

The tremendous potential of deep-sea mud as a source of rare-earth elements

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Figure and Table captions:

Fig. S1 (A) Particle size distribution of the over-flow (OF) and under-flow (UF) components recovered from hydrocyclone experiments. (B) Partition curves of the grain size separation experiments with hydrocyclone separator. The vertical axis shows the rate of under-flow component at each grain size fraction.

Fig. S2 Comparison of the actual submarine topographic map and a seabed topographic map reproduced by using ArcGIS with seafloor depth data of each coring point. The actual topographic map was created from the data obtained by the research cruises mentioned in the text, by using the Generic Mapping Tools software (<https://www.soest.hawaii.edu/gmt/>), Version 4.5.8 (ref. S1).

Table S1 Locations of sediment core samples used in the resource amount estimation.

Table S2 Whole rock chemical compositions of all sediment samples used in this study. The data of KR13-02 PC05 and PC06 are from Iijima et al. (ref. S2) and Fujinaga et al. (ref. S3), and are highlighted with yellow color.

Table S3 Average Σ REY and the total resource amount of REY-rich mud distributed from the seafloor to each target depth.

Table S4 Average concentration and resource amount of each interval for each grid (A1–D6). (A) lanthanum, (B) cerium, (C) praseodymium, (D) neodymium, (E) samarium, (F) europium, (G) gadolinium, (H) terbium, (I) dysprosium, (J) holmium, (K) erbium, (L) thulium, (M) ytterbium, (N) lutetium, and (O) yttrium.

Table S5 Chemical compositions of BCP and phillipsite grains in REY-rich mud determined by EPMA and LA-ICP-MS.

Table S6 The results of grain-size separation experiments by using test sieves for (A) “normally” REY-rich mud, (B) “highly” REY-rich mud, and (C) “extremely” REY-rich mud.

Table S7 The results of grain-size separation experiments with a hydrocyclone separator.

Supplementary References:

- S1. Wessel, P. & Smith, W. H. F. New, improved version of Generic Mapping Tools released. *Eos Trans. Amer. Geophys. U.* 79, 579 (1998).
- S2. Iijima, K. *et al.* Discovery of extremely REY-rich mud in the western North Pacific Ocean. *Geochem. J.*, **50**, 557–573 (2016).
- S3. Fujinaga, K. *et al.* Geochemistry of REY-rich mud in the Japanese Exclusive Economic Zone around Minamitorishima Island. *Geochem. J.*, **50**, 575–590 (2016).

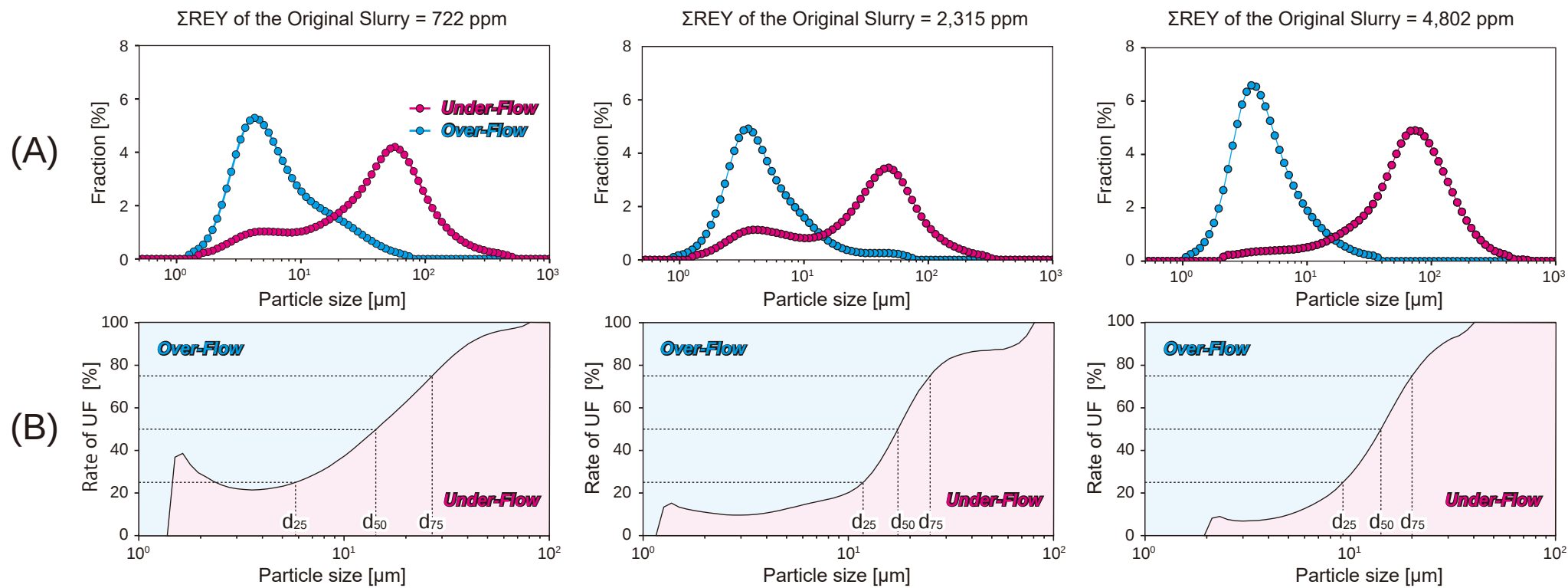


Fig. S1

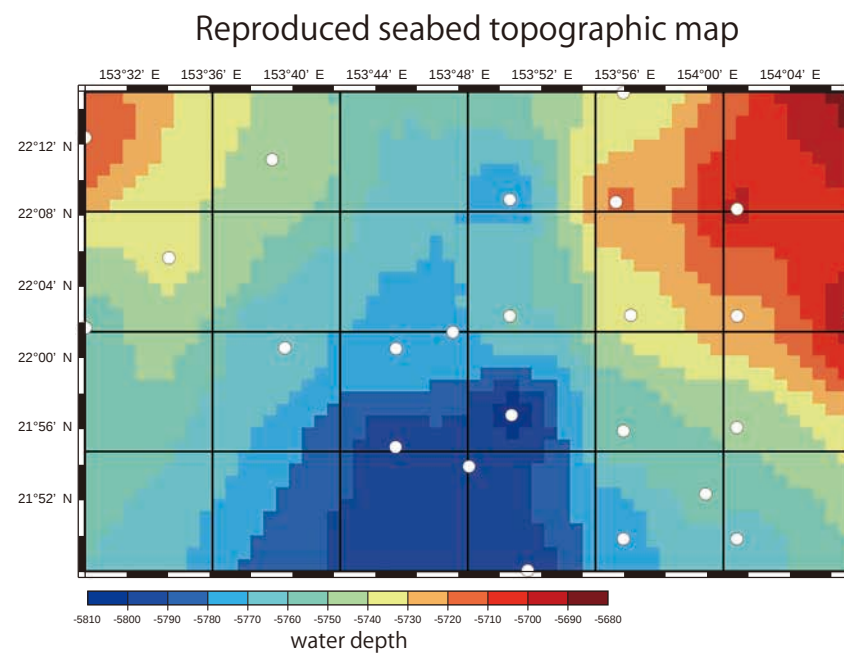
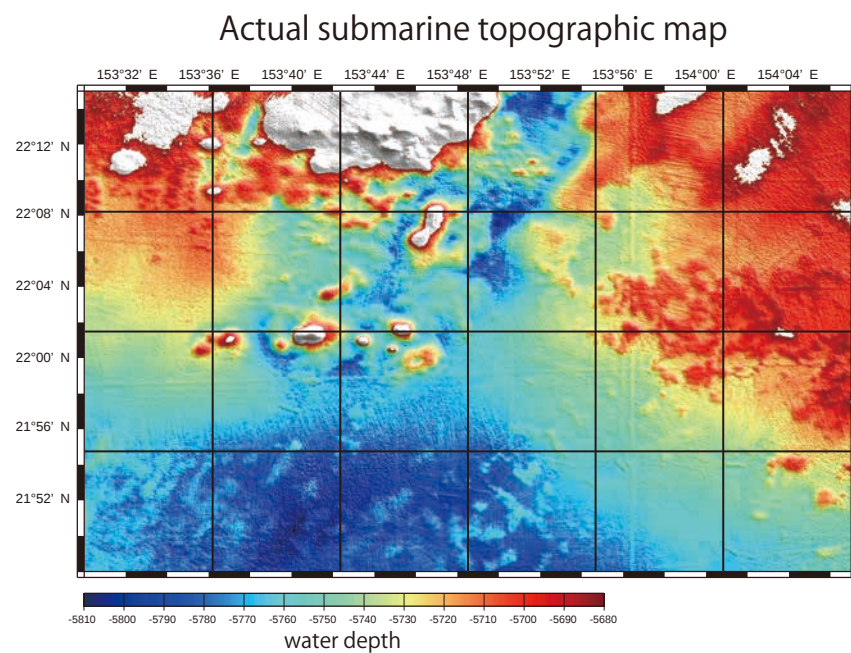


Fig. S2

Table S1

Cruise	Core No.	Latitude	Longitude	Water depth [m]
KR13-02	PC05	21°59.03'N	153°56.35'E	5,735
KR13-02	PC06	21°51.01'N	153°59.98'E	5,755
MR14-E02	PC01	21°59'N	154°07'E	5,694
MR14-E02	PC03	21°57.54'N	153°45'E	5,771
MR14-E02	PC04	22°09'N	153°56'E	5,740
MR14-E02	PC06	22°09'N	154°07'E	5,688
MR14-E02	PC08	21°49'N	153°56'E	5,775
MR14-E02	PC10	21°53.12'N	153°44.97'E	5,797
MR15-E01	PC01	21°59.0027'N	153°50.5056'E	5,759
MR15-E01	PC02	21°54.5504'N	153°50.5904'E	5,805
MR15-E01	PC03	21°47.5884'N	153°51.3625'E	5,795
MR15-E01	PC04	21°52.2491'N	153°48.5244'E	5,794
MR15-E01	PC05	21°53.8391'N	153°56.0060'E	5,756
MR15-E01	PC06	21°48.9981'N	154°01.4930'E	5,764
MR15-E01	PC07	21°53.9987'N	154°01.4834'E	5,748
MR15-E01	PC08	21°59.0065'N	154°01.5074'E	5,722
MR15-E01	PC09	22°03.7921'N	154°01.5021'E	5,699
MR15-E01	PC10	21°57.5755'N	153°39.6260'E	5,766
MR15-E01	PC11	21°58.2732'N	153°47.7461'E	5,770
MR15-E01	PC12	22°04.2191'N	153°50.5017'E	5,777
MR15-E01	PC13	22°04.1094'N	153°55.6448'E	5,719
MR15-02	PC01	22°01.6085'N	153°34.0013'E	5,738
MR15-02	PC09	22°06.0064'N	153°38.9968'E	5,740
MR15-02	PC10	22°07.0000'N	153°29.9631'E	5,710
MR15-02	PC11	21°58.4792'N	153°29.9763'E	5,754

Table S2 (1)

Cname	Corg	Sec.	Int.	Int. [cm]	Depth [cm]	Depth [m]	SRF	Na (wt%)	Al	P	Si	Ca	Ti	V	Cr	Mn (wt%)	Co (ppm)	Ni	Cu	Zn	Rb	Sr	V	Zr	Nb	Mo	Co	Br	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Er	Tm	Yb	Hf	Ta	Pb	Th	U						
KR13-02	PC05	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45					
KR13-02	PC05	1	12	14	13	0.130	312	243	1.86	8.17	0.11	2.70	0.75	0.50	164	83.4	0.64	5.40	77.1	136	219	134	123	168	65.5	144	127	14.3	15.7	11.9	51.5	45.2	101	12.4	48.5	1.06	2.54	10.9	1.63	10.3	2.05	6.03	0.88	5.65	0.88	3.15	1.02	92.4	14.7	2.31	
KR13-02	PC05	1	22	24	23	0.230	358	254	1.94	8.45	0.11	2.84	0.84	0.52	168	76.3	0.79	5.65	94.8	193	260	145	126	180	68.8	138	154	14.5	16.5	12.5	51.4	50.8	105	14.3	58.6	1.29	2.96	11.4	2.03	12.6	2.56	7.46	1.07	6.85	1.08	3.46	1.06	427	13.9	2.52	
KR13-02	PC05	1	32	34	35	0.350	536	330	2.14	10.0	0.15	3.28	1.22	0.72	170	103	1.05	6.40	109	337	375	228	157	78.5	132	157	78.5	132	157	78.5	132	157	78.5	132	157	78.5	132	157	78.5	132	157	78.5	132	157	78.5	132	157	78.5	132	157	
KR13-02	PC05	2	82	84	109.5	1.095	453	449	1.32	7.29	0.24	2.85	0.91	0.37	113	31.5	0.09	4.09	429	127	167	106	336	124	67.6	154	104	14.4	11.5	6.96	4.09	227	61.3	109	17.9	73.6	1.71	4.00	19.1	2.94	18.2	3.71	10.6	1.46	92.1	14.1	3.79	0.83	39.5	11.8	1.88
KR13-02	PC05	3	2	4	130	1.300	608	349	1.40	7.30	0.39	2.68	1.29	0.42	136	30.4	1.32	4.87	168	258	342	145	71.5	197	151	146	110	86.5	51.8	259	85.1	127	24.4	103	240	5.93	27.7	40.9	25.8	53.5	21.3	13.4	2.06	36.1	0.66	44.1	10.0	247			
KR13-02	PC05	3	12	14	140	1.400	142	142	1.23	7.42	0.39	2.72	1.03	0.42	136	30.4	1.32	4.87	168	258	342	145	71.5	197	151	146	110	86.5	51.8	259	85.1	127	24.4	103	240	5.93	27.7	40.9	25.8	53.5	21.3	13.4	2.06	36.1	0.66	44.1	10.0	247			
KR13-02	PC05	3	22	24	150	1.500	558	378	1.59	8.08	0.38	3.28	1.20	0.47	142	32.3	1.62	5.75	196	296	353	176	77.9	207	127	159	117	90.6	56.6	281	70.5	126	22.8	95.5	22.1	3.78	23.8	43.4	14.2	19.8	12.7	19.1	3.88	0.65	46.9	10.4	240				
KR13-02	PC05	3	32	34	160	1.600	590	340	1.44	7.46	0.37	2.78	1.30	0.45	139	33.2	1.39	4.92	186	261	343	139	72.6	200	142	144	111	89.3	55.3	271	80.1	125	23.6	99.3	23.2	5.78	26.2	39.3	24.6	50.1	24.5	20.0	12.5	19.7	3.60	0.64	45.6	10.4	247		
KR13-02	PC05	3	40	42	160	1.600	590	340	1.44	7.46	0.37	2.78	1.30	0.45	139	33.2	1.39	4.92	186	261	343	139	72.6	200	142	144	111	89.3	55.3	271	80.1	125	23.6	99.3	23.2	5.78	26.2	39.3	24.6	50.1	24.5	20.0	12.5	19.7	3.60	0.64	45.6	10.4	247		
KR13-02	PC05	3	52	54	180	1.800	633	349	1.38	7.17	0.39	2.74	1.33	0.45	134	32.7	1.33	4.89	189	266	332	134	70.4	200	158	142	106	86.0	50.0	267	87.9	121	25.9	109	25.3	6.32	29.3	43.8	27.0	55.4	15.9	21.9	13.8	2.12	3.50	0.62	44.6	10.3	244		
KR13-02	PC05	3	62	64	190	1.900	679	352	1.35	7.14	0.42	2.71	1.39	0.44	131	32.2	1.33	4.83	185	254	333	135	67.7	204	173	137	102	83.5	4.75	257	95.0	121	27.8	119	27.9	6.82	31.7	47.2	29.7	61.0	17.5	24.1	15.0	2.29	3.35	0.58	44.3	10.3	247		
KR13-02	PC05	3	72	74	200	2.000	756	411	1.54	7.64	0.51	3.51	1.48	0.45	142	31.6	1.51	5.76	209	366	447	219	228	159	153	111	84.5	60.3	277	92.2	133	27.4	91.3	32.4	81.8	36.4	64.5	34.4	63.4	19.9	27.1	13.8	2.52	4.41	14.2	2.49					
KR13-02	PC05	4	82	84	210	2.100	796	355	1.30	7.25	0.50	2.82	1.58	0.42	131	29.5	1.43	4.76	188	280	342	131	68.6	213	213	129	93.5	48.7	259	111	122	33.4	143	33.6	83.3	38.8	58.2	35.9	73.6	20.8	28.7	17.7	27.4	3.16	0.56	44.1	10.7	249			
KR13-02	PC05	4	2	4	227	2.270	993	334	1.25	6.92	0.63	2.66	1.27	0.40	130	28.9	1.39	4.62	186	349	363	134	65.5	220	273	127	97.0	78.2	44.1	255	140	129	42.9	184	43.4	10.8	49.6	7.48	46.1	9.54	26.7	3.64	22.5	3.40	3.12	0.55	43.3	11.9	249		
KR13-02	PC05	4	12	14	227	2.270	1296	327	1.24	7.05	0.77	2.69	2.06	0.40	130	27.9	1.41	4.66	189	276	328	129	67.0	240	143	133	102	78.3	44.0	257	173	137	52.4	227	53.8	13.2	61.2	91.2	86.7	11.6	33.1	44.9	27.5	42.1	3.18	0.58	45.6	13.6	300		
KR13-02	PC05	4	22	24	247	2.470	1654	394	1.60	8.46	1.17	3.52	2.62	0.51	161	32.3	2.01	6.17	248	336	392	194	80.5	314	280	166	12.9	97.0	54.6	135	220	179	76.7	326	76.9	19.2	87.3	12.9	81.7	16.4	46.5	62.9	38.7	5.86	0.67	54.7	17.1	3.81			
KR13-02	PC05	4	32	34	257	2.570	2331	414	1.28	6.66	1.48	2.41	3.48	0.45	138	29.8	1.67	4.92	226	355	367	141	58.8	317	683	150	120	85.8	38.1	249	337	194	105	45.7	109	27.1	125	18.6	115	23.6	65.9	8.89	54.2	8.27	3.60	0.66	50.3	10.6	439		
KR13-02	PC05	4	42	44	267	2.670	2932	342	1.48	6.94	1.93	2.47	4.35	0.47	140	33.3	1.88	5.13	257	417	397	171	62.9	380	877	157	125	89.1	41.4	256	423	290	133	57.6	137	33.9	156	23.1	144	29.2	81.9	11.1	66.7	10.1	3.79	0.68	51.8	22.8	488		
KR13-02	PC05	4	52	54	277	2.770	3051	321	1.49	6.81	2.58	2.47	5.61	0.45	134	35.9	2.07	4.85	262	406	405	180	64.7	453	1154	159	13.1	86.2	40.0	266	553	280	174	754	180	44.2	201	201	188	38.0	106	14.3	85.6	13.2	3.89	0.67	51.1	27.5	582		
KR13-02	PC05	4	62	64	287	2.870	4402	295	1.39	6.43	2.94	2.42	6.36	0.41	116	34.3	1.63	4.38	220	400	360	165	62.3	481	2338	156	13.1	70.8	4.15	241	642	309	201	80.7	206	50.9	235	34.8	217	42.2	16.5	99.9	15.1	3.78	0.74	41.8	30.8	648			
KR13-02	PC05	4	72	74	297	2.970	6607	269	1.29	5.95	4.66	2.77	86.7	0.37	90.9	29.6	1.4	3.78	172	386	309	183	62.8	657	2070	133	11.7	52.6	36.2	233	1011	491	291	1245	293	73.8	335	40.5	313	63.3	179	24.1	47	21.9	3.04	0.38	34.2	40.4	944		
KR13-02	PC05	4	82	84	307	3.070	6677	256	1.21	5.30	4.82	2.25	10.1	0.33	83.7	28.8	1.12	3.40	142	327	286	162	53.0	673	2057	126	10.2	44.9	3.28	216	981	437	304	1317	313	77.0	354	25.5	328	67.1	188	25.3	153	23.0	2.79	0.21	32.0	42.4	10.3		
KR13-02	PC05	4	92	94	317	3.170	5955	265	1.21	5.50	4.28	2.36	9.09	0.33	86.8	26.7	1.12	3.48	140	284	274	151	56.2	618	1823	143	10.3	50.1	3.19	227	878	394	272	1178	280	69.2	317	47.0	293	59.6	167	22.4	135	20.3	3.41	0.49	32.8	39.1	96.2		
KR13-02	PC05	5	2	4	327	3.270	6106	292	1.29	5.79	4.44	2.51	9.41	0.34	94.5	28.0	1.20	3.73	144	297	278	160	59.8	642	1864	152	10.8	56.3	3.55	243	903	400	281	1213	290	71.5	325	48.1	299	61.0	170	22.8	137	20.6	3.62	0.63	32.2	40.4	10.2		
KR13-02	PC05	5	12	14	337	3.370	5220	366	1.32	5.85	4.25	2.67	9.14	0.27	92.4	27.7	1.29	3.72	145	285	270	160	61.2	614	1853	145	10.3	61.4	3.53	249	778	345	242	1042	246	71.0	318	41.7	255	51.8	144	19.1	17.2	3.46	0.57	37.9	35.8	90.4			
KR13-02	PC05	5	22	24	347	3.470	4269	286	1.35	6.23	3.10	3.00	5.97	0.32	106	36.0	1.64	3.96	172	399	283	169	68.7	488	1290	142	10.2	74.8	4.72	283	662	303	195	83.5	198	49.6	223	32.9	204	41.0	114	15.3	92.0	13.6	3.65	0.57	43.8	33.8	81.4		
KR13-02	PC05	5	32	34	357	3.570	3055	289	1.70	7.67	2.12	3.29	4.82	0.38	135	38.9	1.71	4.79	196	450	311	164	106	396	908	166	12.0	89.4	8.33	359	459	271	138	588	143	34.9	157	231	41.1	28.7	79.9	10.6	63.2	9.54	40.6	0.71	54.3	28.9	62.5		
KR13-02	PC05	5	42	44	456.5	4.565	198	2.54	1.78	7.0																																									

