Angola.
- The Company will continue to engage with potential P4 partners with a view to securing a technical and funding partner to advance the Stage 2 strategy.

<sup>1</sup> European Commission: Critical Raw Materials Resilience: Charting a Path towards greater Security and Sustainability (September,2020)

- Applications have been submitted to secure prospecting licences in Angola to support further phosphate exploration.

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**Minbos Resources Limited (ASX:MNB) (“Minbos” or “the Company”)** is pleased to provide an update on its progress to provide more high-value products from its Cácata Phosphate Deposit, located in Angola.

This strategy has been developed on the back of the AU\$25 million placement completed by the Company in mid-July 2022, which included the signing of a Strategic Cooperation Agreement with a syndicate of investors, including Mr. Liang Feng, the Chairman of US \$18 Billion Shanghai Putailai New Energy, who were seeking exposure to Ferro Phosphate and Lithium Ferro Phosphate Projects<sup>2</sup>.

**Cácata Mineral Resources**

The 2021 Cácata JORC (2012) Mineral Resource contains a total Measured, Indicated and Inferred Mineral Resource of 8.4 million tonnes at 29.6% P<sub>2</sub>O<sub>5</sub> (Table 1)<sup>3</sup> of which 4.72 Mt at 30.1% P<sub>2</sub>O<sub>5</sub> has been converted into JORC (2012) Proven and Probable Ore Reserves (Table 2)<sup>4</sup>.

**Table 1: Mineral Resource Statement Cácata Phosphate Project as of 31 October 2021<sup>5</sup>**

Classification	Cut-Off Grade (P <sub>2</sub> O <sub>5</sub> )	Tonnes (Mt)	P <sub>2</sub> O <sub>5</sub> (%)	Contained P <sub>2</sub> O <sub>5</sub> (%)	Density	Ca:P <sub>2</sub> O <sub>5</sub> ratio
Measured	19.0	2.20	29.9	0.66	1.83	1.48
Indicated	19.0	4.76	29.7	1.41	1.84	1.46
Measured + Indicated	19.0	6.96	29.7	2.07	1.84	1.47
Inferred	19.0	1.45	29.5	0.43	1.58	1.46

<sup>2</sup> ASX Announcement: Minbos receives firm commitments for \$25m placement (12<sup>th</sup> July 2022)

<sup>3</sup> Resource Update for High-Grade Cabinda Phosphate Project - ASX Announcement dated 23 November 2021

<sup>4</sup> DFS Delivers Compelling Economics for Cabinda Phosphate Project- ASX announcement dated 17<sup>th</sup> October 2022

<sup>5</sup> Resource Update for High-Grade Cabinda Phosphate Project - ASX Announcement dated 23 November 2021

**Table 2: Cácata Phosphate Mine Ore Reserve Statement as at September 2022<sup>6</sup>**

Classification	Tonnes (Kt)	P <sub>2</sub> O <sub>5</sub> (%)
Proven	1,172.6	30.5
Probable	3,543.9	30.0
<b>Total (Proven + Probable)</b>	<b>4,716.5</b>	<b>30.1</b>

Minbos plans to evaluate the potential of producing P4 using Cácata Mineral Resources, which are exclusive of the Proven and Probable Ore Reserves defined by 2022 DFS mine plan.

With reference to the above statements, Minbos notes the following:

- The 2021 Cácata Mineral Resources have been classified and reported at a 19% P<sub>2</sub>O<sub>5</sub> cut-off grade on the basis of using Cácata Phosphate Rock for the production of phosphate fertilizer.<sup>7</sup>
- Mineral Resources are not Ore Reserves and do not have demonstrated economic viability, nor have any mining modifying factors been applied.
- Minbos has yet to undertake any test work or economic evaluation to determine the viability of Cácata Phosphate Rock in the production of P4.
- Please refer to APPENDIX 1 for grade tonnage inventories of Cacata Mineral Resources exclusive of the Proven and Probable Ore Reserves defined by 2022 DFS mine plan.
- Tonnages are reported in metric units, grades in percent (%). Tonnages and grades are rounded appropriately. Rounding, as required by reporting guidelines, may result in apparent summation differences between tonnes, grade and contained metal content. Where these occur, they are not considered to be material.

