

Sample Name	SP 2 BLOCK B	Dilution Material	-
Method	Geochem Traces cups (A2)	Sample Mass	5.0000
Sample Folder	October 2024	Dilution Mass	-
Sample Type	Powder	Dilution Factor	-
Sample Status	A A A X X X X	Measurement Date	10/9/2024 4:01 PM
Operator	Admin User	Evaluation Date	10/9/2024 4:01 PM

Results - SP 2 BLOCK B

The error is the statistical error with 1 sigma confidence interval

	Element	Concentration	Abs. Error
11	Na ₂ O Sodium oxide	< 0.0027 %	-
12	MgO Magnesium oxide	< 0.0044 %	-
13	Al ₂ O ₃ Aluminium oxide	21.55 %	0.02
14	SiO ₂ Silicon dioxide	34.61 %	0.02
15	P ₂ O ₅ Phosphorus pentoxide	0.0448 %	0.0013
16	SO ₃ Sulfur trioxide	0.02732 %	0.0003
17	Cl Chlorine	0.00614 %	0.0000
19	K ₂ O Potassium oxide	1.110 %	0.001
20	CaO Calcium oxide	0.1881 %	0.0003
22	TiO ₂ Titanium dioxide	9799 ppm	4
23	V Vanadium	177.8 ppm	1.0
24	Cr Chromium	160.1 ppm	0.4
25	MnO Manganese(II) oxide	1522 ppm	1
26	Fe ₂ O ₃ Iron(III) oxide	9.941 %	0.003
27	Co Cobalt	< 0.3 ppm	-
28	Ni Nickel	62.8 ppm	0.7
29	Cu Copper	49.2 ppm	0.5
30	Zn Zinc	94.8 ppm	0.5
31	Ga Gallium	30.5 ppm	0.3
32	Ge Germanium	< 0.2 ppm	-
33	As Arsenic	1.5 ppm	0.2
34	Se Selenium	0.3 ppm	0.1
35	Br Bromine	3.5 ppm	0.1
37	Rb Rubidium	77.4 ppm	0.2
38	Sr Strontium	48.7 ppm	0.2
39	Y Yttrium	51.4 ppm	0.2
40	Zr Zirconium	340.3 ppm	0.4
41	Nb Niobium	51.6 ppm	0.2
42	Mo Molybdenum	1.4 ppm	0.2
44	Ru Ruthenium	< 0.2 ppm	-
45	Rh Rhodium	< 0.2 ppm	-
46	Pd Palladium	< 0.2 ppm	-
47	Ag Silver	1.6 ppm	0.2
48	Cd Cadmium	< 0.2 ppm	-
49	In Indium	< 0.3 ppm	-
50	Sn Tin	4.7 ppm	0.4
51	Sb Antimony	2.8 ppm	0.5
52	Te Tellurium	8.0 ppm	1.0
53	I Iodine	27.7 ppm	1.2
55	Cs Cesium	37.8 ppm	2.7
56	Ba Barium	446.3 ppm	4.0
57	La Lanthanum	150.7 ppm	5.1

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58	Ce	Cerium	241.3	ppm	6.6
59	Pr	Praseodymium	47.9	ppm	2.0
60	Nd	Neodymium	113.1	ppm	0.8
62	Sm	Samarium	< 1.5	ppm	-
70	Yb	Ytterbium	5.5	ppm	0.7
72	Hf	Hafnium	10.2	ppm	0.9
73	Ta	Tantalum	4.0	ppm	1.5
74	W	Tungsten	24.0	ppm	0.9
79	Au	Gold	< 0.1	ppm	-
80	Hg	Mercury	< 0.1	ppm	-
81	Tl	Thallium	< 0.2	ppm	-
82	Pb	Lead	19.5	ppm	0.3
83	Bi	Bismuth	< 0.3	ppm	-
90	Th	Thorium	11.5	ppm	0.3
92	U	Uranium	1.3	ppm	0.3

