

## Supplementary Materials

**Table S1.** Coordinates of sampling sites in the study area (locations indicated in Figure 1b, c, d).

Sample	Latitude	Longitude	Elevation(m)
<b>A1 (Around the SSP)</b>	35° 36' 59.86" N	45° 08' 09.73" E	937
<b>A2 (Around the SSP)</b>	35° 36' 59.38" N	45° 08' 09.05" E	932
<b>A3(Around the SSP)</b>	35° 36' 59.38" N	45° 08' 05.72" E	933
<b>SS1</b>	35° 37' 11.95" N	45° 08' 27.61" E	1012
<b>SS2</b>	35° 37' 13.21" N	45° 08' 26.43" E	1017
<b>SS3</b>	35° 37' 05.27" N	45° 08' 30.60" E	981
<b>SS4</b>	35° 37' 04.80" N	45° 08' 30.93" E	979
<b>SS5</b>	35° 37' 11.37" N	45° 08' 40.73" E	1022
<b>SS6</b>	35° 37' 14.09" N	45° 08' 08.06" E	987
<b>SS7</b>	35° 36' 50.29" N	45° 08' 34.81" E	984
<b>SS8</b>	35° 36' 50.58" N	45° 08' 01.92" E	894
<b>SS9</b>	35° 37' 35.92" N	45° 08' 26.80" E	1159
<b>SS10</b>	35° 36' 31.18" N	45° 08' 28.33" E	948
<b>SS11</b>	35° 37' 02.17" N	45° 09' 02.68" E	1043
<b>SS12</b>	35° 37' 08.12" N	45° 07' 44.80" E	903
<b>SS13</b>	35° 36' 02.96" N	45° 08' 52.31" E	930
<b>SS14</b>	35° 37' 44.56" N	45° 09' 24.35" E	1066
<b>SS15</b>	35° 37' 42.08" N	45° 07' 19.26" E	999
<b>SS16</b>	35° 36' 16.85" N	45° 07' 26.62" E	815
<b>SS17</b>	35° 37' 02.70" N	45° 08' 33.97" E	975
<b>SS18</b>	35° 37' 01.18" N	45° 08' 33.97" E	969
<b>SS19</b>	35° 37' 01.00" N	45° 08' 35.45" E	966
<b>SS20</b>	35° 37' 01.61" N	45° 08' 38.15" E	968
<b>SS21</b>	35° 37' 01.22" N	45° 08' 41.57" E	978
<b>SS22</b>	35° 36' 59.80" N	45° 08' 48.98" E	1023
<b>SS23</b>	35° 36' 43.18" N	45° 08' 46.28" E	1039
<b>SS24</b>	35° 36' 28.76" N	45° 08' 34.49" E	956
<b>SS25</b>	35° 36' 24.08" N	45° 08' 49.45" E	971
<b>SS26</b>	35° 36' 15.46" N	45° 08' 44.28" E	928
<b>SS27</b>	35° 36' 04.23" N	45° 08' 44.04" E	861
<b>CS1(Clean sample)</b>	35° 36' 00.87" N	45° 08' 56.00" E	924
<b>CS2(Clean sample)</b>	35° 37' 46.51" N	45° 09' 42.77" E	1092
<b>SR1(Limestone rock)</b>	35° 37' 16.29" N	45° 08' 44.61" E	1071
<b>SR2 (Sandstone rock)</b>	35° 35' 21.67" N	45° 10' 59.60" E	892
<b>SR3(shale rock)</b>	35° 35' 21.67" N	45° 10' 59.60" E	892

**Table S2.** Trace element composition (in mg kg<sup>-1</sup>) of the studied samples.

Sample	Rb	Ba	Li	Cs	Be	Sr	Th	U	Zr	P	Sc	V	Cr	Co
LOD	0.15	0.30	0.14	0.06	0.03	0.60	0.5	0.03	1.0	25	0.60	0.03	0.40	0.04
A1	35.6	223	20.5	2.21	0.89	168	19	1.21	70	501	9.49	77.1	278	18.9
A2	36.5	217	20.9	2.34	1.01	157	19	1.27	91	509	10.4	80.9	261	19.9
A3	45.8	271	26.3	2.98	1.19	127	32	1.46	84	643	12.3	96.6	284	22.9
SS1	49.7	262	31.6	3.19	1.39	166	15	1.45	113	502	13.9	112	465	38.2
SS2	51.0	277	30.0	3.13	1.23	169	N	1.43	111	458	13.5	100	545	33.1
SS3	29.1	161	22.8	2.11	0.81	138	N	1.11	69	387	10.6	79.5	314	29.2
SS4	31.8	193	21.3	2.17	0.83	205	1	1.27	71	396	9.61	77.5	269	21.4
SS5	7.7	72.5	11.9	0.48	0.32	121	35	0.51	25	213	8.39	133	1365	49.4
SS6	63.5	332	34.6	4.00	1.62	111	21	1.77	140	711	14.0	128	358	31.1
SS7	43.7	233	26.9	2.80	1.13	187	25	1.53	96	542	12.5	96.7	281	21.1
SS8	14.5	56.3	14.2	0.83	0.35	294	25	1.06	89	282	10.7	71.6	692	34.3
SS9	45.3	259	26.7	2.72	1.13	123	N	1.43	95	819	12.0	93.3	317	21.5
SS10	68.6	337	41.1	4.55	1.97	85.6	N	1.95	167	500	13.0	144	314	28.7
SS11	21.5	114	20.1	1.27	0.54	143	N	0.88	51	436	12.7	93.5	1098	50.0
SS12	49.5	233	29.7	3.02	1.20	147	N	1.45	101	504	15.3	116	531	36.4
SS13	62.8	346	39.0	4.09	1.85	106	N	1.92	167	595	13.2	146	318	29.1
SS14	49.5	262	29.3	3.05	1.25	72.0	N	1.32	128	467	9.75	96.4	649	42.6
SS15	45.5	232	27.1	2.73	1.21	120	N	1.41	122	732	12.9	95.5	477	35.2
SS16	49.6	283	30.5	3.20	1.28	205	7	1.55	114	1168	12.5	101	226	20.2
SS17	39.7	224	27.1	2.55	1.07	200	4	1.37	93	447	11.8	91.0	416	30.9
SS18	16.5	105	21.4	1.20	0.44	170	N	0.78	35	245	11.9	72.4	789	49.7
SS19	36.6	223	27.6	2.39	0.87	206	N	1.23	74	416	13.2	84.2	653	45.8
SS20	25.5	141	23.4	1.71	0.65	146	8	0.96	60	308	12.9	76.5	839	50.3
SS21	32.3	135	25.2	2.01	0.75	140	17	1.23	68	445	15.8	109	806	45.9
SS22	74.7	374	42.4	4.69	2.01	98.1	N	2.05	142	762	17.6	142	307	29.5
SS23	73.2	361	42.9	4.70	1.94	93.6	N	1.99	172	578	18.3	144	292	29.2
SS24	70.6	370	41.8	4.43	1.86	99.3	N	2.07	180	664	17.8	139	366	29.2
SS25	44.2	260	27.1	2.74	1.20	109	10	1.40	100	571	11.6	89.9	213	18.5
SS26	68.9	376	41.3	4.23	1.80	118	5	2.03	141	728	17.4	139	304	28.0
SS27	41.4	241	26.3	2.67	1.23	193	N	1.60	105	687	11.2	89.4	252	20.1
CS1	62.4	307	37.6	4.34	1.71	76.1	3	1.82	170	365	16.0	136	284	27.2
CS2	21.7	124	15.6	1.31	0.60	171	23	0.92	54	415	11.9	76.1	909	46.5
SR1	0.68	4.90	2.49	0.01	0.21	503	N	1.08	21	64.1	0.38	11.8	36.6	1.22
SR2	6.09	42.3	10.4	0.47	0.28	159	6	0.18	16	190	10.9	49.0	968	45.6
SR3	29.6	72.4	32.9	1.80	0.65	116	N	1.77	59	346	14.0	126	802	51.9
Min	0.7	4.9	2.5	0.0	0.2	72.0	1.0	0.2	16.0	64.1	0.4	11.8	36.6	1.2
Max	74.7	375.8	42.9	4.7	2.0	503	35.0	2.1	180.	1168	18.3	146	1365	51.9
Average	41.3	221	27.1	2.6	1.1	156	15.3	1.4	97.0	503	12.6	100	494	32.4
SD	19.7	103	9.61	1.26	0.52	75.9	10.63	0.44	44.7	209	3.24	30.0	297	12.0

