

SOIL SAMPLING COMPLETED OVER 47 RARE EARTH AND NIOBIUM ANOMALIES WITH ALL TARGETS CONFIRMING PATHFINDER ELEMENTS

KEY POINTS

- These results follow from an initial batch of one hundred and one (101) soil samples collected from 11 targets announced on 13 January 2025, and a further one hundred and twenty-one (121) samples testing 19 anomalies, as announced 09 May 2025
- Surface soil sampling and analysis of an additional 17 anomalous targets has now been completed from a batch of two hundred and sixty three (263) samples analysed for low-level multi-element geochemistry.
- The analysis of all 47 anomalies based on their geochemical signatures has enabled the ranking of targets according to their potential for hard rock (carbonatite-hosted or adjacent) REE mineralisation, as shown in Table 1 below, to guide subsequent diamond drilling programs.
- Geophysical targets have been ranked based on REE and multi-element analyses (ALS ME-MS23) of surface soils, using associations characteristic of alkaline intrusives and carbonatites on the Company's license and globally.
- After relocating from our original target at Mposa, drilling operations are currently underway at an anomaly in the Mpyupyu area, as illustrated in Figure 3. Results from the ICPMS four-acid digest of the first drill core are anticipated imminently.
- The Company's REE focus remains on enriched, alkaline intrusion (carbonatite style) targets to evaluate and prioritise for drilling and seek its maiden discovery.
- Chilwa has a twin, parallel strategy for the Chilwa Critical Minerals Project, with dedicated teams focused on both the Heavy Mineral Sands and Rare Earth Element & Niobium potential.

OVERVIEW

Chilwa Minerals Limited (ASX: CHW) ("**Chilwa**" or "**the "Company"**") is pleased to announce a further set of results from the field assessment of the rare earth element ("**REE**") anomalies generated in 2024. A further 17 anomalies identified in the airborne radiometric and magnetic geophysics study, carried out in the second half of 2024 are reported here. Anomalies were identified as **Thorium, Potassium, Thorium-Uranium, magnetic** and **zoned intrusive** targets for ground truthing (mapping, soil geochemistry and rock-chip sampling and potentially follow up diamond drilling).

The soil survey results have confirmed and enhanced the prospectivity of targets, with coherent REE anomalies (including Ce, La, Nd, and Tb) spatially coincident with magnetic and radiometric features



interpreted as potential carbonatite intrusions or alteration halos. These anomalies extend over areas of up to 84 km² (averaging 2.6km²) and alongside geochemical work form robust anomalies for follow-up diamond drilling. The total area covered by Thorium, Potassium, Thorium-Uranium, and magnetic anomalies identified thus far in the Company's 866km² license amounts to 122km².

Chilwa Minerals' Managing Director, Cadell Buss, commented:

We are pleased to announce the completion of our initial soil geochemistry program, which covered all 47 geophysical anomalies identified during our radiometrics survey in mid-2024. The results have significantly increased our confidence in the potential discovery of REE mineralisation within our licensed area, located in a region already recognised for its Rare Earths prospectivity.

The positive identification of pathfinder elements across all targets, together with the confirmation of Monazite streams¹, indicates a strong opportunity for our first carbonatite discovery, especially given the scope presented by 47 distinct anomalies.

As we anticipate further reporting from our diamond drilling program, the success of soil geochemistry as a method of validating these anomalies has enabled us to strategically schedule future drilling campaigns throughout our extensive 866km² license area.

*These results demonstrate significant potential for both **Heavy and Light Rare Earth** elements, as well as **Niobium**, within our license area. This is supported by an established operational framework focused on advancing these targets in parallel with our late-stage Heavy Mineral Sands exploration asset. .*

*Following successful diamond drilling on the initial anomaly at Mposa, advanced exploration is underway at two promising thorium anomalies at Mpyupyu. **The objective is to demonstrate the presence of not just a single deposit, but an extensive carbonatite system.***

Regarding a carbonatite discovery, the company remains focused on achieving its initial discovery among the 47 identified opportunities.

WHAT THESE RESULTS MEAN FOR THE CHILWA CRITICAL MINERALS PROJECT?

The soil geochemistry results and subsequent analyses indicate that the areas delineated by the Company's geophysical surveys are enriched in rare earth elements at surface. This finding supports the hypothesis of a substantial carbonatite-hosted REE system at depth.

In summary, soil sampling has verified the presence of key minerals within the anticipated locations, thereby increasing confidence in our exploration model. Consequently, the project has progressed from an early-stage concept to a more advanced phase, permitting the initiation of targeted drilling to investigate these highly prospective zones.

Should the drilling confirm mineralisation persists at depth, Chilwa Minerals may achieve significant new discoveries of rare earth elements critical for clean energy technologies and advanced manufacturing.

Furthermore, comprehensive multielement analysis reveals distinct anomalies: one characterised by Light Rare Earths & Niobium, and another by Heavy Rare Earths. **This distinction allows the project to diversify its exploration focus, particularly towards Heavy Rare Earths, which are currently in even greater demand than Light Rare Earths.**

PROGRAM BACKGROUND

Chilwa Minerals launched its soil sampling program in November 2024 on licence EL0670-22R1, located at the western and northern shores of Lake Chilwa in Southern Malawi, after initial geophysical survey interpretations identified a total of 47 magnetic and radiometric anomalies potentially linked with REE carbonatite mineralisation.

¹ Refer ASX 30 September 2025 announcement

Soil sampling activity entailed staking out anomaly area-sizes and shapes, and sampling at approximately 200m sample spacing across the anomalies. 30cm diameter holes were excavated using shovels down to approximately 25cm depth, with basal material then scooped using hand trowels from the hole and sieved through -5mm size fraction and placed into sample bags with IDs and weighed with all weights recorded.

The analysis method used is the ALS ME-MS-23, with low detection limits allowing characterisation of background for greater confidence in subtle anomalies.

Results for REE elemental values were recorded in ppb and ppm units. Values are reported both in parts per billion (ppb) as well as parts per million (ppm) after being converted from elemental to stoichiometric oxide form.

The assay results recorded results for 61 elements including 15 of these belonging to the REE suite: Ce, Dy, Er, Eu, Gd, Ho, La, Lu, Nd, Pr, Sm, Tb, Tm, Y, Yb with Nb also included in the analysis.

Only these 15 REE elements have been considered in this report.

METHOD AND RESULTS

Analysis of the entire data set of soil geochemistry results over all anomalies was undertaken with initial definition of carbonatite intrusion REE indicator elements and groups, and subsequent statistical analysis to represent those groups and indicator elements per anomaly.

- Two REE (+ associated element) groups were defined, as;
Light REE – Pr, Nd, Gd, Eu, Sm & La, Ce - the LREE GROUP.
Heavy REE – Dy, Er, Ho, Lu, Tb, Tm, Yb & Y – the HREE GROUP
- Carbonatite system pathfinder elements (commonly associated with carbonatite systems) were also identified, as;
LREE GROUP associates - **Nb, Ta, U, Ge,**
HREE GROUP associates – **Pb, Sc, Pd, Cs, Tl**
- In addition, broader mineral system identification elements demonstrating hydrothermal alteration styles have been reviewed, to derive five element groups for statistical analysis:
 - LREE
 - HREE
 - Metals
 - Geology
 - Alteration
- Prospectivity values for REE rich zones were then calculated for each target using the values from samples constituting that target, with each REE zone further assessed and ranked based on response factors for metals, geology and evidence of an alteration system.

Table 1 below shows the relative associations between the ranking for potential carbonatite presence, and the other factors considered. Further information, notably drilling results, is expected to reposition anomalies in their overall ranking score as the Company's knowledge and detail on the various styles of mineralisation is refined.

Table 1: Priority ranking of anomalies based on geochemical signature

Target	Target Ranking	LREE Affinity	HREE Affinity	Metals Affinity	Carbonate	LREE Affinity	HREE Affinity	Metals Affinity	Th Ratio	Carb(TREO_Th	SAMPLE	East	North
MPYTH005	1	6	4	12	104	51	53	45	13	117	MPYTH044	770852	8294992
PHLTH002	2	2	10	8	103	57	46	48	3	106	PHLTH051	773668	8273893
BMBNWT001	3	4	8	20	101	54	47	33	32	133	BMBNWT014	763844	8312375
MPYTH004	4	7	6	11	101	51	50	46	12	113	MPYTH051	770682	8295321
MPYTH003	5	1	17	16	96	58	38	39	15	111	MPYTH067	769168	8297388
NMJTHU001	6	8	11	21	95	50	45	32	8	103	NMJTHU007	781686	8344234
MPETH002	7	16	3	19	93	39	54	36	22	115	MPMAG024	765886	8320954
BMBNWT005	8	3	18	24	92	55	37	29	28	120	THNT016	763698	8310715
PHLTH010	9	19	1	17	92	35	57	38	55	147	PHLTH172	776379	8264894
BMBNWT002	10	9	14	4	90	49	41	52	31	121	BMBNWT005	764525	8312169
PHLTH012	11	15	7	14	90	40	50	42	49	139	PHLTH155	781655	8274217
BIMBSTH002	12	12	13	13	89	46	43	43	34	123	BIMBSTH023	767952	8300544
BIMBSTH003	13	5	19	25	89	53	36	28	33	122	BIMBSTH014	767126	8299385
MPMAG001	14	18	5	10	89	37	53	46	37	126	MPMAG011	770000	8317680
PHLTH008	15	21	2	18	88	33	55	37	53	141	PHLTH012	775353	8268969
MPYTH002	16	10	20	2	83	48	35	55	16	99	MPYTH033	772433	8293203
PHLTH006	17	11	22	27	81	47	34	27	2	83	PHLTH034	774601	8270496
MPYTH001	18	24	9	1	78	32	47	56	29	107	MPYTH037	772474	8294101
CHKTH001	19	13	23	28	77	44	33	26	27	104	CHKTHAN003	771783	8323771
HLTHU001	20	14	24	29	74	42	32	25	26	100	HLTHU43	771749	8336749
PHLMAG003	21	17	25	15	68	38	31	41	58	126	PHLMAG027	783573	8284552
HLTHU002	22	22	21	26	68	33	35	28	25	92	HLTHU009	769241	8332075
PHLTH007	23	20	26	9	62	34	28	46	54	116	PHLTH026	776105	8269678
BIMBSTH001	24	37	12	22	60	16	44	31	35	95	BIMBSTH006	769530	8302232
NMJK001	25	23	27	31	59	32	27	23	52	111	NMJK007	780843	8346707
BMBNWT003	26	38	15	6	55	15	40	50	30	85	THNT004	764809	8311738
PHLTH005	27	25	28	32	54	29	25	22	48	102	PHLTH004	772837	8267811
PHLTH011	28	26	29	33	52	28	24	21	47	99	PHLTH073	781045	8271750
PHLTH003	29	27	30	34	48	26	22	19	45	93	PHLTH167	778124	8276548
PHLTH013	30	28	31	35	47	26	22	19	45	92	PHLTH139	782928	8273332
PHLTH014	31	29	32	36	46	25	21	18	44	90	PHLTH097	783401	8272247
PHLTH004	32	30	33	37	42	23	19	16	42	84	PHLTH164	779029	8275841
PHLTH001	33	46	16	23	41	2	39	30	4	45	PHLTH046	772310	8272521
BIMBSK001	34	31	34	38	39	21	18	15	40	79	BIMBSK016	766690	8302931
MPYK001	35	32	35	39	37	20	17	14	39	76	MPYK005	766917	8298481
BIMBSK002	36	34	36	40	35	19	16	13	38	73	BIMBSK012	766782	8301979
PHLMAG002	37	33	37	41	35	20	16	13	31	66	PHLMAG022	778428	8283963
PHLMAG004	38	35	38	30	34	19	16	24	30	64	PHLMAG006	779953	8268462
BIMBSK003	39	36	39	42	32	18	15	12	37	69	BIMBSK004	766855	8300154
BMBNWT004	40	39	40	43	27	14	13	10	29	56	THNT009	765448	8311244
MPYK002	41	40	41	44	21	11	10	7	20	41	MPYK011	775347	8298028
MPYK003	42	41	42	5	17	9	8	51	18	35	MPYK039	778390	8293917
MPYTH006	43	42	43	45	15	8	7	5	12	27	MPYTH010	768377	8298504
MPYTH007	44	43	44	46	13	7	6	4	11	24	MPYTH059	767897	8299109
PHLK001	45	44	45	3	9	5	4	54	7	16	PHLK055	773529	8274760
PHLMAG001	46	45	46	7	7	4	3	49	6	13	MAAN071	773518	8280775
PHLTH009	47	47	47	47	2	1	1	1	1	3	PHLTH019	774670	8269664