**-END-**

<sup>6</sup> DFS Delivers Compelling Economics for Cabinda Phosphate Project- ASX announcement dated 17th October 2022

<sup>7</sup> Resource Update for High-Grade Cabinda Phosphate Project - ASX Announcement dated 23 November 2021

This announcement is authorised for release by the Board of Minbos Resources Limited.

## **COMPLIANCE STATEMENT**

The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and, in the case of material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed.

## **COMPETENT PERSON STATEMENT**

The Competent Person with responsibility for the total Mineral Resources of this report is Mrs Kathleen Body, Pr. Sci. Nat, who is registered as a Professional Natural Scientist with the South African Council for Natural Scientific Professions ("SACNASP"). She is an Associate Resource Geologist with SRK Consulting (UK) Limited and the Director and a Principal Consultant of Red Bush Analytics. Mrs Body was a fulltime employee of Coffey Mining at the time the original Mineral Resource estimation was completed in 2013. Mrs Body has 27 years' experience in the mining industry and has sufficient experience which is relevant to the style of mineralization 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 Mineral Reserves. Kathleen Body consents to the inclusion in the report of the matters based on her information in the form and context in which it appears.

Information in this announcement relating to Mineral Resources is extracted from the ASX release dated 21 November 2021. Minbos Resources Limited confirms that it is not aware of any new information or data that materially affects the information included in this announcement and that all material assumptions and technical parameters underpinning the Mineral Resource continue to apply and have not materially changed. Minbos Resources Limited confirms that the form and context in which the Competent Persons' findings are presented in this announcement have not been materially modified from the original market announcement.

The scientific and technical information in this announcement that relates to Ore Reserves estimates for the Project is based on information compiled by Mr Ross Cheyne, a Principal Consultant of Orelogy Consulting Pty Ltd. Mr Cheyne is a Fellow of the Australasian Institute of Mining and Metallurgy (AusIMM). Mr Cheyne 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 Cheyne consents to the inclusion in the announcement of the matters related to the Ore Reserve estimate in the form and context in which it appears.

Information in this announcement relating to Ore Reserves is extracted from the ASX release dated 17 October 2022. Minbos Resources Limited confirms that it is not aware of any new information or data that materially affects the information included in this announcement and that all material assumptions and technical parameters underpinning the Mineral Resource continue to apply and have not materially changed. Minbos Resources Limited confirms that the form and context in which the Competent Persons' findings are presented in this announcement have not been materially modified from the original market announcement.

### **FORWARD LOOKING STATEMENTS**

Statements contained in this release, particularly those regarding possible or assumed future performance, revenue, costs, dividends, production levels or rates, prices, or potential growth of Minbos Resources Limited, are, or may be, forward looking statements. Such statements relate to future events and expectations and, as such, involve known and unknown risks and uncertainties. Actual results and developments may differ materially from those expressed or implied by these forward-looking statements depending on a variety of factors.

**APPENDIX 1**

The grade and tonnages reported here do not constitute a Mineral Resource Statement and are presented here for illustrative purposes only.

**Table 3: Grade tonnage table of material classified as Measured located outside of the current Life of Mine pit design that are exclusive of the Proven and Probable Ore Reserves defined by the 2022 DFS mine plan and inside the October 2022 Mineral Resource Pit.**