Table S2. Continued

Sample	Ni	Cu	Cd	Zn	Mo	Pb	Ti	Bi	Sn	Sb	As	S	Cl
LOD	0.60	0.30	0.03	1.5	0.15	0.45	0.04	0.03	0.15	0.15	0.30	25	-
A1	128	58.3	0.89	584	1.14	532	0.28	0.23	11.0	5.07	7.45	597	N
A2	133	42.4	0.55	283	0.89	132	0.27	0.29	4.38	1.87	7.26	507	N
A3	145	45.1	0.57	240	1.00	740	0.37	0.38	8.77	6.33	7.53	444	N
SS1	310	36.2	0.41	188	0.88	16.3	2.07	0.19	2.40	0.86	10.6	242	1
SS2	311	39.1	0.47	408	0.77	37.4	0.62	0.55	10.8	0.99	8.18	206	N
SS3	271	51.5	1.18	636	0.92	43.6	0.38	0.45	5.02	1.34	7.19	303	N
SS4	174	38.5	0.83	708	1.04	48.6	0.34	0.43	5.09	1.34	8.59	435	N
SS5	485	25.5	0.26	87.4	0.58	11.6	0.15	0.31	0.89	0.53	9.64	234	N
SS6	186	48.6	0.73	371	1.34	73.4	0.48	0.32	4.91	2.11	10.3	606	N
SS7	149	30.6	0.47	136	0.87	24.4	0.34	0.32	2.14	0.88	9.66	490	N
SS8	415	21.7	0.20	78.5	0.43	19.2	0.13	0.15	0.90	0.55	5.43	446	N
SS9	146	27.8	0.32	98.6	1.10	15.1	0.34	0.19	1.74	0.72	8.14	437	N
SS10	159	39.4	0.43	98.7	1.14	18.8	0.49	0.30	2.35	0.93	12.6	292	N
SS11	589	27.4	0.22	76.1	0.88	8.13	0.17	0.17	0.91	0.59	5.45	381	N
SS12	304	34.7	0.32	135	0.80	25.9	0.33	0.31	1.87	0.83	9.38	368	N
SS13	167	40.4	0.46	102	1.17	22.2	0.46	0.27	2.29	1.13	13.5	469	N
SS14	365	32.2	0.27	76.3	0.55	12.6	0.34	0.40	1.67	0.60	6.09	262	N
SS15	296	31.8	0.34	100	0.83	15.8	0.31	0.16	1.57	0.69	7.65	595	N
SS16	110	36.6	0.29	84.8	0.77	13.9	0.34	0.22	1.73	0.79	7.64	391	177
SS17	264	38.6	0.50	373	0.76	31.1	0.27	0.16	2.65	0.87	7.39	294	N
SS18	537	34.9	0.31	251	0.56	19.4	0.13	0.34	1.62	0.63	4.33	220	N
SS19	451	38.2	0.34	256	0.70	20.1	0.24	0.27	2.21	0.62	6.11	247	2461
SS20	544	34.2	0.20	119	0.51	13.0	0.19	0.17	1.36	0.44	5.01	203	N
SS21	501	81.1	0.34	158	0.63	17.4	0.21	0.10	1.99	0.66	9.00	303	N
SS22	161	49.2	0.48	175	1.31	26.2	0.49	0.24	2.71	1.06	10.9	550	N
SS23	152	47.7	0.44	147	1.19	23.6	0.51	0.68	2.44	0.96	12.1	389	N
SS24	155	48.8	0.41	131	1.26	22.5	0.48	0.37	2.35	0.97	11.8	478	N
SS25	94.2	36.7	0.28	103	0.83	16.4	0.32	0.19	1.63	0.69	7.23	364	N
SS26	149	47.9	0.49	140	1.26	24.2	0.48	0.44	2.48	1.03	11.5	641	N
SS27	129	34.7	0.42	95.3	0.90	16.5	0.31	0.11	1.52	0.75	8.19	516	N
CS1	148	44.8	0.36	106	1.01	17.6	0.46	0.33	2.18	0.96	11.7	242	N
CS2	473	31.8	0.19	70.9	0.58	7.14	0.16	0.20	0.87	0.37	5.47	380	N
SR1	22.2	11.0	0.84	43.8	0.23	0.31	0.02	0.02	0.18	0.14	1.41	202	N
SR2	597	23.0	0.32	66.4	0.26	2.21	0.05	0.13	0.38	0.21	1.10	64	421
SR3	628	46.0	0.06	93.6	0.34	4.47	0.20	0.17	1.00	0.38	2.35	1891	N
Min	22.2	11.0	0.1	43.8	0.2	0.3	0.0	N	0.2	0.1	1.1	64.5	1.0
Max	628	81.1	1.2	708	1.3	740	2.1	0.7	11.0	6.3	13.5	1891	2461
Average	281	38.8	0.4	195	0.8	59.2	0.4	0.3	2.8	1.1	7.9	420	765
SD	173	12.1	0.23	167	0.30	148	0.33	0.14	2.60	1.22	3.04	291	420

LOD: limits of detection; N: not detected.

**Table S3.** Enrichment factors (EF) for trace elements in studied samples calculated based on soil world average soil values [33] using Al as a reference element.

Sample	Rb	Ba	Li	Cs	Be	Sr	Th	U	Zr	Sc	V	Cr	Co
A1	0.93	0.81	0.96	0.36	0.61	1.49	3.03	0.43	0.31	1.31	1.68	<b>8.65</b>	3.59
A2	0.84	0.69	0.86	0.33	0.61	1.22	2.65	0.39	0.35	1.25	1.55	<b>7.12</b>	3.3
A3	0.84	0.69	0.86	0.34	0.57	0.79	3.58	0.36	0.26	1.19	1.48	<b>6.2</b>	3.04
SS1	0.78	0.57	0.89	0.31	0.58	0.89	1.44	0.31	0.3	1.15	1.47	<b>8.74</b>	4.37
SS2	0.84	0.63	0.89	0.32	0.54	0.95	—	0.32	0.31	1.18	1.38	<b>10.7</b>	3.97
SS3	0.73	0.55	1.02	0.33	0.53	1.17	—	0.37	0.29	1.4	1.65	<b>9.32</b>	5.28
SS4	0.85	0.71	1.01	0.36	0.58	1.85	0.16	0.46	0.32	1.35	1.72	<b>8.52</b>	4.13
SS5	0.33	0.42	0.9	0.13	0.36	1.75	<b>9.05</b>	0.29	0.18	1.87	4.69	<b>68.9</b>	15.2
SS6	0.79	0.57	0.77	0.31	0.53	0.47	1.6	0.3	0.29	0.93	1.34	5.33	2.82
SS7	0.84	0.62	0.92	0.34	0.57	1.22	2.93	0.4	0.31	1.26	1.55	<b>6.43</b>	2.94
SS8	0.32	0.17	0.56	0.11	0.2	2.22	3.38	0.32	0.33	1.25	1.33	<b>18.3</b>	5.52
SS9	0.79	0.62	0.83	0.29	0.52	0.73	—	0.34	0.28	1.1	1.35	<b>6.56</b>	2.7
SS10	0.68	0.46	0.73	0.28	0.52	0.29	—	0.26	0.28	0.68	1.19	3.7	2.07
SS11	0.61	0.45	1.02	0.23	0.41	1.38	—	0.34	0.24	1.9	2.22	<b>37.2</b>	<b>10.3</b>
SS12	0.82	0.53	0.88	0.31	0.52	0.83	—	0.32	0.28	1.33	1.59	<b>10.5</b>	4.36
SS13	0.66	0.51	0.74	0.27	0.52	0.38	—	0.27	0.29	0.73	1.28	4	2.23
SS14	0.64	0.47	0.68	0.25	0.43	0.32	—	0.23	0.28	0.67	1.04	<b>10</b>	4.01
SS15	0.84	0.59	0.89	0.31	0.59	0.75	—	0.35	0.37	1.25	1.46	<b>10.4</b>	4.68
SS16	0.82	0.64	0.9	0.33	0.56	1.15	0.7	0.34	0.31	1.09	1.38	4.44	2.41
SS17	0.80	0.62	0.97	0.32	0.56	1.36	0.49	0.37	0.31	1.25	1.52	<b>9.92</b>	4.48
SS18	0.46	0.4	1.06	0.21	0.32	1.6	—	0.29	0.16	1.74	1.67	<b>26.1</b>	<b>9.99</b>
SS19	0.78	0.65	1.04	0.32	0.49	1.49	—	0.35	0.26	1.47	1.49	<b>16.5</b>	<b>7.05</b>
SS20	0.63	0.48	1.04	0.27	0.42	1.23	1.21	0.32	0.25	1.69	1.58	<b>24.8</b>	<b>9.04</b>
SS21	0.7	0.4	0.97	0.27	0.43	1.03	2.25	0.36	0.25	1.81	1.97	<b>20.8</b>	7.21
SS22	0.84	0.58	0.85	0.33	0.59	0.38	—	0.31	0.27	1.04	1.33	4.12	2.41
SS23	0.72	0.49	0.75	0.29	0.5	0.31	—	0.27	0.28	0.95	1.18	3.43	2.09
SS24	0.74	0.53	0.78	0.29	0.51	0.35	—	0.29	0.31	0.98	1.21	4.55	2.21
SS25	0.83	0.67	0.9	0.32	0.59	0.69	1.14	0.35	0.31	1.14	1.4	4.75	2.51
SS26	0.77	0.58	0.82	0.29	0.53	0.45	0.34	0.31	0.26	1.02	1.29	4.03	2.26
SS27	0.69	0.56	0.79	0.28	0.54	1.1	—	0.36	0.29	0.99	1.24	5.02	2.44

EF categories: insufficient to minimal enrichment (EF < 2), moderate enrichment (EF = 2-5), significant enrichment (EF = 5-20; indicated in bold), very high enrichment (EF = 20-40; indicated in bold red), and extremely high enrichment (EF > 40; indicated in bold purple)