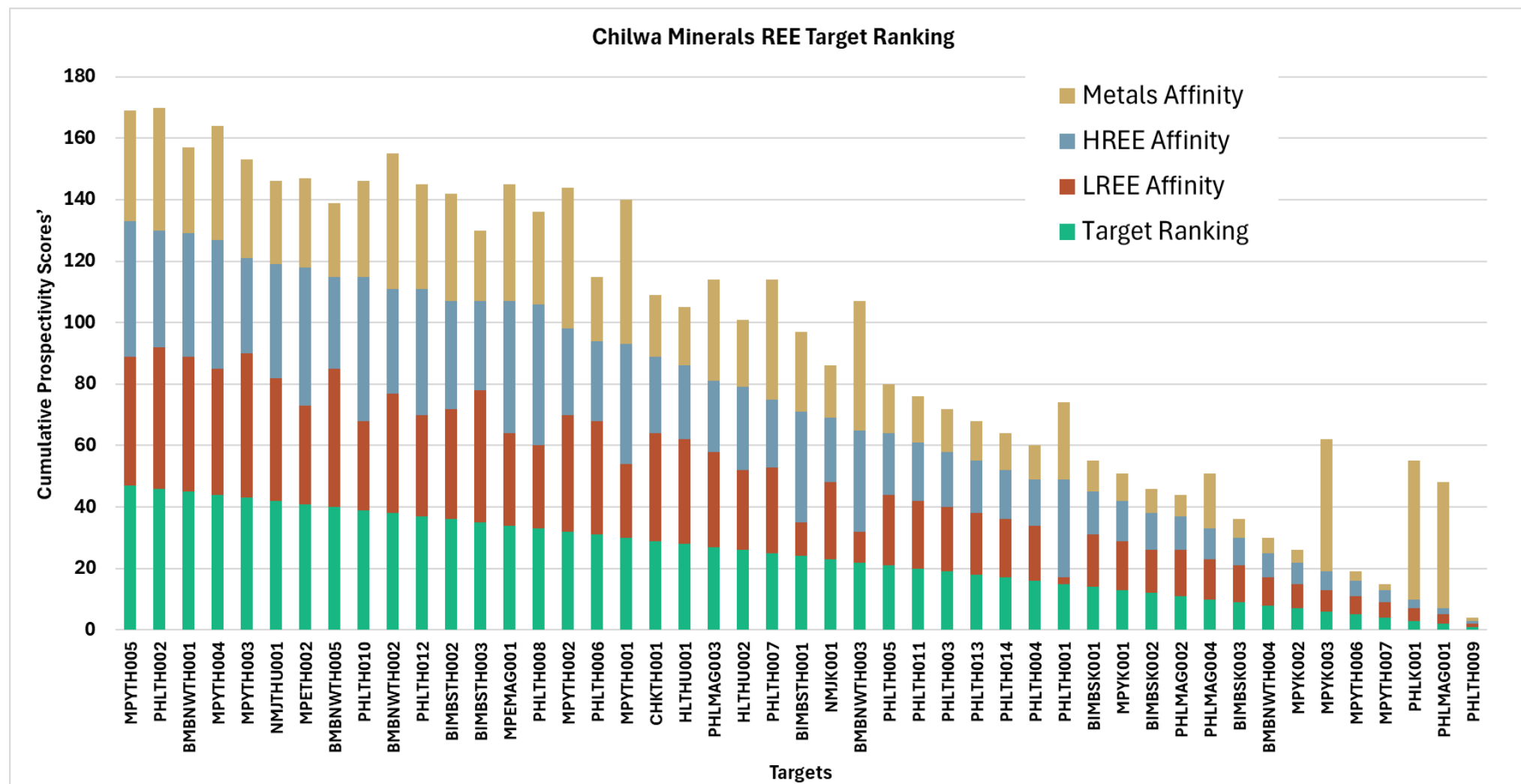


Figure 1: Chilwa Minerals REE Target Ranking

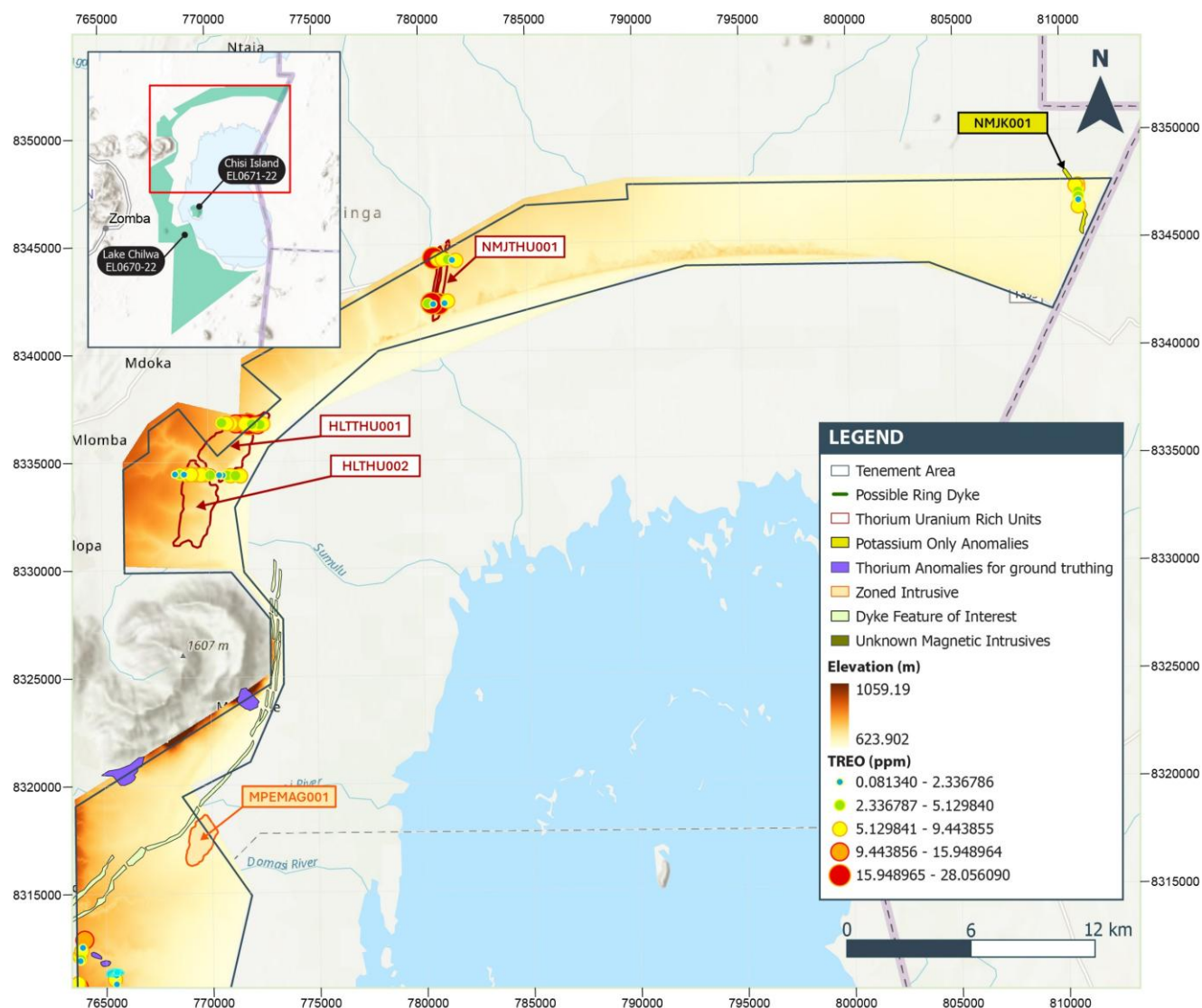


Figure 2: Lake Chilwa Northern shore anomalies and soil results as TREO from the batch reported

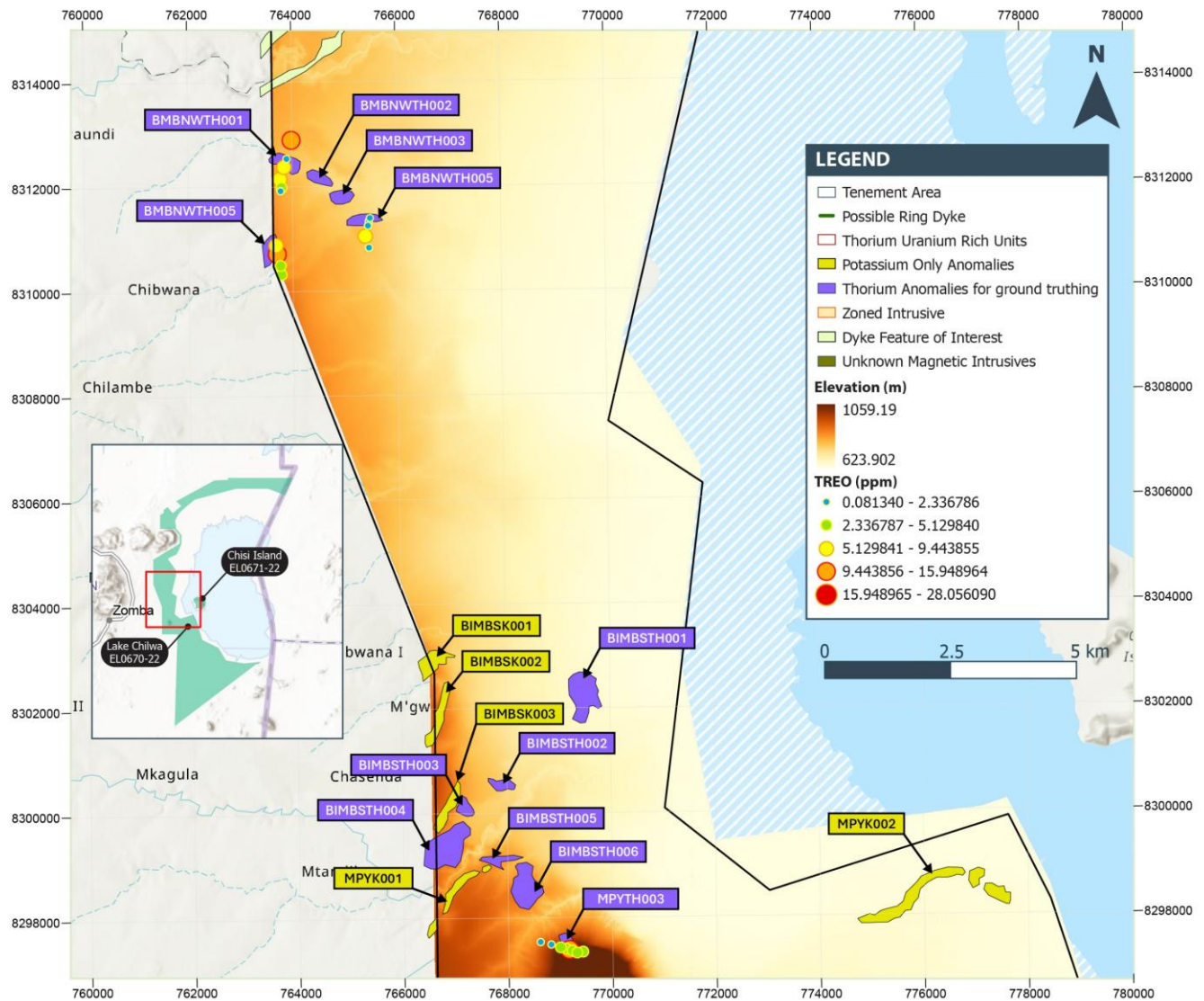


Figure 3: Central license area anomalies and soil results as TREO from the batch reported

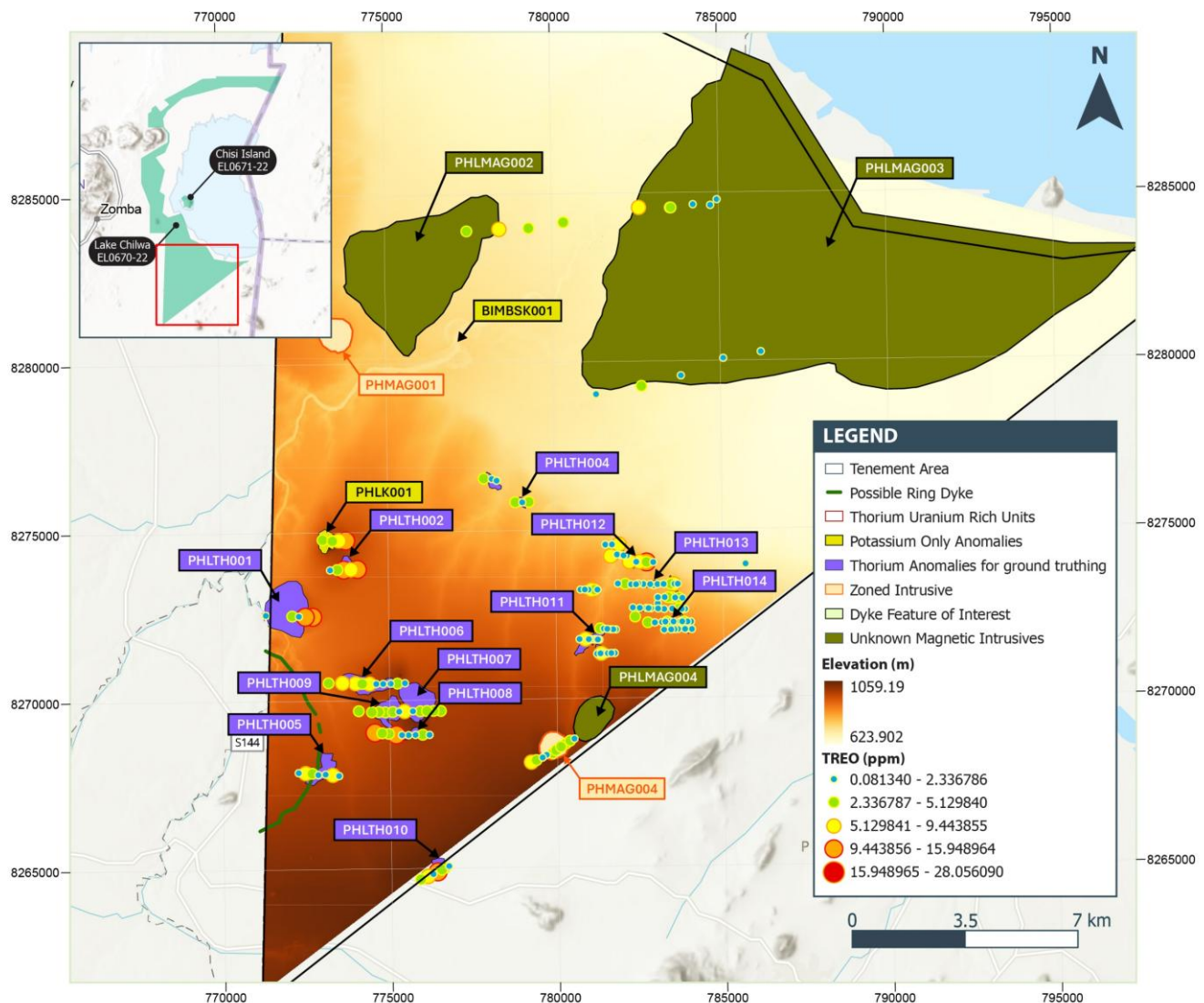


Figure 4: Southern license area anomalies and soil results as TREO from the batch reported