Table S2 (2: continued)

Cruise	Core	Sec.	Int.	Int.	Depth [cm]	Depth [m]	SI	SREY	ppm	Na (wt%)	Mg	P	K	Ca	Co	Ti	V	Cr	Mn (wt%)	Fe	Co (ppm)	Ni	Cu	Zn	Rb	Sr	V	Y	Zr	Mo	Co	Th	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Tm	Yb	Er	HF	Ta	Pb	Th	U		
MR14-02	PC01	1	4	6	1015.1	6.115	204	2.99	266	1.91	9.55	0.09	2.29	0.22	0.82	0.50	152	95.7	0.66	6.15	72.1	144	212	148	141	159	46.0	110	15.6	23.8	14.0	68.4	42.6	107	12.7	48.8	10.8	2.45	10.6	1.57	9.92	1.96	5.79	0.81	5.45	0.84	3.20	1.08	34.4	14.5	27.1	2.58
MR14-02	PC01	2	4	6	1117.1	7.117	215	2.76	2.15	9.14	0.11	2.89	0.73	0.49	145	89.9	0.68	5.88	76.8	150	216	144	213	155	50.4	109	15.4	22.4	13.3	60.7	43.7	104	13.1	50.8	11.3	2.59	11.3	1.67	10.6	2.11	6.29	0.88	5.81	0.91	3.14	1.06	33.4	14.1	24.5	2.65		
MR14-02	PC01	3	4	6	1617.1	16.17	361	2.81	2.17	9.19	0.12	3.61	0.75	0.55	144	92.2	0.61	6.37	81.1	177	245	155	162	158	109	154	109	15.2	21.8	13.8	62.1	43.7	104	13.1	50.8	11.3	2.59	11.3	1.67	10.6	2.11	6.29	0.88	5.81	0.91	3.14	1.06	33.4	14.1	24.5	2.65	
MR14-02	PC01	4	4	6	2119.1	21.19	358	2.79	2.21	9.35	0.13	2.86	0.77	0.57	156	93.1	0.76	6.73	87.1	160	252	155	136	163	60.5	120	16.3	24.2	13.4	52.4	40.3	101	11.5	50.8	11.3	3.09	13.5	1.92	12.6	2.42	7.42	0.99	6.82	1.06	34.2	1.10	36.1	14.4	24.5	2.78		
MR14-02	PC01	5	4	6	2619.1	26.19	349	2.89	2.18	9.24	0.13	2.90	0.77	0.54	148	86.6	0.78	6.16	87.3	168	255	152	131	163	60.4	119	15.8	26.4	13.0	48.1	40.9	105	14.7	57.4	12.8	30.1	13.1	1.86	12.5	2.36	7.04	0.98	6.82	1.05	3.37	1.08	34.7	13.9	27.0	2.78		
MR14-02	PC01	6	4	6	3115.1	31.15	345	2.85	2.15	9.22	0.13	2.80	0.78	0.54	147	86.6	0.78	6.16	87.3	168	255	152	131	163	60.4	119	15.8	26.4	13.0	48.1	40.9	105	14.7	57.4	12.8	30.1	13.1	1.86	12.5	2.36	7.04	0.98	6.82	1.05	3.37	1.08	34.7	13.9	27.0	2.78		
MR14-02	PC01	7	4	6	3615.1	36.15	345	2.85	2.15	9.22	0.13	2.80	0.78	0.54	147	86.6	0.78	6.16	87.3	168	255	152	131	163	60.4	119	15.8	26.4	13.0	48.1	40.9	105	14.7	57.4	12.8	30.1	13.1	1.86	12.5	2.36	7.04	0.98	6.82	1.05	3.37	1.08	34.7	13.9	27.0	2.78		
MR14-02	PC01	8	4	6	4116.1	41.16	345	2.85	2.15	9.22	0.13	2.80	0.78	0.54	147	86.6	0.78	6.16	87.3	168	255	152	131	163	60.4	119	15.8	26.4	13.0	48.1	40.9	105	14.7	57.4	12.8	30.1	13.1	1.86	12.5	2.36	7.04	0.98	6.82	1.05	3.37	1.08	34.7	13.9	27.0	2.78		
MR14-02	PC01	9	4	6	4616.1	46.16	345	2.85	2.15	9.22	0.13	2.80	0.78	0.54	147	86.6	0.78	6.16	87.3	168	255	152	131	163	60.4	119	15.8	26.4	13.0	48.1	40.9	105	14.7	57.4	12.8	30.1	13.1	1.86	12.5	2.36	7.04	0.98	6.82	1.05	3.37	1.08	34.7	13.9	27.0	2.78		
MR14-02	PC01	10	4	6	5116.1	51.16	345	2.85	2.15	9.22	0.13	2.80	0.78	0.54	147	86.6	0.78	6.16	87.3	168	255	152	131	163	60.4	119	15.8	26.4	13.0	48.1	40.9	105	14.7	57.4	12.8	30.1	13.1	1.86	12.5	2.36	7.04	0.98	6.82	1.05	3.37	1.08	34.7	13.9	27.0	2.78		
MR14-02	PC01	11	4	6	5616.1	56.16	345	2.85	2.15	9.22	0.13	2.80	0.78	0.54	147	86.6	0.78	6.16	87.3	168	255	152	131	163	60.4	119	15.8	26.4	13.0	48.1	40.9	105	14.7	57.4	12.8	30.1	13.1	1.86	12.5	2.36	7.04	0.98	6.82	1.05	3.37	1.08	34.7	13.9	27.0	2.78		
MR14-02	PC01	12	4	6	6116.1	61.16	345	2.85	2.15	9.22	0.13	2.80	0.78	0.54	147	86.6	0.78	6.16	87.3	168	255	152	131	163	60.4	119	15.8	26.4	13.0	48.1	40.9	105	14.7	57.4	12.8	30.1	13.1	1.86	12.5	2.36	7.04	0.98	6.82	1.05	3.37	1.08	34.7	13.9	27.0	2.78		
MR14-02	PC01	13	4	6	6616.1	66.16	345	2.85	2.15	9.22	0.13	2.80	0.78	0.54	147	86.6	0.78	6.16	87.3	168	255	152	131	163	60.4	119	15.8	26.4	13.0	48.1	40.9	105	14.7	57.4	12.8	30.1	13.1	1.86	12.5	2.36	7.04	0.98	6.82	1.05	3.37	1.08	34.7	13.9	27.0	2.78		
MR14-02	PC01	14	4	6	7116.1	71.16	345	2.85	2.15	9.22	0.13	2.80	0.78	0.54	147	86.6	0.78	6.16	87.3	168	255	152	131	163	60.4	119	15.8	26.4	13.0	48.1	40.9	105	14.7	57.4	12.8	30.1	13.1	1.86	12.5	2.36	7.04	0.98	6.82	1.05	3.37	1.08	34.7	13.9	27.0	2.78		
MR14-02	PC01	15	4	6	7616.1	76.16	345	2.85	2.15	9.22	0.13	2.80	0.78	0.54	147	86.6	0.78	6.16	87.3	168	255	152	131	163	60.4	119	15.8	26.4	13.0	48.1	40.9	105	14.7	57.4	12.8	30.1	13.1	1.86	12.5	2.36	7.04	0.98	6.82	1.05	3.37	1.08	34.7	13.9	27.0	2.78		
MR14-02	PC01	16	4	6	8116.1	81.16	345	2.85	2.15	9.22	0.13	2.80	0.78	0.54	147	86.6	0.78	6.16	87.3	168	255	152	131	163	60.4	119	15.8	26.4	13.0	48.1	40.9	105	14.7	57.4	12.8	30.1	13.1	1.86	12.5	2.36	7.04	0.98	6.82	1.05	3.37	1.08	34.7	13.9	27.0	2.78		
MR14-02	PC01	17	4	6	8616.1	86.16	345	2.85	2.15	9.22	0.13	2.80	0.78	0.54	147	86.6	0.78	6.16	87.3	168	255	152	131	163	60.4	119	15.8	26.4	13.0	48.1	40.9	105	14.7	57.4	12.8	30.1	13.1	1.86	12.5	2.36	7.04	0.98	6.82	1.05	3.37	1.08	34.7	13.9	27.0	2.78		
MR14-02	PC01	18	4	6	9116.1	91.16	345	2.85	2.15	9.22	0.13	2.80	0.78	0.54	147	86.6	0.78	6.16	87.3	168	255	152	131	163	60.4	119	15.8	26.4	13.0	48.1	40.9	105	14.7	57.4	12.8	30.1	13.1	1.86	12.5	2.36	7.04	0.98	6.82	1.05	3.37	1.08	34.7	13.9	27.0	2.78		
MR14-02	PC01	19	4	6	9616.1	96.16	345	2.85	2.15	9.22	0.13	2.80	0.78	0.54	147	86.6	0.78	6.16	87.3	168	255	152	131	163	60.4	119	15.8	26.4	13.0	48.1	40.9	105	14.7	57.4	12.8	30.1	13.1	1.86	12.5	2.36	7.04	0.98	6.82	1.05	3.37	1.08	34.7	13.9	27.0	2.78		
MR14-02	PC01	20	4	6	10116.1	101.16	345	2.85	2.15	9.22	0.13	2.80	0.78	0.54	147	86.6	0.78	6.16	87.3	168	255	152	131	163	60.4	119	15.8	26.4	13.0	48.1	40.9	105	14.7	57.4	12.8	30.1	13.1	1.86	12.5	2.36	7.04	0.98	6.82	1.05	3.37	1.08	34.7	13.9	27.0	2.78		
MR14-02	PC03	1	4	6	5	0.05	2.91	2.77	2.02	8.73	0.12	2.51	1.21	0.40	134	73.9	0.58	55.7	72.9	147	226	140	160	169	106	170	54.0	101	12.3	6.29	10.2	52.7	40.3	85.5	11.9	46.8	0.99	2.58	1.11	1.69	10.6	2.15	6.22	0.88	5.80	0.90	2.78	0.84	32.4	12.5	20.6	2.28
MR14-02	PC03	2	4	6	301.1	0.301	465	3.03	1.96	8.89	0.18	2.86	0.90	0.42	135	49.9	1.02	6.00	120	479	174	179	106	165	107	131	13.9	17.3	10.5	35.6	65.9	100.0	19.3	79.2	18.2	4.53	20.5	3.14	19.7	4.10	11.9	1.67	10.7	1.67	3.51	0.89	41.5	11.9	2.30	2.80		
MR14-02	PC03	3	4	6	132	1.320	561	4.06	1.87	9.23	0.28	3.07	1.04	0.46	146	47.8	1.16	6.01	151	275	352	160	186	312	197	201	142	14.5	12.9	8.75	62.4	115	25.5	85.0	10.2	23.6	101	23.5	5.22	15.1	21.2	4.40	2.99	0.87	12.3	1.41	20.9	1.73	2.67	3.11	2.67	
MR14-02	PC03	4	4	6	231.5	2.315	537	4.73	1.40	8.84	0.14	3.53	0.67	0.31	182	36.9	0.83	5.87	183	96.4	180	294	120	69.7	120	66.3	13.2	12.7	49.2	3.72	17.9	44.8	108	14.5	58.3	13.8	2.81	14.5	2.23	1.65	5.65	7.48	10.3	6.47	0.98	4.17	0.96	34.8	14.2	14.3	2.80	
MR14-02	PC03	5	4	6	281.5	2.815	629	4.10	1.69	8.82	0.32	3.14	1.31	0.41	138	36.5	1.48	5.74	185	252	340	151	82.3	201	149	138	11.9	86.2	6.09	28.4	85.3	13.2	25.8	10.7	25.3	6.25	28.3	4.26	26.4	5.42	5.55	2.16	13.7	2.13	3.81	0.88	44.9	11.1	2.59	2.80		
MR14-02	PC03	6	4	6	331.5	3.315	629	4.10	1.69	8.82	0.32	3.14	1.31	0.41	138	36.5	1.48	5.74	185	252	340	151	82.3	201	149	138	11.9	86.2	6.09	28.4	85.3	13.2	25.8	10.7	25.3	6.25	28.3	4.26	26.4	5.42	5.55	2.16	13.7	2.13	3.81	0.88	44.9	11.1	2.59	2.80		
MR14-02	PC03	7	4	6	381.5	3.815	2471	3.73	1.63	7.72	1.38	2.60	4.39	0.41	137	34.3	1.78	5.66	217	434	384	169	65.7	360	127	135	11.9	77.6	4.68	25.7	36.																					

Table S2 (3: continued)

[illegible]

Table S2 (4: continued)

[illegible]

Table S2 (continued)

Cname	Core	Sec.	Int. [cm]	Int. [cm]	Depth [cm]	T _{eff} [K]	REY [ppm]	M (w%)	M ₁	P	K	Ca	V	Cr	Mn (w%)	Co	Cu	Zn	Rb	Sr	V	Zr	Nb	Mo	Cs	Ba	Ta	La	Ce	Pr	Nd	Sm	Eu	Gd	Tm	Yb	Lu	HF	Th	U										
MR15-E01	PC10	01	24	26	25	0.25	485	1.56	1.65	8.19	0.27	3.02	0.86	0.56	5.67	6.31	289	150	181	179	121	121	147	11.5	40.9	6.69	278	48	9.36	20.1	83.9	19.5	4.85	22.1	3.34	2.13	4.46	12.8	180	116	1.74	3.44	0.68	3.77	Th	U				
MR15-E01	PC10	02	24	26	64.4	0.644	503	3.87	1.53	8.05	0.37	1.08	0.46	148	40.1	1.25	5.92	174	214	378	166	74.5	197	124	153	11.5	87.7	5.27	263	68.6	102	20.3	85.0	19.7	4.88	22.2	3.32	2.11	4.36	12.6	1.75	1.14	1.72	3.64	0.63	4.12	9.08	2.12		
MR15-E01	PC10	02	74	76	114.4	1.144	850	3.86	1.44	7.96	0.59	3.16	1.58	0.44	145	37.0	1.25	5.77	175	310	384	130	73.3	224	134	10.3	74.8	4.86	270	117	110	37.6	199	37.7	9.30	42.2	6.29	396	812	23.1	3.15	19.9	30.0	3.26	0.52	4.13	11.3	2.58		
MR15-E01	PC10	03	24	26	165.6	1.656	3511	3.01	1.46	6.60	2.32	2.55	4.62	0.40	128	35.6	1.74	5.13	252	570	416	160	61.1	487	1003	16.3	11.8	74.6	4.33	271	531	289	152	651	156	38.1	176	26.2	166	31.6	95.8	12.8	79.5	11.8	0.60	0.21	24.0	5.49		
MR15-E01	PC10	03	74	76	215.6	2.156	807	2.82	1.79	8.08	0.54	3.26	1.22	0.34	129	44.5	1.48	5.17	182	533	388	166	112	175	198	11.6	81.9	9.83	369	106	145	35.6	148	36.0	8.68	38.4	5.74	35.6	7.05	20.0	2.70	1.67	2.44	3.63	0.70	5.40	13.8	2.57		
MR15-E01	PC10	04	24	26	264.4	2.644	679	2.89	1.84	8.07	0.44	3.25	1.04	0.34	133	46.0	1.62	5.31	201	627	298	170	114	166	152	137	11.4	81.1	9.81	380	89.0	144	29.9	123	30.1	7.21	31.7	4.71	28.8	56.2	15.8	21.4	13.2	1.93	3.68	0.71	5.34	13.2	2.48	
MR15-E01	PC10	05	24	26	315.8	3.158	612	2.84	1.81	8.11	0.39	3.29	0.94	0.36	136	44.1	1.85	5.28	230	603	312	181	115	164	143	136	11.4	80.9	9.79	382	86.6	145	27.5	651	28.1	6.84	29.9	4.92	43.1	26.2	16.6	31.6	95.8	12.8	79.5	11.8	0.60	0.21	24.0	5.49
MR15-E01	PC10	05	74	76	365.8	3.658	645	3.04	1.86	7.95	0.40	3.17	0.98	0.33	134	47.0	1.58	5.28	207	471	264	164	114	161	143	133	11.2	78.3	9.90	375	85.2	140	28.3	114	28.5	68.1	30.0	4.44	27.3	53.7	15.0	20.2	12.4	1.80	3.61	0.68	5.40	13.2	2.36	
MR15-E01	PC10	06	24	26	409.1	4.091	665	2.87	1.85	7.99	0.41	3.19	1.00	0.33	138	46.5	1.74	5.22	226	531	273	169	116	164	145	135	11.0	81.0	9.96	387	84.4	144	27.9	111	28.1	6.70	29.6	4.35	27.1	53.0	15.0	20.3	12.6	1.86	3.56	0.67	5.52	12.4	2.35	
MR15-E01	PC10	06	74	76	459.5	4.595	612	2.84	1.81	8.12	0.39	3.29	0.94	0.36	136	44.1	1.85	5.28	230	603	312	181	115	164	143	136	11.4	80.9	9.79	382	86.6	145	27.5	651	28.1	6.84	29.9	4.92	43.1	26.2	16.6	31.6	95.8	12.8	79.5	11.8	0.60	0.21	24.0	5.49
MR15-E01	PC10	7	24	26	509	5.09	597	2.78	1.79	7.93	0.32	3.08	0.82	0.32	133	42.3	1.82	5.19	211	558	285	170	109	109	125	137	11.1	75.6	9.23	380	75.6	150	25.3	102	25.3	6.05	26.7	3.96	24.2	47.4	13.2	1.80	3.11	1.60	3.67	0.68	5.50	11.8	2.02	
MR15-E01	PC10	7	74	76	559	5.59	597	2.78	1.79	7.93	0.32	3.08	0.82	0.32	133	42.3	1.82	5.19	211	558	285	170	109	109	125	137	11.1	75.6	9.23	380	75.6	150	25.3	102	25.3	6.05	26.7	3.96	24.2	47.4	13.2	1.80	3.11	1.60	3.67	0.68	5.50	11.8	2.02	
MR15-E01	PC10	8	24	26	599	5.99	673	2.81	1.83	8.08	0.39	3.21	0.97	0.33	135	42.4	1.92	5.27	249	588	303	174	109	173	147	139	11.2	74.8	9.12	402	85.4	163	28.3	114	28.3	6.84	29.9	4.47	27.4	54.2	15.2	2.06	12.7	1.88	3.71	0.71	5.85	12.7	2.08	
MR15-E01	PC10	8	74	76	699.1	6.991	652	2.84	1.83	8.12	0.39	3.29	0.94	0.36	136	44.1	1.85	5.28	230	603	312	181	115	164	143	136	11.4	80.9	9.79	382	86.6	145	27.5	651	28.1	6.84	29.9	4.92	43.1	26.2	16.6	31.6	95.8	12.8	79.5	11.8	0.60	0.21	24.0	5.49
MR15-E01	PC10	8	74	76	699.1	6.991	747	2.72	1.91	8.16	0.48	3.29	1.12	0.40	134	56.9	1.72	5.51	208	581	308	182	114	175	173	138	12.1	62.4	9.28	400	88.3	152	32.6	135	32.5	7.99	34.8	5.21	32.0	63.4	17.6	2.39	1.48	2.16	3.69	0.78	5.81	12.6	2.23	
MR15-E01	PC10	9	24	26	710.6	7.106	776	2.62	1.87	8.19	0.48	3.34	1.13	0.37	138	49.3	1.74	5.47	181	540	287	175	119	179	185	135	11.7	58.7	9.78	405	103	150	33.7	141	33.9	8.29	36.4	5.41	33.5	66.7	18.8	25.4	15.7	2.31	3.51	0.77	6.31	13.5	2.22	
MR15-E01	PC10	9	74	76	760.6	7.606	1026	2.28	1.68	7.05	0.61	2.92	1.33	0.33	121	50.6	1.38	4.83	148	450	248	159	105	172	255	120	10.7	45.7	8.61	344	138	151	47.2	198	48.4	12.0	53.9	7.95	48.8	9.64	27.0	3.64	22.2	3.16	3.22	0.74	5.26	15.7	2.45	
MR15-E01	PC10	10	24	26	810	8.1	936	2.36	1.76	7.49	0.55	3.09	1.22	0.35	130	49.7	1.46	4.95	168	512	271	167	110	169	222	125	10.4	40.9	9.13	363	124	155	42.3	174	43.3	10.7	47.3	7.00	43.1	85.3	25.8	3.21	1.96	2.82	0.71	5.75	15.2	2.40		
MR15-E01	PC10	10	74	76	860	8.6	1062	2.52	1.71	7.41	0.65	3.05	1.23	0.34	129	40.7	1.82	4.86	227	632	328	177	97.9	199	266	127	10.8	58.4	9.75	384	141	166	48.3	195	49.1	12.2	54.0	7.97	48.8	9.66	26.9	3.57	21.8	3.12	3.35	0.66	6.35	14.5	2.34	
MR15-E01	PC10	11	24	26	910.7	9.107	2598	2.79	1.86	7.26	1.65	3.71	2.25	0.42	137	49.0	1.58	5.59	201	633	299	201	118	337	62	146	11.9	51.3	9.27	414	384	200	118	47.2	123	30.5	131	19.8	121	23.6	65.2	8.56	51.7	7.68	3.83	0.74	6.89	26.4	3.53	
MR15-E01	PC10	11	74	76	960.7	9.607	4242	2.53	1.70	7.61	2.89	3.14	5.41	0.42	122	46.9	2.05	5.12	226	754	355	205	146	345	445	12.2	47.4	7.22	382	460	340	222	764	202	50.4	219	31.0	203	40.4	112	14.9	90.6	13.5	3.82	0.75	6.69	33.2	3.51		
MR15-E01	PC10	12	24	26	1009.2	10.092	5416	2.10	1.62	6.00	3.88	2.64	7.07	0.35	103	47.0	1.74	4.23	162	606	298	191	82.5	541	155.4	29.9	10.8	32.4	63.0	354	354	797	381	200	1157	261	64.7	28.2	41.0	138	18.0	16.0	0.94	3.53	60.9	37.1	6.87			
MR15-E01	PC11	01	24	26	25	0.25	401	1.56	1.75	7.99	0.21	2.80	0.80	0.46	154	47.8	0.84	6.17	116	365	388	163	104	172	92.7	143	13.9	18.3	9.98	376	55.5	86.6	17.2	64.4	16.4	40.4	17.8	27.4	17.4	35.6	10.4	1.46	8.50	1.46	3.59	0.87	4.25	9.19	2.21	
MR15-E01	PC11	02	24	26	94.8	0.948	492	3.48	1.55	7.86	0.30	2.91	0.86	0.47	148	46.8	0.99	5.86	150	380	170	150	78.3	182	122	142	11.3	60.4	6.00	255	68.5	90.9	21.1	81.4	28.5	5.14	23.1	3.52	22.3	4.57	13.2	1.84	11.8	1.84	3.50	0.66	38.1	9.32	2.24	
MR15-E01	PC11	02	74	76	144.8	1.448	504	3.54	1.48	7.72	0.31	2.86	0.93	0.43	145	43.0	1.19	5.62	173	364	144	175	75.8	184	122	144	11.2	77.1	5.59	259	69.2	102	21.0	82.5	20.3	4.99	22.9	3.46	22.0	4.49	12.9	1.82	11.6	1.78	3.61	0.63	42.0	9.36	2.07	
MR15-E01	PC11	03	24	26	195.5	1.953	499	3.74	1.41	7.85	0.32	3.09	0.99	0.43	136	36.6	1.10	5.46	153	198	355	127	75.2	186	122	148	11.2	76.9	4.91	255	68.9	97.8	21.1	83.3	20.2	4.97	22.9	3.46	22.0	4.49	12.9	1.81	11.5	1.76	3.66	0.69	40.1	9.30	2.07	
MR15-E01	PC11	03	74	76	245.3	2.453	680	3.04	1.39	7.78	0.45	3.11	1.28	0.44	136	36.6	1.10	5.46	153	198	355	127	75.2	186	122	148	11.2	76.9	4.91	255	68.9	97.8	21.1	83.3	20.2	4.97	22.9	3.46	22.0	4.49	12.9	1.81	11.5	1.76	3.66	0.69	40.1	9.30	2.07	
MR15-E01	PC11	04	24	26	294.7	2.947	1532	3.49	1.39	7.23	1.05	2.71	2.29	0.49	156	35.5	1.34	6.05	187	291	372	140	67.3	275	443	11.2	76.2	4.52	262	238	140	68.4	290	69.3	17.2	78.1	11.7													