Sample Name	SP 3 BOCK A	Dilution Material	-
Method	Geochem Traces cups (A2)	Sample Mass	5.0000
Sample Folder	October 2024	Dilution Mass	-
Sample Type	Powder	Dilution Factor	-
Sample Status	A A A X X X X	Measurement Date	10/9/2024 3:25 PM
Operator	Admin User	Evaluation Date	10/9/2024 3:25 PM

Results - SP 3 BOCK A

The error is the statistical error with 1 sigma confidence interval

	Element	Concentration	Abs. Error
11	Na ₂ O Sodium oxide	< 0.0100 %	-
12	MgO Magnesium oxide	0.01313 %	0.0003
13	Al ₂ O ₃ Aluminium oxide	29.10 %	0.03
14	SiO ₂ Silicon dioxide	35.05 %	0.02
15	P ₂ O ₅ Phosphorus pentoxide	0.2835 %	0.0022
16	SO ₃ Sulfur trioxide	0.02107 %	0.0004
17	Cl Chlorine	0.01738 %	0.0001
19	K ₂ O Potassium oxide	1.468 %	0.001
20	CaO Calcium oxide	0.09294 %	0.0002
22	TiO ₂ Titanium dioxide	16970 ppm	10
23	V Vanadium	184.1 ppm	1.3
24	Cr Chromium	111.9 ppm	0.4
25	MnO Manganese(II) oxide	523.9 ppm	0.6
26	Fe ₂ O ₃ Iron(III) oxide	11.27 %	0.01
27	Co Cobalt	< 0.3 ppm	-
28	Ni Nickel	63.8 ppm	0.8
29	Cu Copper	38.6 ppm	0.6
30	Zn Zinc	85.3 ppm	0.6
31	Ga Gallium	37.8 ppm	0.3
32	Ge Germanium	1.5 ppm	0.1
33	As Arsenic	1.3 ppm	0.2
34	Se Selenium	< 0.1 ppm	-
35	Br Bromine	3.2 ppm	0.1
37	Rb Rubidium	66.5 ppm	0.2
38	Sr Strontium	220.2 ppm	0.3
39	Y Yttrium	77.3 ppm	0.3
40	Zr Zirconium	532.8 ppm	0.5
41	Nb Niobium	61.1 ppm	0.3
42	Mo Molybdenum	2.1 ppm	0.3
44	Ru Ruthenium	< 0.2 ppm	-
45	Rh Rhodium	< 0.2 ppm	-
46	Pd Palladium	< 0.2 ppm	-
47	Ag Silver	1.5 ppm	0.2
48	Cd Cadmium	< 0.2 ppm	-
49	In Indium	0.7 ppm	0.5
50	Sn Tin	5.0 ppm	0.4
51	Sb Antimony	3.1 ppm	0.4
52	Te Tellurium	10.9 ppm	1.0
53	I Iodine	21.0 ppm	1.2
55	Cs Cesium	48.5 ppm	2.6
56	Ba Barium	834.4 ppm	4.4
57	La Lanthanum	214.8 ppm	5.0

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58	Ce	Cerium	303.8	ppm	6.5
59	Pr	Praseodymium	72.1	ppm	2.7
60	Nd	Neodymium	191.2	ppm	1.2
62	Sm	Samarium	7.7	ppm	1.0
70	Yb	Ytterbium	5.1	ppm	0.6
72	Hf	Hafnium	18.6	ppm	1.0
73	Ta	Tantalum	2.2	ppm	1.6
74	W	Tungsten	< 0.5	ppm	-
79	Au	Gold	< 0.1	ppm	-
80	Hg	Mercury	< 0.1	ppm	-
81	Tl	Thallium	< 0.2	ppm	-
82	Pb	Lead	25.6	ppm	0.3
83	Bi	Bismuth	< 0.3	ppm	-
90	Th	Thorium	17.0	ppm	0.3
92	U	Uranium	0.8	ppm	0.3

Sample Name	SP 2 BLOCK A NORTH	Dilution Material	-
Method	Geochem Traces cups (A2)	Sample Mass	5.0000
Sample Folder	October 2024	Dilution Mass	-
Sample Type	Powder	Dilution Factor	-
Sample Status	A A A X X X X	Measurement Date	10/9/2024 2:43 PM
Operator	Admin User	Evaluation Date	10/9/2024 2:44 PM