FURTHER WORK PROGRAMME

1. Targets with elevated Heavy REE soil geochemical responses (including Terbium) are being prioritised for drilling.
2. Results of ongoing diamond drilling over already tested geophysics anomalies to be analysed to further 'fingerprint' the element associations and mineralogy controlling the distribution of REE in carbonatites.
3. Diamond drilling of targets to continue and progress through all targets in the license area with ICP-MS 4 acid digest for 14 REE + Niobium.
4. Results from initial drilling at the Mpyupyu anomalies (MPYTH004 and MPYTH005) to be announced within one to two weeks.

AUTHORISATION STATEMENT

This update has been authorised to be given to ASX by the Board of Chilwa Minerals Limited

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-ENDS-

Competent Person Statement

The information in this report that relates to the REE soil sampling exploration results is based on, and fairly represents, information and supporting documentation prepared by Mr Russell Birrell, who is a Fellow of the Geological Society of London and a Chartered Geologist. Mr Birrell is an employee of Globex Solutions Pty Ltd and has sufficient experience relevant to the style of mineralisation and type of deposit under consideration 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 Birrell confirms there is no potential for a conflict of interest in acting as a Competent Person and has provided his prior written consent to the inclusion in the report of the matters based on his information in the form and context in which it appears.

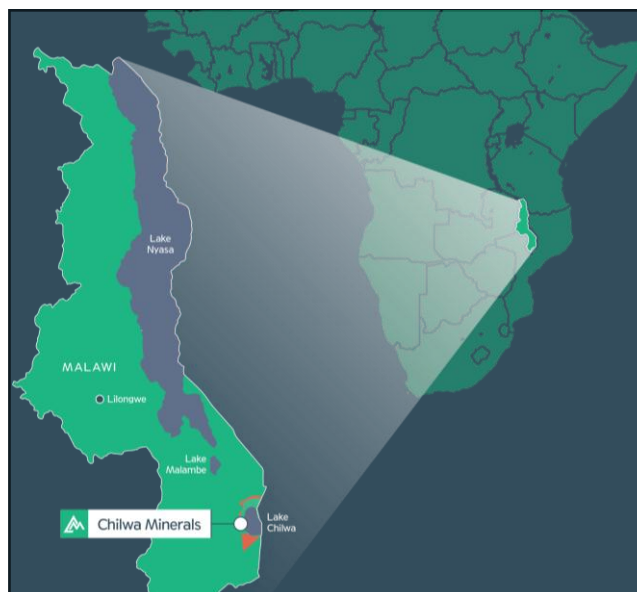
ABOUT CHILWA MINERALS

Chilwa Minerals Limited (ASX:CHW) is exploring the Lake Chilwa mineral system in southern Malawi.

The Lake Chilwa Critical Minerals Project hosts significant mineral sands mineralisation, with sonic drilling underway to expand and increase the quality of the existing mineral resources.

Since listing, drilling at Mposa has intersected thicker sequences with higher grades, with a high-quality assemblage of value minerals.

Rare earth mineralisation has also been identified within the clay profile, with a dedicated team recruited to assess the REE potential of the Project, which is located in an area of well-known carbonatite-hosted REE mineralisation.





Appendix 1: Individual sample REE oxide values in soils with TREO values recorded in ppb and ppm.

SampleID	X_UTM	Y_UTM	CeO2 (ppm)	Dy2O3 (ppm)	Er2O3 (ppm)	Eu2O3 (ppm)	Gd2O3 (ppm)	Ho2O3 (ppm)	La2O3 (ppm)	Lu2O3 (ppm)	Nd2O3 (ppm)	Pr6O11 (ppm)	Sc ₂ O ₃ (ppm)	Sm2O3 (ppm)	Tb4O7 (ppm)	Th (ppm)	Tm2O3 (ppm)	U (ppb)	Y2O3 (ppm)	Yb2O3 (ppm)	TREO (ppb)	TREO (ppm)
PHLTH001	772251	8267874	0.0208	0.0438	0.0135	0.0331	0.130	0.0071	0.1065	0.0012	0.3872	0.0571	0.0011	0.1293	0.0106	0.0005	0.0013	0.00076	0.2641	0.0069	1213.40	1.2134
PHLTH002	772462	8267858	0.8157	0.4866	0.2710	0.1069	0.535	0.1040	0.3167	0.0262	1.0206	0.1655	0.0331	0.3432	0.0780	0.0008	0.0339	0.00374	3.0224	0.1628	7521.39	7.5214
PHLTH003	772660	8267854	0.4250	0.2215	0.0897	0.0900	0.399	0.0403	0.2269	0.0088	0.8316	0.1244	0.0129	0.2934	0.0438	0.0025	0.0103	0.00376	1.1874	0.0493	4054.10	4.0541
PHLTH004	772837	8267811	0.0459	0.0712	0.0271	0.0311	0.138	0.0123	0.0762	0.0022	0.2869	0.0410	0.0004	0.1061	0.0144	0.0008	0.0029	0.00120	0.3632	0.0130	1232.32	1.2323
PHLTH005	773055	8267822	0.2297	0.0460	0.0240	0.0170	0.075	0.0092	0.1068	0.0031	0.2263	0.0419	0.0078	0.0601	0.0083	0.0004	0.0031	0.00133	0.2819	0.0163	1156.38	1.1564
PHLTH006	773271	8267799	0.5552	0.3168	0.1304	0.1239	0.538	0.0589	0.3190	0.0124	1.1419	0.1698	0.0064	0.3977	0.0621	0.0043	0.0149	0.00434	1.6318	0.0688	5548.24	5.5482
PHLTH007	773458	8267775	0.1160	0.0434	0.0178	0.0170	0.072	0.0078	0.0663	0.0016	0.1592	0.0265	0.0051	0.0521	0.0082	0.0012	0.0021	0.00162	0.2064	0.0102	811.71	0.8117
PHLTH008	774546	8269045	1.2898	1.2395	0.9422	0.1482	0.761	0.3173	0.4152	0.1017	1.5921	0.2755	0.0601	0.4917	0.1476	0.0006	0.1285	0.00754	7.2892	0.6513	15850.70	15.8507
PHLTH009	774760	8269030	0.6289	0.1808	0.0715	0.0775	0.338	0.0324	0.3272	0.0067	0.8900	0.1510	0.0083	0.2748	0.0365	0.0097	0.0082	0.01190	0.8204	0.0401	3891.84	3.8918
PHLTH010	774958	8269011	0.7690	0.2651	0.1418	0.0747	0.364	0.0540	0.3730	0.0173	0.9599	0.1679	0.0232	0.2737	0.0449	0.0032	0.0191	0.00624	1.4223	0.1001	5070.08	5.0701
PHLTH011	775183	8268979	1.4065	0.6657	0.4300	0.1308	0.633	0.1541	0.5149	0.0441	1.3064	0.2392	0.0275	0.4151	0.0974	0.0017	0.0578	0.00816	4.0256	0.2870	10434.71	10.4347
PHLTH012	775353	8268969	0.0886	0.0768	0.0303	0.0321	0.141	0.0135	0.1163	0.0023	0.3919	0.0590	0.0035	0.1200	0.0161	0.0077	0.0033	0.00211	0.3987	0.0148	1508.40	1.5084
PHLTH013	775550	8268965	0.1763	0.0738	0.0311	0.0280	0.116	0.0134	0.1454	0.0026	0.4397	0.0759	0.0092	0.1095	0.0136	0.0213	0.0038	0.00401	0.4203	0.0175	1676.57	1.6766
PHLTH014	775757	8268970	0.0526	0.0359	0.0135	0.0155	0.067	0.0059	0.0544	0.0008	0.1977	0.0315	0.0066	0.0573	0.0073	0.0101	0.0013	0.00277	0.1962	0.0057	749.74	0.7497
PHLTH015	775974	8268974	0.7149	0.1024	0.0427	0.0393	0.155	0.0182	0.2780	0.0031	0.6357	0.1281	0.0140	0.1490	0.0199	0.0506	0.0050	0.00874	0.4826	0.0217	2809.46	2.8095
PHLTH016	776175	8268967	0.1867	0.1285	0.0509	0.0600	0.247	0.0286	0.1454	0.0048	0.4292	0.0632	0.0074	0.1855	0.0240	0.0009	0.0065	0.00254	0.5422	0.0327	2142.40	2.1424
PHLTH017	774069	8269695	0.1259	0.1509	0.0556	0.0772	0.345	0.0320	0.2170	0.0052	0.7080	0.1035	0.0089	0.2760	0.0309	0.0018	0.0072	0.00334	0.7315	0.0344	2908.80	2.9088
PHLTH018	774462	8269661	0.9004	0.1538	0.0748	0.0587	0.241	0.0368	0.4609	0.0063	0.7173	0.1347	0.0095	0.2058	0.0261	0.0151	0.0102	0.00986	0.6337	0.0486	3718.53	3.7185
PHLTH019	774670	8269664	0.5712	0.2628	0.1258	0.0830	0.352	0.0631	0.3260	0.0107	0.7652	0.1281	0.0117	0.2679	0.0419	0.0266	0.0172	0.00859	1.1658	0.0830	4274.93	4.2749
PHLTH020	774865	8269652	1.2530	0.1693	0.0755	0.0674	0.278	0.0397	0.6884	0.0059	1.0253	0.2042	0.0129	0.2551	0.0291	0.0631	0.0099	0.01580	0.7200	0.0461	4879.56	4.8796
PHLTH021	775088	8269660	0.6597	0.2766	0.1549	0.0765	0.353	0.0741	0.3671	0.0152	0.8281	0.1450	0.0132	0.2528	0.0418	0.0041	0.0228	0.01030	1.2826	0.1144	4677.61	4.6776
PHLTH022	775272	8269667	0.1965	0.0630	0.0249	0.0293	0.112	0.0145	0.1742	0.0018	0.4012	0.0710	0.0084	0.1029	0.0116	0.0205	0.0033	0.00669	0.2730	0.0146	1502.77	1.5028
PHLTH023	775437	8269671	2.2480	0.2399	0.1083	0.0727	0.284	0.0543	0.5137	0.0086	1.1839	0.2398	0.0675	0.2864	0.0368	0.1125	0.0153	0.01145	1.0540	0.0756	6488.36	6.4884
PHLTH024	775688	8269674	0.3624	0.1171	0.0577	0.0371	0.152	0.0286	0.1806	0.0057	0.4292	0.0736	0.0207	0.1177	0.0191	0.0248	0.0086	0.00651	0.5791	0.0427	2231.44	2.2314
PHLTH025	775910	8269671	0.5798	0.3110	0.1761	0.0881	0.355	0.0820	0.2744	0.0169	0.8211	0.1389	0.0239	0.2598	0.0454	0.0057	0.0258	0.00914	1.5874	0.1275	4913.27	4.9133
PHLTH026	776105	8269678	0.1726	0.2491	0.1607	0.0509	0.231	0.0717	0.1101	0.0173	0.3896	0.0615	0.0238	0.1409	0.0322	0.0004	0.0254	0.00319	1.3143	0.1304	3181.00	3.1810
PHLTH027	776305	8269678	0.5921	0.1670	0.1067	0.0506	0.216	0.0465	0.3073	0.0137	0.6753	0.1192	0.0181	0.1757	0.0248	0.0002	0.0164	0.00152	0.9702	0.0919	3591.70	3.5917
PHLTH028	776522	8269673	0.4631	0.1687	0.0601	0.0991	0.409	0.0354	0.2873	0.0053	0.9739	0.1408	0.0069	0.3467	0.0354	0.0017	0.0072	0.00317	0.7505	0.0344	3824.07	3.8241
PHLTH029	773174	8270534	0.6781	0.2410	0.0884	0.0996	0.464	0.0519	0.2967	0.0062	1.0813	0.1577	0.0078	0.3780	0.0467	0.0029	0.0108	0.00516	1.0591	0.0481	4715.78	4.7158
PHLTH030	773590	8270530	2.0330	0.2221	0.0953	0.0822	0.318	0.0501	0.7952	0.0072	1.4230	0.2900	0.0199	0.3305	0.0379	0.0995	0.0132	0.00868	1.0337	0.0594	6810.76	6.8108
PHLTH031	773982	8270515	2.2111	0.2295	0.1034	0.0739	0.278	0.0518	0.8034	0.0093	1.2364	0.2743	0.1143	0.2887	0.0361	0.1565	0.0151	0.01255	1.0540	0.0771	6856.05	6.8561
PHLTH032	774181	8270504	0.0824	0.1888	0.0916	0.0623	0.262	0.0458	0.1918	0.0083	0.6415	0.0977	0.0118	0.2081	0.0301	0.0372	0.0127	0.00628	0.7518	0.0624	2748.89	2.7489
PHLTH033	774396	8270499	1.4372	0.2290	0.1049	0.0919	0.322	0.0536	0.6052	0.0087	1.3822	0.2682	0.0471	0.3351	0.0375	0.1010	0.0150	0.01250	0.9766	0.0741	5987.90	5.9879
PHLTH034	774601	8270496	0.1357	0.0411	0.0226	0.0153	0.064	0.0110	0.0836	0.0022	0.1744	0.0298	0.0066	0.0496	0.0064	0.0011	0.0032	0.00158	0.1981	0.0159	859.85	0.8599
PHLTH035	774808	8270496	0.0329	0.0280	0.0100	0.0106	0.045	0.0062	0.0289	0.0007	0.1126	0.0165	0.0058	0.0373	0.0051	0.0113	0.0012	0.00216	0.1460	0.0052	492.18	0.4922
PHLTH036	775032	8270500	0.0829	0.0477	0.0184	0.0189	0.083	0.0101	0.0573	0.0010	0.2554	0.0389	0.0060	0.0736	0.0089	0.0157	0.0021	0.00375	0.2356	0.0088	949.26	0.9493
PHLTH037	775234	8270501	1.1043	0.1458	0.0569	0.0659	0.234	0.0318	0.3683	0.0040	1.0113	0.1849	0.0206	0.2447	0.0256	0.0540	0.0078	0.01005	0.6197	0.0352	4160.72	4.1607
PHLTH038	775458	8270510	0.0310	0.0684	0.0239	0.0313	0.134	0.0143	0.0534	0.0016	0.2379	0.0314	0.0054	0.0936	0.0130	0.0021	0.0028	0.00165	0.3022	0.0123	1056.11	1.0561
PHLTH041	771323	8272560	0.0817	0.0778	0.0336	0.0259	0.126	0.0183	0.0585	0.0029	0.2438	0.0331	0.0120	0.0957	0.0135	0.0028	0.0044	0.00445	0.3810	0.0208	1229.15	1.2291
PHLTH045	772110	8272531	0.1824	0.2192	0.1361	0.0505	0.263	0.0607	0.1572	0.0195	0.4526	0.0731	0.0202	0.1647	0.0326	0.0021	0.0226	0.00565	1.1353	0.1270	3116.37	3.1164
PHLTH046	772310	8272521	0.0232	0.0926	0.0449	0.0242	0.124	0.0224	0.0391	0.0036	0.1650	0.0209	0.0086	0.0760	0.0146	0.0036	0.0059	0.00415	0.4749	0.0272	1167.00	1.1670
PHLTH047	772502	8272506	1.9102	0.5050	0.2813	0.1592	0.695	0.1340	0.9324	0.0301	2.0062	0.3770	0.0248	0.5531	0.0783	0.0122	0.0427	0.01250	2.1525	0.2158	10097.67	10.0977
PHLTH048	772722	8272502	2.0207	0.4614	0.2196	0.1714	0.674	0.1079	0.9805	0.0195	2.4611	0.4603	0.0604	0.6529	0.0757	0.0721	0.0319	0.02070	1.8223	0.1566	10376.36	10.3764
PHLTH049	773259	8273888	0.0544	0.0646	0.0228	0.0368	0.153	0.0134	0.1061	0.0021	0.3184	0.0482	0.0094	0.1212	0.0132	0.0013	0.0027	0.00085	0.2806	0.0144	1261.09	1.2611
PHLTH050	773476	8273899	0.1155	0.2686	0.1212	0.1097	0.430	0.0624	0.4328	0.0105	1.2364	0.2012	0.0176	0.3664	0.0466	0.0347	0.0164	0.01220	1.1810	0.0814	4697.62	4.6976
PHLTH051	773668	8273893	0.4140	0.8126	0.4094	0.2779	1.158	0.1987	1.4132	0.0388	3.3592	0.5993	0.0209	0.9822	0.1311	0.079						