Cutoff (P <sub>2</sub> O <sub>5</sub> %)	Tonnes (Mt)	P <sub>2</sub> O <sub>5</sub> %	SiO <sub>2</sub> %	Al <sub>2</sub> O <sub>3</sub> %	CaO %	Fe <sub>2</sub> O <sub>3</sub> %	K <sub>2</sub> O %	MgO %
0	0.97	27.9	12.5	1.69	42.11	0.94	0.39	1.15
1	0.97	27.9	12.5	1.69	42.11	0.94	0.39	1.15
2	0.97	27.9	12.5	1.69	42.11	0.94	0.39	1.15
3	0.97	27.9	12.5	1.69	42.11	0.94	0.39	1.15
4	0.97	27.9	12.5	1.69	42.11	0.94	0.39	1.15
5	0.97	27.9	12.5	1.69	42.11	0.94	0.39	1.15
6	0.97	27.9	12.5	1.69	42.11	0.94	0.39	1.15
7	0.97	27.9	12.5	1.69	42.11	0.94	0.39	1.15
8	0.97	27.9	12.5	1.69	42.11	0.94	0.39	1.15
9	0.97	27.9	12.5	1.69	42.11	0.94	0.39	1.15
10	0.97	27.9	12.5	1.69	42.11	0.94	0.39	1.15
11	0.97	27.9	12.5	1.69	42.11	0.94	0.39	1.15
12	0.97	27.9	12.5	1.69	42.14	0.94	0.39	1.15
13	0.96	27.9	12.5	1.69	42.19	0.94	0.39	1.15
14	0.96	28.0	12.5	1.70	42.31	0.95	0.39	1.16
15	0.96	28.0	12.5	1.70	42.35	0.95	0.39	1.15
16	0.95	28.1	12.5	1.70	42.40	0.95	0.39	1.15
17	0.94	28.2	12.6	1.70	42.53	0.95	0.39	1.14
18	0.94	28.3	12.5	1.70	42.62	0.95	0.39	1.09
19	0.92	28.4	12.5	1.70	42.75	0.95	0.39	1.03
20	0.90	28.6	12.5	1.70	42.92	0.95	0.39	0.98
21	0.88	28.9	12.4	1.70	43.17	0.96	0.38	0.90
22	0.83	29.3	12.2	1.69	43.49	0.96	0.37	0.72
23	0.79	29.6	12.0	1.68	43.74	0.95	0.36	0.62
24	0.76	29.8	11.7	1.65	44.00	0.94	0.35	0.56
25	0.68	30.5	11.1	1.61	44.70	0.91	0.33	0.44
26	0.62	31.0	10.2	1.54	45.37	0.88	0.30	0.37
27	0.51	31.9	8.2	1.42	46.68	0.79	0.24	0.32
28	0.46	32.4	7.2	1.37	47.35	0.76	0.21	0.29
29	0.44	32.6	6.7	1.34	47.69	0.74	0.19	0.27
30	0.42	32.8	6.4	1.33	47.85	0.73	0.19	0.25
31	0.41	32.8	6.3	1.32	47.91	0.73	0.18	0.25
32	0.37	33.0	6.1	1.26	48.09	0.72	0.18	0.23
33	0.18	33.4	5.4	1.13	48.69	0.70	0.16	0.22
34	0.01	34.3	4.0	0.92	50.04	0.63	0.14	0.20

**Table 4: Grade tonnage table of material classified as Indicated located outside of the current Life of Mine pit design that are exclusive of the Proven and Probable Ore Reserves defined by the 2022 DFS mine plan and inside the October 2022 Mineral Resource Pit.**

Cutoff (P <sub>2</sub> O <sub>5</sub> %)	Tonnes (Mt)	P <sub>2</sub> O <sub>5</sub> %	SiO <sub>2</sub> %	Al <sub>2</sub> O <sub>3</sub> %	CaO %	Fe <sub>2</sub> O <sub>3</sub> %	K <sub>2</sub> O %	MgO %
0	1.35	23.1	21.1	2.29	35.31	1.21	0.62	1.54
1	1.35	23.1	21.1	2.29	35.31	1.21	0.62	1.54
2	1.35	23.1	21.1	2.29	35.31	1.21	0.62	1.54
3	1.35	23.1	21.1	2.29	35.31	1.21	0.62	1.54
4	1.35	23.1	21.1	2.29	35.31	1.21	0.62	1.54
5	1.35	23.1	21.1	2.29	35.31	1.21	0.62	1.54
6	1.35	23.1	21.1	2.29	35.31	1.21	0.62	1.54
7	1.35	23.1	21.1	2.29	35.31	1.21	0.62	1.54
8	1.35	23.1	21.1	2.29	35.32	1.21	0.62	1.54
9	1.35	23.1	21.1	2.29	35.35	1.21	0.62	1.54
10	1.35	23.2	21.1	2.29	35.44	1.21	0.62	1.54
11	1.34	23.3	21.1	2.29	35.52	1.21	0.62	1.54
12	1.33	23.3	21.1	2.29	35.64	1.21	0.62	1.54
13	1.31	23.5	21.1	2.28	35.82	1.21	0.62	1.52
14	1.28	23.7	20.9	2.25	36.11	1.19	0.61	1.48
15	1.25	24.0	20.9	2.22	36.37	1.18	0.60	1.42
16	1.17	24.5	20.8	2.18	36.81	1.16	0.59	1.20
17	1.06	25.4	20.7	2.10	37.62	1.12	0.57	0.98
18	1.02	25.7	20.2	2.04	38.01	1.09	0.56	0.92
19	0.92	26.5	19.2	1.91	38.91	1.03	0.52	0.77
20	0.83	27.2	18.0	1.82	39.82	0.98	0.48	0.65
21	0.73	28.1	16.1	1.76	40.98	0.95	0.43	0.56
22	0.67	28.7	15.4	1.74	41.60	0.93	0.41	0.43
23	0.63	29.1	14.5	1.72	42.12	0.92	0.39	0.38
24	0.61	29.4	14.2	1.70	42.44	0.91	0.38	0.36
25	0.54	30.0	13.7	1.70	43.27	0.89	0.37	0.32
26	0.43	31.1	11.4	1.68	44.82	0.87	0.34	0.29
27	0.40	31.4	10.8	1.67	45.19	0.86	0.33	0.26
28	0.35	32.0	9.6	1.58	45.94	0.82	0.30	0.25
29	0.32	32.3	8.8	1.57	46.41	0.83	0.27	0.24
30	0.31	32.4	8.5	1.57	46.56	0.82	0.26	0.22
31	0.30	32.5	8.4	1.57	46.64	0.82	0.26	0.22
32	0.22	32.8	7.6	1.49	47.18	0.79	0.22	0.20
33	0.08	33.2	6.8	1.32	47.80	0.75	0.21	0.20
34	0.00	34.2	6.2	1.32	48.10	0.72	0.16	0.15