Table S3. *Continued*

Sample	Ni	Cu	Cd	Zn	Mo	Pb	Tl	Bi	Sb	As	Cl
A1	<b>9.28</b>	<b>5.45</b>	1.06	<b>12.3</b>	0.83	<b>27.8</b>	0.61	0.43	<b>10.7</b>	2.07	—
A2	<b>8.48</b>	3.47	0.58	5.22	0.57	<b>6.06</b>	0.51	0.47	3.45	1.77	—
A3	<b>7.41</b>	2.95	0.48	3.55	0.51	<b>27.2</b>	0.57	0.5	<b>9.36</b>	1.47	—
SS1	<b>13.6</b>	2.04	0.3	2.4	0.39	0.52	2.73	0.21	1.09	1.79	—
SS2	<b>14.3</b>	2.31	0.36	5.44	0.36	1.24	0.85	0.65	1.33	1.44	—
SS3	<b>18.8</b>	4.59	1.34	<b>12.8</b>	0.64	2.18	0.79	0.8	2.7	1.91	—
SS4	<b>12.9</b>	3.66	1.01	<b>15.2</b>	0.77	2.59	0.76	0.81	2.88	2.43	—
SS5	<b>57.1</b>	3.85	0.5	2.99	0.69	0.99	0.54	0.93	1.81	<b>4.35</b>	—
SS6	<b>6.47</b>	2.17	0.42	3.75	0.47	1.84	0.5	0.29	2.13	1.38	—
SS7	<b>7.96</b>	2.1	0.41	2.11	0.46	0.94	0.55	0.43	1.37	1.97	—
SS8	<b>25.6</b>	1.72	0.21	1.41	0.27	0.85	0.23	0.25	0.99	1.28	—
SS9	<b>7.02</b>	1.73	0.25	1.38	0.53	0.52	0.49	0.24	1.01	1.5	—
SS10	4.39	1.39	0.19	0.79	0.31	0.37	0.4	0.21	0.75	1.33	—
SS11	<b>46.5</b>	2.78	0.29	1.75	0.7	0.46	0.41	0.34	1.34	1.65	—
SS12	<b>13.9</b>	2.05	0.24	1.8	0.37	0.86	0.45	0.37	1.11	1.65	—
SS13	4.9	1.52	0.22	0.87	0.34	0.47	0.41	0.21	0.96	1.51	—
SS14	<b>13.2</b>	1.5	0.16	0.8	0.2	0.33	0.37	0.37	0.63	0.84	—
SS15	<b>15.1</b>	2.09	0.29	1.49	0.42	0.58	0.48	0.21	1.03	1.5	—
SS16	5.04	2.15	0.22	1.13	0.35	0.46	0.47	0.26	1.05	1.34	0.38
SS17	<b>14.7</b>	2.76	0.46	<b>6.03</b>	0.42	1.25	0.46	0.23	1.4	1.57	—
SS18	<b>41.4</b>	3.46	0.4	5.61	0.43	1.07	0.3	0.67	1.42	1.28	—
SS19	<b>26.6</b>	2.89	0.32	4.39	0.41	0.85	0.43	0.4	1.06	1.38	<b>6.88</b>
SS20	<b>37.5</b>	3.03	0.22	2.37	0.35	0.64	0.39	0.3	0.87	1.32	—
SS21	<b>30.1</b>	<b>6.28</b>	0.33	2.75	0.38	0.75	0.38	0.15	1.15	2.07	—
SS22	<b>5.03</b>	1.98	0.25	1.59	0.41	0.59	0.46	0.19	0.96	1.31	—
SS23	<b>4.17</b>	1.68	0.2	1.17	0.33	0.47	0.42	0.48	0.77	1.27	—
SS24	<b>4.49</b>	1.82	0.19	1.1	0.37	0.47	0.42	0.27	0.82	1.32	—
SS25	<b>4.89</b>	2.45	0.24	1.56	0.43	0.61	0.49	0.26	1.04	1.44	—
SS26	<b>4.6</b>	1.91	0.25	1.26	0.39	0.54	0.45	0.35	0.93	1.37	—
SS27	<b>5.96</b>	2.07	0.32	1.28	0.42	0.55	0.43	0.14	1.02	1.45	—

EF categories: insufficient to minimal enrichment (EF < 2), moderate enrichment (EF = 2-5), significant enrichment (EF = 5-20; indicated in bold), very high enrichment (EF = 20-40; indicated in bold red), and extremely high enrichment (EF > 40; indicated in bold purple)

**Table S4.** Enrichment factors (EF) for trace elements in studied samples calculated based on average values in reference soils (CS1 and CS2) using Al as a reference element.

Sample	Rb	Ba	Li	Cs	Be	Sr	Th	U	Zr	P	Sc	V	Cr	Co
A1	1.52	1.93	1.45	1.35	1.38	<b>5.88</b>	<b>16.7</b>	1.76	1.1	3.65	1.58	1.51	2.60	1.86
A2	1.37	1.65	1.3	1.26	1.38	4.8	<b>14.8</b>	1.62	1.25	3.25	1.52	1.39	2.14	1.71
A3	1.37	1.64	1.31	1.28	1.3	3.12	<b>19.9</b>	1.49	0.92	3.29	1.44	1.33	1.87	1.57
SS1	1.28	1.37	1.35	1.18	1.31	3.52	<b>8.04</b>	1.28	1.07	2.21	1.4	1.32	2.63	2.26
SS2	1.38	1.52	1.34	1.21	1.21	3.74	-	1.32	1.1	2.11	1.43	1.24	3.23	2.05
SS3	1.19	1.33	1.54	1.24	1.2	4.61	-	1.54	1.03	2.69	1.69	1.49	2.81	2.73
SS4	1.38	1.7	1.53	1.36	1.32	7.3	0.9	1.89	1.13	2.94	1.63	1.55	2.57	2.13
SS5	0.54	1.02	1.36	0.48	0.8	<b>6.87</b>	<b>50.4</b>	1.22	0.64	2.52	2.27	4.21	<b>20.7</b>	<b>7.84</b>
SS6	1.30	1.38	1.17	1.17	1.21	1.86	8.93	1.23	1.05	2.48	1.12	1.2	1.61	1.46
SS7	1.37	1.48	1.4	1.26	1.29	4.82	<b>16.3</b>	1.64	1.1	2.9	1.53	1.39	1.94	1.52
SS8	0.53	0.41	0.85	0.43	0.46	<b>8.74</b>	<b>18.9</b>	1.31	1.18	1.74	1.52	1.19	5.5	2.85
SS9	1.28	1.49	1.26	1.11	1.17	2.87	-	1.39	0.99	3.97	1.33	1.21	1.98	1.39
SS10	1.11	1.11	1.1	1.06	1.16	1.14	-	1.08	0.99	1.38	0.82	1.07	1.11	1.07
SS11	1.00	1.07	1.55	0.85	0.92	5.43	-	1.4	0.87	3.45	2.3	1.99	11.2	5.32
SS12	1.34	1.27	1.33	1.17	1.18	3.26	-	1.34	1	2.32	1.61	1.43	3.15	2.25
SS13	1.08	1.21	1.12	1.01	1.17	1.5	-	1.13	1.06	1.75	0.89	1.15	1.2	1.15
SS14	1.05	1.13	1.03	0.93	0.97	1.25	-	0.96	1	1.69	0.81	0.94	3.02	2.07
SS15	1.37	1.41	1.35	1.18	1.33	2.96	-	1.45	1.34	3.75	1.51	1.31	3.14	2.42
SS16	1.33	1.55	1.36	1.24	1.26	4.53	3.92	1.43	1.13	5.37	1.32	1.24	1.34	1.25
SS17	1.30	1.49	1.47	1.2	1.27	5.37	2.72	1.53	1.12	2.49	1.51	1.36	2.98	2.32
SS18	0.75	0.97	1.61	0.78	0.72	<b>6.31</b>	-	1.22	0.58	1.9	2.11	1.5	7.85	5.16
SS19	1.27	1.57	1.59	1.19	1.1	5.86	-	1.46	0.94	2.46	1.78	1.34	4.97	3.64
SS20	1.03	1.15	1.57	1	0.96	4.83	<b>6.73</b>	1.34	0.89	2.13	2.05	1.42	7.45	4.67
SS21	1.14	0.97	1.48	1.02	0.97	4.05	12.5	1.49	0.88	2.69	2.19	1.77	<b>6.25</b>	3.72
SS22	1.37	1.39	1.29	1.24	1.34	1.48	-	1.29	0.96	2.39	1.26	1.2	1.24	1.24
SS23	1.18	1.18	1.14	1.09	1.14	1.24	-	1.1	1.02	1.59	1.15	1.06	1.03	1.08
SS24	1.2	1.28	1.18	1.09	1.16	1.39	-	1.21	1.13	1.93	1.19	1.09	1.37	1.14
SS25	1.35	1.61	1.37	1.2	1.33	2.73	<b>6.34</b>	1.46	1.12	2.97	1.38	1.26	1.43	1.3
SS26	1.26	1.39	1.25	1.11	1.19	1.76	1.89	1.27	0.94	2.26	1.24	1.16	1.21	1.17
SS27	1.13	1.33	1.19	1.05	1.22	4.32	-	1.49	1.05	3.2	1.19	1.12	1.51	1.26

EF categories: insufficient to minimal enrichment (EF < 2), moderate enrichment (EF = 2-5), significant enrichment (EF = 5-20; indicated in bold), very high enrichment (EF = 20-40; indicated in bold red), and extremely high enrichment (EF > 40; indicated in bold purple)