SampleID	X_UTM	Y_UTM	CeO2 (ppm)	Dy2O3 (ppm)	Er2O3 (ppm)	Eu2O3 (ppm)	Gd2O3 (ppm)	Ho2O3 (ppm)	La2O3 (ppm)	Lu2O3 (ppm)	Nd2O3 (ppm)	Pr6O11 (ppm)	Sc ₂ O ₃ (ppm)	Sm2O3 (ppm)	Tb4O7 (ppm)	Th (ppm)	Tm2O3 (ppm)	U (ppb)	Y2O3 (ppm)	Yb2O3 (ppm)	TREO (ppb)	TREO (ppm)
PHLTH062	781315	8271327	0.0094	0.0104	0.0047	0.0033	0.017	0.0020	0.0091	0.0004	0.0294	0.0041	0.0029	0.0102	0.0020	0.0007	0.0005	0.00033	0.0669	0.0024	174.92	0.1749
PHLTH063	781339	8271328	0.7641	0.1871	0.0897	0.0714	0.277	0.0356	1.0555	0.0067	1.4347	0.3129	0.0215	0.2632	0.0325	0.0310	0.0099	0.01485	1.0388	0.0494	5649.61	5.6496
PHLTH064	781388	8271331	0.0128	0.0544	0.0212	0.0229	0.100	0.0095	0.0694	0.0015	0.1960	0.0280	0.0023	0.0668	0.0109	0.0024	0.0021	0.00060	0.2743	0.0101	882.47	0.8825
PHLTH065	781469	8271330	0.1462	0.1074	0.0566	0.0329	0.141	0.0215	0.2305	0.0049	0.3896	0.0707	0.0090	0.0979	0.0178	0.0111	0.0062	0.00666	0.5753	0.0329	1939.96	1.9400
PHLTH066	781538	8271329	0.0106	0.0403	0.0158	0.0175	0.078	0.0069	0.0354	0.0011	0.1365	0.0178	0.0014	0.0526	0.0082	0.0005	0.0015	0.00073	0.2387	0.0070	669.48	0.6695
PHLTH067	781517	8271320	0.3489	0.0698	0.0250	0.0372	0.150	0.0116	0.1495	0.0017	0.4129	0.0644	0.0080	0.1160	0.0149	0.0037	0.0024	0.00275	0.3543	0.0117	1778.11	1.7781
PHLTH068	781641	8271332	0.0015	0.0138	0.0038	0.0087	0.037	0.0021	0.0153	0.0003	0.0738	0.0096	0.0012	0.0303	0.0034	0.0001	0.0004	0.00023	0.0841	0.0015	286.70	0.2867
PHLTH069	781742	8271333	0.0017	0.0264	0.0075	0.0166	0.070	0.0040	0.0266	0.0005	0.1411	0.0180	0.0011	0.0558	0.0064	0.0001	0.0007	0.00015	0.1676	0.0029	547.19	0.5472
PHLTH070	780694	8271757	0.0587	0.0660	0.0200	0.0499	0.192	0.0101	0.0985	0.0016	0.4257	0.0565	0.0023	0.1542	0.0164	0.0004	0.0019	0.00060	0.3708	0.0089	1533.64	1.5336
PHLTH071	780873	8271755	1.0785	0.4602	0.2253	0.1389	0.656	0.0879	0.4140	0.0185	1.4872	0.2241	0.0221	0.4476	0.0781	0.0015	0.0247	0.00629	2.5906	0.1247	8078.17	8.0782
PHLTH072	780971	8271751	0.0943	0.0614	0.0340	0.0153	0.080	0.0131	0.0839	0.0031	0.1785	0.0300	0.0035	0.0488	0.0100	0.0008	0.0037	0.00164	0.3797	0.0196	1058.91	1.0589
PHLTH073	781045	8271750	0.3059	0.0811	0.0262	0.0481	0.198	0.0128	0.1642	0.0018	0.5715	0.0828	0.0060	0.1681	0.0183	0.0035	0.0024	0.00355	0.4178	0.0114	2116.10	2.1161
PHLTH074	781102	8271747	0.0100	0.0351	0.0091	0.0362	0.127	0.0050	0.0945	0.0005	0.3767	0.0506	0.0023	0.1223	0.0094	0.0010	0.0008	0.00051	0.2045	0.0033	1087.21	1.0872
PHLTH075	781151	8271744	0.0527	0.0763	0.0260	0.0459	0.177	0.0124	0.1005	0.0018	0.4141	0.0571	0.0060	0.1380	0.0171	0.0016	0.0025	0.00172	0.3835	0.0117	1522.40	1.5224
PHLTH076	781195	8271745	0.0868	0.0380	0.0111	0.0265	0.099	0.0058	0.0848	0.0008	0.2659	0.0397	0.0049	0.0836	0.0089	0.0013	0.0011	0.00101	0.1886	0.0049	950.60	0.9506
PHLTH077	781241	8271740	0.0049	0.0219	0.0069	0.0132	0.055	0.0035	0.0264	0.0005	0.1070	0.0140	0.0012	0.0417	0.0050	0.0001	0.0006	0.00031	0.1198	0.0029	423.96	0.4240
PHLTH078	781285	8271737	0.0039	0.0246	0.0076	0.0149	0.062	0.0038	0.0222	0.0005	0.1120	0.0141	0.0012	0.0484	0.0058	0.0000	0.0007	0.00020	0.1384	0.0032	463.25	0.4633
PHLTH079	781316	8272071	0.0168	0.1526	0.0507	0.0795	0.337	0.0247	0.1022	0.0035	0.5459	0.0677	0.0031	0.2424	0.0345	0.0007	0.0046	0.00034	0.9143	0.0211	2600.14	2.6001
PHLTH080	781425	8272061	0.0045	0.0372	0.0110	0.0249	0.100	0.0056	0.0562	0.0007	0.2158	0.0291	0.0014	0.0821	0.0090	0.0003	0.0010	0.00027	0.2279	0.0041	810.80	0.8108
PHLTH081	781527	8272051	0.0048	0.0169	0.0050	0.0120	0.048	0.0026	0.0425	0.0004	0.1260	0.0179	0.0015	0.0416	0.0040	0.0003	0.0005	0.00023	0.1063	0.0021	432.46	0.4325
PHLTH082	781628	8272039	0.5761	0.0735	0.0357	0.0293	0.120	0.0140	0.2369	0.0031	0.4292	0.0779	0.0161	0.1020	0.0135	0.0165	0.0040	0.00892	0.4026	0.0206	2154.34	2.1543
PHLTH083	781706	8272037	0.0572	0.0658	0.0223	0.0360	0.153	0.0109	0.0983	0.0016	0.3336	0.0463	0.0032	0.1129	0.0146	0.0015	0.0021	0.00092	0.3949	0.0097	1362.18	1.3622
PHLTH084	781783	8272034	0.0970	0.1099	0.0359	0.0624	0.258	0.0178	0.1642	0.0025	0.5867	0.0811	0.0038	0.2012	0.0247	0.0035	0.0033	0.00237	0.5969	0.0158	2261.49	2.2615
PHLTH085	783228	8272007	0.0597	0.0467	0.0164	0.0255	0.100	0.0078	0.1118	0.0012	0.2659	0.0422	0.0049	0.0763	0.0101	0.0027	0.0015	0.00132	0.2514	0.0073	1029.18	1.0292
PHLTH086	783437	8272013	0.0047	0.0150	0.0045	0.0124	0.044	0.0023	0.0474	0.0003	0.1236	0.0185	0.0012	0.0385	0.0036	0.0006	0.0004	0.00036	0.0921	0.0019	410.24	0.4102
PHLTH087	783537	8272019	0.0052	0.0305	0.0111	0.0181	0.066	0.0052	0.0342	0.0006	0.1376	0.0185	0.0011	0.0515	0.0067	0.0003	0.0010	0.00082	0.1816	0.0045	574.02	0.5740
PHLTH088	783640	8272023	0.0050	0.0391	0.0134	0.0254	0.097	0.0064	0.0489	0.0009	0.1989	0.0266	0.0011	0.0785	0.0091	0.0002	0.0012	0.00107	0.2381	0.0059	795.25	0.7953
PHLTH089	783853	8272023	0.1456	0.0271	0.0114	0.0118	0.058	0.0048	0.0836	0.0011	0.1837	0.0321	0.0052	0.0511	0.0056	0.0022	0.0012	0.00484	0.1568	0.0065	785.25	0.7853
PHLTH090	783901	8272021	0.4852	0.0777	0.0378	0.0384	0.139	0.0135	0.2357	0.0048	0.4724	0.0871	0.0087	0.1397	0.0139	0.0012	0.0045	0.00386	0.3759	0.0271	2161.44	2.1614
PHLTH091	784057	8272017	0.0118	0.0528	0.0173	0.0353	0.119	0.0076	0.0661	0.0014	0.2449	0.0349	0.0004	0.1074	0.0113	0.0006	0.0016	0.00054	0.2235	0.0086	944.29	0.9443
PHLTH092	782744	8272232	0.4287	0.1458	0.0525	0.0787	0.282	0.0220	0.2557	0.0046	0.7780	0.1226	0.0043	0.2771	0.0289	0.0046	0.0054	0.00362	0.5778	0.0278	3092.30	3.0923
PHLTH093	782951	8272225	0.0114	0.0340	0.0107	0.0230	0.081	0.0049	0.0663	0.0008	0.2135	0.0317	0.0004	0.0821	0.0074	0.0004	0.0010	0.00048	0.1454	0.0052	718.30	0.7183
PHLTH094	783168	8272234	0.3796	0.0731	0.0248	0.0445	0.170	0.0107	0.2615	0.0022	0.5657	0.0992	0.0057	0.1745	0.0153	0.0039	0.0025	0.00158	0.2984	0.0128	2140.53	2.1405
PHLTH095	783267	8272246	0.0350	0.0239	0.0092	0.0132	0.047	0.0037	0.0477	0.0008	0.1312	0.0199	0.0012	0.0444	0.0046	0.0027	0.0009	0.00051	0.1065	0.0050	494.17	0.4942
PHLTH096	783320	8272249	0.5945	0.0972	0.0424	0.0530	0.175	0.0160	0.3237	0.0046	0.5995	0.1107	0.0081	0.1728	0.0176	0.0150	0.0048	0.00661	0.4165	0.0276	2664.34	2.6643
PHLTH097	783401	8272247	0.0674	0.0386	0.0137	0.0266	0.087	0.0057	0.1331	0.0012	0.2916	0.0511	0.0052	0.0885	0.0078	0.0023	0.0014	0.00170	0.1613	0.0074	987.59	0.9876
PHLTH098	783511	8272246	0.1157	0.0405	0.0174	0.0196	0.069	0.0066	0.0972	0.0018	0.1860	0.0332	0.0058	0.0602	0.0074	0.0012	0.0019	0.00158	0.1791	0.0107	852.57	0.8526
PHLTH099	783714	8272249	0.1407	0.1199	0.0451	0.0589	0.219	0.0186	0.1401	0.0043	0.4607	0.0701	0.0029	0.1937	0.0232	0.0030	0.0046	0.00204	0.5168	0.0253	2043.91	2.0439
PHLTH100	783771	8272246	0.0066	0.0331	0.0119	0.0177	0.068	0.0050	0.0441	0.0009	0.1417	0.0211	0.0004	0.0618	0.0066	0.0003	0.0011	0.00024	0.1587	0.0059	584.66	0.5847
PHLTH101	783821	8272246	0.3747	0.1567	0.0622	0.0698	0.279	0.0249	0.2240	0.0054	0.6194	0.0993	0.0063	0.2435	0.0294	0.0056	0.0063	0.00260	0.6921	0.0340	2926.82	2.9268
PHLTH102	783928	8272243	0.0102	0.0495	0.0188	0.0216	0.093	0.0077	0.0488	0.0016	0.1720	0.0241	0.0004	0.0785	0.0096	0.0003	0.0018	0.00058	0.2273	0.0099	774.53	0.7745
PHLTH103	784032	8272241	0.0109	0.0582	0.0214	0.0273	0.107	0.0089	0.0398	0.0016	0.1843	0.0248	0.0004	0.0885	0.0112	0.0002	0.0020	0.00115	0.2654	0.0106	861.97	0.8620
PHLTH104	782365	8272407	0.4791	0.1400	0.0664	0.0514	0.206	0.0244	0.2592	0.0065	0.5097	0.0907	0.0080	0.1710	0.0235	0.0019	0.0071	0.00311	0.5753	0.0400	2658.09	2.6581
PHLTH105	782299	8272679	0.1450	0.0537	0.0179	0.0291	0.113	0.0079	0.1214	0.0014	0.2974	0.0487	0.0020	0.1063	0.0110	0.0014	0.0017	0.00080	0.2051	0.0090	1170.90	1.1709
PHLTH106	782506	8272665	0.0145	0.0409	0.0128	0.0242	0.094	0.0057	0.0686	0.0009	0.2228	0.0326	0.0004	0.0923	0.0087	0.0005	0.0012	0.00020	0.1702	0.0059	795.54	0.7955
PHLTH107	782703	8272661	0.2960	0.0732	0.0350	0.0301	0.119	0.0124	0.1566	0.0039	0.3243	0.0576	0.0115	0.1036	0.0129	0.0011	0.0039	0.00111	0.3251	0.0229	1587.64	1.5876
PHLTH108</																						