**Table 5: Grade tonnage table of material classified as Inferred located outside of the current Life of Mine pit design that are exclusive of the Proven and Probable Ore Reserves defined by the 2022 DFS mine plan and inside the October 2022 Mineral Resource Pit.**

Cutoff (P <sub>2</sub> O <sub>5</sub> %)	Tonnes (Mt)	P <sub>2</sub> O <sub>5</sub> %	SiO <sub>2</sub> %	Al <sub>2</sub> O <sub>3</sub> %	CaO %	Fe <sub>2</sub> O <sub>3</sub> %	K <sub>2</sub> O %	MgO %
0	7.15	13.4	33.7	2.85	25.27	1.36	0.96	4.01
1	7.15	13.4	33.7	2.85	25.27	1.36	0.96	4.01
2	7.14	13.4	33.7	2.85	25.28	1.36	0.96	4.01
3	7.10	13.5	33.6	2.85	25.37	1.36	0.96	4.01
4	7.01	13.6	33.7	2.85	25.49	1.36	0.96	3.97
5	6.87	13.8	33.7	2.85	25.80	1.36	0.96	3.99
6	6.66	14.0	33.7	2.85	26.15	1.37	0.95	3.98
7	6.25	14.5	32.7	2.77	26.88	1.34	0.92	3.99
8	5.66	15.3	31.7	2.69	27.79	1.33	0.89	3.88
9	4.78	16.5	30.3	2.61	29.01	1.32	0.84	3.54
10	3.69	18.6	26.9	2.41	31.30	1.30	0.75	3.09
11	2.77	21.3	22.8	2.15	34.20	1.22	0.63	2.49
12	2.38	22.9	20.5	2.05	35.80	1.21	0.57	2.07
13	2.22	23.6	20.1	2.05	36.45	1.22	0.56	1.80
14	2.00	24.7	19.3	2.05	37.40	1.22	0.54	1.41
15	1.79	25.9	17.5	1.93	38.75	1.15	0.50	1.17
16	1.68	26.6	16.4	1.86	39.59	1.11	0.48	1.04
17	1.59	27.2	16.5	1.89	40.32	1.12	0.49	0.97
18	1.50	27.8	15.7	1.84	40.93	1.10	0.46	0.84
19	1.41	28.3	15.0	1.78	41.57	1.07	0.44	0.72
20	1.36	28.7	14.6	1.77	41.98	1.06	0.43	0.66
21	1.29	29.1	14.0	1.76	42.50	1.06	0.42	0.58
22	1.24	29.4	13.5	1.75	42.85	1.05	0.41	0.54
23	1.20	29.7	13.1	1.73	43.15	1.04	0.40	0.51
24	1.17	29.8	12.8	1.72	43.39	1.03	0.39	0.50
25	1.05	30.4	11.9	1.58	44.28	0.95	0.38	0.46
26	0.84	31.6	10.2	1.52	45.74	0.86	0.34	0.31
27	0.81	31.8	9.9	1.50	45.96	0.85	0.33	0.28
28	0.68	32.7	7.8	1.43	47.20	0.81	0.27	0.29
29	0.66	32.8	7.5	1.42	47.37	0.81	0.26	0.29
30	0.64	32.9	7.3	1.42	47.49	0.80	0.26	0.27
31	0.62	33.0	7.3	1.42	47.53	0.80	0.26	0.26
32	0.53	33.2	7.1	1.44	47.63	0.82	0.25	0.19
33	0.46	33.3	6.9	1.45	47.75	0.83	0.24	0.18
34	0.00	34.2	6.2	1.32	48.10	0.72	0.16	0.15