Table S4. *Continued*

Sample	Ni	Cu	Cd	Zn	Mo	Pb	Ti	Bi	Sn	Sb	As	S
A1	2.30	3.47	<b>6.61</b>	<b>14.6</b>	3.01	<b>80.4</b>	1.60	1.86	<b>13.4</b>	<b>14.1</b>	1.7	<b>6.59</b>
A2	2.11	2.21	3.6	<b>6.2</b>	2.06	<b>17.5</b>	1.36	2.04	4.69	4.54	1.45	4.89
A3	1.84	1.88	2.97	4.21	1.86	<b>78.5</b>	1.5	2.19	<b>7.53</b>	<b>12.3</b>	1.2	3.43
SS1	3.37	1.3	1.85	2.85	1.41	1.49	<b>7.2</b>	0.91	1.77	1.44	1.47	1.61
SS2	3.55	1.47	2.22	<b>6.47</b>	1.29	3.58	2.25	2.83	<b>8.37</b>	1.75	1.18	1.43
SS3	4.66	2.92	<b>8.35</b>	<b>15.2</b>	2.32	<b>6.29</b>	2.09	3.48	<b>5.86</b>	3.55	1.57	3.19
SS4	3.20	2.33	<b>6.28</b>	18.1	2.8	<b>7.48</b>	2.00	3.52	<b>6.34</b>	3.79	2.00	4.88
SS5	<b>14.2</b>	2.45	3.1	3.55	2.5	2.85	1.44	4.06	1.78	2.38	3.57	4.18
SS6	1.61	1.38	2.59	4.45	1.7	5.31	1.32	1.25	2.88	2.81	1.13	3.2
SS7	1.97	1.33	2.53	2.51	1.68	2.71	1.46	1.89	1.93	1.8	1.62	3.97
SS8	<b>6.34</b>	1.1	1.28	1.67	0.97	2.46	0.62	1.07	0.93	1.31	1.05	4.18
SS9	1.74	1.1	1.56	1.64	1.94	1.52	1.30	1.03	1.41	1.32	1.23	3.2
SS10	1.09	0.89	1.2	0.94	1.14	1.08	1.06	0.93	1.09	0.98	1.09	1.22
SS11	<b>11.5</b>	1.77	1.79	2.07	2.53	1.34	1.08	1.49	1.21	1.77	1.35	4.56
SS12	3.46	1.3	1.48	2.14	1.33	2.48	1.20	1.62	1.45	1.46	1.35	2.56
SS13	1.22	0.97	1.36	1.04	1.25	1.36	1.08	0.9	1.13	1.27	1.24	2.09
SS14	3.27	0.95	0.99	0.95	0.72	0.94	0.98	1.6	1.01	0.83	0.69	1.43
SS15	3.75	1.33	1.78	1.76	1.53	1.68	1.27	0.91	1.35	1.35	1.23	4.6
SS16	1.25	1.37	1.36	1.34	1.28	1.33	1.25	1.11	1.34	1.39	1.10	2.71
SS17	3.65	1.76	2.85	<b>7.16</b>	1.53	3.6	1.21	1.01	2.48	1.85	1.29	2.48
SS18	<b>10.3</b>	2.2	2.46	<b>6.67</b>	1.57	3.11	0.80	2.93	2.11	1.87	1.05	2.57
SS19	<b>6.60</b>	1.84	2.02	5.21	1.5	2.47	1.14	1.76	2.2	1.4	1.13	2.21
SS20	<b>9.30</b>	1.93	1.38	2.82	1.29	1.86	1.03	1.29	1.57	1.15	1.08	2.12
SS21	<b>7.48</b>	4.00	2.06	3.27	1.38	2.18	1.00	0.65	2.01	1.52	1.70	2.77
SS22	1.25	1.26	1.54	1.89	1.48	1.71	1.22	0.83	1.43	1.26	1.07	2.61
SS23	1.04	1.07	1.23	1.39	1.18	1.35	1.11	2.1	1.13	1.01	1.04	1.62
SS24	1.12	1.16	1.2	1.31	1.33	1.36	1.11	1.19	1.15	1.07	1.08	2.11
SS25	1.21	1.56	1.48	1.85	1.57	1.77	1.30	1.12	1.42	1.37	1.18	2.87
SS26	1.14	1.22	1.54	1.5	1.41	1.56	1.18	1.51	1.29	1.22	1.12	3.01
SS27	1.48	1.32	1.99	1.52	1.51	1.59	1.14	0.59	1.19	1.34	1.19	3.63

EF categories: insufficient to minimal enrichment (EF < 2), moderate enrichment (EF = 2-5), significant enrichment (EF = 5-20; indicated in bold), very high enrichment (EF = 20-40; indicated in bold red), and extremely high enrichment (EF > 40; indicated in bold purple)

**Table S5.** Enrichment factors (EF) for rare earth elements in studied samples calculated based on UCC values [34] using Al as a reference element.

Sample	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Y	Ho	Er	Tm	Yb	Lu
<b>A1</b>	1.61	1.58	1.74	1.74	2.02	2.13	2.13	1.71	1.91	1.89	1.88	1.83	2.15	1.92	1.95
<b>A2</b>	1.56	1.52	1.69	1.64	2.04	2.19	1.94	1.70	1.86	1.83	1.73	1.78	2.18	1.86	1.83
<b>A3</b>	1.48	1.50	1.61	1.66	1.98	1.98	1.95	1.63	1.78	1.79	1.80	1.79	1.99	1.94	1.79
<b>SS1</b>	1.30	1.29	1.40	1.40	1.67	1.67	1.75	1.38	1.54	1.59	1.54	1.56	1.65	1.67	1.60
<b>SS2</b>	1.35	1.32	1.49	1.49	1.76	1.85	1.70	1.47	1.63	1.62	1.53	1.51	1.75	1.65	1.64
<b>SS3</b>	1.31	1.30	1.40	1.47	1.64	1.74	1.67	1.46	1.62	1.64	1.58	1.60	1.92	1.60	1.64
<b>SS4</b>	1.47	1.48	1.59	1.60	1.89	1.92	2.01	1.62	1.77	1.82	1.71	1.80	2.02	1.80	1.82
<b>SS5</b>	0.97	0.89	0.99	1.05	1.20	1.39	1.29	1.13	1.18	1.24	1.17	1.23	1.41	1.23	1.27
<b>SS6</b>	1.33	1.38	1.51	1.49	1.81	1.86	1.76	1.56	1.67	1.71	1.68	1.57	1.74	1.73	1.66
<b>SS7</b>	1.56	1.52	1.67	1.71	2.05	1.98	1.96	1.64	1.88	1.94	1.81	1.69	2.04	1.87	1.91
<b>SS8</b>	0.66	0.60	0.68	0.71	0.89	0.97	0.86	0.74	0.84	0.88	0.77	0.85	0.91	0.78	0.78
<b>SS9</b>	1.39	1.28	1.37	1.37	1.61	1.63	1.68	1.35	1.48	1.52	1.45	1.47	1.75	1.49	1.48
<b>SS10</b>	1.08	1.09	1.23	1.25	1.47	1.48	1.63	1.25	1.35	1.30	1.33	1.32	1.49	1.39	1.37
<b>SS11</b>	1.26	1.16	1.34	1.31	1.75	1.84	1.59	1.38	1.63	1.62	1.67	1.57	1.81	1.60	1.68
<b>SS12</b>	1.39	1.38	1.50	1.48	1.76	1.86	1.77	1.59	1.73	1.72	1.66	1.66	1.93	1.82	1.79
<b>SS13</b>	1.09	1.14	1.25	1.26	1.60	1.59	1.56	1.28	1.38	1.37	1.39	1.35	1.51	1.52	1.33
<b>SS14</b>	0.93	1.00	1.04	1.03	1.24	1.37	1.25	1.06	1.16	1.13	1.18	1.17	1.31	1.25	1.11
<b>SS15</b>	1.47	1.48	1.60	1.65	1.98	2.01	1.98	1.69	1.80	1.79	1.78	1.70	1.98	1.89	1.87
<b>SS16</b>	1.39	1.39	1.51	1.52	1.80	1.88	1.88	1.55	1.71	1.69	1.62	1.64	1.81	1.67	1.65
<b>SS17</b>	1.34	1.34	1.47	1.49	1.81	1.82	1.76	1.53	1.69	1.69	1.64	1.72	1.89	1.68	1.71
<b>SS18</b>	0.98	0.95	1.03	1.03	1.20	1.48	1.36	1.08	1.21	1.22	1.19	1.12	1.40	1.25	1.27
<b>SS19</b>	1.22	1.22	1.38	1.35	1.61	1.68	1.68	1.44	1.53	1.51	1.46	1.57	1.74	1.56	1.62
<b>SS20</b>	1.22	1.26	1.31	1.31	1.47	1.76	1.68	1.36	1.48	1.49	1.46	1.57	1.65	1.65	1.69
<b>SS21</b>	1.15	1.11	1.23	1.21	1.44	1.66	1.51	1.28	1.43	1.46	1.43	1.40	1.68	1.45	1.54
<b>SS22</b>	1.42	1.42	1.54	1.54	1.85	1.91	1.88	1.60	1.66	1.66	1.62	1.64	1.92	1.74	1.73
<b>SS23</b>	1.27	1.29	1.39	1.41	1.65	1.66	1.62	1.37	1.45	1.47	1.47	1.44	1.62	1.59	1.58
<b>SS24</b>	1.23	1.24	1.24	1.21	1.22	1.20	1.28	1.11	1.16	1.17	1.18	1.17	1.15	1.11	1.12
<b>SS25</b>	1.57	1.58	1.70	1.72	2.00	2.09	1.88	1.68	1.80	1.79	1.72	1.78	1.96	2.04	1.89
<b>SS26</b>	1.45	1.45	1.56	1.55	1.90	1.92	1.90	1.51	1.65	1.64	1.63	1.66	1.83	1.66	1.69
<b>SS27</b>	1.32	1.32	1.46	1.48	1.72	1.80	1.77	1.42	1.56	1.57	1.52	1.52	1.69	1.58	1.67

EF categories: insufficient to minimal enrichment (EF < 2), moderate enrichment (EF = 2-5), significant enrichment (EF = 5-20; indicated in bold), very high enrichment (EF = 20-40; indicated in bold red), and extremely high enrichment (EF >40; indicated in bold purple)



**Table S6.** Enrichment factors (EF) for rare earth elements in studied samples calculated based on average values in reference soils (CS1 and CS2) using Al as a reference element.