Table S2 (6 continued)

Cname	Core	Sec.	Int. [cm]	Int. [cm]	Depth [cm]	Depth [cm]	MREY [ppm]	Mn (wt%)	Mg	P	K	Ca	Ca	Ti	V	Cr	Mn (wt%)	Co	Co (ppm)	Ni	Cu	Zn	Rb	Sr	V	Zr	Nb	Mo	Cs	Ba	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	HF	Th	U			
MREY-02	PC01	1	14	6	15	0.15	2.77	2.69	2.00	8.57	0.11	2.81	0.85	0.47	173	84.3	0.57	6.07	93.7	130	226	138	151	172	4.56	121	14.0	9.0	10.9	39.9	92.2	11.3	44.7	9.87	2.22	9.80	1.48	9.14	5.34	0.77	3.14	0.95	3.13	13.2	2.29					
MREY-02	PC01	1	14	16	15	0.15	2.77	2.69	2.00	8.57 <td>0.11</td> <td>2.81</td> <td>0.85<td>0.47</td><td>173</td><td>84.3</td><td>0.57</td><td>6.07</td><td>93.7</td><td>130</td><td>226</td><td>138</td><td>151</td><td>172</td><td>4.56</td><td>121</td><td>14.0</td><td>9.0</td><td>11.4</td><td>11.7</td><td>573</td><td>40.8</td><td>88.4</td><td>11.6</td><td>40.3</td><td>10.1</td><td>2.34</td><td>9.89</td><td>1.50</td><td>9.37</td><td>1.86</td><td>5.47</td><td>0.78</td><td>5.10</td><td>0.80</td><td>3.09</td><td>0.95</td><td>3.55</td><td>13.2</td><td>2.30</td></td>	0.11	2.81	0.85 <td>0.47</td> <td>173</td> <td>84.3</td> <td>0.57</td> <td>6.07</td> <td>93.7</td> <td>130</td> <td>226</td> <td>138</td> <td>151</td> <td>172</td> <td>4.56</td> <td>121</td> <td>14.0</td> <td>9.0</td> <td>11.4</td> <td>11.7</td> <td>573</td> <td>40.8</td> <td>88.4</td> <td>11.6</td> <td>40.3</td> <td>10.1</td> <td>2.34</td> <td>9.89</td> <td>1.50</td> <td>9.37</td> <td>1.86</td> <td>5.47</td> <td>0.78</td> <td>5.10</td> <td>0.80</td> <td>3.09</td> <td>0.95</td> <td>3.55</td> <td>13.2</td> <td>2.30</td>	0.47	173	84.3	0.57	6.07	93.7	130	226	138	151	172	4.56	121	14.0	9.0	11.4	11.7	573	40.8	88.4	11.6	40.3	10.1	2.34	9.89	1.50	9.37	1.86	5.47	0.78	5.10	0.80	3.09	0.95	3.55	13.2	2.30
MREY-02	PC01	1	24	26	25	0.25	2.80	2.53	1.91	8.36	0.11	2.57	0.74	0.48	156	80.8	0.54	5.79	122	207	127	122	108	47.4	124	13.9	12.7	11.6	570	40.7	89.7	11.4	44.2	9.83	2.24	9.66	1.48	9.10	1.86	5.38	0.78	5.14	0.79	3.23	0.99	3.55	13.3	2.40		
MREY-02	PC01	2	4	6	41.9	0.419	2.88	2.73	2.00	8.62	0.10	2.94	0.70	0.51	176	84.6	0.58	6.24	93.8	126	207	132	130	204	48.8	15.8	12.5	60.8	42.1	94.7	12.0	41.5	10.4	24.0	10.2	11.5	9.52	1.91	5.64	0.80	5.33	0.81	3.31	1.04	3.91	14.2	2.54			
MREY-02	PC01	2	24	26	51.9	0.519	2.98	2.56	1.91	8.35	0.11	2.66	0.64	0.49	157	81.1	0.56	5.88	78.3	123	209	128	127	165	51.4	125	14.6	11.1	12.2	552	43.1	92.2	11.7	43.5	10.5	2.43	10.6	1.60	9.91	2.01	5.86	0.84	5.61	0.85	3.32	1.03	3.83	13.7	2.49	
MREY-02	PC01	2	34	36	62.4	0.624	3.02	2.61	1.90	8.28	0.12	2.61	0.62	0.49	157	81.1	0.56	5.88	78.3	123	209	128	127	165	51.4	125	14.6	11.1	12.2	552	43.1	92.2	11.7	43.5	10.5	2.43	10.6	1.60	9.91	2.01	5.86	0.84	5.61	0.85	3.32	1.03	3.83	13.7	2.49	
MREY-02	PC01	2	44	46	71.9	0.719	3.14	2.60	1.91	8.28	0.13	2.63	0.73	0.50	173	80.3	0.62	6.12	97.8	128	221	131	125	202	60.7	15.1	14.6	21.3	12.1	55.2	45.4	96.4	8.97	13.3	46.8	11.8	2.77	12.0	18.2	11.5	2.31	6.80	0.97	6.31	0.97	3.12	0.99	3.93	14.3	2.42
MREY-02	PC01	2	54	56	81.9	0.819	3.21	2.51	1.93	8.28	0.13	2.86	0.71	0.51	172	79.4	0.63	6.10	103	138	222	134	127	202	59.3	15.8	15.1	19.4	12.1	546	45.5	91.5	13.2	46.5	11.7	2.75	11.8	18.2	11.4	2.26	6.59	0.94	6.11	0.94	3.23	1.02	3.81	13.8	2.45	
MREY-02	PC01	2	64	66	91.9	0.919	3.28	2.51	1.93	8.28	0.13	2.86	0.71	0.51	172	79.4	0.63	6.10	103	138	222	134	127	202	59.3	15.8	15.1	19.4	12.1	546	45.5	91.5	13.2	46.5	11.7	2.75	11.8	18.2	11.4	2.26	6.59	0.94	6.11	0.94	3.23	1.02	3.81	13.8	2.45	
MREY-02	PC01	2	74	76	101.9	1.019	3.78	2.65	1.94	8.48	0.17	2.68	0.78	0.53	167	78.7	0.70	6.29	103	155	262	141	123	183	77.9	14.1	15.8	22.6	11.9	458	54.3	98.1	15.6	16.6	14.2	34.2	15.0	22.7	14.4	2.91	8.41	1.20	7.85	1.21	3.55	1.08	4.21	13.8	2.63	
MREY-02	PC01	2	84	86	111.9	1.119	3.80	2.80	1.95	8.28	0.19	2.84	0.86	0.53	181	79.1	0.74	6.41	121	156	259	139	122	221	81.7	17.2	15.7	25.5	11.9	455	55.3	95.1	16.2	17.3	14.8	3.55	15.5	2.40	15.0	3.03	8.93	1.25	8.20	1.27	3.46	1.03	4.11	13.5	2.56	
MREY-02	PC01	3	4	6	112.4	1.124	4.17	2.75	1.91	8.32	0.20	2.81	0.88	0.52	181	61.5	0.82	6.45	136	173	281	142	119	226	96.1	18.2	15.5	30.0	11.9	418	60.7	94.9	17.6	63.1	16.2	3.94	17.8	21.7	17.2	35.1	10.4	4.49	9.58	1.47	3.66	1.01	4.30	13.5	2.60	
MREY-02	PC01	3	14	16	142.4	1.424	4.54	2.79	1.89	8.19	0.22	2.69	0.90	0.50	178	57.1	0.90	6.44	149	228	313	149	112	226	111	184	15.3	33.7	11.4	38.2	66.1	93.3	19.2	69.9	18.0	4.46	19.9	3.02	10.6	4.09	11.8	1.66	10.8	1.67	3.71	0.95	4.36	12.6	2.53	
MREY-02	PC01	3	24	26	152.4	1.524	4.75	2.94	1.96	8.57	0.21	2.60	0.85	0.52	171	61.2	0.86	6.56	132	233	340	155	113	226	108	196	112	35.9	11.9	39.2	68.6	98.6	19.7	79.4	18.5	4.58	20.3	3.12	2.00	4.09	12.0	1.69	4.00	1.01	4.52	12.8	2.64			
MREY-02	PC01	3	34	36	162.4	1.624	4.89	3.83	1.90	8.34	0.21	2.77	0.85	0.52	180	54.8	0.94	6.58	142	237	313	155	111	226	108	196	112	35.9	11.9	39.2	68.6	98.6	19.7	79.4	18.5	4.58	20.3	3.12	2.00	4.09	12.0	1.69	4.00	1.01	4.52	12.8	2.64			
MREY-02	PC01	3	44	46	172.4	1.724	4.51	2.74	1.85	8.18	0.21	2.76	0.85	0.51	176	55.0	0.85	6.50	145	232	304	156	109	223	107	197	16.1	36.4	11.3	37.7	65.6	93.6	19.4	79.0	18.2	4.51	20.2	3.06	1.95	3.98	11.6	1.63	10.6	1.63	3.93	0.99	4.28	12.2	2.55	
MREY-02	PC01	3	54	56	182.4	1.824	5.04	3.16	1.95	9.03	0.24	3.05	0.95	0.54	183	45.6	0.89	6.95	153	259	324	162	112	238	124	208	16.7	39.4	11.3	37.4	72.5	97.1	21.8	79.4	20.7	5.12	23.2	3.52	2.26	4.63	13.4	1.91	4.21	1.02	4.41	12.7	2.67			
MREY-02	PC01	3	64	66	192.4	1.924	5.11	3.19	1.81	8.59	0.26	2.96	0.95	0.51	170	42.9	0.89	6.55	156	280	330	157	100	226	131	200	14.9	41.9	9.60	33.2	73.0	91.9	21.8	80.2	21.2	5.22	23.9	3.62	2.34	4.79	14.0	1.98	1.29	1.99	3.99	0.88	4.18	11.4	2.48	
MREY-02	PC01	3	74	76	202.4	2.024	5.04	3.20	1.77	8.53	0.24	2.75	0.89	0.50	155	47.0	0.88	6.25	137	319	349	161	95.0	182	126	159	13.9	40.6	8.92	32.4	70.7	93.8	20.6	85.2	20.1	5.03	22.9	3.48	2.23	4.62	13.4	1.90	1.23	1.89	3.95	0.85	4.10	11.0	2.43	
MREY-02	PC01	3	84	86	212.4	2.124	4.66	3.25	1.71	8.39	0.23	2.97	0.89	0.50	168	44.2	0.89	6.40	158	294	322	160	92.7	208	117	198	13.1	41.8	8.55	31.1	66.1	90.6	20.4	71.5	18.8	4.69	21.4	3.26	2.09	4.23	12.6	1.77	1.15	1.77	3.85	0.79	3.96	10.4	2.38	
MREY-02	PC01	4	4	6	222.4	2.224	4.78	3.50	1.69	8.64	0.25	3.17	0.91	0.50	170	42.8	0.97	6.45	170	326	335	161	91.7	211	123	197	12.7	44.8	8.02	30.4	68.0	92.4	19.7	72.2	19.2	4.81	21.9	3.34	21.4	44.1	12.9	1.83	1.17	1.82	3.91	0.75	4.01	9.96	2.38	
MREY-02	PC01	4	14	16	222.6	2.226	4.80	3.62	1.52	8.60	0.26	3.01	0.93	0.46	156	36.4	0.98	5.89	176	312	320	146	81.0	206	126	178	11.5	55.0	6.21	26.9	68.5	89.7	19.6	71.9	19.0	4.78	22.0	3.35	21.5	44.9	13.2	1.87	1.20	1.86	3.54	0.67	3.87	8.76	2.24	
MREY-02	PC01	4	24	26	222.6	2.226	4.80	3.62	1.52	8.60	0.26	3.01	0.93	0.46	156	36.4	0.98	5.89	176	312	320	146	81.0	206	126	178	11.5	55.0	6.21	26.9	68.5	89.7	19.6	71.9	19.0	4.78	22.0	3.35	21.5	44.9	13.2	1.87	1.20	1.86	3.54	0.67	3.87	8.76	2.24	
MREY-02	PC01	4	34	36	222.6	2.226	5.03	3.62	1.55	7.97	0.29	2.92	1.00	0.48	156	37.0	1.03	5.91	188	323	353	148	79.7	212	128	178	11.6	62.2	6.21	25.8	72.2	92.6	21.4	78.3	20.7	5.16	23.7	3.60	22.7	4.68	13.5	1.91	1.22	1.89	3.57	0.68	3.98	9.48	2.37	
MREY-02	PC01	4	44	46	222.6	2.226	5.40	3.68	1.60	8.24	0.32	3.07	1.02	0.49	163	39.6	1.16	6.05	208	326	363	154	85.7	223	137	187	12.2	71.1	6.69	27.1	77.3	10.4	22.8	83.3	22.1	5.46	24.8	3.78	23.8	4.68	14.1	1.96	1.27	1.97	3.71	0.68	4.18	10.2	2.40	
MREY-02	PC01	4	54	56	222.6	2.226	5.80	3.68	1.60	8.24	0.32	3.07	1.02	0.49	163	39.6	1.16	6.05	208	326	363	154	85.7	223	137	187	12.2	71.1	6.69	27.1	77.3	10.4	22.8	83.3	22.1	5.46	24.8	3.78	23.8	4.68	14.1	1.96	1.27	1.97	3.71	0.68	4.18	10.2	2.40	
MREY-02	PC01	4	64	66	222.6	2.226	5.80	3.68	1.60	8.24	0.32	3.07	1.02	0.49	163	39.6	1.16	6.05	208	326	363	154	85.7	223	137	187	12.2	71.1	6.69	27.1	77.3	10.4	22.8	83.3	22.1	5.46	24.8	3.78	23.8	4.68	14.1	1.96	1.27	1.97	3.71	0.68	4.18	10.2	2.40	
MREY-02	PC01	4	74	76	222.6	2.226	5.80	3.68	1.60	8.24	0.32	3.07	1.02	0.49	163	39.6	1.16	6.05	208	326	363	154	85.7	223	137	187	12.																							