Results - SP 2 BLOCK A NORTH

The error is the statistical error with 1 sigma confidence interval

	Element	Concentration	Abs. Error
11	Na ₂ O Sodium oxide	3.754 %	0.071
12	MgO Magnesium oxide	0.0769 %	0.0080
13	Al ₂ O ₃ Aluminium oxide	17.53 %	0.02
14	SiO ₂ Silicon dioxide	62.23 %	0.03
15	P ₂ O ₅ Phosphorus pentoxide	0.04534 %	0.0009
16	SO ₃ Sulfur trioxide	0.08909 %	0.0006
17	Cl Chlorine	0.00507 %	0.0000
19	K ₂ O Potassium oxide	4.809 %	0.002
20	CaO Calcium oxide	0.09292 %	0.0004
22	TiO ₂ Titanium dioxide	401.1 ppm	1.0
23	V Vanadium	4.2 ppm	0.3
24	Cr Chromium	< 0.1 ppm	-
25	MnO Manganese(II) oxide	119.3 ppm	0.3
26	Fe ₂ O ₃ Iron(III) oxide	0.8279 %	0.0010
27	Co Cobalt	13.2 ppm	1.1
28	Ni Nickel	< 0.2 ppm	-
29	Cu Copper	< 0.4 ppm	-
30	Zn Zinc	31.4 ppm	0.3
31	Ga Gallium	46.7 ppm	0.3
32	Ge Germanium	1.6 ppm	0.3
33	As Arsenic	1.2 ppm	0.2
34	Se Selenium	< 0.1 ppm	-
35	Br Bromine	< 0.2 ppm	-
37	Rb Rubidium	180.3 ppm	0.3
38	Sr Strontium	30.2 ppm	0.1
39	Y Yttrium	49.0 ppm	0.2
40	Zr Zirconium	26.5 ppm	0.2
41	Nb Niobium	132.9 ppm	0.2
42	Mo Molybdenum	0.8 ppm	0.1
44	Ru Ruthenium	< 0.2 ppm	-
45	Rh Rhodium	< 0.2 ppm	-
46	Pd Palladium	< 0.2 ppm	-
47	Ag Silver	1.4 ppm	0.2
48	Cd Cadmium	< 0.2 ppm	-
49	In Indium	< 0.3 ppm	-
50	Sn Tin	2.3 ppm	0.3
51	Sb Antimony	2.5 ppm	0.5
52	Te Tellurium	7.8 ppm	0.9
53	I Iodine	14.9 ppm	1.1
55	Cs Cesium	42.0 ppm	2.6
56	Ba Barium	94.3 ppm	3.5
57	La Lanthanum	117.9 ppm	4.9

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58	Ce	Cerium	183.9	ppm	6.4
59	Pr	Praseodymium	30.2	ppm	0.8
60	Nd	Neodymium	79.7	ppm	0.6
62	Sm	Samarium	< 1.5	ppm	-
70	Yb	Ytterbium	16.8	ppm	0.7
72	Hf	Hafnium	3.2	ppm	0.4
73	Ta	Tantalum	5.6	ppm	0.9
74	W	Tungsten	226.4	ppm	1.2
79	Au	Gold	< 0.1	ppm	-
80	Hg	Mercury	< 0.1	ppm	-
81	Tl	Thallium	< 0.2	ppm	-
82	Pb	Lead	30.0	ppm	0.3
83	Bi	Bismuth	< 0.3	ppm	-
90	Th	Thorium	20.6	ppm	0.2
92	U	Uranium	1.8	ppm	0.4

Sample Name	SP 1 BLOCK A	Dilution Material	-
Method	Geochem Traces cups (A2)	Sample Mass	5.0000
Sample Folder	October 2024	Dilution Mass	-
Sample Type	Powder	Dilution Factor	-
Sample Status	A A A X X X X	Measurement Date	10/9/2024 2:23 PM
Operator	Admin User	Evaluation Date	10/9/2024 2:23 PM