Sample	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Y	Ho	Er	Tm	Yb	Lu
A1	1.43	1.42	1.43	1.42	1.39	1.37	1.49	1.37	1.40	1.41	1.40	1.35	1.47	1.30	1.37
A2	1.39	1.38	1.39	1.33	1.40	1.40	1.36	1.37	1.37	1.37	1.29	1.32	1.49	1.26	1.29
A3	1.32	1.35	1.33	1.35	1.36	1.27	1.36	1.31	1.31	1.33	1.34	1.32	1.36	1.31	1.26
SS1	1.16	1.17	1.16	1.14	1.15	1.07	1.22	1.11	1.14	1.18	1.15	1.15	1.12	1.13	1.13
SS2	1.20	1.19	1.23	1.22	1.21	1.19	1.18	1.18	1.20	1.21	1.14	1.12	1.19	1.12	1.16
SS3	1.16	1.18	1.16	1.20	1.13	1.12	1.17	1.17	1.19	1.23	1.17	1.18	1.31	1.08	1.15
SS4	1.30	1.33	1.31	1.30	1.30	1.23	1.40	1.30	1.31	1.36	1.28	1.33	1.38	1.22	0.76
SS5	0.86	0.80	0.81	0.85	0.82	0.89	0.90	0.91	0.87	0.93	0.87	0.91	0.96	0.83	0.90
SS6	1.18	1.24	1.24	1.21	1.25	1.20	1.23	1.25	1.23	1.27	1.25	1.16	1.18	1.17	1.17
SS7	1.38	1.37	1.38	1.39	1.41	1.27	1.37	1.32	1.38	1.45	1.35	1.25	1.39	1.27	1.34
SS8	0.59	0.55	0.56	0.58	0.61	0.62	0.60	0.60	0.62	0.66	0.58	0.63	0.62	0.53	0.55
SS9	1.23	1.15	1.12	1.12	1.11	1.04	1.17	1.08	1.09	1.14	1.08	1.08	1.19	1.01	1.04
SS10	0.95	0.98	1.01	1.02	1.01	0.95	1.14	1.00	1.00	0.97	0.99	0.97	1.02	0.94	0.96
SS11	1.12	1.05	1.10	1.06	1.20	1.18	1.11	1.11	1.20	1.21	1.24	1.16	1.23	1.08	1.19
SS12	1.23	1.24	1.23	1.21	1.21	1.19	1.24	1.27	1.28	1.29	1.24	1.23	1.31	1.23	1.26
SS13	0.97	1.03	1.03	1.02	1.10	1.02	1.09	1.03	1.01	1.02	1.04	1.00	1.03	1.03	0.94
SS14	0.82	0.90	0.86	0.84	0.85	0.88	0.87	0.85	0.85	0.84	0.88	0.87	0.89	0.84	0.78
SS15	1.24	1.27	1.25	1.27	1.29	1.22	1.31	1.29	1.26	1.26	1.25	1.19	1.27	1.21	1.25
SS16	1.23	1.26	1.24	1.24	1.24	1.21	1.31	1.25	1.26	1.26	1.21	1.21	1.23	1.13	1.16
SS17	1.19	1.21	1.21	1.22	1.25	1.17	1.23	1.23	1.25	1.26	1.23	1.27	1.29	1.14	1.20
SS18	0.87	0.85	0.84	0.84	0.82	0.95	0.95	0.87	0.89	0.91	0.89	0.83	0.95	0.84	0.90
SS19	1.08	1.10	1.13	1.10	1.11	1.08	1.17	1.16	1.13	1.13	1.09	1.16	1.18	1.06	1.14
SS20	1.08	1.14	1.08	1.06	1.01	1.13	1.17	1.09	1.09	1.12	1.09	1.16	1.12	1.11	1.19
SS21	1.02	1.00	1.01	0.98	0.99	1.07	1.05	1.03	1.05	1.09	1.07	1.03	1.15	0.98	1.08
SS22	1.26	1.28	1.27	1.25	1.27	1.22	1.32	1.29	1.22	1.24	1.20	1.21	1.31	1.18	1.22
SS23	1.13	1.16	1.15	1.15	1.13	1.06	1.13	1.10	1.07	1.10	1.10	1.06	1.10	1.08	1.11
SS24	1.23	1.24	1.24	1.21	1.22	1.20	1.28	1.11	1.16	1.17	1.18	1.17	1.15	1.11	1.12
SS25	1.39	1.42	1.40	1.40	1.37	1.34	1.31	1.35	1.32	1.33	1.28	1.31	1.33	1.38	1.33
SS26	1.28	1.30	1.28	1.26	1.31	1.23	1.33	1.21	1.21	1.23	1.22	1.22	1.24	1.12	1.19
SS27	1.17	1.19	1.20	1.20	1.18	1.15	1.24	1.14	1.14	1.18	1.13	1.12	1.15	1.07	1.18

EF categories: insufficient to minimal enrichment (EF < 2), moderate enrichment (EF = 2-5), significant enrichment (EF = 5-20; indicated in bold), very high enrichment (EF = 20-40; indicated in bold red), and extremely high enrichment (EF > 40; indicated in bold purple)

**Table S7.** Geoaccumulation indices ( $I_{\text{geo}}$ ) for trace elements in studied samples calculated based on soil world average soil values [33].

Samples	Rb	Ba	Li	Cs	Be	Sr	Th	U	Zr	Sc	V	Cr	Co
A1	-1.07	-1.28	-1.03	-2.44	-1.68	-0.39	0.63	-2.2	-2.68	-0.59	-0.22	2.14	0.87
A2	-1.04	-1.32	-1	-2.36	-1.5	-0.49	0.63	-2.13	-2.31	-0.45	-0.15	2.05	0.94
A3	-0.71	-1.01	-0.68	-2.01	-1.26	-0.79	1.38	-1.93	-2.42	-0.21	0.1	2.17	1.15
SS1	-0.6	-1.05	-0.41	-1.91	-1.03	-0.41	0.29	-1.94	-1.99	-0.04	0.31	2.88	1.88
SS2	-0.56	-0.97	-0.49	-1.94	-1.21	-0.39	-	-1.96	-2.02	-0.07	0.15	<b>3.11</b>	1.68
SS3	-1.37	-1.76	-0.88	-2.51	-1.81	-0.68	-	-2.33	-2.71	-0.42	-0.18	2.32	1.5
SS4	-1.24	-1.49	-0.98	-2.46	-1.78	-0.11	-3.62	-2.13	-2.66	-0.57	-0.22	2.09	1.05
SS5	-3.28	-2.9	-1.82	-4.63	-3.16	-0.87	1.51	-3.43	-4.17	-0.76	0.56	<b>4.44</b>	2.25
SS6	-0.24	-0.71	-0.28	-1.59	-0.81	-0.99	0.77	-1.65	-1.68	-0.02	0.51	2.51	1.59
SS7	-0.78	-1.22	-0.64	-2.1	-1.34	-0.23	1.02	-1.86	-2.23	-0.19	0.1	2.16	1.03
SS8	-2.37	-3.27	-1.57	-3.86	-3.03	0.41	1.02	-2.39	-2.34	-0.41	-0.33	<b>3.46</b>	1.73
SS9	-0.6	-1.05	-0.41	-1.91	-1.03	-0.41	0.29	-1.94	-1.99	-0.04	0.31	2.88	1.88
SS10	-0.13	-0.69	-0.03	-1.4	-0.53	-1.37	-	-1.51	-1.43	-0.14	0.68	2.32	1.47
SS11	-1.8	-2.25	-1.06	-3.24	-2.39	-0.63	-	-2.66	-3.14	-0.17	0.06	<b>4.12</b>	2.27
SS12	-0.6	-1.22	-0.5	-1.99	-1.25	-0.58	-	-1.94	-2.16	0.1	0.36	<b>3.08</b>	1.81
SS13	-0.26	-0.65	-0.11	-1.55	-0.62	-1.06	-	-1.53	-1.43	-0.11	0.7	2.34	1.49
SS14	-0.6	-1.05	-0.52	-1.98	-1.19	-1.61	-	-2.08	-1.81	-0.55	0.1	<b>3.36</b>	2.04
SS15	-0.72	-1.23	-0.63	-2.13	-1.23	-0.88	-	-1.98	-1.88	-0.14	0.09	2.92	1.77
SS16	-0.6	-0.94	-0.46	-1.91	-1.15	-0.1	-0.81	-1.84	-1.98	-0.18	0.16	1.84	0.96
SS17	-0.92	-1.27	-0.63	-2.23	-1.42	-0.14	-1.62	-2.02	-2.27	-0.27	0.02	2.72	1.58
SS18	-2.18	-2.37	-0.97	-3.32	-2.71	-0.38	-	-2.82	-3.68	-0.26	-0.31	<b>3.65</b>	2.26
SS19	-1.03	-1.29	-0.61	-2.33	-1.71	-0.1	-	-2.18	-2.6	-0.12	-0.1	<b>3.37</b>	2.15
SS20	-1.55	-1.95	-0.84	-2.81	-2.14	-0.6	-0.62	-2.53	-2.91	-0.14	-0.23	<b>3.74</b>	2.28
SS21	-1.21	-2.01	-0.74	-2.57	-1.92	-0.66	0.47	-2.18	-2.73	0.15	0.28	<b>3.68</b>	2.15
SS22	-0.01	-0.54	0.02	-1.35	-0.51	-1.17	-	-1.44	-1.66	0.3	0.66	2.29	1.51
SS23	-0.03	-0.59	0.03	-1.35	-0.56	-1.24	-	-1.48	-1.39	0.36	0.68	2.21	1.5
SS24	-0.09	-0.55	-0.01	-1.44	-0.62	-1.15	-	-1.42	-1.32	0.32	0.63	2.54	1.5
SS25	-0.76	-1.07	-0.63	-2.13	-1.25	-1.02	-0.3	-1.99	-2.17	-0.3	0	1.76	0.84
SS26	-0.12	-0.53	-0.02	-1.51	-0.66	-0.9	-1.3	-1.45	-1.67	0.29	0.63	2.27	1.44
SS27	-0.86	-1.17	-0.67	-2.17	-1.21	-0.19	-	-1.79	-2.10	-0.35	-0.01	2.00	0.96