Table S3

Area	Σ REY [ppm]										Resource amount of REY [REO-t/km ²]									
	0-1 m	0-2 m	0-3 m	0-4 m	0-5 m	0-6 m	0-7 m	0-8 m	0-9 m	0-10 m	0-1 m	0-2 m	0-3 m	0-4 m	0-5 m	0-6 m	0-7 m	0-8 m	0-9 m	0-10 m
A1	443	547	758	874	1,078	1,342	1,444	1,445	1,410	1,390	288	711	1,477	2,271	3,500	5,226	6,564	7,505	8,241	9,027
A2	316	338	364	394	417	446	534	593	612	634	205	440	711	1,024	1,357	1,743	2,431	3,084	3,583	4,120
A3	393	501	613	754	832	842	860	867	860	878	255	651	1,194	1,959	2,701	3,282	3,909	4,503	5,027	5,703
A4	339	383	492	572	592	637	678	701	705	702	221	498	959	1,487	1,922	2,482	3,082	3,643	4,120	4,559
A5	313	330	394	455	467	479	503	526	533	538	204	429	768	1,181	1,519	1,866	2,286	2,735	3,116	3,493
A6	287	297	318	339	360	380	400	425	440	457	186	386	620	881	1,169	1,481	1,822	2,207	2,572	2,972
B1	332	427	477	539	1,166	1,916	2,027	1,912	1,798	1,708	216	555	930	1,400	3,788	7,462	9,210	9,929	10,507	11,092
B2	447	769	752	799	965	1,103	1,124	1,109	1,103	1,204	291	1,000	1,467	2,076	3,133	4,297	5,109	5,761	6,447	7,815
B3	450	579	722	1,034	1,221	1,185	1,142	1,108	1,076	1,089	292	752	1,406	2,685	3,962	4,616	5,189	5,755	6,284	7,067
B4	453	604	976	1,100	1,061	1,038	1,028	1,001	967	942	295	785	1,903	2,858	3,444	4,046	4,670	5,201	5,650	6,114
B5	384	466	857	1,162	1,088	1,025	1,039	1,059	1,032	1,008	250	606	1,669	3,018	3,530	3,991	4,722	5,500	6,033	6,546
B6	295	315	372	437	456	467	508	569	577	583	192	410	726	1,135	1,481	1,821	2,309	2,956	3,376	3,788
C1	479	710	748	780	968	1,226	1,292	1,307	1,306	1,343	311	923	1,458	2,027	3,146	4,777	5,873	6,790	7,631	8,725
C2	520	1,056	1,004	969	993	996	978	973	998	1,204	338	1,372	1,957	2,517	3,224	3,883	4,444	5,054	5,834	7,819
C3	439	557	640	878	1,120	1,092	1,050	1,024	995	1,000	285	723	1,247	2,280	3,635	4,254	4,771	5,318	5,813	6,491
C4	552	840	991	1,010	951	905	880	850	819	797	359	1,091	1,930	2,624	3,089	3,526	4,001	4,416	4,788	5,178
C5	421	667	1,361	1,453	1,356	1,285	1,332	1,328	1,279	1,240	274	866	2,651	3,773	4,402	5,008	6,054	6,899	7,472	8,052
C6	324	387	521	583	646	666	769	861	874	888	211	504	1,016	1,517	2,100	2,598	3,498	4,475	5,106	5,770
D1	457	709	749	786	955	1,127	1,154	1,153	1,148	1,204	297	922	1,460	2,043	3,102	4,392	5,248	5,990	6,712	7,815
D2	450	705	773	870	934	904	876	864	861	934	292	916	1,506	2,259	3,032	3,523	3,981	4,489	5,029	6,063
D3	384	503	644	753	795	783	764	755	743	756	250	654	1,256	1,958	2,582	3,050	3,472	3,923	4,344	4,908
D4	378	525	750	849	856	872	913	904	882	866	245	682	1,462	2,207	2,781	3,398	4,147	4,693	5,153	5,623
D5	396	532	891	925	967	1,049	1,271	1,284	1,254	1,226	257	692	1,735	2,403	3,141	4,087	5,772	6,665	7,322	7,960
D6	352	436	605	671	766	823	926	951	938	931	229	567	1,179	1,744	2,489	3,209	4,211	4,941	5,486	6,046

Table S4 (A) La

Area	La [ppm]											Resource amount of La [REO-t/km ²]										
	0-1 m	1-2 m	2-3 m	3-4 m	4-5 m	5-6 m	6-7 m	7-8 m	8-9 m	9-10 m	average	0-1 m	1-2 m	2-3 m	3-4 m	4-5 m	5-6 m	6-7 m	7-8 m	8-9 m	9-10 m	sum
A1	66	96	178	183	288	408	322	225	172	183	212	42	61	112	116	183	258	204	142	109	116	1,342
A2	49	55	63	74	78	89	162	146	110	119	95	31	35	40	47	49	57	103	93	69	76	599
A3	58	90	123	176	167	131	143	133	116	152	129	36	57	78	111	106	83	91	84	73	97	816
A4	51	63	106	122	99	130	141	130	110	103	105	32	40	67	77	63	82	89	82	70	65	668
A5	47	51	76	94	76	79	95	102	85	85	79	30	32	48	59	48	50	60	64	54	54	499
A6	42	45	52	58	64	68	74	85	79	85	65	26	28	33	37	40	43	47	54	50	54	412
B1	49	76	83	103	559	849	410	157	123	125	253	31	48	52	65	354	537	260	99	78	79	1,605
B2	64	161	101	135	238	261	181	140	147	310	174	40	102	64	85	151	165	115	89	93	196	1,100
B3	64	102	146	294	286	142	124	123	113	174	157	40	64	93	186	181	90	79	78	72	110	994
B4	66	110	257	219	132	137	144	121	101	106	139	42	70	163	138	84	87	91	77	64	67	883
B5	55	78	239	306	110	98	160	178	118	116	146	35	49	151	194	70	62	102	113	75	73	924
B6	42	48	69	90	75	72	105	145	90	88	82	27	30	44	57	47	46	67	92	57	56	522
C1	70	139	119	125	254	373	249	207	191	254	198	44	88	75	79	161	236	158	131	121	161	1,254
C2	72	234	125	120	153	140	119	129	169	456	172	46	148	79	76	97	89	75	82	107	289	1,088
C3	62	96	116	237	307	137	114	124	110	157	146	39	61	73	150	194	87	72	78	70	99	925
C4	78	165	191	158	105	100	109	95	84	89	118	50	105	121	100	67	63	69	60	53	57	744
C5	59	131	404	247	132	126	228	191	126	128	177	37	83	256	157	83	80	145	121	80	81	1,122
C6	45	63	112	107	126	104	201	221	136	143	126	29	40	71	68	80	66	127	140	86	91	797
D1	66	141	118	129	241	293	193	167	163	258	177	42	89	75	82	152	186	123	106	104	163	1,121
D2	64	140	131	171	174	109	102	116	123	243	137	40	89	83	108	110	69	64	73	78	154	869
D3	56	90	136	163	146	110	99	110	102	141	115	35	57	86	103	92	69	63	70	65	90	730
D4	55	98	176	172	132	141	169	125	106	109	128	35	62	112	109	84	89	107	79	67	69	813
D5	56	95	236	145	160	208	376	200	144	140	176	35	60	149	92	101	132	238	127	91	89	1,114
D6	49	72	134	120	163	157	226	164	120	125	133	31	46	85	76	103	99	143	104	76	79	842

Table S4 (B) Ce

Area	Ce [ppm]											Resource amount of Ce [REO-t/km ²]										
	0-1 m	1-2 m	2-3 m	3-4 m	4-5 m	5-6 m	6-7 m	7-8 m	8-9 m	9-10 m	average	0-1 m	1-2 m	2-3 m	3-4 m	4-5 m	5-6 m	6-7 m	7-8 m	8-9 m	9-10 m	sum
A1	104	119	148	169	210	250	216	190	173	179	176	69	79	98	112	140	166	143	126	115	119	1,165
A2	102	108	107	110	113	111	149	184	172	171	133	68	71	71	73	75	74	99	122	114	114	880
A3	100	116	129	151	153	150	159	165	160	168	145	66	77	86	100	101	99	105	109	106	111	962
A4	101	106	120	126	116	138	149	148	137	131	127	67	70	80	84	77	92	99	98	91	87	845
A5	99	100	110	115	110	108	115	115	107	109	109	65	66	73	76	73	72	77	76	71	72	722
A6	94	95	100	100	99	99	102	104	105	107	101	62	63	66	66	66	66	68	69	70	71	667
B1	94	102	106	119	300	404	256	183	169	173	191	62	67	70	79	199	268	170	121	112	115	1,264
B2	98	142	131	144	193	207	180	171	178	234	168	65	94	87	96	128	137	120	113	118	155	1,114
B3	97	118	138	197	210	172	162	158	161	177	159	64	78	92	130	139	114	108	105	107	117	1,054
B4	103	120	176	178	146	153	153	144	138	136	145	68	80	117	118	97	101	101	95	92	90	960
B5	101	114	173	205	149	142	162	158	141	140	148	67	76	114	136	99	94	107	105	93	93	985
B6	96	100	109	115	110	108	123	135	121	119	114	64	66	72	76	73	71	82	89	81	79	754
C1	104	137	145	156	212	254	224	206	197	212	185	69	91	96	104	141	168	149	136	131	141	1,225
C2	98	171	148	148	169	174	161	155	178	279	168	65	113	98	98	112	116	107	103	118	185	1,116
C3	97	117	130	173	215	167	154	150	150	163	152	65	78	86	114	143	111	102	100	100	108	1,006
C4	109	137	161	157	138	137	137	131	129	127	136	72	91	107	104	92	91	91	87	85	84	904
C5	102	134	254	217	184	179	212	181	161	161	179	68	89	169	144	122	118	140	120	107	107	1,184
C6	106	113	137	145	159	149	178	181	155	151	147	70	75	91	96	106	99	118	120	103	100	977
D1	101	135	141	149	200	222	193	177	176	205	170	67	90	93	99	132	147	128	118	117	136	1,126
D2	98	132	137	154	165	149	140	138	146	187	144	65	87	91	102	109	99	93	91	97	124	958
D3	97	110	132	145	146	137	127	125	124	137	128	64	73	87	96	97	91	84	83	83	91	849
D4	97	112	150	156	148	157	162	148	141	141	141	64	75	100	104	98	104	107	98	94	94	937
D5	97	120	189	179	189	205	254	190	181	181	178	64	79	125	119	125	136	169	126	120	120	1,184
D6	109	117	150	163	187	186	203	176	160	156	161	72	78	99	108	124	124	135	117	106	103	1,066

Table S4 (C) Pr

Area	Pr [ppm]											Resource amount of Pr [REO-t/km ²]										
	0-1 m	1-2 m	2-3 m	3-4 m	4-5 m	5-6 m	6-7 m	7-8 m	8-9 m	9-10 m	average	0-1 m	1-2 m	2-3 m	3-4 m	4-5 m	5-6 m	6-7 m	7-8 m	8-9 m	9-10 m	sum
A1	17	26	50	53	84	122	89	61	47	52	60	11	17	33	34	55	80	58	40	31	34	392
A2	12	14	16	19	20	23	43	42	30	33	25	8	9	11	12	13	15	28	27	20	22	165
A3	16	25	36	51	51	38	41	39	34	47	38	10	16	23	33	33	25	27	25	22	30	245
A4	13	17	30	34	27	36	39	36	30	28	29	9	11	19	22	18	24	26	23	19	18	189
A5	13	14	22	27	21	22	27	28	24	24	22	8	9	14	18	14	14	18	19	15	16	145
A6	12	13	15	17	19	20	22	25	23	26	19	8	8	10	11	12	13	14	16	15	17	125
B1	14	22	24	31	169	272	120	50	39	39	78	9	14	16	20	110	178	78	33	26	26	510
B2	18	47	31	41	74	83	54	44	47	103	54	12	30	20	27	48	54	35	29	30	67	354
B3	19	30	44	88	91	45	39	38	35	56	48	12	19	29	57	60	29	25	25	23	36	316
B4	18	32	76	64	39	41	42	35	29	31	41	12	21	50	42	25	27	27	23	19	20	265
B5	15	23	73	93	34	30	50	52	35	35	44	10	15	48	61	22	20	32	34	23	23	287
B6	12	14	21	27	23	22	33	44	28	27	25	8	9	13	18	15	14	21	28	18	18	163
C1	19	39	34	37	76	116	73	62	56	77	59	12	26	22	24	50	75	48	40	37	50	384
C2	22	69	39	38	49	45	38	42	55	155	55	14	45	26	25	32	30	25	28	36	101	360
C3	18	28	35	72	98	43	35	38	34	48	45	12	18	23	47	64	28	23	25	22	32	293
C4	22	49	57	46	31	29	32	27	24	26	34	15	32	37	30	20	19	21	18	16	17	224
C5	17	40	126	77	42	41	74	58	39	39	55	11	26	82	50	27	26	48	38	25	26	359
C6	13	18	34	32	38	33	62	68	43	45	39	8	12	22	21	25	22	40	44	28	29	252
D1	19	41	35	39	74	92	58	51	49	81	54	12	26	23	25	48	60	38	33	32	53	350
D2	19	41	40	51	54	34	31	35	38	78	42	12	27	26	33	35	22	20	23	25	51	274
D3	16	26	40	47	43	32	29	31	30	40	33	10	17	26	31	28	21	19	20	19	26	218
D4	15	28	53	49	39	43	55	37	31	32	38	10	19	34	32	25	28	36	24	20	21	250
D5	16	28	72	45	51	69	129	64	45	43	56	11	18	47	29	33	45	84	42	29	28	367
D6	14	21	40	36	49	50	71	50	37	38	41	9	14	26	24	32	33	46	33	24	25	265

Table S4 (D) Nd

Area	Nd [ppm]											Resource amount of Nd [REO-t/km ²]										
	0-1 m	1-2 m	2-3 m	3-4 m	4-5 m	5-6 m	6-7 m	7-8 m	8-9 m	9-10 m	average	0-1 m	1-2 m	2-3 m	3-4 m	4-5 m	5-6 m	6-7 m	7-8 m	8-9 m	9-10 m	sum
A1	71	111	217	223	352	529	393	262	200	215	257	45	70	137	140	222	333	248	165	126	135	1,620
A2	49	57	66	78	84	101	196	186	136	149	110	31	36	42	49	53	63	123	117	86	94	694
A3	64	105	149	215	214	165	179	169	145	193	160	40	66	94	136	135	104	113	106	91	121	1,006
A4	55	71	126	146	119	160	172	157	131	123	126	34	45	79	92	75	101	108	99	82	77	793
A5	51	57	91	114	89	93	113	119	99	100	93	32	36	57	72	56	58	71	75	62	63	584
A6	46	49	59	67	75	82	89	103	93	105	77	29	31	37	42	47	51	56	65	59	66	483
B1	51	84	93	121	680	1,145	509	198	157	151	319	32	53	59	76	429	721	320	124	99	95	2,009
B2	75	196	126	168	302	347	231	186	191	394	222	47	123	79	106	190	218	145	117	121	248	1,396
B3	75	123	183	370	383	188	162	161	147	226	202	47	77	115	233	241	118	102	102	92	142	1,269
B4	74	133	321	273	164	174	177	146	122	129	171	47	83	202	172	104	109	112	92	77	82	1,079
B5	63	94	312	401	142	126	211	219	145	145	186	40	59	197	252	89	79	133	138	92	91	1,171
B6	47	55	84	112	93	91	136	182	111	111	102	30	34	53	71	58	57	86	115	70	70	645
C1	78	165	143	153	315	491	315	263	237	310	247	49	104	90	96	198	309	198	166	150	195	1,556
C2	90	292	163	155	199	186	156	175	221	578	222	56	184	103	98	126	117	98	110	139	364	1,396
C3	73	116	142	297	408	174	144	154	137	193	184	46	73	90	187	257	110	91	97	87	122	1,158
C4	93	205	239	194	128	120	130	112	98	105	142	58	129	150	122	80	75	82	70	62	66	896
C5	69	162	528	326	172	167	308	242	158	161	229	43	102	333	205	108	105	194	152	100	102	1,444
C6	50	73	137	134	159	137	260	286	179	188	160	32	46	86	84	100	86	164	180	113	119	1,009
D1	75	169	144	159	301	384	243	212	204	315	221	47	107	91	100	190	242	153	134	129	199	1,391
D2	75	171	162	211	223	135	127	144	152	299	170	47	108	102	133	140	85	80	91	96	188	1,070
D3	62	106	164	194	175	128	116	125	118	160	135	39	67	103	122	110	81	73	79	74	101	849
D4	62	117	220	206	157	173	227	153	126	129	157	39	74	139	130	99	109	143	97	79	81	988
D5	64	113	293	181	203	272	531	262	181	174	227	40	71	184	114	128	171	334	165	114	110	1,430
D6	54	84	163	149	203	204	291	207	150	154	166	34	53	103	94	128	128	183	130	94	97	1,044

Table S4 (E) Sm

Area	Sm [ppm]											Resource amount of Sm [REO-t/km ²]										
	0-1 m	1-2 m	2-3 m	3-4 m	4-5 m	5-6 m	6-7 m	7-8 m	8-9 m	9-10 m	average	0-1 m	1-2 m	2-3 m	3-4 m	4-5 m	5-6 m	6-7 m	7-8 m	8-9 m	9-10 m	sum
A1	16	26	52	55	82	118	91	62	48	51	60	10	16	33	34	52	74	57	39	30	32	377
A2	10	12	14	17	18	21	45	43	31	34	24	6	7	9	10	11	13	28	27	19	21	152
A3	14	24	35	50	49	38	41	39	33	45	37	9	15	22	31	31	24	26	24	21	28	230
A4	12	16	28	33	26	36	39	35	29	27	28	7	10	18	21	17	22	24	22	18	17	175
A5	11	12	20	26	20	21	26	27	23	23	21	7	8	13	16	12	13	16	17	14	15	131
A6	10	11	13	15	17	19	21	24	23	25	18	6	7	8	10	11	12	13	15	14	16	111
B1	12	21	24	31	162	253	123	51	40	39	76	8	13	15	20	101	158	77	32	25	24	473
B2	17	47	30	40	71	79	55	45	47	98	53	11	29	19	25	45	49	35	28	30	61	332
B3	18	29	44	87	89	45	38	38	35	54	48	11	18	27	55	56	28	24	24	22	34	299
B4	17	31	76	65	38	40	41	33	28	29	40	11	19	48	40	24	25	26	21	17	18	250
B5	14	22	73	95	33	30	50	51	34	34	43	9	14	46	59	21	19	31	32	21	21	272
B6	10	12	19	26	21	21	32	43	26	26	24	7	8	12	16	13	13	20	27	16	16	149
C1	18	40	35	38	75	113	75	63	56	74	59	11	25	22	24	47	71	47	40	35	47	368
C2	21	70	39	38	48	44	38	43	55	145	54	13	44	25	24	30	28	24	27	35	91	339
C3	17	28	34	70	94	42	34	37	33	46	43	11	17	21	44	59	26	22	23	20	29	272
C4	22	49	56	46	30	28	30	26	23	24	33	14	31	35	29	19	17	19	16	14	15	209
C5	16	39	124	77	42	41	74	57	37	38	54	10	24	77	48	26	25	47	36	23	24	341
C6	11	17	32	32	38	33	63	68	42	44	38	7	11	20	20	24	21	40	43	26	27	238
D1	18	41	35	39	71	89	59	51	49	77	53	11	26	22	24	45	55	37	32	31	48	330
D2	18	41	39	50	52	32	30	34	37	73	41	11	26	24	31	33	20	19	21	23	46	254
D3	14	25	39	46	41	30	27	29	27	37	32	9	16	25	29	26	19	17	18	17	23	198
D4	14	28	52	49	37	41	52	36	30	30	37	9	17	32	31	23	26	33	22	19	19	231
D5	15	27	72	45	50	68	125	63	44	43	55	10	17	45	28	32	42	78	39	28	27	345
D6	12	20	40	36	49	50	71	49	35	36	40	8	13	25	23	31	31	44	31	22	23	250