SampleID	X_UTM	Y_UTM	CeO2 (ppm)	Dy2O3 (ppm)	Er2O3 (ppm)	Eu2O3 (ppm)	Gd2O3 (ppm)	Ho2O3 (ppm)	La2O3 (ppm)	Lu2O3 (ppm)	Nd2O3 (ppm)	Pr6O11 (ppm)	Sc ₂ O ₃ (ppm)	Sm2O3 (ppm)	Tb4O7 (ppm)	Th (ppm)	Tm2O3 (ppm)	U (ppb)	Y2O3 (ppm)	Yb2O3 (ppm)	TREO (ppb)	TREO (ppm)
PHLTH117	783050	8272973	0.1169	0.0795	0.0421	0.0239	0.107	0.0145	0.1068	0.0049	0.2344	0.0405	0.0081	0.0811	0.0130	0.0005	0.0049	0.00142	0.3886	0.0299	1296.40	1.2964
PHLTH118	783047	8272790	0.3145	0.0924	0.0368	0.0405	0.170	0.0147	0.1794	0.0032	0.4514	0.0750	0.0058	0.1525	0.0173	0.0035	0.0038	0.00404	0.3810	0.0206	1959.03	1.9590
PHLTH119	783254	8272974	0.2997	0.0453	0.0165	0.0244	0.090	0.0068	0.1501	0.0013	0.3732	0.0652	0.0086	0.1011	0.0085	0.0084	0.0016	0.00472	0.1987	0.0085	1399.36	1.3994
PHLTH120	783354	8272969	0.3673	0.1590	0.0771	0.0571	0.232	0.0281	0.2246	0.0079	0.5785	0.0994	0.0072	0.1966	0.0267	0.0019	0.0088	0.00556	0.6921	0.0502	2812.22	2.8122
PHLTH121	783467	8272963	0.6842	0.2072	0.0963	0.0833	0.330	0.0353	0.3178	0.0108	0.8130	0.1371	0.0120	0.2876	0.0363	0.0047	0.0112	0.01040	0.9296	0.0658	4057.04	4.0570
PHLTH122	783567	8272960	0.0123	0.0366	0.0152	0.0144	0.063	0.0060	0.0264	0.0012	0.1025	0.0140	0.0004	0.0484	0.0068	0.0002	0.0016	0.00030	0.1695	0.0083	526.25	0.5262
PHLTH123	783674	8272953	0.1529	0.1503	0.0567	0.0719	0.271	0.0231	0.1308	0.0055	0.5167	0.0733	0.0021	0.2319	0.0292	0.0017	0.0058	0.00172	0.6413	0.0326	2395.09	2.3951
PHLTH124	783785	8272946	0.0008	0.0186	0.0059	0.0096	0.043	0.0033	0.0189	0.0004	0.0746	0.0107	0.0004	0.0346	0.0037	0.0000	0.0006	0.00014	0.0856	0.0031	313.52	0.3135
PHLTH126	780739	8273229	0.1099	0.1314	0.0526	0.0585	0.259	0.0257	0.1190	0.0046	0.5260	0.0720	0.0064	0.2024	0.0246	0.0032	0.0056	0.00203	0.6413	0.0317	2271.06	2.2711
PHLTH127	780869	8273230	0.0040	0.0282	0.0173	0.0115	0.054	0.0073	0.0210	0.0014	0.0854	0.0131	0.0009	0.0395	0.0057	0.0002	0.0014	0.00045	0.1702	0.0091	470.22	0.4702
PHLTH128	780979	8273224	0.0176	0.0644	0.0269	0.0242	0.110	0.0127	0.0752	0.0024	0.2146	0.0341	0.0086	0.0806	0.0113	0.0015	0.0030	0.00128	0.3022	0.0171	1005.09	1.0051
PHLTH129	781064	8273220	0.3329	0.3615	0.2333	0.0903	0.399	0.0881	0.3683	0.0300	0.8818	0.1577	0.0281	0.2853	0.0510	0.0075	0.0316	0.00962	1.9175	0.2107	5466.87	5.4669
PHLTH130	781164	8273221	0.2764	0.2582	0.1178	0.0959	0.396	0.0532	0.1712	0.0110	0.7407	0.1045	0.0107	0.2945	0.0438	0.0076	0.0135	0.00843	1.3397	0.0815	4009.21	4.0092
PHLTH131	781247	8273221	0.0355	0.0557	0.0272	0.0200	0.090	0.0117	0.0834	0.0031	0.1855	0.0318	0.0060	0.0637	0.0094	0.0003	0.0033	0.00088	0.2883	0.0209	935.60	0.9356
PHLTH132	781861	8273395	0.0416	0.0409	0.0162	0.0249	0.094	0.0076	0.0714	0.0017	0.2368	0.0352	0.0041	0.0850	0.0081	0.0005	0.0019	0.00059	0.2146	0.0116	895.89	0.8959
PHLTH133	782082	8273385	0.2653	0.1240	0.0512	0.0699	0.262	0.0242	0.1765	0.0055	0.6170	0.0933	0.0117	0.2302	0.0236	0.0012	0.0059	0.00206	0.6248	0.0355	2620.26	2.6203
PHLTH134	782257	8273367	0.0040	0.0308	0.0162	0.0191	0.076	0.0070	0.0358	0.0010	0.1744	0.0251	0.0008	0.0707	0.0068	0.0001	0.0011	0.00066	0.1759	0.0064	651.02	0.6510
PHLTH135	782403	8273366	0.0051	0.0267	0.0147	0.0127	0.053	0.0064	0.0182	0.0013	0.0976	0.0135	0.0004	0.0409	0.0056	0.0001	0.0012	0.00046	0.1600	0.0075	464.81	0.4648
PHLTH136	782465	8273390	0.0026	0.0357	0.0194	0.0180	0.071	0.0081	0.0342	0.0014	0.1394	0.0210	0.0008	0.0551	0.0071	0.0002	0.0015	0.00029	0.2108	0.0098	635.85	0.6358
PHLTH137	782623	8273370	0.0332	0.1153	0.0454	0.0445	0.214	0.0221	0.1084	0.0043	0.3721	0.0553	0.0117	0.1606	0.0211	0.0008	0.0048	0.00181	0.5803	0.0305	1824.02	1.8240
PHLTH138	782825	8273365	0.0022	0.0107	0.0064	0.0040	0.018	0.0030	0.0073	0.0005	0.0327	0.0046	0.0009	0.0135	0.0022	0.0001	0.0005	0.00014	0.0639	0.0035	174.11	0.1741
PHLTH139	782928	8273332	0.4029	0.0621	0.0281	0.0249	0.104	0.0126	0.1519	0.0031	0.3418	0.0622	0.0080	0.0947	0.0107	0.0080	0.0034	0.00268	0.2806	0.0215	1612.18	1.6122
PHLTH140	783044	8273364	0.2039	0.0746	0.0312	0.0324	0.129	0.0146	0.1132	0.0029	0.3254	0.0513	0.0086	0.1062	0.0132	0.0082	0.0035	0.00280	0.3429	0.0205	1472.97	1.4730
PHLTH141	783228	8273365	0.0053	0.0342	0.0220	0.0112	0.053	0.0092	0.0165	0.0016	0.0625	0.0095	0.0004	0.0315	0.0065	0.0001	0.0017	0.00099	0.1632	0.0102	438.19	0.4382
PHLTH142	783445	8273368	0.6400	0.1968	0.0872	0.0812	0.349	0.0396	0.3683	0.0089	0.9483	0.1613	0.0141	0.2992	0.0343	0.0212	0.0102	0.00814	0.9181	0.0627	4219.59	4.2196
PHLTH143	783483	8273367	0.5896	0.2376	0.1235	0.0768	0.349	0.0519	0.3952	0.0140	0.8946	0.1583	0.0106	0.2806	0.0385	0.0187	0.0156	0.00875	1.1683	0.0979	4502.28	4.5023
PHLTH145	783533	8273367	1.5601	0.2777	0.1572	0.0725	0.398	0.0632	0.6744	0.0185	1.2306	0.2404	0.0104	0.3432	0.0438	0.0104	0.0202	0.01195	1.3207	0.1287	6559.24	6.5592
PHLTH146	783555	8273368	0.4582	0.0745	0.0328	0.0343	0.159	0.0147	0.1982	0.0037	0.4701	0.0816	0.0083	0.1426	0.0139	0.0037	0.0038	0.00389	0.3607	0.0239	2080.28	2.0803
PHLTH147	783651	8273369	0.0862	0.0817	0.0285	0.0442	0.192	0.0147	0.1302	0.0025	0.4771	0.0698	0.0043	0.1734	0.0165	0.0038	0.0029	0.00192	0.3962	0.0168	1736.86	1.7369
PHLTH148	782212	8274045	0.9790	0.4017	0.2127	0.0992	0.560	0.0890	0.4703	0.0227	1.3414	0.2253	0.0123	0.4128	0.0622	0.0076	0.0265	0.00731	1.9049	0.1617	6981.90	6.9819
PHLTH149	782417	8274034	0.0667	0.1093	0.0431	0.0477	0.221	0.0211	0.0943	0.0042	0.4374	0.0613	0.0041	0.1809	0.0210	0.0008	0.0048	0.00078	0.5905	0.0282	1935.23	1.9352
PHLTH150	782516	8274035	0.5258	0.4040	0.2710	0.1094	0.468	0.0994	0.6474	0.0354	1.4055	0.2658	0.0156	0.3792	0.0568	0.0161	0.0373	0.01110	2.0699	0.2505	7041.07	7.0411
PHLTH151	782639	8274026	1.2137	0.3294	0.1830	0.1268	0.526	0.0735	0.5207	0.0234	1.4463	0.2489	0.0230	0.4221	0.0528	0.0030	0.0238	0.00562	1.8160	0.1554	7184.36	7.1844
PHLTH152	782725	8274026	0.2021	0.1779	0.1025	0.0560	0.259	0.0408	0.2134	0.0139	0.5890	0.0980	0.0109	0.1919	0.0283	0.0005	0.0136	0.00068	1.0273	0.0904	3115.42	3.1154
PHLTH153	782725	8274025	0.5110	0.8918	0.7627	0.1679	0.920	0.2669	0.2346	0.0542	1.1781	0.1855	0.0190	0.5381	0.1411	0.0010	0.0668	0.00231	4.9272	0.3997	11264.31	11.2643
PHLTH154	782925	8274020	0.0159	0.1108	0.0480	0.0317	0.174	0.0225	0.0582	0.0049	0.2333	0.0329	0.0015	0.1112	0.0192	0.0004	0.0056	0.00108	0.5562	0.0345	1460.32	1.4603
PHLTH155	781655	8274217	0.6719	0.3569	0.2236	0.0747	0.392	0.0864	0.3014	0.0257	0.8585	0.1528	0.0163	0.2829	0.0500	0.0015	0.0296	0.00737	1.8160	0.1907	5529.24	5.5292
PHLTH156	781844	8274258	0.0188	0.0775	0.0311	0.0285	0.142	0.0151	0.0501	0.0028	0.2578	0.0343	0.0041	0.1092	0.0142	0.0018	0.0034	0.00156	0.3924	0.0202	1201.14	1.2011
PHLTH157	781943	8274241	0.0504	0.0839	0.0366	0.0221	0.129	0.0169	0.1296	0.0034	0.2869	0.0501	0.0037	0.0947	0.0139	0.0046	0.0041	0.00195	0.3835	0.0241	1332.52	1.3325
PHLTH158	782041	8274229	0.0041	0.0295	0.0157	0.0160	0.070	0.0067	0.0436	0.0009	0.1837	0.0289	0.0009	0.0649	0.0068	0.0004	0.0011	0.00098	0.1594	0.0060	637.92	0.6379
PHLTH159	782139	8274225	0.0284	0.0428	0.0141	0.0249	0.105	0.0074	0.0729	0.0011	0.2589	0.0388	0.0012	0.0981	0.0089	0.0003	0.0014	0.00055	0.1987	0.0081	911.22	0.9112
PHLTH160	781498	8274556	0.0055	0.0870	0.0326	0.0452	0.183	0.0148	0.1099	0.0024	0.4502	0.0610	0.0004	0.1641	0.0171	0.0012	0.0031	0.00058	0.4483	0.0154	1639.62	1.6396
PHLTH161	781697	8274557	0.0690	0.0535	0.0221	0.0185	0.084	0.0093	0.0615	0.0020	0.1732	0.0262	0.0043	0.0619	0.0095	0.0014	0.0023	0.00091	0.2470	0.0118	856.36	0.8564
PHLTH162	781906	8274562	0.2788	0.5945	0.3465	0.0970	0.576	0.1249	0.6298	0.0331	1.6563	0.3105	0.0845	0.4905	0.0836	0.0039	0.0409	0.00719	3.3906	0.2289	8966.76	8.9668
PHLTH163	778820	8275846	0.2690	0.0918	0.0296	0.0608	0.233	0.0148	0.2281	0.0025	0.8200	0.1184	0.0029	0.2470	0.0197	0.0018	0.0029	0.00092	0.4216	0.0153	2577.21	2.5772
PHLTH164	779029	8275841	0.0098	0.0634	0.0244	0.0274	0.127	0.0108	0.0537	0.0018	0.3138	0.0394	0.0009	0.1145	0.0122	0.0013	0.0024	0.00064	0.3111	0.0115	1124.37	1.1244