$I_{\text{geo}}$  classes: practically uncontaminated ( $I_{\text{geo}} \leq 0$ ), uncontaminated to moderately contaminated ( $0 < I_{\text{geo}} < 1$ ), moderately contaminated ( $1 < I_{\text{geo}} < 2$ ), moderately to heavily contaminated ( $2 < I_{\text{geo}} < 3$ ), heavily contaminated ( $3 < I_{\text{geo}} < 4$ ; indicated in bold), heavily to extremely contaminated ( $4 < I_{\text{geo}} < 5$ ; indicated in bold red), and extremely contaminated ( $I_{\text{geo}} > 5$ ; indicated in bold purple)

Table S7. Continued

Samples	Ni	Cu	Cd	Zn	Mo	Pb	Tl	Bi	Sb	As	Cl
A1	2.24	1.47	-0.88	2.65	-1.25	<b>3.83</b>	-1.69	-2.2	2.45	0.08	—
A2	2.3	1.01	-1.57	1.6	-1.6	1.82	-1.74	-1.87	1.01	0.04	—
A3	2.43	1.10	-1.53	1.37	-1.43	<b>4.30</b>	-1.27	-1.45	2.77	0.09	—
SS1	<b>3.52</b>	0.79	-1.99	1.02	-1.61	-1.2	1.2	-2.5	-0.12	0.59	-9.15
SS2	<b>3.53</b>	0.90	-1.8	2.13	-1.8	-	-0.54	-0.93	0.10	0.21	—
SS3	<b>3.33</b>	1.29	-0.48	2.77	-1.55	0.22	-1.24	-1.23	0.53	0.03	—
SS4	2.69	0.88	-0.98	2.93	-1.37	0.37	-1.4	-1.3	0.53	0.29	—
SS5	<b>4.17</b>	0.28	-2.67	-0.09	-2.21	-1.69	-2.55	-1.77	-0.81	0.45	—
SS6	2.79	1.21	-1.18	2	-1.01	0.97	-0.92	-1.71	1.18	0.55	—
SS7	2.47	0.54	-1.83	0.55	-1.64	-0.62	-1.38	-1.73	-0.08	0.45	—
SS8	<b>3.94</b>	0.05	-3.01	-0.24	-2.63	-0.97	-2.83	-2.76	-0.75	-0.38	—
SS9	<b>3.52</b>	0.79	-1.99	1.02	-1.61	-1.20	1.2	-2.5	-0.12	0.59	-9.15
SS10	2.56	0.91	-1.95	0.09	-1.25	-1.00	-0.89	-1.8	0.01	0.84	—
SS11	<b>4.45</b>	0.38	-2.89	-0.29	-1.61	-2.21	-2.38	-2.64	-0.67	-0.37	—
SS12	<b>3.49</b>	0.72	-2.38	0.54	-1.76	-0.53	-1.45	-1.74	-0.16	0.41	—
SS13	2.63	0.94	-1.85	0.14	-1.21	-0.76	-0.95	-1.94	0.28	0.93	—
SS14	<b>3.76</b>	0.62	-2.61	-0.29	-2.3	-1.58	-1.4	-1.4	-0.64	-0.21	—
SS15	<b>3.46</b>	0.60	-2.27	0.11	-1.71	-1.24	-1.51	-2.72	-0.43	0.12	—
SS16	2.03	0.80	-2.5	-0.13	-1.81	-1.43	-1.39	-2.28	-0.23	0.12	-1.69
SS17	<b>3.29</b>	0.88	-1.72	2.01	-1.83	-0.27	-1.71	-2.69	-0.10	0.07	—
SS18	<b>4.32</b>	0.73	-2.39	1.43	-2.27	-0.95	-2.78	-1.63	-0.55	-0.7	—
SS19	<b>4.06</b>	0.86	-2.3	1.46	-1.95	-0.90	-1.88	-1.98	-0.58	-0.21	2.11
SS20	<b>4.33</b>	0.71	-3.07	0.35	-2.39	-1.53	-2.25	-2.65	-1.09	-0.49	—
SS21	<b>4.21</b>	1.95	-2.3	0.76	-2.09	-1.11	-2.11	-3.44	-0.50	0.35	—
SS22	2.57	1.23	-1.77	0.91	-1.05	-0.52	-0.87	-2.14	0.18	0.63	—
SS23	2.50	1.18	-1.91	0.66	-1.19	-0.67	-0.82	-0.62	0.05	0.78	—
SS24	2.52	1.22	-2.02	0.49	-1.10	-0.74	-0.9	-1.52	0.06	0.75	—
SS25	1.80	0.80	-2.55	0.15	-1.70	-1.19	-1.51	-2.44	-0.43	0.04	—
SS26	2.46	1.19	-1.75	0.59	-1.10	-0.63	-0.91	-1.27	0.15	0.71	—
SS27	2.25	0.72	-1.97	0.03	-1.59	-1.19	-1.53	-3.20	-0.30	0.22	—

$I_{\text{geo}}$  classes: practically uncontaminated ( $I_{\text{geo}} \leq 0$ ), uncontaminated to moderately contaminated ( $0 < I_{\text{geo}} < 1$ ), moderately contaminated ( $1 < I_{\text{geo}} < 2$ ), moderately to heavily contaminated ( $2 < I_{\text{geo}} < 3$ ), heavily contaminated ( $3 < I_{\text{geo}} < 4$ ; indicated in bold), heavily to extremely contaminated ( $4 < I_{\text{geo}} < 5$ ; indicated in bold red), and extremely contaminated ( $I_{\text{geo}} > 5$ ; indicated in bold purple)

**Table S8.** Geoaccumulation indices ( $I_{\text{geo}}$ ) for trace elements in studied samples calculated based on average values in reference soils (CS1 and CS2).

Samples	Rb	Ba	Li	Cs	Be	Sr	Th	U	Zr	P	Sc	V	Cr	Co
A1	0.13	0.26	-0.19	0.16	-0.03	-0.61	-0.86	-0.20	-0.21	-0.31	-0.91	-0.57	-2.30	-1.88
A2	0.16	0.23	-0.16	0.25	0.16	-0.71	-0.86	-0.12	0.17	-0.29	-0.78	-0.50	-2.39	-1.81
A3	0.49	0.54	0.17	0.60	0.39	-1.01	-0.11	0.07	0.05	0.05	-0.54	-0.24	-2.26	-1.61
SS1	0.61	0.49	0.43	0.70	0.62	-0.62	-1.20	0.07	0.48	-0.31	-0.37	-0.03	-1.55	-0.87
SS2	0.65	0.58	0.36	0.67	0.44	-0.60	—	0.04	0.45	-0.44	-0.40	-0.19	-1.32	-1.07
SS3	-0.16	-0.21	-0.04	0.10	-0.16	-0.89	—	-0.32	-0.23	-0.69	-0.75	-0.52	-2.12	-1.25
SS4	-0.04	0.05	-0.14	0.14	-0.12	-0.32	-5.11	-0.13	-0.19	-0.65	-0.89	-0.56	-2.34	-1.70
SS5	-2.08	-1.36	-0.98	-2.02	-1.51	-1.08	0.02	-1.43	-1.70	-1.55	-1.09	0.22	0.00	-0.50
SS6	0.96	0.84	0.56	1.02	0.84	-1.20	-0.72	0.35	0.79	0.19	-0.35	0.17	-1.93	-1.16
SS7	0.42	0.32	0.20	0.51	0.32	-0.45	-0.46	0.14	0.25	-0.20	-0.52	-0.24	-2.28	-1.72
SS8	-1.17	-1.72	-0.72	-1.25	-1.37	0.20	-0.46	-0.39	0.14	-1.14	-0.74	-0.67	-0.98	-1.02
SS9	0.47	0.48	0.19	0.47	0.32	-1.05	—	0.05	0.23	0.40	-0.57	-0.29	-2.10	-1.70
SS10	1.07	0.86	0.81	1.21	1.12	-1.58	—	0.49	1.04	-0.32	-0.46	0.34	-2.12	-1.28
SS11	-0.60	-0.71	-0.22	-0.63	-0.74	-0.84	—	-0.65	-0.67	-0.51	-0.49	-0.29	-0.31	-0.48
SS12	0.60	0.32	0.35	0.62	0.40	-0.80	—	0.07	0.32	-0.30	-0.23	0.02	-1.36	-0.94
SS13	0.94	0.90	0.74	1.06	1.03	-1.27	—	0.47	1.04	-0.06	-0.44	0.35	-2.10	-1.26
SS14	0.60	0.49	0.32	0.63	0.47	-1.83	—	-0.07	0.66	-0.41	-0.87	-0.24	-1.07	-0.71
SS15	0.48	0.32	0.21	0.47	0.42	-1.09	—	0.03	0.59	0.23	-0.47	-0.26	-1.51	-0.99
SS16	0.60	0.61	0.38	0.70	0.50	-0.32	-2.30	0.16	0.49	0.91	-0.51	-0.18	-2.59	-1.79
SS17	0.28	0.27	0.21	0.37	0.24	-0.36	-3.11	-0.01	0.20	-0.48	-0.60	-0.33	-1.71	-1.17
SS18	-0.98	-0.82	-0.13	-0.72	-1.06	-0.59	—	-0.82	-1.21	-1.34	-0.58	-0.66	-0.79	-0.49
SS19	0.17	0.26	0.24	0.28	-0.06	-0.31	—	-0.17	-0.13	-0.58	-0.44	-0.44	-1.06	-0.60
SS20	-0.35	-0.40	0.00	-0.20	-0.48	-0.81	-2.11	-0.52	-0.43	-1.01	-0.47	-0.58	-0.70	-0.47
SS21	-0.01	-0.46	0.10	0.03	-0.27	-0.87	-1.02	-0.17	-0.25	-0.48	-0.17	-0.06	-0.76	-0.60
SS22	1.20	1.01	0.86	1.25	1.15	-1.38	—	0.57	0.81	0.29	-0.02	0.31	-2.15	-1.24
SS23	1.17	0.96	0.87	1.26	1.10	-1.45	—	0.53	1.09	-0.11	0.03	0.34	-2.22	-1.25
SS24	1.11	1.00	0.84	1.17	1.04	-1.37	—	0.58	1.15	0.09	-0.01	0.28	-1.90	-1.25
SS25	0.44	0.48	0.21	0.48	0.41	-1.23	-1.79	0.02	0.30	-0.12	-0.63	-0.34	-2.68	-1.91
SS26	1.08	1.02	0.82	1.10	0.99	-1.12	-2.79	0.56	0.80	0.23	-0.04	0.29	-2.17	-1.31
SS27	0.35	0.38	0.17	0.44	0.44	-0.41	—	0.21	0.37	0.14	-0.67	-0.35	-2.43	-1.79