Table S4 (F) Eu

Area	Eu [ppm]											Resource amount of Eu [REO-t/km ²]										
	0-1 m	1-2 m	2-3 m	3-4 m	4-5 m	5-6 m	6-7 m	7-8 m	8-9 m	9-10 m	average	0-1 m	1-2 m	2-3 m	3-4 m	4-5 m	5-6 m	6-7 m	7-8 m	8-9 m	9-10 m	sum
A1	3.9	6.2	12.2	12.7	19.7	28.4	21.6	14.7	11.2	12.2	14.3	2.4	3.9	7.6	7.9	12.3	17.7	13.5	9.2	7.0	7.6	89.2
A2	2.5	3.0	3.6	4.3	4.5	5.5	10.6	10.0	7.4	8.2	5.9	1.5	1.8	2.3	2.7	2.8	3.4	6.6	6.2	4.6	5.1	37.1
A3	3.5	5.9	8.5	12.3	12.1	9.2	9.8	9.2	8.0	10.9	9.0	2.2	3.7	5.3	7.7	7.6	5.8	6.1	5.8	5.0	6.8	56.0
A4	2.8	3.8	7.0	8.1	6.5	8.6	9.2	8.3	6.8	6.4	6.8	1.7	2.4	4.4	5.1	4.1	5.4	5.8	5.2	4.3	4.0	42.2
A5	2.5	2.9	4.9	6.3	4.9	5.1	6.3	6.8	5.7	5.7	5.1	1.6	1.8	3.1	3.9	3.0	3.2	4.0	4.2	3.6	3.6	32.0
A6	2.3	2.5	3.1	3.7	4.1	4.6	5.1	6.0	5.6	6.3	4.3	1.4	1.6	2.0	2.3	2.6	2.9	3.2	3.7	3.5	3.9	27.1
B1	2.9	5.1	5.8	7.6	40.1	62.7	30.5	12.3	9.5	9.4	18.6	1.8	3.2	3.6	4.8	25.1	39.2	19.0	7.7	6.0	5.9	116.2
B2	4.3	11.4	7.4	9.9	17.6	19.4	13.5	11.0	11.6	24.2	13.0	2.7	7.1	4.6	6.2	11.0	12.1	8.4	6.9	7.2	15.1	81.4
B3	4.4	7.2	10.7	21.5	21.9	10.9	9.3	9.3	8.5	13.3	11.7	2.7	4.5	6.7	13.4	13.7	6.8	5.8	5.8	5.3	8.3	73.0
B4	4.2	7.7	18.8	15.9	9.3	9.7	9.9	8.0	6.6	7.0	9.7	2.6	4.8	11.8	9.9	5.8	6.1	6.2	5.0	4.1	4.4	60.6
B5	3.3	5.3	18.1	23.4	8.1	7.2	12.3	12.4	8.2	8.1	10.6	2.1	3.3	11.3	14.6	5.1	4.5	7.7	7.8	5.1	5.1	66.5
B6	2.4	2.9	4.7	6.4	5.2	5.2	7.9	10.6	6.4	6.4	5.8	1.5	1.8	2.9	4.0	3.3	3.2	4.9	6.6	4.0	4.0	36.3
C1	4.4	9.6	8.4	9.0	18.2	27.5	18.1	15.1	13.7	18.1	14.2	2.8	6.0	5.2	5.6	11.4	17.2	11.3	9.4	8.6	11.3	88.8
C2	5.2	17.1	9.6	9.1	11.7	10.7	9.2	10.5	13.7	35.9	13.3	3.2	10.7	6.0	5.7	7.3	6.7	5.8	6.5	8.6	22.5	82.9
C3	4.2	6.8	8.3	17.2	23.1	10.2	8.3	8.9	7.9	11.3	10.6	2.6	4.2	5.2	10.8	14.5	6.4	5.2	5.6	4.9	7.0	66.4
C4	5.4	12.1	13.8	11.1	7.1	6.6	7.2	6.2	5.4	5.7	8.1	3.4	7.6	8.6	6.9	4.4	4.1	4.5	3.8	3.4	3.6	50.4
C5	3.8	9.5	30.6	19.0	10.2	10.0	18.4	14.0	9.0	9.1	13.4	2.4	6.0	19.2	11.9	6.4	6.2	11.5	8.7	5.6	5.7	83.5
C6	2.6	4.1	8.0	7.8	9.3	8.1	15.7	16.7	10.2	10.7	9.3	1.6	2.6	5.0	4.9	5.8	5.0	9.8	10.4	6.4	6.7	58.2
D1	4.3	9.9	8.5	9.3	17.4	21.6	14.1	12.3	11.9	18.7	12.8	2.7	6.2	5.3	5.8	10.9	13.5	8.8	7.7	7.5	11.7	80.1
D2	4.3	10.0	9.5	12.2	12.7	7.8	7.2	8.3	8.9	17.9	9.9	2.7	6.3	6.0	7.7	7.9	4.9	4.5	5.2	5.6	11.2	61.8
D3	3.5	6.2	9.7	11.2	9.8	7.2	6.5	6.9	6.5	9.0	7.6	2.2	3.9	6.0	7.0	6.2	4.5	4.0	4.3	4.0	5.6	47.7
D4	3.4	6.8	12.8	11.9	9.0	9.9	12.7	8.6	7.1	7.3	9.0	2.1	4.3	8.0	7.5	5.6	6.2	7.9	5.4	4.4	4.5	56.0
D5	3.7	6.8	17.7	11.0	12.4	16.8	31.2	15.4	10.7	10.3	13.6	2.3	4.2	11.1	6.9	7.8	10.5	19.5	9.6	6.7	6.5	85.0
D6	2.9	4.9	9.8	8.9	12.1	12.1	17.4	12.0	8.5	8.7	9.7	1.8	3.1	6.1	5.6	7.6	7.6	10.9	7.5	5.3	5.4	60.8

Table S4 (G) Gd

Area	Gd [ppm]											Resource amount of Gd [REO-t/km ²]										
	0-1 m	1-2 m	2-3 m	3-4 m	4-5 m	5-6 m	6-7 m	7-8 m	8-9 m	9-10 m	average	0-1 m	1-2 m	2-3 m	3-4 m	4-5 m	5-6 m	6-7 m	7-8 m	8-9 m	9-10 m	sum
A1	17.4	28.2	56.0	57.7	90.5	130.0	99.8	67.4	51.5	55.4	65.4	10.8	17.6	34.8	35.9	56.3	80.9	62.1	42.0	32.0	34.5	407
A2	10.3	12.6	15.4	18.8	19.9	24.5	48.1	43.9	31.5	35.0	26.0	6.4	7.8	9.6	11.7	12.4	15.2	29.9	27.4	19.6	21.8	162
A3	15.5	26.6	38.6	55.8	54.5	41.2	44.2	41.2	35.2	48.0	40.1	9.6	16.6	24.1	34.7	33.9	25.6	27.5	25.7	21.9	29.9	249
A4	11.9	16.6	31.5	36.7	29.6	39.2	42.0	38.0	31.1	28.9	30.6	7.4	10.3	19.6	22.9	18.4	24.4	26.2	23.6	19.4	18.0	190
A5	10.8	12.7	22.0	28.3	21.9	22.8	28.7	30.9	26.0	25.9	23.0	6.7	7.9	13.7	17.6	13.6	14.2	17.9	19.2	16.2	16.1	143
A6	9.8	10.9	13.7	16.2	18.5	20.6	23.1	26.9	25.4	28.6	19.4	6.1	6.8	8.5	10.1	11.5	12.8	14.4	16.7	15.8	17.8	121
B1	12.6	23.2	26.5	34.9	183.9	285.7	138.1	54.0	41.8	41.5	84.2	7.8	14.4	16.5	21.7	114.5	177.8	86.0	33.6	26.0	25.9	524
B2	19.1	52.2	33.1	44.7	79.6	87.5	60.5	48.5	50.7	105.3	58.1	11.9	32.5	20.6	27.8	49.5	54.5	37.6	30.2	31.5	65.6	362
B3	19.6	32.8	48.8	97.8	98.8	47.9	40.7	40.9	37.1	58.2	52.3	12.2	20.4	30.4	60.9	61.5	29.8	25.3	25.5	23.1	36.2	325
B4	18.7	34.9	86.2	71.5	41.6	43.2	44.7	36.4	29.7	31.5	43.8	11.7	21.7	53.7	44.5	25.9	26.9	27.8	22.7	18.5	19.6	273
B5	15.0	23.9	82.5	105.8	36.0	31.9	54.7	56.5	37.1	36.2	48.0	9.3	14.9	51.4	65.9	22.4	19.8	34.0	35.2	23.1	22.5	299
B6	10.3	12.4	20.7	28.5	23.3	23.2	35.4	47.6	28.9	28.8	25.9	6.4	7.7	12.9	17.8	14.5	14.5	22.0	29.6	18.0	17.9	161
C1	19.9	44.1	37.9	40.6	83.0	125.1	82.2	68.5	61.4	80.8	64.3	12.4	27.4	23.6	25.3	51.7	77.9	51.2	42.6	38.2	50.3	400
C2	23.5	78.5	42.9	40.9	52.5	47.8	40.6	46.6	60.1	156.4	59.0	14.6	48.9	26.7	25.5	32.6	29.8	25.3	29.0	37.4	97.4	367
C3	18.8	31.2	38.0	78.7	105.0	44.8	36.4	39.2	34.6	49.7	47.7	11.7	19.4	23.7	49.0	65.3	27.9	22.7	24.4	21.6	30.9	297
C4	24.5	55.5	62.9	50.2	31.8	29.5	32.4	27.6	24.0	25.6	36.4	15.3	34.6	39.2	31.2	19.8	18.4	20.2	17.2	14.9	15.9	227
C5	17.4	43.5	139.9	85.5	44.9	43.8	81.5	62.5	40.0	40.4	59.9	10.8	27.1	87.1	53.2	28.0	27.3	50.7	38.9	24.9	25.2	373
C6	11.4	18.3	36.0	35.2	41.8	35.6	69.4	74.0	45.2	47.7	41.5	7.1	11.4	22.4	21.9	26.0	22.2	43.2	46.1	28.2	29.7	258
D1	19.2	45.6	38.6	42.3	79.2	97.9	63.7	55.3	53.0	82.9	57.8	11.9	28.4	24.1	26.3	49.3	61.0	39.7	34.4	33.0	51.6	360
D2	19.3	46.0	43.3	55.7	57.3	34.4	31.8	36.7	39.1	78.7	44.2	12.0	28.6	26.9	34.7	35.7	21.4	19.8	22.8	24.3	49.0	275
D3	15.4	28.3	44.2	50.9	44.6	32.1	28.8	31.0	28.7	40.2	34.4	9.6	17.6	27.5	31.7	27.8	20.0	17.9	19.3	17.9	25.0	214
D4	15.1	30.8	58.5	54.3	40.6	44.6	56.6	38.5	31.4	32.2	40.3	9.4	19.2	36.4	33.8	25.3	27.8	35.2	24.0	19.6	20.0	251
D5	16.5	30.9	80.5	48.6	54.8	73.7	137.6	68.6	47.5	45.5	60.4	10.3	19.2	50.1	30.2	34.1	45.9	85.7	42.7	29.5	28.3	376
D6	12.9	22.1	44.5	39.9	54.2	53.4	77.2	53.4	37.7	38.8	43.4	8.0	13.8	27.7	24.8	33.7	33.2	48.1	33.2	23.5	24.2	270

Table S4 (H) Tb

Area	Tb [ppm]											Resource amount of Tb [REO-t/km ²]										
	0-1 m	1-2 m	2-3 m	3-4 m	4-5 m	5-6 m	6-7 m	7-8 m	8-9 m	9-10 m	average	0-1 m	1-2 m	2-3 m	3-4 m	4-5 m	5-6 m	6-7 m	7-8 m	8-9 m	9-10 m	sum
A1	2.7	4.3	8.6	8.7	13.5	19.4	14.9	10.0	7.5	8.1	9.8	1.7	2.7	5.4	5.5	8.6	12.3	9.5	6.3	4.8	5.2	62.1
A2	1.5	1.9	2.3	2.8	3.0	3.7	7.4	6.7	4.9	5.4	4.0	1.0	1.2	1.5	1.8	1.9	2.4	4.7	4.3	3.1	3.4	25.2
A3	2.3	4.0	5.8	8.4	8.2	6.1	6.6	6.2	5.3	7.2	6.0	1.5	2.5	3.7	5.3	5.2	3.9	4.2	3.9	3.4	4.6	38.2
A4	1.8	2.5	4.7	5.5	4.5	5.8	6.2	5.7	4.7	4.3	4.6	1.1	1.6	3.0	3.5	2.8	3.7	4.0	3.6	3.0	2.8	29.1
A5	1.6	1.9	3.3	4.3	3.3	3.5	4.3	4.7	4.0	3.9	3.5	1.0	1.2	2.1	2.7	2.1	2.2	2.7	3.0	2.5	2.5	22.1
A6	1.5	1.7	2.1	2.4	2.8	3.1	3.5	4.1	3.9	4.3	2.9	0.9	1.1	1.3	1.6	1.8	2.0	2.2	2.6	2.5	2.8	18.7
B1	1.9	3.5	4.0	5.2	27.4	42.4	20.4	8.0	6.2	6.2	12.5	1.2	2.2	2.5	3.3	17.4	26.9	12.9	5.1	4.0	3.9	79.5
B2	2.9	7.8	4.9	6.7	11.9	13.0	9.0	7.2	7.6	15.8	8.7	1.8	4.9	3.1	4.2	7.5	8.3	5.7	4.6	4.8	10.0	55.1
B3	3.0	4.9	7.3	14.6	14.7	7.1	6.1	6.1	5.6	8.7	7.8	1.9	3.1	4.6	9.3	9.4	4.5	3.9	3.9	3.5	5.5	49.7
B4	2.8	5.2	12.8	10.7	6.2	6.4	6.7	5.5	4.5	4.7	6.6	1.8	3.3	8.1	6.8	4.0	4.1	4.2	3.5	2.8	3.0	41.6
B5	2.3	3.6	12.3	15.7	5.4	4.8	8.2	8.5	5.6	5.4	7.2	1.4	2.3	7.8	10.0	3.4	3.0	5.2	5.4	3.6	3.5	45.6
B6	1.6	1.9	3.1	4.2	3.5	3.5	5.3	7.1	4.4	4.3	3.9	1.0	1.2	2.0	2.7	2.2	2.2	3.4	4.5	2.8	2.8	24.7
C1	3.0	6.5	5.6	6.0	12.3	18.5	12.1	10.0	9.1	11.9	9.5	1.9	4.1	3.5	3.8	7.8	11.7	7.7	6.3	5.8	7.6	60.3
C2	3.5	11.7	6.4	6.1	7.8	7.1	6.0	6.9	8.9	23.4	8.8	2.2	7.4	4.1	3.9	4.9	4.5	3.8	4.4	5.7	14.9	55.8
C3	2.9	4.7	5.7	11.8	15.7	6.7	5.4	5.8	5.2	7.4	7.1	1.8	3.0	3.6	7.5	10.0	4.3	3.5	3.7	3.3	4.7	45.3
C4	3.7	8.3	9.4	7.5	4.7	4.4	4.9	4.1	3.6	3.8	5.4	2.3	5.3	6.0	4.8	3.0	2.8	3.1	2.6	2.3	2.4	34.6
C5	2.6	6.5	20.8	12.7	6.7	6.5	12.1	9.3	6.0	6.0	8.9	1.7	4.1	13.2	8.1	4.3	4.2	7.7	5.9	3.8	3.8	56.8
C6	1.7	2.8	5.4	5.3	6.2	5.3	10.3	11.0	6.8	7.2	6.2	1.1	1.8	3.4	3.3	4.0	3.4	6.6	7.0	4.3	4.5	39.3
D1	2.9	6.8	5.7	6.3	11.8	14.5	9.4	8.1	7.8	12.3	8.5	1.8	4.3	3.6	4.0	7.5	9.2	5.9	5.1	5.0	7.8	54.3
D2	2.9	6.9	6.5	8.3	8.6	5.1	4.7	5.4	5.8	11.7	6.6	1.9	4.4	4.1	5.3	5.4	3.3	3.0	3.5	3.7	7.5	41.9
D3	2.3	4.3	6.6	7.6	6.7	4.8	4.3	4.6	4.2	5.9	5.1	1.5	2.7	4.2	4.9	4.2	3.0	2.7	2.9	2.7	3.8	32.7
D4	2.3	4.6	8.8	8.1	6.1	6.7	8.4	5.7	4.7	4.8	6.0	1.4	3.0	5.6	5.2	3.9	4.2	5.3	3.7	3.0	3.0	38.2
D5	2.5	4.7	12.0	7.3	8.2	11.0	20.4	10.2	7.1	6.8	9.0	1.6	3.0	7.6	4.6	5.2	7.0	12.9	6.5	4.5	4.3	57.2
D6	2.0	3.3	6.7	6.0	8.1	7.9	11.5	7.9	5.6	5.8	6.5	1.2	2.1	4.2	3.8	5.2	5.0	7.3	5.0	3.6	3.7	41.2

Table S4 (I) Dy

Area	Dy [ppm]											Resource amount of Dy [REO-t/km ²]										
	0-1 m	1-2 m	2-3 m	3-4 m	4-5 m	5-6 m	6-7 m	7-8 m	8-9 m	9-10 m	average	0-1 m	1-2 m	2-3 m	3-4 m	4-5 m	5-6 m	6-7 m	7-8 m	8-9 m	9-10 m	sum
A1	16.8	27.1	54.2	54.6	84.8	121.3	93.1	62.5	47.2	50.5	61.2	10.4	16.8	33.6	33.8	52.6	75.2	57.7	38.7	29.3	31.3	379
A2	9.3	11.4	14.4	17.7	18.9	23.8	46.0	40.7	29.3	32.1	24.4	5.8	7.1	8.9	11.0	11.7	14.7	28.5	25.2	18.2	19.9	151
A3	14.6	25.1	36.3	52.4	50.9	38.1	41.2	37.9	32.6	44.0	37.3	9.1	15.6	22.5	32.5	31.5	23.6	25.5	23.5	20.2	27.3	231
A4	11.2	15.7	29.8	34.5	27.9	36.5	39.1	35.4	29.4	26.7	28.6	7.0	9.7	18.5	21.4	17.3	22.6	24.2	21.9	18.2	16.5	177
A5	10.1	11.9	20.8	26.5	20.7	21.7	27.2	29.6	25.0	24.4	21.8	6.2	7.4	12.9	16.4	12.8	13.5	16.9	18.3	15.5	15.1	135
A6	9.2	10.3	13.0	15.5	17.8	19.9	22.2	25.8	24.5	27.2	18.5	5.7	6.4	8.0	9.6	11.0	12.3	13.8	16.0	15.2	16.9	115
B1	11.9	22.3	25.3	32.8	172.9	267.4	126.1	48.9	38.0	38.2	78.4	7.4	13.8	15.7	20.4	107.2	165.7	78.1	30.3	23.6	23.7	486
B2	18.1	49.2	30.8	41.5	74.1	81.4	55.6	44.1	46.3	96.6	53.8	11.2	30.5	19.1	25.8	45.9	50.5	34.4	27.4	28.7	59.9	333
B3	18.8	31.2	45.8	91.8	91.6	43.8	37.4	37.3	34.1	53.3	48.5	11.7	19.4	28.4	56.9	56.8	27.1	23.2	23.1	21.1	33.0	301
B4	18.0	33.1	80.8	66.6	38.7	39.5	41.4	34.1	27.8	29.1	40.9	11.1	20.5	50.1	41.3	24.0	24.5	25.7	21.1	17.3	18.0	253
B5	14.2	22.5	76.9	97.4	33.3	29.5	50.9	53.5	35.1	33.5	44.7	8.8	13.9	47.7	60.4	20.6	18.3	31.5	33.1	21.8	20.8	277
B6	9.6	11.8	19.6	26.9	22.3	22.3	33.3	44.8	27.5	27.3	24.5	6.0	7.3	12.1	16.7	13.8	13.8	20.7	27.8	17.1	16.9	152
C1	18.8	41.0	34.6	36.9	76.8	115.1	74.5	61.3	55.5	73.7	58.8	11.7	25.4	21.4	22.8	47.6	71.3	46.2	38.0	34.4	45.7	365
C2	22.4	74.0	39.7	37.7	48.3	43.9	37.1	42.3	54.7	143.5	54.4	13.9	45.9	24.6	23.4	30.0	27.2	23.0	26.2	33.9	88.9	337
C3	18.0	29.6	35.5	73.7	97.2	40.8	33.2	35.6	31.4	45.2	44.0	11.2	18.4	22.0	45.7	60.2	25.3	20.6	22.1	19.5	28.0	273
C4	23.4	52.2	58.9	46.8	29.3	27.1	30.1	25.6	22.2	23.7	33.9	14.5	32.3	36.5	29.0	18.2	16.8	18.6	15.8	13.8	14.7	210
C5	16.6	41.0	130.8	79.1	41.4	40.2	74.5	57.8	37.0	37.5	55.6	10.3	25.4	81.1	49.0	25.7	24.9	46.2	35.8	22.9	23.2	345
C6	10.7	17.4	34.1	33.2	39.1	33.1	63.7	68.3	42.1	44.9	38.7	6.6	10.8	21.1	20.6	24.2	20.5	39.5	42.3	26.1	27.8	240
D1	18.2	42.7	35.4	38.7	73.3	90.1	57.6	49.6	47.9	75.7	52.9	11.3	26.5	22.0	24.0	45.4	55.8	35.7	30.7	29.7	46.9	328
D2	18.4	43.5	40.4	52.0	53.0	31.3	29.1	33.4	35.5	71.9	40.8	11.4	27.0	25.0	32.3	32.8	19.4	18.0	20.7	22.0	44.6	253
D3	14.6	27.0	41.4	47.9	41.4	29.4	26.3	28.3	25.9	36.4	31.9	9.1	16.7	25.6	29.7	25.6	18.3	16.3	17.5	16.1	22.5	197
D4	14.4	29.3	54.9	50.9	37.8	41.1	51.6	35.4	28.8	29.4	37.4	8.9	18.2	34.1	31.6	23.4	25.5	32.0	22.0	17.9	18.2	232
D5	15.8	29.2	74.9	44.7	50.2	67.0	124.3	62.5	43.4	41.5	55.3	9.8	18.1	46.4	27.7	31.1	41.5	77.0	38.7	26.9	25.8	343
D6	12.2	21.1	41.9	37.3	50.4	48.8	70.5	48.9	34.8	36.0	40.2	7.6	13.1	26.0	23.1	31.2	30.2	43.7	30.3	21.6	22.3	249