Results - SP 1 BLOCK A

The error is the statistical error with 1 sigma confidence interval

	Element	Concentration	Abs. Error
11	Na ₂ O Sodium oxide	< 0.0027 %	-
12	MgO Magnesium oxide	0.989 %	0.011
13	Al ₂ O ₃ Aluminium oxide	21.93 %	0.02
14	SiO ₂ Silicon dioxide	34.36 %	0.02
15	P ₂ O ₅ Phosphorus pentoxide	1.469 %	0.004
16	SO ₃ Sulfur trioxide	0.00962 %	0.0003
17	Cl Chlorine	0.03175 %	0.0001
19	K ₂ O Potassium oxide	2.173 %	0.001
20	CaO Calcium oxide	0.1694 %	0.0004
22	TiO ₂ Titanium dioxide	45340 ppm	10
23	V Vanadium	238.1 ppm	2.4
24	Cr Chromium	45.4 ppm	0.6
25	MnO Manganese(II) oxide	478.3 ppm	0.7
26	Fe ₂ O ₃ Iron(III) oxide	14.27 %	0.01
27	Co Cobalt	52.2 ppm	5.9
28	Ni Nickel	32.0 ppm	0.7
29	Cu Copper	53.0 ppm	0.7
30	Zn Zinc	198.0 ppm	0.9
31	Ga Gallium	31.3 ppm	0.4
32	Ge Germanium	< 0.3 ppm	-
33	As Arsenic	0.7 ppm	0.2
34	Se Selenium	< 0.1 ppm	-
35	Br Bromine	0.3 ppm	0.1
37	Rb Rubidium	91.3 ppm	0.3
38	Sr Strontium	790.8 ppm	0.7
39	Y Yttrium	131.6 ppm	0.3
40	Zr Zirconium	459.1 ppm	0.6
41	Nb Niobium	61.6 ppm	0.3
42	Mo Molybdenum	< 0.1 ppm	-
44	Ru Ruthenium	< 0.2 ppm	-
45	Rh Rhodium	< 0.2 ppm	-
46	Pd Palladium	< 0.2 ppm	-
47	Ag Silver	1.3 ppm	0.2
48	Cd Cadmium	< 0.2 ppm	-
49	In Indium	< 0.3 ppm	-
50	Sn Tin	3.7 ppm	0.3
51	Sb Antimony	1.5 ppm	0.2
52	Te Tellurium	9.1 ppm	1.0
53	I Iodine	16.3 ppm	1.3
55	Cs Cesium	36.2 ppm	2.7
56	Ba Barium	3173 ppm	7
57	La Lanthanum	312.7 ppm	5.3

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58	Ce	Cerium	524.3	ppm	7.1
59	Pr	Praseodymium	138.8	ppm	5.0
60	Nd	Neodymium	425.6	ppm	2.1
62	Sm	Samarium	50.3	ppm	1.8
70	Yb	Ytterbium	9.2	ppm	0.8
72	Hf	Hafnium	15.3	ppm	1.2
73	Ta	Tantalum	4.9	ppm	1.9
74	W	Tungsten	< 0.5	ppm	-
79	Au	Gold	< 0.1	ppm	-
80	Hg	Mercury	< 0.1	ppm	-
81	Tl	Thallium	< 0.2	ppm	-
82	Pb	Lead	27.4	ppm	0.4
83	Bi	Bismuth	< 0.3	ppm	-
90	Th	Thorium	11.1	ppm	0.4
92	U	Uranium	< 0.3	ppm	-

Sample Name	SP 4 BLOCK B	Dilution Material	-
Method	Geochem Traces cups (A2)	Sample Mass	5.0000
Sample Folder	October 2024	Dilution Mass	-
Sample Type	Powder	Dilution Factor	-
Sample Status	A A A X X X X	Measurement Date	10/9/2024 4:22 PM
Operator	Admin User	Evaluation Date	10/9/2024 4:22 PM