$I_{\text{geo}}$  classes: practically uncontaminated ( $I_{\text{geo}} \leq 0$ ), uncontaminated to moderately contaminated ( $0 < I_{\text{geo}} < 1$ ), moderately contaminated ( $1 < I_{\text{geo}} < 2$ ), moderately to heavily contaminated ( $2 < I_{\text{geo}} < 3$ ), heavily contaminated ( $3 < I_{\text{geo}} < 4$ ; indicated in bold), heavily to extremely contaminated ( $4 < I_{\text{geo}} < 5$ ; indicated in bold red), and extremely contaminated ( $I_{\text{geo}} > 5$ ; indicated in bold purple)

Table S8. *Continued*

Samples	Ni	Cu	Cd	Zn	Mo	Pb	Tl	Bi	Sn	Sb	As	S
A1	-2.47	0.29	1.62	2.46	0.39	5.63	0.25	-0.39	3.07	3.19	-0.14	0.07
A2	-2.41	-0.17	0.94	1.41	0.03	3.63	0.2	-0.06	1.74	1.75	-0.18	-0.17
A3	-2.29	-0.08	0.98	1.17	0.21	6.11	0.67	0.36	2.75	3.51	-0.12	-0.36
SS1	-1.19	-0.4	0.51	0.82	0.02	0.61	3.15	-0.69	0.88	0.63	0.38	-1.23
SS2	-1.19	-0.29	0.71	1.94	-0.17	1.8	1.4	0.88	3.05	0.84	0	-1.47
SS3	-1.39	0.11	2.03	2.58	0.08	2.02	0.7	0.59	1.94	1.27	-0.19	-0.91
SS4	-2.02	-0.31	1.52	2.73	0.26	2.18	0.55	0.51	1.96	1.27	0.07	-0.39
SS5	-0.55	-0.91	-0.16	-0.28	-0.57	0.12	-0.6	0.04	-0.55	-0.07	0.23	-1.28
SS6	-1.93	0.03	1.33	1.8	0.62	2.78	1.03	0.1	1.91	1.93	0.33	0.09
SS7	-2.25	-0.64	0.68	0.36	-0.01	1.19	0.56	0.08	0.71	0.67	0.24	-0.22
SS8	-0.77	-1.13	-0.5	-0.44	-1	0.84	-0.89	-0.95	-0.54	0	-0.6	-0.35
SS9	-2.28	-0.78	0.13	-0.11	0.34	0.49	0.54	-0.64	0.41	0.37	-0.01	-0.38
SS10	-2.15	-0.28	0.56	-0.11	0.39	0.81	1.05	0.02	0.85	0.75	0.62	-0.96
SS11	-0.27	-0.8	-0.38	-0.48	0.02	-0.4	-0.43	-0.83	-0.52	0.08	-0.59	-0.58
SS12	-1.22	-0.46	0.12	0.34	-0.12	1.27	0.49	0.07	0.52	0.58	0.19	-0.63
SS13	-2.09	-0.24	0.65	-0.05	0.43	1.05	0.99	-0.13	0.81	1.03	0.72	-0.28
SS14	-0.96	-0.57	-0.1	-0.48	-0.66	0.23	0.55	0.41	0.35	0.11	-0.43	-1.12
SS15	-1.26	-0.58	0.24	-0.08	-0.07	0.56	0.43	-0.91	0.27	0.32	-0.1	0.06
SS16	-2.69	-0.38	0.01	-0.33	-0.18	0.38	0.55	-0.47	0.41	0.52	-0.1	-0.54
SS17	-1.42	-0.3	0.79	1.81	-0.2	1.54	0.23	-0.88	1.02	0.65	-0.15	-0.95
SS18	-0.4	-0.45	0.11	1.24	-0.63	0.85	-0.84	0.18	0.31	0.19	-0.92	-1.37
SS19	-0.65	-0.32	0.21	1.27	-0.32	0.91	0.06	-0.17	0.76	0.16	-0.43	-1.21
SS20	-0.38	-0.48	-0.56	0.16	-0.76	0.28	-0.31	-0.84	0.05	-0.34	-0.71	-1.49
SS21	-0.50	0.77	0.21	0.57	-0.46	0.7	-0.16	-1.63	0.61	0.25	0.13	-0.91
SS22	-2.14	0.04	0.74	0.72	0.59	1.29	1.07	-0.33	1.05	0.93	0.41	-0.05
SS23	-2.22	0	0.6	0.46	0.45	1.14	1.13	1.19	0.9	0.8	0.57	-0.55
SS24	-2.2	0.03	0.48	0.3	0.54	1.07	1.04	0.29	0.85	0.81	0.53	-0.25
SS25	-2.91	-0.38	-0.05	-0.04	-0.07	0.61	0.43	-0.63	0.32	0.32	-0.18	-0.65
SS26	-2.25	0.01	0.76	0.4	0.53	1.17	1.04	0.54	0.92	0.89	0.49	0.17
SS27	-2.46	-0.46	0.54	-0.16	0.05	0.62	0.41	-1.39	0.22	0.44	0	-0.14

$I_{\text{geo}}$  classes: practically uncontaminated ( $I_{\text{geo}} \leq 0$ ), uncontaminated to moderately contaminated ( $0 < I_{\text{geo}} < 1$ ), moderately contaminated ( $1 < I_{\text{geo}} < 2$ ), moderately to heavily contaminated ( $2 < I_{\text{geo}} < 3$ ), heavily contaminated ( $3 < I_{\text{geo}} < 4$ ; indicated in bold), heavily to extremely contaminated ( $4 < I_{\text{geo}} < 5$ ; indicated in bold red), and extremely contaminated ( $I_{\text{geo}} > 5$ ; indicated in bold purple)