Table S4 (J) Ho

Area	Ho [ppm]											Resource amount of Ho [REO-t/km ²]										
	0-1 m	1-2 m	2-3 m	3-4 m	4-5 m	5-6 m	6-7 m	7-8 m	8-9 m	9-10 m	average	0-1 m	1-2 m	2-3 m	3-4 m	4-5 m	5-6 m	6-7 m	7-8 m	8-9 m	9-10 m	sum
A1	3.4	5.5	10.8	10.8	17.1	24.3	18.7	12.6	9.5	10.1	12.3	2.1	3.4	6.7	6.7	10.6	15.0	11.6	7.8	5.9	6.3	76.0
A2	1.9	2.3	2.9	3.7	3.9	4.9	9.2	8.0	5.8	6.4	4.9	1.2	1.4	1.8	2.3	2.4	3.0	5.7	5.0	3.6	3.9	30.3
A3	3.0	5.1	7.3	10.6	10.3	7.5	8.1	7.5	6.5	8.7	7.4	1.8	3.1	4.5	6.6	6.4	4.7	5.0	4.6	4.0	5.4	46.1
A4	2.2	3.1	6.0	7.0	5.7	7.2	7.6	7.1	5.9	5.3	5.7	1.4	1.9	3.7	4.3	3.5	4.4	4.7	4.4	3.6	3.3	35.3
A5	2.0	2.4	4.2	5.4	4.3	4.4	5.5	6.1	5.1	4.9	4.4	1.2	1.5	2.6	3.4	2.6	2.7	3.4	3.8	3.2	3.1	27.5
A6	1.8	2.1	2.6	3.2	3.7	4.1	4.6	5.3	5.0	5.6	3.8	1.1	1.3	1.6	2.0	2.3	2.5	2.8	3.3	3.1	3.5	23.5
B1	2.4	4.5	5.2	6.6	35.1	53.8	25.1	9.6	7.5	7.6	15.7	1.5	2.8	3.2	4.1	21.7	33.3	15.5	5.9	4.6	4.7	97.4
B2	3.7	10.0	6.2	8.4	15.0	16.3	11.1	8.7	9.1	19.1	10.7	2.3	6.2	3.8	5.2	9.3	10.1	6.8	5.4	5.6	11.8	66.5
B3	3.9	6.4	9.2	18.6	18.5	8.6	7.4	7.4	6.8	10.5	9.7	2.4	3.9	5.7	11.5	11.5	5.3	4.6	4.6	4.2	6.5	60.2
B4	3.7	6.7	16.3	13.4	7.7	7.8	8.2	6.8	5.6	5.8	8.2	2.3	4.1	10.1	8.3	4.8	4.8	5.1	4.2	3.4	3.6	50.6
B5	2.9	4.6	15.6	19.8	6.7	5.9	10.3	11.0	7.2	6.7	9.1	1.8	2.8	9.7	12.2	4.1	3.7	6.4	6.8	4.4	4.1	56.0
B6	1.9	2.4	3.9	5.4	4.5	4.5	6.8	9.1	5.6	5.6	5.0	1.2	1.5	2.4	3.4	2.8	2.8	4.2	5.6	3.5	3.4	30.7
C1	3.8	8.3	6.9	7.3	15.5	22.9	14.7	12.1	11.0	14.6	11.7	2.4	5.1	4.3	4.5	9.6	14.1	9.1	7.5	6.8	9.0	72.4
C2	4.6	15.0	7.9	7.5	9.7	8.7	7.4	8.4	10.8	28.3	10.8	2.9	9.3	4.9	4.7	6.0	5.4	4.6	5.2	6.7	17.5	67.0
C3	3.7	6.1	7.2	15.0	19.7	8.1	6.6	7.1	6.3	9.0	8.9	2.3	3.8	4.5	9.3	12.2	5.0	4.1	4.4	3.9	5.6	54.9
C4	4.8	10.5	11.9	9.4	5.8	5.4	6.0	5.1	4.4	4.7	6.8	2.9	6.5	7.3	5.8	3.6	3.3	3.7	3.2	2.7	2.9	42.1
C5	3.4	8.3	26.4	15.9	8.2	8.0	14.8	11.6	7.4	7.5	11.1	2.1	5.1	16.3	9.8	5.1	4.9	9.1	7.2	4.6	4.6	68.9
C6	2.2	3.5	6.9	6.6	7.8	6.6	12.6	13.6	8.5	9.1	7.7	1.3	2.2	4.3	4.1	4.8	4.1	7.8	8.4	5.2	5.6	47.8
D1	3.7	8.7	7.1	7.8	14.8	17.9	11.4	9.8	9.5	15.0	10.6	2.3	5.4	4.4	4.8	9.1	11.1	7.0	6.0	5.9	9.3	65.3
D2	3.8	8.9	8.1	10.5	10.7	6.3	5.8	6.7	7.0	14.2	8.2	2.3	5.5	5.0	6.5	6.6	3.9	3.6	4.1	4.4	8.8	50.7
D3	3.0	5.5	8.4	9.7	8.4	5.9	5.2	5.7	5.2	7.3	6.4	1.8	3.4	5.2	6.0	5.2	3.7	3.2	3.5	3.2	4.5	39.8
D4	2.9	6.0	11.1	10.3	7.6	8.2	10.3	7.1	5.7	5.8	7.5	1.8	3.7	6.9	6.4	4.7	5.1	6.4	4.4	3.5	3.6	46.4
D5	3.2	6.0	15.1	8.9	10.0	13.3	24.6	12.5	8.6	8.3	11.1	2.0	3.7	9.4	5.5	6.2	8.2	15.2	7.7	5.3	5.1	68.4
D6	2.5	4.3	8.5	7.5	10.1	9.6	13.9	9.7	6.9	7.2	8.0	1.5	2.7	5.2	4.6	6.2	5.9	8.6	6.0	4.3	4.4	49.5

Table S4 (K) Er

Area	Er [ppm]											Resource amount of Er [REO-t/km ²]										
	0-1 m	1-2 m	2-3 m	3-4 m	4-5 m	5-6 m	6-7 m	7-8 m	8-9 m	9-10 m	average	0-1 m	1-2 m	2-3 m	3-4 m	4-5 m	5-6 m	6-7 m	7-8 m	8-9 m	9-10 m	sum
A1	10.0	15.8	30.6	30.6	48.8	69.1	53.2	36.1	27.2	28.9	35.0	6.2	9.8	18.9	18.9	30.1	42.7	32.8	22.3	16.8	17.8	216
A2	5.5	6.8	8.7	10.8	11.4	14.1	26.0	22.4	16.2	17.9	14.0	3.4	4.2	5.4	6.7	7.1	8.7	16.1	13.8	10.0	11.0	86
A3	8.6	14.7	21.0	30.3	29.3	21.3	22.8	21.0	18.2	24.3	21.2	5.3	9.1	13.0	18.7	18.1	13.2	14.1	13.0	11.2	15.0	131
A4	6.5	9.2	17.4	20.2	16.4	20.5	21.7	20.1	16.9	14.9	16.4	4.0	5.7	10.8	12.4	10.2	12.7	13.4	12.4	10.4	9.2	101
A5	5.9	7.0	12.2	15.5	12.3	12.8	16.0	17.6	14.9	14.1	12.8	3.6	4.3	7.5	9.6	7.6	7.9	9.9	10.9	9.2	8.7	79
A6	5.4	6.1	7.7	9.2	10.7	11.9	13.3	15.2	14.6	16.0	11.0	3.3	3.7	4.8	5.7	6.6	7.4	8.2	9.4	9.0	9.9	68
B1	7.0	13.2	14.9	19.0	100.3	152.6	70.3	27.1	21.1	21.4	44.7	4.3	8.1	9.2	11.7	62.0	94.2	43.4	16.7	13.0	13.2	276
B2	10.7	28.5	17.6	23.7	42.5	46.2	31.0	24.4	25.5	53.1	30.3	6.6	17.6	10.9	14.7	26.2	28.5	19.1	15.1	15.7	32.8	187
B3	11.2	18.3	26.3	52.6	52.2	24.2	20.7	20.7	19.0	29.4	27.5	6.9	11.3	16.2	32.5	32.2	14.9	12.8	12.8	11.7	18.2	170
B4	10.6	19.2	46.3	38.0	22.0	21.9	23.3	19.5	15.9	16.2	23.3	6.6	11.9	28.6	23.4	13.6	13.5	14.4	12.1	9.8	10.0	144
B5	8.4	13.1	44.0	55.4	18.9	16.8	29.0	31.4	20.6	18.7	25.6	5.2	8.1	27.2	34.2	11.7	10.4	17.9	19.4	12.7	11.6	158
B6	5.6	6.9	11.5	15.7	13.1	13.1	19.3	25.7	16.2	15.9	14.3	3.5	4.3	7.1	9.7	8.1	8.1	11.9	15.9	10.0	9.8	88
C1	11.1	23.7	19.7	20.8	43.9	64.6	41.4	34.1	31.0	41.2	33.2	6.8	14.7	12.1	12.9	27.1	39.9	25.6	21.1	19.2	25.5	205
C2	13.3	42.8	22.4	21.2	27.3	24.6	20.6	23.5	30.0	78.6	30.4	8.2	26.4	13.9	13.1	16.9	15.2	12.7	14.5	18.5	48.5	188
C3	10.8	17.4	20.5	42.4	55.5	22.7	18.5	19.9	17.5	25.1	25.0	6.6	10.8	12.6	26.2	34.3	14.0	11.4	12.3	10.8	15.5	154
C4	13.8	30.1	33.7	26.5	16.5	15.0	17.0	14.5	12.6	13.3	19.3	8.5	18.6	20.8	16.4	10.2	9.3	10.5	9.0	7.8	8.2	119
C5	9.8	23.7	74.6	44.7	23.1	22.3	41.2	32.8	21.1	21.1	31.4	6.0	14.6	46.1	27.6	14.3	13.8	25.5	20.2	13.0	13.1	194
C6	6.3	10.3	19.8	19.1	22.2	18.6	35.3	38.2	24.1	25.9	22.0	3.9	6.3	12.2	11.8	13.7	11.5	21.8	23.6	14.9	16.0	136
D1	10.8	24.8	20.3	22.1	41.9	50.6	32.0	27.5	26.6	42.0	29.8	6.6	15.3	12.5	13.6	25.9	31.3	19.8	17.0	16.4	25.9	184
D2	11.0	25.4	23.1	29.8	30.1	17.5	16.2	18.7	19.6	39.6	23.1	6.8	15.7	14.3	18.4	18.6	10.8	10.0	11.5	12.1	24.5	143
D3	8.7	15.9	23.9	27.7	23.7	16.6	14.8	16.1	14.5	20.3	18.2	5.3	9.8	14.8	17.1	14.7	10.3	9.1	9.9	9.0	12.5	112
D4	8.4	17.1	31.7	29.4	21.6	23.1	28.7	20.1	16.2	16.4	21.3	5.2	10.6	19.6	18.1	13.3	14.2	17.7	12.4	10.0	10.1	131
D5	9.4	17.2	42.8	25.2	27.9	36.8	68.2	34.9	24.3	23.1	31.0	5.8	10.6	26.4	15.5	17.2	22.7	42.1	21.6	15.0	14.3	191
D6	7.2	12.5	24.1	21.3	28.5	26.7	38.8	27.2	19.5	20.3	22.6	4.4	7.7	14.9	13.1	17.6	16.5	24.0	16.8	12.1	12.6	140

Table S4 (L) Tm

Area	Tm [ppm]											Resource amount of Tm [REO-t/km ²]										
	0-1 m	1-2 m	2-3 m	3-4 m	4-5 m	5-6 m	6-7 m	7-8 m	8-9 m	9-10 m	average	0-1 m	1-2 m	2-3 m	3-4 m	4-5 m	5-6 m	6-7 m	7-8 m	8-9 m	9-10 m	sum
A1	1.42	2.21	4.27	4.26	6.67	9.44	7.34	5.02	3.72	3.94	4.83	0.88	1.36	2.64	2.63	4.11	5.82	4.53	3.09	2.30	2.43	29.8
A2	0.77	0.95	1.22	1.50	1.59	1.96	3.62	3.11	2.24	2.46	1.94	0.48	0.59	0.75	0.93	0.98	1.21	2.23	1.92	1.38	1.52	12.0
A3	1.22	2.03	2.88	4.12	3.98	2.89	3.11	2.87	2.48	3.28	2.89	0.75	1.25	1.78	2.54	2.45	1.78	1.92	1.77	1.53	2.02	17.8
A4	0.93	1.30	2.41	2.77	2.27	2.79	2.93	2.76	2.32	2.03	2.25	0.57	0.80	1.49	1.71	1.40	1.72	1.81	1.70	1.43	1.25	13.9
A5	0.84	0.99	1.71	2.15	1.73	1.79	2.22	2.45	2.08	1.96	1.79	0.52	0.61	1.05	1.33	1.07	1.11	1.37	1.51	1.28	1.21	11.0
A6	0.77	0.87	1.10	1.30	1.51	1.68	1.87	2.12	2.04	2.22	1.55	0.47	0.54	0.68	0.80	0.93	1.04	1.15	1.31	1.26	1.37	9.5
B1	1.00	1.85	2.09	2.62	13.53	20.52	9.44	3.65	2.84	2.89	6.04	0.62	1.14	1.29	1.61	8.35	12.66	5.82	2.25	1.75	1.78	37.3
B2	1.50	3.88	2.41	3.22	5.75	6.23	4.19	3.30	3.42	7.06	4.10	0.92	2.39	1.49	1.99	3.54	3.84	2.59	2.04	2.11	4.35	25.3
B3	1.57	2.52	3.58	7.13	7.05	3.27	2.81	2.81	2.57	3.95	3.73	0.97	1.56	2.21	4.40	4.35	2.02	1.73	1.73	1.59	2.44	23.0
B4	1.49	2.64	6.25	5.15	3.01	2.94	3.16	2.68	2.18	2.21	3.17	0.92	1.63	3.85	3.18	1.85	1.82	1.95	1.65	1.35	1.36	19.6
B5	1.19	1.82	5.96	7.46	2.59	2.30	3.94	4.34	2.86	2.54	3.50	0.73	1.12	3.68	4.60	1.60	1.42	2.43	2.68	1.76	1.57	21.6
B6	0.80	0.98	1.59	2.14	1.80	1.82	2.64	3.52	2.24	2.19	1.97	0.49	0.61	0.98	1.32	1.11	1.12	1.63	2.17	1.38	1.35	12.2
C1	1.56	3.27	2.70	2.84	5.94	8.73	5.61	4.62	4.15	5.50	4.49	0.96	2.02	1.67	1.75	3.66	5.38	3.46	2.85	2.56	3.39	27.7
C2	1.85	5.78	3.04	2.87	3.70	3.32	2.78	3.17	4.00	10.39	4.09	1.14	3.56	1.87	1.77	2.28	2.05	1.72	1.96	2.47	6.41	25.2
C3	1.51	2.41	2.80	5.75	7.50	3.09	2.51	2.70	2.38	3.38	3.40	0.93	1.49	1.73	3.55	4.62	1.90	1.55	1.66	1.47	2.08	21.0
C4	1.91	4.10	4.57	3.61	2.25	2.05	2.33	1.99	1.73	1.83	2.64	1.18	2.53	2.82	2.23	1.39	1.27	1.43	1.22	1.07	1.13	16.3
C5	1.37	3.24	10.02	6.01	3.12	3.01	5.52	4.46	2.87	2.87	4.25	0.85	2.00	6.18	3.70	1.92	1.86	3.41	2.75	1.77	1.77	26.2
C6	0.90	1.44	2.71	2.60	3.00	2.51	4.74	5.14	3.27	3.54	2.99	0.55	0.89	1.67	1.60	1.85	1.55	2.92	3.17	2.02	2.18	18.4
D1	1.51	3.40	2.77	3.00	5.67	6.83	4.32	3.72	3.56	5.59	4.04	0.93	2.10	1.71	1.85	3.49	4.22	2.67	2.30	2.20	3.45	24.9
D2	1.53	3.46	3.15	4.05	4.09	2.39	2.21	2.54	2.66	5.29	3.14	0.95	2.13	1.94	2.50	2.52	1.47	1.37	1.57	1.64	3.26	19.4
D3	1.22	2.20	3.27	3.78	3.25	2.29	2.03	2.21	1.99	2.75	2.50	0.75	1.36	2.01	2.33	2.00	1.41	1.25	1.36	1.23	1.70	15.4
D4	1.19	2.37	4.31	4.00	2.95	3.13	3.87	2.75	2.22	2.25	2.90	0.73	1.46	2.66	2.46	1.82	1.93	2.39	1.70	1.37	1.39	17.9
D5	1.31	2.38	5.78	3.40	3.76	4.92	9.10	4.73	3.30	3.15	4.18	0.81	1.47	3.56	2.10	2.32	3.03	5.61	2.92	2.03	1.94	25.8
D6	1.02	1.75	3.29	2.91	3.87	3.58	5.21	3.69	2.67	2.78	3.08	0.63	1.08	2.03	1.79	2.39	2.21	3.21	2.27	1.64	1.71	19.0