Results - SP 4 BLOCK B

The error is the statistical error with 1 sigma confidence interval

Element	Concentration	Abs. Error
11 Na ₂ O Sodium oxide	< 0.013 %	-
12 MgO Magnesium oxide	1.170 %	0.012
13 Al ₂ O ₃ Aluminium oxide	18.83 %	0.02
14 SiO ₂ Silicon dioxide	28.99 %	0.02
15 P ₂ O ₅ Phosphorus pentoxide	2.938 %	0.005
16 SO ₃ Sulfur trioxide	0.1581 %	0.0009
17 Cl Chlorine	0.03107 %	0.0001
19 K ₂ O Potassium oxide	1.308 %	0.001
20 CaO Calcium oxide	1.184 %	0.001
22 TiO ₂ Titanium dioxide	25830 ppm	10
23 V Vanadium	217.1 ppm	1.8
24 Cr Chromium	65.3 ppm	0.4
25 MnO Manganese(II) oxide	1762 ppm	1
26 Fe ₂ O ₃ Iron(III) oxide	12.93 %	0.01
27 Co Cobalt	32.4 ppm	5.2
28 Ni Nickel	79.7 ppm	0.9
29 Cu Copper	58.1 ppm	0.7
30 Zn Zinc	134.5 ppm	0.7
31 Ga Gallium	32.4 ppm	0.4
32 Ge Germanium	< 0.2 ppm	-
33 As Arsenic	2.3 ppm	0.2
34 Se Selenium	0.3 ppm	0.1
35 Br Bromine	98.7 ppm	0.3
37 Rb Rubidium	85.2 ppm	0.3
38 Sr Strontium	777.8 ppm	0.6
39 Y Yttrium	40.3 ppm	0.2
40 Zr Zirconium	658.1 ppm	0.7
41 Nb Niobium	167.2 ppm	0.3
42 Mo Molybdenum	< 0.1 ppm	-
44 Ru Ruthenium	< 0.2 ppm	-
45 Rh Rhodium	< 0.2 ppm	-
46 Pd Palladium	< 0.2 ppm	-
47 Ag Silver	1.7 ppm	0.2
48 Cd Cadmium	< 0.2 ppm	-
49 In Indium	< 0.3 ppm	-
50 Sn Tin	3.9 ppm	0.3
51 Sb Antimony	3.2 ppm	0.3
52 Te Tellurium	12.5 ppm	1.0
53 I Iodine	35.6 ppm	1.2
55 Cs Cesium	45.4 ppm	2.6
56 Ba Barium	1909 ppm	6
57 La Lanthanum	218.7 ppm	4.9

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58	Ce	Cerium	329.9	ppm	6.4
59	Pr	Praseodymium	73.4	ppm	3.6
60	Nd	Neodymium	199.8	ppm	1.5
62	Sm	Samarium	6.4	ppm	1.2
70	Yb	Ytterbium	< 3.5	ppm	-
72	Hf	Hafnium	19.0	ppm	1.2
73	Ta	Tantalum	11.8	ppm	1.9
74	W	Tungsten	< 0.5	ppm	-
79	Au	Gold	< 0.1	ppm	-
80	Hg	Mercury	< 0.1	ppm	-
81	Tl	Thallium	< 0.2	ppm	-
82	Pb	Lead	25.9	ppm	0.4
83	Bi	Bismuth	< 0.3	ppm	-
90	Th	Thorium	14.0	ppm	0.4
92	U	Uranium	3.5	ppm	0.4

Sample Name	SP 2 BLOCK A WEST	Dilution Material	-
Method	Geochem Traces cups (A2)	Sample Mass	5.0000
Sample Folder	October 2024	Dilution Mass	-
Sample Type	Powder	Dilution Factor	-
Sample Status	A A A X X X X	Measurement Date	10/9/2024 3:04 PM
Operator	Admin User	Evaluation Date	10/9/2024 3:04 PM