**Table 6: Grade tonnage table of Inferred Resources located inside of the current Life of Mine pit design that are exclusive of the Proven and Probable Ore Reserves defined by the 2022 DFS mine plan.**

Cutoff (P <sub>2</sub> O <sub>5</sub> %)	Tonnes (Mt)	P <sub>2</sub> O <sub>5</sub> %	SiO <sub>2</sub> %	Al <sub>2</sub> O <sub>3</sub> %	CaO %	Fe <sub>2</sub> O <sub>3</sub> %	K <sub>2</sub> O %	MgO %
0	1.53	15.3	38.9	4.08	23.30	2.57	0.96	1.68
1	1.53	15.3	38.9	4.08	23.30	2.57	0.96	1.68
2	1.53	15.3	38.9	4.08	23.30	2.57	0.96	1.68
3	1.52	15.3	38.9	4.08	23.31	2.57	0.96	1.68
4	1.52	15.3	38.9	4.08	23.34	2.57	0.96	1.68
5	1.51	15.4	38.9	4.08	23.49	2.58	0.96	1.69
6	1.49	15.5	38.9	4.09	23.62	2.59	0.96	1.69
7	1.47	15.6	38.8	4.08	23.85	2.59	0.95	1.68
8	1.42	15.9	39.0	4.11	24.18	2.62	0.95	1.65
9	1.38	16.1	38.9	4.10	24.42	2.63	0.94	1.62
10	1.32	16.4	38.6	4.09	24.73	2.64	0.94	1.53
11	1.26	16.7	38.5	4.09	25.03	2.65	0.94	1.47
12	1.15	17.2	37.5	4.04	25.86	2.60	0.94	1.48
13	1.02	17.8	36.6	4.02	26.65	2.56	0.94	1.41
14	0.86	18.6	34.8	3.89	27.91	2.46	0.92	1.40
15	0.60	20.3	30.7	3.64	30.46	2.29	0.87	1.37
16	0.40	22.7	24.3	3.23	34.28	2.00	0.77	1.41
17	0.33	24.0	22.1	2.99	36.00	1.86	0.70	1.25
18	0.23	27.0	17.1	2.24	39.93	1.47	0.49	0.91
19	0.21	27.9	15.7	2.07	41.04	1.38	0.44	0.81
20	0.20	28.2	15.3	2.03	41.48	1.36	0.42	0.77
21	0.19	28.4	15.0	2.00	41.72	1.34	0.41	0.72
22	0.18	28.8	14.4	1.92	42.20	1.30	0.39	0.67
23	0.17	29.4	13.4	1.86	42.94	1.21	0.37	0.59
24	0.16	29.8	12.6	1.80	43.56	1.14	0.36	0.54
25	0.14	30.6	11.7	1.73	44.39	1.08	0.33	0.41
26	0.11	31.7	9.6	1.59	46.01	0.90	0.29	0.35
27	0.11	32.1	9.0	1.50	46.50	0.85	0.28	0.32
28	0.09	32.6	7.8	1.44	47.28	0.80	0.24	0.31
29	0.09	32.7	7.5	1.43	47.43	0.79	0.24	0.30
30	0.08	33.0	7.1	1.40	47.76	0.76	0.23	0.27
31	0.08	33.1	7.0	1.40	47.85	0.75	0.22	0.23
32	0.07	33.4	6.7	1.38	48.08	0.74	0.21	0.18
33	0.06	33.5	6.5	1.39	48.18	0.73	0.21	0.16
34	0.01	34.1	5.9	1.31	48.43	0.74	0.15	0.15