Table S4 (M) Yb

Area	Yb [ppm]											Resource amount of Yb [REO-t/km ²]										
	0-1 m	1-2 m	2-3 m	3-4 m	4-5 m	5-6 m	6-7 m	7-8 m	8-9 m	9-10 m	average	0-1 m	1-2 m	2-3 m	3-4 m	4-5 m	5-6 m	6-7 m	7-8 m	8-9 m	9-10 m	sum
A1	9.2	14.1	26.9	26.5	41.3	58.4	45.8	31.7	23.4	24.7	30.2	5.68	8.67	16.52	16.31	25.41	35.91	28.16	19.50	14.36	15.19	185.7
A2	5.1	6.2	7.8	9.7	10.3	12.7	23.0	19.4	14.0	15.3	12.3	3.13	3.80	4.79	5.98	6.30	7.81	14.16	11.92	8.58	9.42	75.9
A3	7.9	12.9	18.0	25.7	24.7	17.9	19.3	17.8	15.4	20.1	18.0	4.84	7.92	11.06	15.78	15.18	11.03	11.87	10.96	9.48	12.38	110.5
A4	6.0	8.3	15.2	17.4	14.4	17.3	18.1	17.3	14.7	12.7	14.1	3.71	5.12	9.32	10.70	8.84	10.64	11.14	10.67	9.02	7.78	86.9
A5	5.5	6.4	10.8	13.5	11.0	11.4	14.1	15.6	13.3	12.3	11.4	3.37	3.95	6.66	8.29	6.76	7.00	8.64	9.58	8.16	7.57	70.0
A6	5.0	5.7	7.2	8.5	9.8	10.9	12.1	13.6	13.1	14.1	10.0	3.09	3.50	4.40	5.21	6.00	6.67	7.42	8.36	8.03	8.66	61.3
B1	6.5	11.9	13.4	16.4	83.4	126.2	57.6	22.4	17.5	17.9	37.3	4.02	7.33	8.22	10.11	51.28	77.57	35.43	13.75	10.78	11.01	229.5
B2	9.7	24.3	15.1	20.0	35.4	38.4	25.9	20.3	20.9	43.0	25.3	5.96	14.95	9.27	12.29	21.77	23.63	15.91	12.49	12.86	26.41	155.5
B3	10.1	15.9	22.3	43.9	43.2	20.1	17.3	17.3	15.8	24.1	23.0	6.23	9.80	13.70	26.99	26.58	12.34	10.62	10.62	9.74	14.83	141.5
B4	9.6	16.7	38.5	31.7	18.7	18.0	19.5	16.8	13.7	13.7	19.7	5.92	10.24	23.70	19.51	11.50	11.09	11.99	10.32	8.44	8.43	121.2
B5	7.7	11.5	36.5	45.2	16.0	14.3	24.2	27.1	18.0	15.6	21.6	4.71	7.09	22.44	27.82	9.85	8.82	14.88	16.66	11.05	9.60	132.9
B6	5.3	6.4	10.2	13.7	11.7	11.8	16.8	22.1	14.2	13.8	12.6	3.25	3.96	6.29	8.42	7.18	7.24	10.33	13.58	8.75	8.52	77.5
C1	10.1	20.7	16.9	17.6	36.5	53.7	34.6	28.5	25.4	33.7	27.8	6.22	12.72	10.37	10.80	22.45	33.03	21.29	17.50	15.63	20.74	170.8
C2	11.9	36.0	18.8	17.7	22.7	20.4	17.2	19.5	24.4	63.0	25.2	7.34	22.15	11.58	10.87	13.98	12.57	10.56	11.97	14.99	38.76	154.8
C3	9.7	15.3	17.5	35.5	45.9	19.0	15.5	16.6	14.6	20.7	21.0	5.97	9.38	10.77	21.81	28.25	11.67	9.51	10.20	9.01	12.70	129.3
C4	12.2	25.6	28.3	22.4	14.0	12.7	14.5	12.4	10.8	11.4	16.4	7.52	15.73	17.40	13.75	8.64	7.82	8.89	7.62	6.64	7.01	101.0
C5	8.9	20.2	61.4	36.6	19.2	18.5	33.6	27.5	17.9	17.7	26.1	5.45	12.44	37.74	22.53	11.81	11.37	20.64	16.90	10.99	10.87	160.7
C6	5.9	9.3	17.1	16.5	18.8	15.7	29.2	31.7	20.4	22.0	18.7	3.61	5.71	10.53	10.12	11.55	9.68	17.94	19.47	12.53	13.55	114.7
D1	9.8	21.5	17.3	18.6	34.8	42.0	26.6	22.9	21.8	34.2	24.9	6.01	13.20	10.61	11.42	21.41	25.85	16.35	14.06	13.40	21.02	153.3
D2	9.9	21.7	19.6	25.1	25.2	14.8	13.7	15.7	16.3	32.2	19.4	6.08	13.36	12.06	15.40	15.49	9.08	8.43	9.65	10.03	19.81	119.4
D3	7.9	14.0	20.4	23.5	20.1	14.2	12.6	13.7	12.4	17.0	15.6	4.85	8.60	12.54	14.44	12.37	8.72	7.76	8.45	7.60	10.43	95.8
D4	7.7	15.0	26.8	24.8	18.4	19.3	23.8	17.2	13.8	14.0	18.1	4.71	9.21	16.48	15.28	11.29	11.88	14.63	10.56	8.51	8.63	111.2
D5	8.5	15.1	35.6	20.9	23.0	29.8	55.1	29.1	20.4	19.4	25.7	5.25	9.26	21.91	12.87	14.13	18.35	33.85	17.87	12.52	11.95	158.0
D6	6.7	11.2	20.5	18.1	23.9	21.8	31.8	22.7	16.6	17.2	19.1	4.09	6.90	12.62	11.13	14.70	13.43	19.56	13.98	10.19	10.61	117.2

Table S4 (N) Lu

Area	Lu [ppm]											Resource amount of Lu [REO-t/km ²]										
	0-1 m	1-2 m	2-3 m	3-4 m	4-5 m	5-6 m	6-7 m	7-8 m	8-9 m	9-10 m	average	0-1 m	1-2 m	2-3 m	3-4 m	4-5 m	5-6 m	6-7 m	7-8 m	8-9 m	9-10 m	sum
A1	1.41	2.11	3.85	3.79	6.04	8.51	6.61	4.59	3.42	3.61	4.39	0.87	1.30	2.36	2.33	3.71	5.23	4.06	2.82	2.10	2.22	27.0
A2	0.80	0.98	1.22	1.50	1.58	1.95	3.40	2.80	2.03	2.22	1.85	0.49	0.60	0.75	0.92	0.97	1.20	2.09	1.72	1.25	1.36	11.3
A3	1.22	1.96	2.72	3.87	3.72	2.67	2.84	2.62	2.28	2.97	2.69	0.75	1.20	1.67	2.38	2.28	1.64	1.74	1.61	1.40	1.82	16.5
A4	0.93	1.27	2.31	2.64	2.19	2.58	2.67	2.60	2.21	1.88	2.13	0.57	0.78	1.42	1.62	1.35	1.58	1.64	1.59	1.36	1.16	13.1
A5	0.84	0.99	1.66	2.06	1.70	1.75	2.15	2.39	2.04	1.87	1.74	0.52	0.61	1.02	1.26	1.04	1.08	1.32	1.47	1.25	1.15	10.7
A6	0.77	0.87	1.10	1.30	1.51	1.68	1.87	2.09	2.01	2.15	1.54	0.47	0.54	0.67	0.80	0.93	1.03	1.15	1.28	1.24	1.32	9.4
B1	1.00	1.82	2.03	2.47	12.44	18.68	8.32	3.29	2.59	2.64	5.53	0.61	1.12	1.25	1.52	7.64	11.47	5.11	2.02	1.59	1.62	33.9
B2	1.48	3.64	2.25	2.99	5.28	5.69	3.77	2.95	3.06	6.35	3.75	0.91	2.23	1.38	1.83	3.24	3.49	2.32	1.81	1.88	3.90	23.0
B3	1.56	2.43	3.36	6.60	6.47	2.98	2.56	2.55	2.35	3.57	3.44	0.96	1.49	2.06	4.05	3.97	1.83	1.57	1.57	1.44	2.19	21.1
B4	1.49	2.53	5.77	4.76	2.80	2.65	2.88	2.50	2.05	2.02	2.95	0.91	1.55	3.54	2.92	1.72	1.63	1.77	1.54	1.26	1.24	18.1
B5	1.18	1.76	5.51	6.79	2.42	2.16	3.62	4.09	2.70	2.30	3.25	0.73	1.08	3.38	4.17	1.49	1.33	2.22	2.51	1.66	1.41	20.0
B6	0.81	0.99	1.56	2.07	1.79	1.81	2.56	3.33	2.15	2.08	1.92	0.50	0.61	0.96	1.27	1.10	1.11	1.57	2.04	1.32	1.28	11.8
C1	1.53	3.05	2.46	2.57	5.39	7.81	4.98	4.08	3.70	4.92	4.05	0.94	1.87	1.51	1.58	3.31	4.80	3.06	2.50	2.27	3.02	24.9
C2	1.82	5.36	2.78	2.61	3.37	3.00	2.51	2.82	3.55	9.34	3.71	1.12	3.29	1.71	1.60	2.07	1.84	1.54	1.73	2.18	5.73	22.8
C3	1.50	2.34	2.65	5.34	6.87	2.82	2.30	2.45	2.17	3.05	3.15	0.92	1.43	1.63	3.28	4.22	1.73	1.41	1.51	1.33	1.87	19.3
C4	1.88	3.86	4.22	3.33	2.08	1.87	2.13	1.83	1.59	1.68	2.45	1.16	2.37	2.59	2.04	1.27	1.15	1.31	1.12	0.98	1.03	15.0
C5	1.36	3.06	9.17	5.46	2.85	2.74	4.95	4.09	2.65	2.60	3.89	0.84	1.88	5.63	3.35	1.75	1.68	3.04	2.51	1.63	1.60	23.9
C6	0.90	1.42	2.59	2.48	2.81	2.35	4.32	4.69	3.03	3.28	2.79	0.55	0.87	1.59	1.52	1.72	1.44	2.65	2.88	1.86	2.01	17.1
D1	1.49	3.19	2.56	2.75	5.16	6.14	3.84	3.30	3.17	5.01	3.66	0.91	1.96	1.57	1.69	3.17	3.77	2.36	2.03	1.95	3.08	22.5
D2	1.52	3.28	2.94	3.74	3.75	2.18	2.03	2.30	2.39	4.76	2.89	0.93	2.01	1.81	2.30	2.30	1.34	1.24	1.41	1.47	2.92	17.7
D3	1.22	2.14	3.08	3.51	2.99	2.09	1.86	2.03	1.82	2.49	2.32	0.75	1.32	1.89	2.16	1.84	1.28	1.14	1.24	1.12	1.53	14.3
D4	1.18	2.29	4.04	3.71	2.72	2.84	3.51	2.55	2.04	2.07	2.69	0.73	1.40	2.48	2.28	1.67	1.74	2.16	1.56	1.25	1.27	16.5
D5	1.32	2.31	5.36	3.11	3.40	4.40	8.11	4.31	3.02	2.90	3.82	0.81	1.42	3.29	1.91	2.09	2.70	4.98	2.65	1.86	1.78	23.5
D6	1.02	1.72	3.10	2.72	3.56	3.20	4.68	3.36	2.46	2.56	2.84	0.63	1.05	1.90	1.67	2.19	1.96	2.87	2.06	1.51	1.57	17.4

Table S4 (O) Y

Area	Y [ppm]											Resource amount of Y [REO-t/km ²]										
	0-1 m	1-2 m	2-3 m	3-4 m	4-5 m	5-6 m	6-7 m	7-8 m	8-9 m	9-10 m	average	0-1 m	1-2 m	2-3 m	3-4 m	4-5 m	5-6 m	6-7 m	7-8 m	8-9 m	9-10 m	sum
A1	103	167	327	333	546	766	588	404	309	331	388	71	115	224	228	375	525	404	277	212	227	2,658
A2	56	70	91	115	123	155	288	246	177	194	152	38	48	62	79	85	106	197	169	122	133	1,039
A3	84	152	222	331	311	226	245	224	193	266	225	57	104	152	227	214	155	168	154	132	183	1,546
A4	63	92	183	216	173	221	236	221	183	162	175	43	63	126	148	119	152	162	152	126	111	1,200
A5	54	65	120	157	121	128	163	182	151	144	128	37	44	82	108	83	88	112	125	104	99	881
A6	47	53	68	84	100	113	129	152	143	159	105	32	37	47	58	68	78	89	104	98	109	720
B1	65	129	149	190	1,137	1,710	789	280	216	223	489	45	88	102	131	780	1,173	541	192	148	153	3,352
B2	104	309	180	249	462	503	333	249	267	598	325	71	212	124	171	317	345	229	170	183	410	2,231
B3	105	185	275	580	555	248	212	210	191	315	288	72	127	189	398	380	170	145	144	131	216	1,972
B4	104	199	503	416	232	230	245	205	165	171	247	72	137	345	285	159	158	168	141	113	117	1,695
B5	80	130	470	601	191	169	297	331	210	191	267	55	89	323	412	131	116	204	227	144	131	1,831
B6	48	61	108	153	124	123	193	274	161	157	140	33	42	74	105	85	84	132	188	110	108	961
C1	115	261	212	223	491	724	462	375	343	472	368	79	179	146	153	337	496	317	257	235	324	2,523
C2	129	471	232	217	284	254	210	231	315	895	324	89	323	159	149	195	174	144	158	216	614	2,220
C3	100	174	211	458	589	232	187	201	175	263	259	69	119	145	314	404	159	128	138	120	180	1,776
C4	137	320	361	286	171	155	176	149	128	138	202	94	219	248	196	117	106	121	102	88	94	1,386
C5	93	247	810	478	237	226	431	348	218	221	331	64	169	556	328	162	155	295	239	149	152	2,270
C6	56	98	203	193	227	183	377	420	253	276	228	38	67	139	132	156	125	259	288	173	189	1,567
D1	107	268	215	233	460	559	349	293	285	473	324	73	184	148	160	316	384	240	201	196	325	2,225
D2	104	268	242	321	316	177	163	186	201	437	241	71	184	166	220	217	121	112	128	138	300	1,656
D3	81	160	254	301	250	170	149	163	147	212	189	56	110	174	207	171	116	102	112	100	145	1,294
D4	79	174	337	317	224	237	291	204	164	168	220	54	119	231	218	153	163	200	140	112	115	1,506
D5	86	171	457	261	289	381	706	357	247	240	320	59	117	314	179	198	261	484	245	170	165	2,191
D6	66	122	253	220	301	274	412	289	202	215	235	45	84	174	151	206	188	282	198	139	147	1,614

Table S5 (A)

Core No.	KR13-02_PC05																				KR13-02_PC04											
depth [mbsf]	1.5	2.47	2.47	2.97	2.97	2.97	2.97	2.97	2.97	2.97	2.97	2.97	2.97	2.97	2.97	2.97	2.97	3.47	3.47	3.97	5.965	6.965	6.965	7.955	7.99	7.99	8.39	8.39	8.39	8.39	11.96	
SiO ₂ [%]	0.29	0.10	0.00	0.05	0.08	0.08	0.04	0.05	0.02	0.08	0.08	0.03	0.06	0.05	0.04	0.10	0.05	0.07	0.31	0.12	0.14	0.08	0.16	0.20	0.10	0.13	0.02	0.04	0.09	0.06	0.31	
TiO ₂	0.05	0.06	0.06	0.04	0.03	0.04	0.04	0.04	0.03	0.03	0.07	0.04	0.03	0.03	0.03	0.04	0.03	0.03	0.05	0.04	0.10	0.05	0.04	0.06	0.08	0.05	0.05	0.04	0.03	0.05	0.05	
Al ₂ O ₃	0.03	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.09	0.04	0.05	0.04	0.06	0.05	0.02	0.02	0.00	0.01	0.04	0.03	0.10	
FeO	0.19	0.12	0.06	0.09	0.15	0.04	0.11	0.09	0.08	0.11	0.08	0.09	0.06	0.06	0.13	0.09	0.14	0.16	0.17	0.23	0.21	0.09	0.16	0.13	0.19	0.21	0.09	0.07	0.07	0.14	0.12	
MnO	0.45	0.02	0.00	0.03	0.02	0.06	0.00	0.03	0.01	0.00	0.02	0.01	0.00	0.01	0.00	0.00	0.02	0.00	0.09	0.14	0.01	0.13	0.05	0.03	0.04	0.02	0.00	0.05	0.01	0.00	0.11	
MgO	0.49	0.26	0.29	0.56	0.36	0.42	0.44	0.60	0.50	0.16	0.48	0.54	0.39	0.36	0.44	0.44	0.49	0.42	0.39	0.39	0.52	0.75	0.50	0.44	0.20	0.25	0.21	0.36	0.51	0.51	0.48	0.47
CaO	37.9	47.6	47.4	41.4	46.2	41.9	45.0	41.3	45.3	40.2	44.1	48.9	39.6	39.9	40.0	44.0	43.3	42.7	33.0	44.3	43.5	39.3	41.7	51.3	45.9	40.5	44.4	43.8	41.4	45.4	43.2	
Na ₂ O	1.42	1.36	1.28	1.78	1.39	1.41	1.39	1.79	1.36	0.62	1.60	1.14	1.15	1.27	1.38	1.47	1.45	1.24	1.57	1.71	1.34	1.45	1.34	1.73	1.25	0.91	0.91	1.23	1.13	1.11	1.29	1.01
K ₂ O	0.00	0.04	0.02	0.04	0.04	0.04	0.02	0.05	0.04	0.03	0.04	0.07	0.03	0.02	0.04	0.04	0.00	0.05	0.04	0.10	0.04	0.05	0.04	0.04	0.08	0.05	0.05	0.01	0.06	0.03	0.12	
P ₂ O ₅	29.0	38.4	37.9	28.6	32.8	30.0	31.2	28.6	31.2	24.3	30.4	32.2	26.9	27.7	27.4	30.0	30.3	28.6	22.7	33.5	30.5	28.2	29.9	31.0	39.3	32.8	27.6	33.1	30.3	30.7	32.6	31.2
Total (Major elements)	69.8	87.9	87.0	72.6	81.0	74.0	78.3	72.5	78.6	65.4	76.8	83.0	68.2	69.3	69.4	76.2	75.7	73.2	58.1	80.7	76.2	70.2	73.8	77.4	92.5	80.2	69.5	79.2	75.8	74.0	80.0	76.3
SrO	0.12	0.19	0.19	0.14	0.14	0.10	0.14	0.17	0.11	0.19	0.19	0.16	0.08	0.13	0.13	0.10	0.11	0.10	0.17	0.07	0.14	0.12	0.14	0.23	0.16	0.13	0.16	0.19	0.12	0.11	0.19	
F	2.24	3.43	3.41	2.23	3.10	2.18	2.23	2.55	3.03	0.76	2.74	3.32	2.68	2.28	2.25	3.18	3.44	2.57	2.39	2.33	2.53	3.03	2.99	2.69	3.32	3.22	2.01	3.47	3.49	3.21	3.47	2.54
BaO	0.00	0.05	0.00															0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.02	0.00	0.01	0.00	0.00	0.05	0.00	
Cl	0.78	0.38	0.36	0.90	0.54	0.50	0.54	0.71	0.57	0.61	0.65	0.46	0.56	0.51	0.55	0.46	0.41	0.50	0.96	0.51	0.65	0.68	0.49	0.15	0.24	0.24	0.19	0.25	0.38	0.64	0.13	
SO ₃	0.00	0.88	1.09	2.40	2.09	1.73	1.93	3.36	2.41	1.34	3.03	2.05	1.84	1.75	2.20	2.32	1.72	2.36	1.95	2.31	2.58	1.88	2.06	2.28	0.44	1.60	2.05	1.54	2.08	1.51	1.71	2.37
Sc [ppm]	367	42.8	88.6	239	273	308	294	297	219	223	268	316	204	285	232	197	268	252	210	186	276	188	249	212	7.01	256	317	301	174	237	174	181
V	2.87	3.52	4.12	3.48	1.96	3.97	4.34	3.81	4.78	3.84	13.4	6.44	4.18	4.09	3.39	4.52	3.64	6.21	5.32	18.6	6.99	15.5	3.20	3.72	1.47	12.6	11.3	6.49	5.62	6.54	6.27	18.1
Cr	8.27	0.00	4.73	0.00	0.00	0.00	0.00	0.00	6.23	0.00	22.3	23.5	5.84	18.3	0.00	6.23	0.00	14.1	2.27	0.00	2.99	13.5	1.64	0.00	0.00	6.88	3.94	5.08	3.41	0.01	6.79	0.00
Co	1.85	3.47	0.61	0.00	0.00	0.00	1.33	1.92	0.00	1.18	25.1	0.46	0.48	0.00	1.45	0.71	0.25	0.00	1.82	30.1	2.40	18.6	0.16	1.57	1.18	14.6	7.97	3.41	3.10	6.28	2.97	14.8
Ni	50.2	9.87	2.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.42	46.4	7.13	28.9	4.82	0.00	21.3	41.1	21.0	8.59	0.79	24.9	6.89	46.0	
Cu	53.6	46.9	32.7	37.6	33.5	23.4	22.9	45.4	32.2	27.8	68.1	28.9	24.8	25.8	22.3	22.1	13.7	29.1	24.0	64.6	31.5	51.8	15.1	16.3	9.09	66.6	50.1	43.0	36.1	42.8	23.3	99.5
Zn	66.1	217	119	81.2	122	91.3	272	103	82.1	81.1	81.2	65.2	56.5	43.2	45.6	59.9	103	38.4	115	129	151	68.4	75.1	69.7	43.0	185	114	62.5	99.6	76.9	194	155
Ga	123	13.8	39.9	129	58.1	63.6	75.4	95.8	79.2	117	120	62.9	94.6	139	105	118	62.0	85.0	167	105	220	176	171	85.2	9.19	152	153	138	133	178	225	81.9
Rb	0.94	1.22	0.36	1.18	1.25	0.46	0.78	1.65	0.90	0.97	10.4	0.00	1.38	1.03	0.88	1.18	0.00	0.36	2.39	5.25	3.15	10.8	0.91	0.47	1.12	5.97	3.90	2.35	1.48	4.36	1.95	8.24
Sr	1081	1288	1404	1614	1440	1107	1240	1458	1321	1364	1671	1472	1347	1316	1452	1548	981	1319	1155	1724	1519	1531	1146	1088	1700	2206	1399	1248	1555	1143	1175	2008
Y	2523	534	1411	6453	3507	3253	3758	8205	4490	4207	5278	4750	5209	5748	5078	6225	3273	4334	4843	2483	6371	4998	4625	2434	134	5491	6627	5609	3697	4964	5694	2756
Zr	179	20.6	21.1	139	114	121	112	127	76.2	68.2	95.0	183	76.2	82.7	86.3	86.0	77.4	89.0	110	117	61.7	89.5	87.9	2.02	1.09	117	101	53.6	88.1	56.9	83.1	
Nb	0.00	0.04	0.04	0.01	0.00	0.03	0.13	0.02	0.04	0.15	0.74	0.34	0.00	0.04	0.18	0.04	0.09	0.01	0.31	0.56	0.40	1.01	0.07	0.00	0.09	1.10	0.55	0.35	0.11	0.52	0.11	0.39
Ba	15.2	17.4	33.5	16.8	19.9	16.3	17.2	15.7	13.8	18.3	79.2	28.7	15.6	13.8	20.4	20.9	16.1	17.4	15.2	58.3	20.0	35.8	16.3	21.4	9.03	55.7	21.8	17.5	23.4	33.4	21.7	143
La	1262	200	714	3481	1512	1627	2072	2575	2325	2338	3342	2404	2439	2961	3038	3073	1569	2022	2974	1281	3912	2860	2344	1294	75.2	3451	3575	2343	2656	2977	3617	1697
Ce	1031	19.5	163	571	626	535	796	680	823	1398	3600	399	1041	1817	726	988	736	895	717	480	944	1195	978	539	27.8	1391	1345	840	1042	1578	2212	872
Pr	324	56.0	173	932	343	442	512	759	588	608	816	590	722	826	900	1050	490	538	808	355	1063	704	658	307	17.7	848	949	626	574	706	940	373
Nd	1394	222	682	4287	1678	1897	2027	3449	2211	2547	3627	2254	2923	4080	3911	4209	2149	2614	3376	1468	4441	3167	3030	1391	70.8	3681	4121	2925	2686	3173	4315	1705
Sm	314	55.0	164	1033	415	486	539	822	626	592	905	501	819	905	977	961	494	557	902	332	1187	747	660	306	14.3	845	1020	724	607	792	937	364
Eu	88.9	15.3	41.0	289	108	106	128	231	159	156	242	155	206	228	252	263	140	151	213	84.6	280	189	174	84.3	3.52	219	242	187	152	200	234	93.4
Gd	382	68.1	176	1125	449	510	606	975	634	603	806	589	760	947	954	983	513	648	945	410	1243	798	713	335	15.1	870	1029	778	600	858	967	406
Tb	62.4	10.2	29.2	178	70.1	72.7	89.8	153	95.7	119	136	92.6	122	153	149	169	79.6	99.3	155	57.9	204	123	116	53.4	2.87	133	163	118	93.6	144	153	65.3
Dy	382	64.0	196	1013	469	533	603	862	617	662	818	640	753	974	787	1011	525	668	762	359	1002	736	730	360	17.8	801	969	759	559	827	930	434
Ho	86.9	15.7	45.3	216	106	117	121	203	144	149	211	149	177	204	165	213	116	137	164	79.9	216	157	152	75.2	3.84	180	217	166	115	175	194	92.9
Er	258	48.9	120	541	335	323	366	488	365	424	482	359	421	579	408	430	281	444	424	223	558	401	397	206	10.9	514						