SampleID	X_UTM	Y_UTM	CeO2 (ppm)	Dy2O3 (ppm)	Er2O3 (ppm)	Eu2O3 (ppm)	Gd2O3 (ppm)	Ho2O3 (ppm)	La2O3 (ppm)	Lu2O3 (ppm)	Nd2O3 (ppm)	Pr6O11 (ppm)	Sc ₂ O ₃ (ppm)	Sm2O3 (ppm)	Tb4O7 (ppm)	Th (ppm)	Tm2O3 (ppm)	U (ppb)	Y2O3 (ppm)	Yb2O3 (ppm)	TREO (ppb)	TREO (ppm)
PHLTH174	776600	8265015	0.2911	0.3156	0.1589	0.0963	0.426	0.0623	0.2240	0.0140	1.0393	0.1589	0.0175	0.3548	0.0499	0.0027	0.0183	0.01225	1.6191	0.0952	4941.78	4.9418
PHLTH175	776716	8265058	0.0072	0.0248	0.0102	0.0129	0.053	0.0045	0.0285	0.0009	0.1475	0.0185	0.0004	0.0506	0.0046	0.0000	0.0011	0.00049	0.1562	0.0063	527.59	0.5276
PHLMAG001	779211	8268120	0.4828	0.3007	0.1129	0.1343	0.580	0.0519	0.3296	0.0097	1.3180	0.1855	0.0035	0.4905	0.0580	0.0047	0.0110	0.00608	1.4731	0.0550	5596.18	5.5962
PHLMAG002	779366	8268179	0.3145	0.1503	0.0608	0.0613	0.273	0.0265	0.2199	0.0060	0.7033	0.1045	0.0092	0.2319	0.0281	0.0013	0.0063	0.00286	0.7023	0.0337	2931.77	2.9318
PHLMAG003	779549	8268253	0.0051	0.0052	0.0035	0.0012	0.006	0.0011	0.0030	0.0005	0.0127	0.0017	0.0004	0.0047	0.0008	0.0000	0.0004	0.00013	0.0323	0.0028	81.34	0.0813
PHLMAG004	779671	8268332	0.0201	0.0356	0.0148	0.0117	0.056	0.0064	0.0226	0.0012	0.1099	0.0145	0.0048	0.0434	0.0061	0.0013	0.0017	0.00134	0.2095	0.0083	566.01	0.5660
PHLMAG005	779851	8268373	0.1806	0.2995	0.1870	0.0548	0.292	0.0658	0.1454	0.0210	0.5622	0.0863	0.0321	0.2081	0.0414	0.0011	0.0232	0.00365	1.6128	0.1361	3947.79	3.9478
PHLMAG006	779953	8268462	0.0671	0.2272	0.1429	0.0324	0.236	0.0503	0.1151	0.0152	0.4374	0.0669	0.0236	0.1594	0.0314	0.0005	0.0172	0.00240	1.3334	0.0967	3052.65	3.0527
PHLMAG007	780101	8268569	0.0891	0.1980	0.1212	0.0364	0.214	0.0441	0.1325	0.0132	0.4269	0.0669	0.0176	0.1444	0.0283	0.0013	0.0150	0.00468	1.1188	0.0862	2753.06	2.7531
PHLMAG008	780255	8268665	0.1910	0.2146	0.1241	0.0493	0.251	0.0449	0.1618	0.0122	0.5505	0.0858	0.0140	0.1786	0.0326	0.0008	0.0144	0.00342	1.2470	0.0819	3254.02	3.2540
PHLMAG009	780376	8268743	0.2702	0.1429	0.0790	0.0418	0.208	0.0294	0.1964	0.0099	0.5295	0.0867	0.0163	0.1618	0.0234	0.0005	0.0094	0.00192	0.8153	0.0572	2677.32	2.6773
PHLMAG010	780506	8268802	0.0097	0.0543	0.0199	0.0265	0.109	0.0090	0.0538	0.0016	0.2327	0.0301	0.0008	0.0936	0.0104	0.0003	0.0020	0.00170	0.2819	0.0097	944.72	0.9447
PHLMAG011	784414	8273471	0.0067	0.0527	0.0190	0.0269	0.111	0.0087	0.0579	0.0013	0.2543	0.0337	0.0004	0.0975	0.0103	0.0002	0.0017	0.00163	0.2806	0.0087	971.19	0.9712
PHLMAG012	785686	8273946	0.0560	0.1383	0.0585	0.0494	0.228	0.0245	0.0817	0.0050	0.3651	0.0455	0.0004	0.1635	0.0246	0.0009	0.0059	0.00431	0.7302	0.0314	2007.77	2.0078
PHLMAG016	781276	8279030	0.0378	0.0946	0.0502	0.0219	0.121	0.0195	0.0346	0.0049	0.1551	0.0193	0.0054	0.0713	0.0149	0.0007	0.0054	0.00151	0.4864	0.0305	1172.75	1.1728
PHLMAG017	782636	8279261	0.1108	0.2244	0.1155	0.0530	0.282	0.0450	0.0694	0.0121	0.3861	0.0483	0.0107	0.1826	0.0355	0.0008	0.0132	0.00344	1.1988	0.0746	2862.51	2.8625
PHLMAG018	783820	8279560	0.0601	0.0965	0.0440	0.0279	0.146	0.0183	0.0426	0.0046	0.2327	0.0283	0.0052	0.1040	0.0167	0.0009	0.0047	0.00315	0.5092	0.0276	1368.20	1.3682
PHLMAG019	785092	8280064	0.0079	0.0273	0.0154	0.0054	0.032	0.0057	0.0048	0.0015	0.0316	0.0035	0.0004	0.0170	0.0040	0.0000	0.0016	0.00182	0.1479	0.0095	316.07	0.3161
PHLMAG020	786218	8280248	0.0807	0.1922	0.1172	0.0277	0.183	0.0433	0.0362	0.0139	0.1592	0.0199	0.0281	0.0816	0.0259	0.0001	0.0138	0.00260	1.2089	0.0819	2313.87	2.3139
PHLMAG021	777456	8283916	0.4422	0.2754	0.1555	0.0681	0.349	0.0578	0.2123	0.0166	0.7383	0.1127	0.0285	0.2505	0.0422	0.0005	0.0183	0.00281	1.6191	0.1038	4490.82	4.4908
PHLMAG022	778428	8283963	0.6977	0.3845	0.2087	0.0790	0.398	0.0735	0.2756	0.0233	0.7897	0.1408	0.0344	0.2690	0.0573	0.0003	0.0264	0.00315	2.0953	0.1588	5711.61	5.7116
PHLMAG023	779311	8283984	0.8722	0.2571	0.1062	0.0858	0.376	0.0419	0.3882	0.0102	1.0778	0.1752	0.0183	0.3085	0.0452	0.0138	0.0128	0.01135	1.2826	0.0722	5129.84	5.1298
PHLMAG024	780354	8284149	0.4152	0.2410	0.1037	0.0683	0.331	0.0409	0.1689	0.0107	0.6252	0.0987	0.0173	0.2290	0.0415	0.0016	0.0124	0.00383	1.2407	0.0720	3716.37	3.7164
PHLMAG025	782616	8284564	0.3550	0.5038	0.3122	0.0647	0.377	0.1033	0.1056	0.0350	0.4257	0.0661	0.0288	0.2012	0.0666	0.0002	0.0409	0.00332	2.9589	0.2482	5892.96	5.8930
PHLMAG026	783551	8284553	0.2033	0.2835	0.1492	0.0512	0.279	0.0528	0.0839	0.0164	0.3651	0.0528	0.0196	0.1583	0.0425	0.0004	0.0187	0.00259	1.6699	0.1125	3558.57	3.5586
PHLMAG027	783573	8284552	0.1413	0.2640	0.1218	0.0582	0.310	0.0469	0.0895	0.0126	0.3907	0.0559	0.0213	0.1774	0.0433	0.0005	0.0146	0.00232	1.4794	0.0849	3311.97	3.3120
PHLMAG028	784758	8284615	0.0425	0.0589	0.0246	0.0175	0.085	0.0097	0.0349	0.0023	0.1633	0.0236	0.0084	0.0600	0.0103	0.0016	0.0028	0.00281	0.3289	0.0158	888.04	0.8880
PHLMAG029	784237	8284642	0.0189	0.0762	0.0336	0.0178	0.095	0.0131	0.0188	0.0034	0.1128	0.0143	0.0060	0.0540	0.0128	0.0004	0.0039	0.00168	0.4305	0.0229	934.10	0.9341
PHLMAG030	784953	8284782	0.0151	0.0772	0.0328	0.0200	0.103	0.0132	0.0205	0.0033	0.1213	0.0153	0.0061	0.0608	0.0136	0.0003	0.0038	0.00156	0.4432	0.0217	970.94	0.9709
HLTHU21	768442	8334442	0.1793	0.0889	0.0340	0.0373	0.131	0.0139	0.1513	0.0029	0.5225	0.0998	0.0106	0.1258	0.0161	0.0502	0.0039	0.01020	0.4318	0.0215	1870.93	1.8709
HLTHU22	768663	8334444	0.7555	0.1159	0.0488	0.0384	0.130	0.0187	0.3284	0.0047	0.6194	0.1450	0.0469	0.1322	0.0187	0.1335	0.0064	0.01165	0.5651	0.0370	3011.31	3.0113
HLTHU23	768865	8334432	0.3820	0.0609	0.0238	0.0243	0.080	0.0096	0.1812	0.0020	0.3394	0.0741	0.0190	0.0776	0.0107	0.0903	0.0028	0.00903	0.2781	0.0158	1581.07	1.5811
HLTHU24	769000	8334421	1.4065	0.2869	0.1326	0.1025	0.328	0.0477	0.8092	0.0152	1.8196	0.4446	0.1505	0.3479	0.0460	0.1355	0.0181	0.01495	1.5810	0.1128	7649.63	7.6496
HLTHU25	769189	8334426	1.1387	0.2186	0.0926	0.0741	0.272	0.0359	0.5688	0.0087	1.2364	0.2610	0.0564	0.2621	0.0365	0.1450	0.0116	0.02670	1.0858	0.0671	5426.29	5.4263
HLTHU26	769422	8334420	0.6363	0.5899	0.2607	0.1598	0.712	0.0971	0.8081	0.0266	2.1345	0.4156	0.0270	0.5473	0.0893	0.0513	0.0321	0.02620	2.7176	0.1896	9443.85	9.4439
HLTHU27	769661	8334408	0.4668	0.2732	0.1166	0.0910	0.373	0.0462	0.7330	0.0106	1.3764	0.2936	0.0112	0.3108	0.0459	0.0546	0.0141	0.02010	1.3651	0.0791	5606.94	5.6069
HLTHU28	769850	8334417	0.6400	0.5394	0.2836	0.1245	0.675	0.1002	0.3061	0.0381	0.9693	0.1522	0.0414	0.3769	0.0869	0.0034	0.0376	0.00941	2.9970	0.2391	7607.71	7.6077
HLTHU29	770087	8334396	0.1836	0.3489	0.1481	0.0944	0.443	0.0588	0.1290	0.0143	0.6159	0.0872	0.0138	0.2806	0.0602	0.0061	0.0170	0.00836	1.7525	0.0986	4345.53	4.3455
HLTHU31	770506	8334389	0.0063	0.0539	0.0212	0.0162	0.083	0.0087	0.0264	0.0017	0.1072	0.0150	0.0004	0.0504	0.0099	0.0004	0.0023	0.00049	0.2946	0.0122	709.34	0.7093
HLTHU32	770672	8334380	0.0251	0.1217	0.0431	0.0406	0.205	0.0188	0.0758	0.0033	0.3639	0.0513	0.0046	0.1467	0.0231	0.0154	0.0044	0.00269	0.6527	0.0238	1804.14	1.8041
HLTHU33	770882	8334373	0.1156	0.2513	0.1384	0.0457	0.267	0.0488	0.1111	0.0146	0.3977	0.0645	0.0095	0.1577	0.0379	0.0062	0.0170	0.00626	1.3397	0.0995	3116.49	3.1165
HLTHU34	771038	8334360	0.9520	0.3317	0.1595	0.0550	0.378	0.0589	0.4973	0.0164	0.8678	0.1740	0.0175	0.2563	0.0528	0.0175	0.0199	0.01030	1.7017	0.1173	5656.02	5.6560
HLTHU35	771271	8334360	0.3501	0.1377	0.0591	0.0418	0.184	0.0230	0.1665	0.0057	0.4712	0.0820	0.0129	0.1450	0.0236	0.0207	0.0071	0.01000	0.6502	0.0412	2401.57	2.4016
HLTHU36	771504	8334344	2.4015	0.3994	0.1715	0.1227	0.551	0.0671	0.8022	0.0147	1.7904	0.3492	0.0078	0.4337	0.0663	0.0340	0.0201	0.02400	2.0382	0.1076	9343.46	9.3435
HLTHU37	772571	8336743	0.9004	0.4212	0.2258	0.0660	0.493	0.0787	0.5676	0.0251	1.1116	0.2042	0.0327	0.3200	0.0645	0.0185	0.0288	0.02510	2.0509	0.1765	6767.35	6.7673
HLTHU38	772429	8336721	0.6449	0.2054	0.0845	0.0685	0.360	0.0332	0.3577	0.0102	1.0533	0.1698	0.0341	0.3038	0.0386	0.0062	0.0104	0.00981	1.1734	0.0648	4612.22	4.6122
HLTHU39																						