Results - SP 2 BLOCK A WEST

The error is the statistical error with 1 sigma confidence interval

Element		Concentration		Abs. Error
11	Na ₂ O Sodium oxide	0.181	%	0.027
12	MgO Magnesium oxide	0.541	%	0.012
13	Al ₂ O ₃ Aluminium oxide	23.36	%	0.02
14	SiO ₂ Silicon dioxide	55.49	%	0.03
15	P ₂ O ₅ Phosphorus pentoxide	< 0.00007	%	-
16	SO ₃ Sulfur trioxide	0.09679	%	0.0006
17	Cl Chlorine	0.01229	%	0.0001
19	K ₂ O Potassium oxide	2.792	%	0.001
20	CaO Calcium oxide	0.4093	%	0.0005
22	TiO ₂ Titanium dioxide	9639	ppm	5
23	V Vanadium	75.3	ppm	1.0
24	Cr Chromium	136.2	ppm	0.4
25	MnO Manganese(II) oxide	314.1	ppm	0.4
26	Fe ₂ O ₃ Iron(III) oxide	2.118	%	0.002
27	Co Cobalt	< 0.3	ppm	-
28	Ni Nickel	17.3	ppm	0.4
29	Cu Copper	11.0	ppm	0.3
30	Zn Zinc	129.1	ppm	0.5
31	Ga Gallium	24.3	ppm	0.3
32	Ge Germanium	1.2	ppm	0.1
33	As Arsenic	1.1	ppm	0.1
34	Se Selenium	< 0.1	ppm	-
35	Br Bromine	1.1	ppm	0.1
37	Rb Rubidium	88.8	ppm	0.2
38	Sr Strontium	87.1	ppm	0.2
39	Y Yttrium	43.9	ppm	0.2
40	Zr Zirconium	636.8	ppm	0.5
41	Nb Niobium	62.0	ppm	0.2
42	Mo Molybdenum	1.1	ppm	0.2
44	Ru Ruthenium	< 0.2	ppm	-
45	Rh Rhodium	< 0.2	ppm	-
46	Pd Palladium	< 0.2	ppm	-
47	Ag Silver	1.2	ppm	0.2
48	Cd Cadmium	< 0.2	ppm	-
49	In Indium	< 0.3	ppm	-
50	Sn Tin	5.4	ppm	0.4
51	Sb Antimony	4.1	ppm	0.5
52	Te Tellurium	11.1	ppm	1.0
53	I Iodine	17.6	ppm	1.1
55	Cs Cesium	44.6	ppm	2.5
56	Ba Barium	616.5	ppm	3.9
57	La Lanthanum	145.8	ppm	4.7

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58	Ce	Cerium	216.0	ppm	6.1
59	Pr	Praseodymium	55.2	ppm	2.1
60	Nd	Neodymium	141.4	ppm	1.0
62	Sm	Samarium	< 1.5	ppm	-
70	Yb	Ytterbium	5.0	ppm	0.7
72	Hf	Hafnium	21.6	ppm	0.7
73	Ta	Tantalum	3.9	ppm	0.9
74	W	Tungsten	< 0.9	ppm	-
79	Au	Gold	< 0.1	ppm	-
80	Hg	Mercury	< 0.1	ppm	-
81	Tl	Thallium	< 0.2	ppm	-
82	Pb	Lead	16.6	ppm	0.3
83	Bi	Bismuth	< 0.3	ppm	-
90	Th	Thorium	13.5	ppm	0.2
92	U	Uranium	1.7	ppm	0.3

REPUBLIC OF MALAWI



30/06/2025

GEOLOGICAL SURVEY
DEPARTMENT

Sample Name	Sample	Dilution Material	-
Method	Geochem Traces cups (A2)	Sample Mass	5.0000
Sample Folder	June 2025	Dilution Mass	-
Sample Type	Powder	Dilution Factor	30/06/2025
Sample Status	AAAAXXXX	Measurement Date	30/06/2025

RESULTS

ORDER No. 240-15-297

Sample ID	Ta ₂ O ₃ %	Nb ₂ O ₃ %	Fe ₂ O ₃ %	SiO ₂ %	MnO %	TiO ₂ %
19	29.19	31.00	10.70	11.92	3.61	2.68
20	24.19	45.36	12.12	2.92	5.10	3.57
21	62.43	12.95	9.86	3.52	4.33	0.73
22	72.68	3.47	12.46	<0.01	1.58	0.85
23	26.47	48.36	9.65	3.05	7.51	1.65
24	38.05	29.03	9.70	6.72	5.09	4.95

GSD

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