**Table S9.** Geoaccumulation indices ( $I_{geo}$ ) for REEs in studied samples calculated based on UCC values [34].

Samples	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Y	Ho	Er	Tm	Yb	Lu
A1	-1.06	-0.98	-1.30	-0.69	-0.39	-1.17	-0.05	-0.42	1.41	-0.28	-1.50	-0.61	-1.51	-1.13	-1.17
A2	-0.91	-0.84	-1.15	-0.59	-0.18	-0.94	0.01	-0.23	1.56	-0.13	-1.43	-0.45	-1.30	-0.98	-1.07
A3	-0.67	-0.54	-0.90	-0.25	0.10	-0.77	0.34	0.02	1.82	0.15	-1.05	-0.13	-1.11	-0.60	-0.78
SS1	-0.64	-0.54	-0.88	-0.28	0.07	-0.79	0.39	0.00	1.83	0.20	-1.05	-0.11	-1.17	-0.60	-0.72
SS2	-0.65	-0.57	-0.86	-0.25	0.08	-0.71	0.28	0.02	1.84	0.16	-1.13	-0.22	-1.15	-0.69	-0.76
SS3	-1.29	-1.19	-1.54	-0.87	-0.62	-1.40	-0.33	-0.58	1.24	-0.41	-1.68	-0.73	-1.61	-1.33	-1.36
SS4	-1.22	-1.10	-1.45	-0.84	-0.51	-1.35	-0.16	-0.53	1.28	-0.35	-1.66	-0.66	-1.63	-1.25	-1.30
SS5	-2.48	-2.51	-2.82	-2.12	-1.84	-2.48	-1.47	-1.72	0.02	-1.58	-2.88	-1.87	-2.82	-2.47	-2.48
SS6	-0.27	-0.11	-0.45	0.15	0.52	-0.30	0.74	0.51	2.28	0.64	-0.60	0.23	-0.76	-0.22	-0.34
SS7	-0.66	-0.59	-0.91	-0.28	0.08	-0.83	0.28	-0.03	1.83	0.21	-1.10	-0.27	-1.15	-0.72	-0.75
SS8	-2.11	-2.13	-2.43	-1.76	-1.33	-2.07	-1.12	-1.39	0.46	-1.14	-2.54	-1.48	-2.52	-2.19	-2.26
SS9	-0.68	-0.56	-0.92	-0.31	0.02	-0.83	0.34	-0.04	1.77	0.14	-1.14	-0.20	-1.08	-0.77	-0.84
SS10	-0.24	-0.11	-0.41	0.23	0.55	-0.30	0.97	0.53	2.31	0.59	-0.60	0.32	-0.64	-0.20	-0.28
SS11	-1.54	-1.54	-1.80	-1.23	-0.71	-1.50	-0.59	-0.85	1.06	-0.62	-1.79	-0.95	-1.88	-1.51	-1.50
SS12	-0.61	-0.52	-0.86	-0.27	0.08	-0.71	0.35	0.13	1.93	0.25	-1.02	-0.08	-1.01	-0.55	-0.64
SS13	-0.31	-0.15	-0.47	0.14	0.59	-0.29	0.82	0.47	2.25	0.57	-0.62	0.26	-0.72	-0.16	-0.41
SS14	-0.85	-0.63	-1.03	-0.44	-0.08	-0.80	0.19	-0.10	1.70	-0.01	-1.16	-0.24	-1.22	-0.74	-0.97
SS15	-0.68	-0.56	-0.91	-0.26	0.10	-0.75	0.36	0.08	1.84	0.16	-1.07	-0.20	-1.12	-0.64	-0.72
SS16	-0.61	-0.49	-0.84	-0.22	0.11	-0.69	0.44	0.11	1.92	0.23	-1.04	-0.09	-1.09	-0.67	-0.74
SS17	-0.94	-0.83	-1.16	-0.53	-0.16	-1.01	0.06	-0.19	1.62	-0.05	-1.30	-0.31	-1.31	-0.93	-0.98
SS18	-1.86	-1.80	-2.15	-1.53	-1.23	-1.78	-0.78	-1.16	0.67	-0.99	-2.24	-1.40	-2.22	-1.84	-1.87
SS19	-1.16	-1.05	-1.34	-0.76	-0.41	-1.21	-0.09	-0.37	1.40	-0.30	-1.56	-0.52	-1.52	-1.13	-1.14
SS20	-1.38	-1.23	-1.64	-1.03	-0.76	-1.37	-0.31	-0.67	1.12	-0.54	-1.78	-0.75	-1.82	-1.27	-1.30
SS21	-1.27	-1.22	-1.53	-0.95	-0.60	-1.26	-0.27	-0.56	1.26	-0.38	-1.62	-0.72	-1.59	-1.26	-1.24
SS22	-0.03	0.08	-0.26	0.34	0.70	-0.11	0.99	0.70	2.42	0.75	-0.50	0.45	-0.46	-0.06	-0.13
SS23	0.01	0.13	-0.22	0.41	0.73	-0.13	0.97	0.67	2.42	0.77	-0.44	0.45	-0.51	0.01	-0.06
SS24	0.05	0.15	-0.19	0.41	0.75	-0.04	1.06	0.60	2.46	0.78	-0.42	0.51	-0.54	-0.03	-0.13
SS25	-0.68	-0.56	-0.91	-0.26	0.10	-0.75	0.36	0.08	1.84	0.16	-1.07	-0.20	-1.12	-0.64	-0.72
SS26	0.01	0.12	-0.23	0.37	0.75	-0.09	1.02	0.63	2.43	0.75	-0.47	0.48	-0.52	-0.11	-0.14
SS27	-0.70	-0.59	-0.91	-0.29	0.03	-0.77	0.33	-0.04	1.76	0.11	-1.16	-0.23	-1.21	-0.77	-0.74

$I_{geo}$  classes: practically uncontaminated ( $I_{geo} \leq 0$ ), uncontaminated to moderately contaminated ( $0 < I_{geo} < 1$ ), moderately contaminated ( $1 < I_{geo} < 2$ ), moderately to heavily contaminated ( $2 < I_{geo} < 3$ ), heavily contaminated ( $3 < I_{geo} < 4$ ; indicated in bold), heavily to extremely contaminated ( $4 < I_{geo} < 5$ ; indicated in bold red), and extremely contaminated ( $I_{geo} > 5$ ; indicated in bold purple)

**Table S10.** Geoaccumulation Index ( $I_{\text{geo}}$ ) for REEs in studied samples calculated based on average values in reference soils (CS1 and CS2).

Samples	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Y	Ho	Er	Tm	Yb	Lu
A1	-0.24	-0.21	-0.26	-0.23	-0.35	-0.20	-0.21	-0.25	-0.29	-0.25	-0.37	-0.27	-0.40	-0.40	-0.18
A2	-0.10	-0.06	-0.16	-0.03	-0.12	-0.14	-0.02	-0.09	-0.14	-0.18	-0.21	-0.06	-0.26	-0.26	-0.08
A3	0.20	0.19	0.19	0.25	0.05	0.19	0.24	0.16	0.14	0.20	0.11	0.13	0.12	0.12	0.21
SS1	0.15	0.20	0.21	0.16	0.22	0.03	0.24	0.22	0.17	0.19	0.20	0.12	0.07	0.13	0.27
SS2	0.14	0.17	0.23	0.18	0.23	0.11	0.13	0.23	0.18	0.15	0.12	0.02	0.09	0.04	0.23
SS3	-0.50	-0.45	-0.45	-0.43	-0.47	-0.57	-0.48	-0.37	-0.42	-0.42	-0.43	-0.49	-0.37	-0.60	-0.36
SS4	-0.43	-0.36	-0.36	-0.40	-0.36	-0.53	-0.31	-0.31	-0.38	-0.36	-0.41	-0.42	-0.39	-0.52	-0.31
SS5	-1.70	-1.77	-1.72	-1.69	-1.68	-1.66	-1.62	-1.50	-1.64	-1.59	-1.63	-1.63	-1.58	-1.74	-1.49
SS6	0.51	0.63	0.65	0.58	0.67	0.52	0.59	0.72	0.62	0.63	0.65	0.47	0.48	0.51	0.65
SS7	0.13	0.15	0.18	0.16	0.23	-0.01	0.12	0.18	0.18	0.19	0.15	-0.04	0.09	0.01	0.24
SS8	-1.39	-1.34	-1.32	-1.18	-1.25	-1.27	-1.17	-1.20	-1.15	-1.29	-1.24	-1.28	-1.46	-1.46	-1.27
SS9	0.19	0.17	0.13	0.17	-0.01	0.19	0.18	0.12	0.13	0.11	0.04	0.16	-0.04	-0.04	0.15
SS10	0.63	0.69	0.66	0.71	0.52	0.82	0.74	0.66	0.57	0.65	0.55	0.60	0.53	0.53	0.71
SS11	-0.75	-0.80	-0.71	-0.79	-0.56	-0.68	-0.74	-0.64	-0.60	-0.63	-0.54	-0.71	-0.65	-0.78	-0.51
SS12	0.18	0.23	0.23	0.17	0.23	0.11	0.20	0.35	0.27	0.24	0.23	0.15	0.23	0.18	0.35
SS13	0.48	0.60	0.62	0.58	0.74	0.53	0.66	0.68	0.59	0.56	0.63	0.50	0.52	0.57	0.58
SS14	-0.06	0.12	0.06	0.00	0.07	0.02	0.04	0.11	0.04	-0.02	0.09	0.00	0.02	-0.02	0.02
SS15	0.11	0.18	0.18	0.17	0.25	0.07	0.21	0.29	0.18	0.14	0.18	0.03	0.11	0.09	0.27
SS16	0.18	0.25	0.25	0.21	0.26	0.14	0.29	0.32	0.26	0.22	0.21	0.14	0.14	0.06	0.25
SS17	-0.15	-0.08	-0.07	-0.09	0.00	-0.19	-0.09	0.02	-0.03	-0.06	-0.05	-0.07	-0.07	-0.20	0.02
SS18	-1.06	-1.06	-1.10	-1.07	-0.96	-0.93	-0.95	-0.99	-1.00	-0.99	-1.16	-0.98	-1.11	-1.11	-0.88
SS19	-0.31	-0.25	-0.32	-0.26	-0.39	-0.24	-0.15	-0.26	-0.31	-0.31	-0.29	-0.28	-0.40	-0.40	-0.15
SS20	-0.49	-0.55	-0.59	-0.61	-0.55	-0.46	-0.46	-0.54	-0.55	-0.53	-0.52	-0.58	-0.54	-0.54	-0.31
SS21	-0.48	-0.48	-0.44	-0.52	-0.45	-0.44	-0.42	-0.35	-0.39	-0.39	-0.37	-0.48	-0.36	-0.53	-0.25
SS22	0.76	0.82	0.83	0.78	0.85	0.71	0.84	0.92	0.76	0.74	0.75	0.69	0.77	0.67	0.86
SS23	0.80	0.88	0.87	0.84	0.88	0.69	0.82	0.88	0.76	0.76	0.81	0.69	0.72	0.74	0.93
SS24	0.84	0.89	0.90	0.84	0.90	0.79	0.91	0.81	0.81	0.76	0.83	0.75	0.70	0.70	0.86
SS25	0.17	0.25	0.25	0.21	0.24	0.11	0.11	0.25	0.15	0.12	0.11	0.07	0.07	0.17	0.26
SS26	0.80	0.87	0.86	0.81	0.91	0.73	0.87	0.85	0.77	0.74	0.78	0.72	0.72	0.62	0.85
SS27	0.09	0.15	0.18	0.15	0.18	0.05	0.18	0.17	0.10	0.09	0.09	0.01	0.03	-0.04	0.25

$I_{\text{geo}}$  classes: practically uncontaminated ( $I_{\text{geo}} \leq 0$ ), uncontaminated to moderately contaminated ( $0 < I_{\text{geo}} < 1$ ), moderately contaminated ( $1 < I_{\text{geo}} < 2$ ), moderately to heavily contaminated ( $2 < I_{\text{geo}} < 3$ ), heavily contaminated ( $3 < I_{\text{geo}} < 4$ ; indicated in bold), heavily to extremely contaminated ( $4 < I_{\text{geo}} < 5$ ; indicated in bold red), and extremely contaminated ( $I_{\text{geo}} > 5$ ; indicated in bold purple)