SampleID	X_UTM	Y_UTM	CeO2 (ppm)	Dy2O3 (ppm)	Er2O3 (ppm)	Eu2O3 (ppm)	Gd2O3 (ppm)	Ho2O3 (ppm)	La2O3 (ppm)	Lu2O3 (ppm)	Nd2O3 (ppm)	Pr6O11 (ppm)	Sc ₂ O ₃ (ppm)	Sm2O3 (ppm)	Tb4O7 (ppm)	Th (ppm)	Tm2O3 (ppm)	U (ppb)	Y2O3 (ppm)	Yb2O3 (ppm)	TREO (ppb)	TREO (ppm)
HLTHU48	770643	8336813	1.0097	0.0730	0.0305	0.0278	0.096	0.0149	0.2932	0.0029	0.7138	0.1516	0.0327	0.1063	0.0132	0.0848	0.0039	0.01915	0.3721	0.0169	2958.86	2.9589
HLTHU49	770643	8336813	1.0306	0.0779	0.0327	0.0293	0.101	0.0163	0.3002	0.0031	0.7372	0.1565	0.0390	0.1140	0.0140	0.0911	0.0043	0.02110	0.3911	0.0185	3065.99	3.0660
THNT007	765463	8310824	0.0489	0.0785	0.0250	0.0491	0.179	0.0148	0.2369	0.0023	0.7395	0.1155	0.0196	0.1647	0.0176	0.0297	0.0026	0.01390	0.3632	0.0106	2068.06	2.0681
THNT008	765395	8311044	0.9508	0.2060	0.1045	0.0834	0.320	0.0475	0.8069	0.0167	1.6330	0.2984	0.0351	0.2760	0.0369	0.0289	0.0139	0.02150	0.9689	0.0737	5872.15	5.8722
THNT009	765448	8311244	0.1321	0.0738	0.0295	0.0342	0.126	0.0153	0.1202	0.0026	0.4654	0.0690	0.0087	0.1075	0.0144	0.0223	0.0033	0.00650	0.3975	0.0142	1613.32	1.6133
THNT010	765464	8311326	0.2070	0.1011	0.0393	0.0497	0.187	0.0207	0.2047	0.0037	0.6718	0.1038	0.0146	0.1577	0.0208	0.0256	0.0043	0.00721	0.5321	0.0188	2336.79	2.3368
THNT011	765486	8311390	0.2352	0.0275	0.0103	0.0164	0.051	0.0053	0.0788	0.0011	0.3033	0.0515	0.0080	0.0609	0.0057	0.0206	0.0012	0.00912	0.1213	0.0055	983.45	0.9835
THNT014	763779	8310324	0.3575	0.3041	0.2041	0.0512	0.267	0.0810	0.2305	0.0272	0.6042	0.1055	0.0299	0.1641	0.0447	0.0017	0.0282	0.01145	2.0255	0.1406	4665.61	4.6656
THNT015	763764	8310494	0.3145	0.1452	0.0823	0.0368	0.178	0.0360	0.2181	0.0111	0.5249	0.0930	0.0155	0.1235	0.0242	0.0048	0.0110	0.01150	1.0020	0.0528	2868.42	2.8684
THNT016	763698	8310715	3.1079	0.3328	0.1607	0.0995	0.462	0.0723	1.2080	0.0176	2.7177	0.5679	0.1002	0.4337	0.0592	0.2090	0.0211	0.02710	2.0763	0.0982	11534.98	11.5350
THNT017	763677	8310880	1.4004	0.3305	0.1670	0.0924	0.421	0.0741	0.7565	0.0198	1.9071	0.3745	0.1272	0.3525	0.0570	0.1770	0.0227	0.02950	2.0001	0.1103	8212.86	8.2129
NMJK001	810821	8347415	0.9090	0.4212	0.2378	0.1314	0.572	0.1024	0.3554	0.0389	1.2830	0.1867	0.0592	0.3456	0.0737	0.0023	0.0324	0.02010	2.4065	0.1674	7322.34	7.3223
NMJK002	810819	8347236	0.8537	0.3764	0.1875	0.1418	0.594	0.0867	0.3542	0.0293	1.3414	0.1897	0.0371	0.3722	0.0716	0.0018	0.0240	0.02040	2.0191	0.1207	6799.24	6.7992
NMJK003	810827	8347074	0.3869	0.2387	0.1349	0.0753	0.287	0.0582	0.1724	0.0217	0.5820	0.0871	0.0160	0.1902	0.0405	0.0011	0.0178	0.00715	1.2115	0.0922	3612.44	3.6124
NMJK006	810849	8346860	0.3919	0.1739	0.0782	0.0687	0.260	0.0379	0.1753	0.0105	0.5785	0.0870	0.0129	0.1751	0.0335	0.0010	0.0096	0.00629	0.8978	0.0457	3036.96	3.0370
NMJK007	810843	8346707	0.2518	0.1121	0.0910	0.0245	0.100	0.0332	0.1051	0.0155	0.2438	0.0411	0.0206	0.0619	0.0152	0.0010	0.0133	0.00980	0.7353	0.0717	1936.21	1.9362
NMJK008	810833	8346736	0.3513	0.1859	0.0830	0.0741	0.273	0.0412	0.1683	0.0110	0.5972	0.0872	0.0114	0.1838	0.0360	0.0013	0.0099	0.01015	0.9677	0.0475	3128.74	3.1287
NMJK009	810837	8346406	0.8390	0.3627	0.1812	0.1308	0.552	0.0840	0.3542	0.0273	1.2714	0.1812	0.0385	0.3456	0.0676	0.0014	0.0233	0.01605	2.0318	0.1161	6606.88	6.6069
NMJK010	810703	8347374	0.8169	0.2904	0.1418	0.1158	0.478	0.0658	0.3518	0.0221	1.1839	0.1698	0.0465	0.3108	0.0567	0.0008	0.0180	0.01310	1.7207	0.0904	5879.58	5.8796
NMJTHU001	781280	8342348	2.3340	0.1228	0.0569	0.0537	0.142	0.0257	0.7717	0.0069	1.2830	0.3262	0.4249	0.1681	0.0212	0.0838	0.0078	0.01560	0.7416	0.0389	6525.85	6.5259
NMJTHU002	781137	8342250	0.0334	0.0259	0.0121	0.0108	0.035	0.0056	0.0219	0.0014	0.1610	0.0232	0.0026	0.0355	0.0047	0.0007	0.0016	0.00112	0.1448	0.0076	526.64	0.5266
NMJTHU003	780857	8342220	7.4195	0.7954	0.4517	0.3138	1.132	0.1919	3.7295	0.0710	6.4502	1.3713	0.1275	1.1399	0.1423	0.0688	0.0624	0.03730	3.5811	0.3746	27353.82	27.3538
NMJTHU004	780611	8342213	0.0873	0.0962	0.0399	0.0380	0.147	0.0208	0.0949	0.0035	0.3429	0.0500	0.0072	0.1005	0.0185	0.0102	0.0044	0.00393	0.5537	0.0188	1623.56	1.6236
NMJTHU005	780537	8342256	6.6579	0.5463	0.2939	0.1922	0.671	0.1289	2.9320	0.0418	4.0591	0.9569	0.2630	0.6111	0.0836	0.1575	0.0418	0.03700	2.8446	0.2158	20539.76	20.5398
NMJTHU006	780356	8342245	0.6511	0.2777	0.1715	0.0602	0.279	0.0709	0.3741	0.0199	0.7372	0.1371	0.0190	0.1844	0.0438	0.0050	0.0224	0.02020	1.7652	0.1049	4918.26	4.9183
NMJTHU007	781686	8344234	0.3218	0.5027	0.2018	0.2032	0.799	0.1019	0.6368	0.0179	2.2220	0.3286	0.0321	0.5485	0.0901	0.0468	0.0224	0.01750	2.6922	0.0949	8815.71	8.8157
NMJTHU008	781508	8344253	0.0256	0.0283	0.0127	0.0116	0.046	0.0062	0.0326	0.0011	0.1184	0.0163	0.0017	0.0337	0.0055	0.0005	0.0014	0.00062	0.1892	0.0058	536.32	0.5363
NMJTHU009	781309	8344285	0.6437	0.1389	0.0493	0.0853	0.279	0.0274	0.4961	0.0046	1.4463	0.2441	0.0172	0.2771	0.0294	0.0601	0.0053	0.01865	0.6692	0.0232	4436.05	4.4360
NMJTHU010	781066	8344301	0.3390	0.3960	0.1641	0.1413	0.688	0.0843	0.6403	0.0150	1.9071	0.2996	0.0199	0.4986	0.0765	0.0512	0.0183	0.02110	1.9302	0.0782	7296.59	7.2966
NMJTHU011	780840	8344303	0.6744	0.4843	0.2367	0.1511	0.626	0.1077	0.8010	0.0262	1.7554	0.3033	0.0221	0.4070	0.0774	0.0248	0.0290	0.02930	2.6414	0.1332	8476.07	8.4761
NMJTHU012	780634	8344356	5.2576	0.9469	0.5260	0.3393	1.041	0.2239	3.1666	0.0629	5.4588	1.1635	0.2209	0.9996	0.1547	0.1900	0.0659	0.05180	5.3971	0.3314	25355.56	25.3556
BMBNWTH011	763775	8311920	0.1407	0.0620	0.0262	0.0248	0.100	0.0132	0.0987	0.0025	0.3837	0.0604	0.0137	0.0852	0.0122	0.0125	0.0030	0.00877	0.3708	0.0128	1409.59	1.4096
BMBNWTH012	763794	8311983	1.0454	0.0685	0.0343	0.0236	0.079	0.0151	0.4023	0.0042	0.5797	0.1444	0.2239	0.0852	0.0117	0.1405	0.0048	0.00996	0.4470	0.0235	3192.92	3.1929
BMBNWTH013	763761	8312145	2.2848	0.2341	0.1298	0.0877	0.295	0.0456	1.3604	0.0127	1.6796	0.4845	0.4433	0.3374	0.0362	0.2270	0.0163	0.02940	1.2661	0.0826	8796.26	8.7963
BMBNWTH014	763844	8312375	1.6276	0.1997	0.1076	0.0755	0.260	0.0384	0.9558	0.0105	1.4230	0.4072	0.3129	0.2992	0.0315	0.2440	0.0137	0.02220	0.9943	0.0706	6828.02	6.8280
BMBNWTH015	763896	8312535	0.1333	0.0640	0.0337	0.0286	0.127	0.0125	0.1437	0.0043	0.3126	0.0599	0.0120	0.0988	0.0118	0.0166	0.0041	0.01335	0.2921	0.0226	1361.33	1.3613
BMBNWTH017	763989	8312889	3.7589	0.5302	0.3705	0.1899	0.753	0.1163	2.1110	0.0500	3.2426	0.8059	0.1557	0.7966	0.0812	0.1880	0.0509	0.03890	2.4573	0.2938	15763.44	15.7634
MPYTH063	768613	8297536	0.0437	0.1148	0.0679	0.0411	0.148	0.0245	0.1040	0.0067	0.2648	0.0491	0.0097	0.0976	0.0172	0.0035	0.0083	0.00652	0.5803	0.0401	1617.94	1.6179
MPYTH064	768818	8297487	0.0198	0.0607	0.0333	0.0233	0.099	0.0121	0.0516	0.0036	0.1522	0.0269	0.0072	0.0593	0.0103	0.0019	0.0036	0.00376	0.3086	0.0188	890.01	0.8900
MPYTH065	768998	8297430	0.0333	0.1888	0.1122	0.0819	0.286	0.0406	0.1407	0.0132	0.5389	0.0900	0.0115	0.2000	0.0308	0.0061	0.0135	0.01365	0.8686	0.0696	2719.41	2.7194
MPYTH066	769106	8297403	0.3083	0.3478	0.2310	0.0271	0.325	0.0782	0.1583	0.0199	0.6135	0.1154	0.0138	0.2302	0.0469	0.0096	0.0273	0.01785	1.9366	0.1281	4607.48	4.6075
MPYTH067	769168	8297388	4.8276	0.3615	0.1704	0.0285	0.501	0.0670	1.2432	0.0117	2.0937	0.5256	0.0595	0.5149	0.0600	0.6170	0.0192	0.05260	1.4985	0.0859	12068.48	12.0685
MPYTH068	769223	8297367	0.1063	0.2376	0.1281	0.0491	0.334	0.0485	0.1507	0.0102	0.5657	0.0936	0.0046	0.2261	0.0381	0.0096	0.0140	0.01310	1.1797	0.0632	3249.80	3.2498
MPYTH069	769314	8297329	0.3071	0.2209	0.1401	0.0390	0.179	0.0480	0.1572	0.0116	0.4246	0.0895	0.0348	0.1351	0.0283	0.0145	0.0166	0.00510	1.2509	0.0802	3163.04	3.1630
MPYTH070	769429	8297345	0.0854	0.3420	0.1847	0.1044	0.477	0.0700	0.2733	0.0173	0.9868	0.1776	0.0141	0.3641	0.0552	0.0067	0.0210	0.01645	1.6382	0.1032	4914.40	4.9144