Table S5 (B)

Core No. depth [mbsf]	KR13-02_PC05								
	1.5	2.47	2.47	2.97	2.97	2.97	2.97	2.97	2.97
SiO ₂ [%]	57.7	55.4	59.2	59.3	59.5	58.9	58.8	59.5	57.8
TiO ₂	0.04	0.02	0.04	0.07	0.05	0.05	0.03	0.07	0.03
Al ₂ O ₃	19.8	18.8	20.8	20.2	20.5	19.7	20.2	20.5	19.5
FeO	0.62	0.34	0.69	0.58	0.66	0.64	0.82	0.82	0.76
MnO	0.00	0.03	0.04	0.04	0.01	0.02	0.00	0.04	0.11
MgO	0.58	0.21	0.33	0.35	0.48	0.36	0.42	0.47	0.64
CaO	0.17	0.22	0.18	0.16	0.10	0.16	0.20	0.16	0.28
Na ₂ O	6.20	7.68	8.08	8.12	7.05	7.22	7.69	7.39	7.20
K ₂ O	5.01	4.68	3.83	4.39	4.23	4.52	3.97	4.59	4.98
P ₂ O ₅	0.04	0.12	0.11	0.30	0.04	0.11	0.03	0.16	0.04
Total (Major elements)	90.0	87.4	93.1	93.2	92.5	91.5	92.1	93.4	91.3
Sc [ppm]	3.61	0.00	3.12	3.32	5.09	2.48	2.34	1.07	2.31
V	9.09	3.11	3.16	9.01	12.8	8.47	8.83	9.29	3.07
Cr	1.59	0.00	0.00	12.8	12.5	19.1	4.42	0.00	1.34
Co	0.00	1.43	1.79	3.12	2.01	3.04	2.07	1.64	3.76
Ni	0.00	0.00	0.00	9.49	0.00	0.00	0.00	0.00	0.00
Cu	33.0	18.5	27.6	63.8	26.0	37.3	25.2	32.1	44.8
Zn	13.6	12.7	16.8	21.8	12.6	21.9	13.5	6.08	17.0
Ga	2.86	2.29	2.46	3.50	1.73	2.71	2.51	5.47	4.73
Rb	32.4	36.2	20.7	24.9	37.1	31.5	30.0	26.1	18.7
Sr	16.5	11.4	32.5	25.3	13.5	18.5	31.8	8.91	10.1
Y	4.44	10.5	7.66	80.0	3.26	14.7	2.69	2.79	4.39
Zr	16.5	11.4	18.3	20.2	19.7	15.7	19.8	78.4	15.0
Nb	1.35	1.13	1.21	2.15	1.32	0.75	1.19	27.3	1.90
Ba	91.1	139	108	91.5	131	94.3	109	77.0	77.0
La	2.54	7.57	8.57	24.0	2.25	8.73	2.90	6.80	2.18
Ce	3.74	2.68	8.14	11.7	3.70	4.83	3.67	20.4	10.7
Pr	0.69	1.68	1.47	6.60	0.52	2.29	1.30	0.48	0.51
Nd	2.46	6.29	12.2	33.3	2.14	8.10	2.48	3.08	2.03
Sm	0.56	2.37	0.96	6.00	0.46	0.91	0.79	0.69	0.87
Eu	0.16	0.37	0.60	2.01	0.32	1.37	0.22	0.24	0.08
Gd	0.54	2.51	1.01	5.39	0.57	1.93	0.83	0.75	0.00
Tb	0.12	0.33	0.12	1.71	0.05	0.24	0.06	0.09	0.06
Dy	0.74	1.60	1.33	7.89	0.66	1.68	0.50	1.36	0.45
Ho	0.15	0.43	0.28	1.56	0.12	0.52	0.32	0.13	0.19
Er	0.46	1.27	0.87	4.08	0.42	0.75	0.26	0.67	0.28
Tm	0.09	0.08	0.08	0.58	0.05	0.13	0.06	0.04	0.04
Yb	0.55	0.60	0.75	4.80	0.37	0.82	0.24	0.41	0.23
Lu	0.08	0.16	0.14	0.54	0.14	0.26	0.05	0.06	0.01
Hf	0.59	0.67	0.57	0.26	0.41	0.57	0.33	1.50	0.44
Ta	0.15	0.00	0.06	0.12	0.20	0.00	0.07	0.79	0.14
Pb	1.02	2.59	1.97	3.80	2.60	5.58	2.59	2.45	3.14
Th	0.46	0.11	0.81	0.82	0.33	0.51	0.56	0.50	0.14
U	0.10	0.03	0.06	0.42	0.17	0.20	0.18	0.12	0.08
ΣREY	17.3	38.4	44.1	190	15.0	47.3	16.4	38.0	22.0

Table S6 (A) Normally REY-rich mud

Grain size [μm]	< 20	20 - 37	37 - 75	75 - 125	> 125	> 20 (in total)	Bulk	Bulk (calculated)
Weight distribution [%]	79.11	6.58	7.48	3.54	3.29	20.89	-	
Major Element [%]								
Na ₂ O	2.05	4.34	3.92	3.28	3.01	3.80	5.04	2.42
MgO	3.04	0.99	1.16	1.64	2.03	1.32	2.37	2.68
Al ₂ O ₃	16.5	16.4	15.2	14.3	13.2	15.1	14.9	16.2
P ₂ O ₅	0.59	1.24	2.17	4.39	1.49	2.14	0.99	0.91
K ₂ O	3.26	5.37	4.86	4.15	3.70	4.72	3.53	3.57
CaO	1.77	2.37	4.34	6.59	3.37	3.95	2.17	2.23
TiO ₂	0.79	0.23	0.25	0.37	0.48	0.30	0.57	0.69
MnO	2.16	0.55	0.57	0.88	7.91	1.77	1.85	2.08
Fe ₂ O ₃	9.43	2.73	3.07	4.96	6.63	3.84	7.15	8.26
Rare Earth Element [ppm]								
La	76.3	134	229	361	129	206	107	103
Ce	130	96.2	154	226	188	153	111	135
Pr	24.0	44.5	76.5	116	42.1	67.6	35.7	33.1
Nd	96.7	183	314	477	173	278	146	135
Sm	23.4	44.8	76.9	117	42.3	68.1	35.6	32.7
Eu	5.76	11.2	19.0	29.0	10.5	16.9	8.79	8.08
Gd	26.2	51.2	87.4	132	48.1	77.4	40.2	36.9
Tb	3.95	7.68	13.2	19.9	7.27	11.7	6.05	5.56
Dy	24.3	47.8	82.1	124	45.6	72.6	37.1	34.3
Ho	4.99	9.81	16.7	25.3	9.38	14.8	7.55	7.05
Er	14.2	27.8	47.5	71.5	26.7	42.1	21.6	20.0
Tm	1.95	3.81	6.54	9.81	3.75	5.79	2.93	2.75
Yb	12.2	23.8	41.0	61.7	24.1	36.4	18.3	17.3
Lu	1.87	3.64	6.24	9.43	3.78	5.57	2.77	2.64
Y	143	282	503	764	268	440	214	205
ΣREY	589	971	1673	2543	1021	1496	795	778

Table S6 (B) Highly REY-rich mud

Grain size [μm]	< 20	20 - 37	37 - 75	75 - 125	> 125	> 20 (in total)	Bulk	Bulk (calculated)
Weight distribution [%]	64.15	3.52	12.38	10.74	9.20	35.85	-	
Major Element [%]								
Na ₂ O	1.98	3.66	2.72	2.48	3.51	2.94	5.13	2.33
MgO	4.11	1.73	2.08	2.21	3.38	2.42	2.97	3.50
Al ₂ O ₃	22.4	17.9	14.5	13.8	18.3	15.6	16.6	20.0
P ₂ O ₅	1.30	12.6	17.9	9.91	3.80	11.4	5.40	4.91
K ₂ O	3.42	4.22	3.19	3.19	4.22	3.56	3.43	3.47
CaO	4.10	20.1	28.0	14.7	7.08	17.9	8.86	9.04
TiO ₂	1.02	0.48	0.53	0.57	0.76	0.60	0.77	0.87
MnO	2.71	0.72	0.67	1.12	19.2	5.56	2.89	3.73
Fe ₂ O ₃	12.8	5.35	5.96	6.23	10.4	7.12	9.08	10.8
Rare Earth Element [ppm]								
La	232	1363	1885	904	317	1137	572	557
Ce	177	590	814	411	349	552	293	311
Pr	75.2	493	675	327	101	406	177	194
Nd	310	2046	2821	1354	417	1688	738	804
Sm	75.4	461	637	305	103	383	180	186
Eu	18.6	115	159	76.2	25.4	95.4	44.9	46.1
Gd	85.9	529	735	349	118	441	206	213
Tb	12.7	79.2	109	52.0	17.5	65.7	30.8	31.7
Dy	78.4	493	722	324	110	423	190	202
Ho	15.9	101	140	66.1	22.4	83.8	38.8	40.3
Er	44.4	284	392	185	63.6	235	109	113
Tm	5.91	38.0	52.8	24.9	8.63	31.7	14.6	15.1
Yb	35.7	233	324	154	53.8	195	89.1	92.7
Lu	5.34	34.9	48.6	23.0	8.16	29.2	13.4	13.9
Y	478	2955	4090	1967	691	2470	1254	1192
ΣREY	1651	9814	13605	6523	2404	8235	3950	4011

Table S6 (C) Extremely REY-rich mud

Grain size [μm]	< 20	20 - 37	37 - 75	75 - 125	> 125	> 20 (in total)	Bulk	Bulk (calculated)
Weight distribution [%]	55.35	6.71	26.41	10.04	1.49	44.65	-	
Major Element [%]								
Na ₂ O	1.22	1.91	1.62	1.93	1.84	1.74	3.56	1.45
MgO	2.79	0.83	0.97	0.96	1.91	0.98	2.20	1.98
Al ₂ O ₃	14.7	7.57	6.92	7.64	7.71	7.20	12.1	11.3
P ₂ O ₅	3.85	16.4	17.5	16.0	9.28	16.7	10.4	9.59
K ₂ O	3.62	2.27	1.79	2.12	2.11	1.95	2.79	2.87
CaO	5.96	22.9	23.9	22.0	13.4	23.0	16.1	13.6
TiO ₂	0.67	0.47	0.45	0.33	0.46	0.43	0.49	0.56
MnO	1.92	0.39	0.35	0.90	15.0	0.97	1.50	1.49
Fe ₂ O ₃	7.19	2.73	2.96	2.77	5.20	2.96	5.74	5.30
Rare Earth Element [ppm]								
La	408	1581	1674	1514	739	1593	1014	937
Ce	195	633	644	563	311	613	463	382
Pr	114	474	512	462	220	485	362	280
Nd	487	2057	2211	1995	943	2097	1486	1206
Sm	114	452	486	442	221	462	335	270
Eu	28.7	113	122	111	55.4	116	83.4	67.7
Gd	132	522	560	508	254	532	381	311
Tb	19.5	77.4	83.3	75.3	37.7	79.1	56.4	46.1
Dy	121	479	515	465	235	489	352	286
Ho	24.9	98.4	106	95.5	47.9	100	72.4	58.6
Er	69.6	277	295	267	135	281	203	164
Tm	9.28	36.9	39.6	35.6	18.1	37.6	27.2	21.9
Yb	56.1	224	241	218	113	229	165	133
Lu	8.34	33.5	36.1	32.8	16.9	34.3	24.8	20.0
Y	769	3207	3339	3121	1552	3210	2200	1859
ΣREY	2558	10265	10865	9907	4897	10360	7226	6041

Table S7

Type of Slurry	Normally REY-rich mud				Highly REY-rich mud				Extremely REY-rich mud			
	Bulk	OF	UF	Bulk (calc.)	Bulk	OF	UF	Bulk (calc.)	Bulk	OF	UF	Bulk (calc.)
Slurry density [g/cm ³]	1.102	1.071	1.197	-	1.101	1.073	1.171	-	1.104	1.060	1.298	-
Flow amount [L]	-	2.74	0.58	-	-	2.93	0.51	-	-	2.85	0.60	-
Particle recovery [%]	-	57.5	42.5	-	-	66.9	33.1	-	-	40.2	59.8	-
Concentration factor of Σ REY	-	-	1.94	-	-	-	2.61	-	-	-	1.85	-
REY recovery rate [%]	-	29.3	70.7	-	-	25.0	75.0	-	-	6.99	93.0	-
Major Element [%]												
Na	6.91	8.31	4.83	6.83	6.68	7.41	4.70	6.51	6.02	8.79	2.99	5.32
Mg	1.72	2.20	1.43	1.87	1.89	2.09	1.30	1.83	1.72	2.36	1.15	1.64
Al	6.90	6.88	7.80	7.27	6.76	7.22	6.43	6.95	5.22	6.09	4.27	5.00
P	0.44	0.22	1.03	0.56	1.57	0.64	4.99	2.08	3.55	0.59	6.64	4.21
K	2.33	2.34	3.23	2.72	2.46	2.45	2.26	2.38	2.11	2.38	1.74	2.00
Ca	1.72	1.39	2.80	1.99	3.76	1.80	9.13	4.23	8.39	2.12	16.1	10.5
Ti	0.38	0.51	0.36	0.44	0.33	0.33	0.29	0.32	0.31	0.36	0.25	0.30
Mn	1.07	1.04	1.26	1.14	1.44	1.57	1.04	1.40	1.54	1.20	2.05	1.71
Fe	4.76	5.38	3.98	4.79	3.99	4.26	2.90	3.81	3.43	4.10	2.66	3.23
Rare Earth Elements [ppm]												
La	111	64.7	216	129	362	156	950	419	738	148	1377	882
Ce	108	91.8	144	114	214	129	467	241	340	104	598	399
Pr	29.6	16.1	60.9	35.1	104	43.2	272	119	212	41.3	390	250
Nd	128	71.2	268	155	447	186	1225	530	947	181	1725	1104
Sm	30.0	15.6	59.7	34.4	104	42.9	279	121	216	40.9	398	254
Eu	14.3	3.83	15.5	8.79	26.1	10.6	69.8	30.2	56.6	10.6	105	67.1
Gd	14.5	18.0	71.6	40.8	116	47.2	310	134	256	48.1	461	295
Tb	5.07	2.64	10.6	6.01	17.4	7.07	46.3	20.0	38.0	7.13	72.1	46.0
Dy	31.7	16.3	65.5	37.2	108	43.9	290	125	239	44.8	432	277
Ho	6.23	3.28	13.6	7.68	21.3	8.66	57.8	25.0	48.7	9.17	89.0	56.9
Er	18.3	9.75	39.5	22.4	60.0	24.3	161	69.7	139	25.7	248	159
Tm	2.58	1.32	5.26	2.99	8.07	3.20	21.8	9.36	18.5	3.40	35.3	22.5
Yb	16.4	8.28	33.3	18.9	49.2	20.1	134	57.8	114	21.0	218	139
Lu	2.37	1.23	4.95	2.81	6.95	2.81	18.7	8.07	16.8	3.02	32.1	20.4
Y	204	105	393	228	672	272	1729	755	1424	307	2721	1750
Σ REE	722	429	1401	842	2315	997	6031	2664	4802	994	8902	5722
Trace Elements [ppm]												
Sc	25.9	22.6	36.2	28.4	50.4	30.3	112	57.5	89.3	29.8	158	106
V	130	145	104	127	104	111	74.3	98.8	89.1	113	76.4	91.0
Cr	35.9	35.7	27.8	32.3	30.3	28.0	29.6	28.5	23.5	31.9	26.2	28.5
Co	161	166	175	170	185	205	124	178	213	171	269	229
Ni	295	173	570	342	361	330	443	368	549	315	844	631
Cu	92.3	328	377	349	268	277	229	261	330	277	396	348
Zn	234	227	224	226	143	150	152	150	166	182	198	191
As	26.2	25.5	27.3	26.3	40.8	28.4	71.5	42.7	42.4	19.6	68.4	48.8
Rb	65.2	68.9	76.0	71.9	77.9	82.7	62.3	76.0	54.6	67.7	38.2	50.1
Sr	217	233	253	242	344	249	634	377	559	246	860	613
Zr	117	146	119	134	126	130	123	128	127	123	125	124
Nb	9.49	11.7	8.61	10.4	10.0	10.2	8.46	9.64	9.28	10.5	8.31	9.20
Mo	79.2	89.9	66.6	80.0	68.6	75.5	41.7	64.3	74.9	79.1	72.4	75.1
Cs	4.48	5.47	3.57	4.66	5.69	6.27	3.54	5.37	3.26	4.75	1.64	2.89
Ba	211	233	229	231	282	298	216	271	241	256	214	231
Hf	2.92	3.52	2.87	3.24	3.00	3.07	2.84	3.00	3.15	3.25	2.93	3.06
Ta	0.38	0.60	0.44	0.53	0.50	0.50	0.47	0.49	0.48	0.58	0.42	0.48
Pb	37.9	44.1	34.1	39.9	40.9	43.7	28.1	38.5	38.5	40.6	36.9	38.4
Th	9.00	6.78	14.2	9.91	19.1	10.1	46.7	22.2	29.1	8.55	49.7	33.1
U	2.10	1.85	2.80	2.25	3.70	2.23	8.08	4.17	6.80	2.21	11.6	7.85