APPENDIX 3 – JORC TABLE 1

Section 1 Sampling Techniques and Data

(Criteria in this section apply to all succeeding sections.)

Criteria	JORC Code explanation	Commentary
Sampling techniques	<i>Nature and quality of sampling (eg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling.</i> <i>Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.</i> <i>Aspects of the determination of mineralisation that are Material to the Public Report.</i> <i>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.</i>	Soil samples of a weight of about 250 grams were taken from a depth of about 15-20 cm below surface. All samples were sieved on site through a 5mm plastic sieve and stored in double snap lock bags. The aim of the study was to test already identified airborne geophysics anomalies and determine if a corresponding geochemical anomaly can be outlined at the same location. A single north-south or east-west profile was undertaken from outside the anomaly, through the centre and out the other side. Sample collection, preparation and ionic leach testing at ALS labs Ireland was to industry standard.
Drilling techniques	<i>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).</i>	The Company’s Diamond Drilling program uses a Boart Longyear LF90D diamond rig equipped for P,H and NQ diameters with core orientation. No diamond drilling results are reported in this announcement.
Drill sample recovery	<i>Method of recording and assessing core and chip sample recoveries and results assessed.</i> <i>Measures taken to maximise sample recovery and ensure representative nature of the samples.</i>	Full drilling results from the diamond drilling program, including core recovery to be part of a subsequent announcement.

Criteria	JORC Code explanation	Commentary
	<i>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.</i>	
Logging	<i>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.</i> <i>Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.</i> <i>The total length and percentage of the relevant intersections logged.</i>	Full drilling results from the diamond drilling program, to be part of a subsequent announcement. Core recovered to date has been logged on site aswell as in detail at the Company's dedicated facility in Zalewa, Malawi. Wet and Dry core photographs are captured and stored utilising Imago software.
Sub-sampling techniques and sample preparation	<i>If core, whether cut or sawn and whether quarter, half or all core taken.</i> <i>If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.</i> <i>For all sample types, the nature, quality and appropriateness of the sample preparation technique.</i> <i>Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.</i> <i>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.</i> <i>Whether sample sizes are appropriate to the grain size of the material being sampled.</i>	Full drilling results from the diamond drilling program, to be part of a subsequent announcement. With respect to REE soil sampling: Sample was sieved on site to required weight (not dried) with no further splitting. A single traverse of points is appropriate for the current level of work, with further detailed soil geochemistry grids to be determined later. A soil sampling grid may be determined for anomalies in a later phase of testing. The sample taken is representative of the medium being tested. Up to 200g as advised by testing laboratory.
Quality of assay data and laboratory tests	<i>The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.</i>	Soil samples submitted to ALS Laboratories in Johannesburg and Ireland ionic leach testing method (ME-MS23, ph controlled) 61 elements including: Ag, Au, Bi, Cd, Co, Cr, Cs, Cu, Li, Mo, Ni, Pb, Pd, Pt, Sn, Ta, W, Zn and REE Ce, La, Tb, Dy,

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	<i>For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.</i> <i>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.</i>	Pm, Pr, Nd, Sm, Gd, Eu, Ho, Er, Tm, Lu, Yb and Rb. No instrumentation used in the collection of the sample. 2 duplicate samples were provided for analysis within the soil sample stream. Full drilling results from the diamond drilling program, including assays, to be part of a subsequent announcement.
Verification of sampling and assaying	<i>The verification of significant intersections by either independent or alternative company personnel.</i> <i>The use of twinned holes.</i> <i>Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.</i> <i>Discuss any adjustment to assay data.</i>	Not undertaken, to be considered in later stages of soil geochemistry program as appropriate. No twinned holes are yet considered required as part of the diamond program for REE. Data has been received, reviewed and examined in Excel and ARCGIS. No adjustments required
Location of data points	<i>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.</i> <i>Specification of the grid system used.</i> <i>Quality and adequacy of topographic control.</i>	Handheld GPS WGS 84 Zone 36S High resolution LIDAR available throughout the license area.
Data spacing and distribution	<i>Data spacing for reporting of Exploration Results.</i> <i>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.</i> <i>Whether sample compositing has been applied.</i>	With respect to REE soil sampling: Samples are predominantly evenly spaced, with several samples taken up to 300m outside of the anomaly to be tested and a series of evenly spaced samples taken from within the anomaly, to pass out the opposite side. Data not intended for mineral resource estimate No compositing of samples.

Criteria	JORC Code explanation	Commentary
		Full drilling results from the diamond drilling program, to be part of a subsequent announcement.
Orientation of data in relation to geological structure	<i>Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.</i> <i>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.</i>	For soil sampling, a single transect of each anomaly reported has been taken in the initial phase of testing, predominantly East-West or North-South (circular anomalies). Several anomalies were tested by a transect oriented perpendicular to a clear trend. For REE diamond drilling, direction of drilling has been guided by any indication of strike of the anomaly. Geophysics information has also been interpreted with an attempt made to intersect magnetic highs, and high contrast in magnetic imaging. Full drilling results from the diamond drilling program, including orientation of any interpreted mineralogy to be part of a subsequent announcement.
Sample security	<i>The measures taken to ensure sample security.</i>	Samples taken by Chilwa Minerals field personnel and maintained securely until delivery to ALS custody.
Audits or reviews	<i>The results of any audits or reviews of sampling techniques and data.</i>	Not considered necessary at this point

Section 2 Reporting of Exploration Results

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

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	<i>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.</i> <i>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.</i>	Chilwa Minerals Africa Limited (Chilwa) has been granted the exploration licences EL0670/2R1, EL0835-23 and EL0671-22R allowing exploration for HMS deposits, REE (and other minerals) over an area of 865.896km ² .
Exploration done by other parties	<i>Acknowledgment and appraisal of exploration by other parties.</i>	Systematic exploration for REE mineralisation and Carbonatites has not been undertaken within the tenement, however, has been conducted in the

Criteria	JORC Code explanation	Commentary
		immediate regional area (eg Tundulu and Songwe hills). Academic research into the deposition of the HMS deposits around Lake Chilwa have been undertaken since the 1980's. Exploration of the HMS mineralisation in the lake Chilwa area has been undertaken by various government concerns and companies, commencing with Claus Brinkmann between 1991 and 1993 as part of an initiative by the German Government to aid mineral development in Malawi. Millennium Mining Limited (MML) concluded exploration work in the area, focusing on the northern deposits of Halala and Namanja during the early 2000s. In 2014, Tate Minerals (Tate) undertook a desktop review of the work undertaken by Claus Brinkmann and entered into a Joint Venture agreement with Mota-Engil Investments (Malawi) Limited (MEIML) to explore EL 0572/20, an EL that contains the current target area. In August 2015, MEIML commenced a drilling programme on the Mpyupyu, Halala, Mposa, and Bimbi targets. This work was completed in November 2015.
Geology	<i>Deposit type, geological setting and style of mineralisation.</i>	Potential REE mineralisation within and beneath previously identified Heavy Mineral Sands deposits as well as potential separate REE deposits within or resulting from Alkaline magmatic activity (Carbonatites) in the area, a component of the Cretaceous age Chilwa Alkaline province.
Drill hole Information	<i>A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes:</i> <i>easting and northing of the drill hole collar</i>	No drilling assay results reported in this announcement A full table of soil sampling results are provided in Appendices.

Criteria	JORC Code explanation	Commentary
	- elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar - dip and azimuth of the hole - downhole length and interception depth - hole length. If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.	
Data aggregation methods	In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (eg cutting of high grades) and cut-off grades are usually Material and should be stated. Where aggregate intercepts incorporate short lengths of high-grade results and longer lengths of low-grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail. The assumptions used for any reporting of metal equivalent values should be clearly stated.	No drilling assay results reported in this announcement
Relationship between mineralisation widths and intercept lengths	These relationships are particularly important in the reporting of Exploration Results. If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported. If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (eg ‘down hole length, true width not known’).	No intercept or mineralisation widths discussed in these results.
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.	Maps, sections and plan view are provided in the accompanying press release.

Criteria	JORC Code explanation	Commentary
Balanced reporting	<i>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.</i>	All relevant information has been included in this press release and is considered to represent a balanced report.
Other substantive exploration data	<i>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.</i>	See previous Company announcements for further reference.
Further work	<i>The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling).</i> <i>Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.</i>	Planned further work recommendations include, and are not limited to: Further soil geochemistry. Diamond Drilling of geophysics and soil geochemistry anomalies. Field mapping including rock chip sampling.