

## APPENDIX 1

### Results of the ICPMS analysis of the bulk soil samples, as compared to mean concentrations in other media

Sample:	PSg1	RD1g	RDT1g	RDT2g	RDT3g	RDT4g	RSH1g	ZBB1g	X <sub>g</sub> <sup>1</sup>	coals <sup>2</sup>	shales <sup>3</sup>	CC <sup>4</sup>	PM <sup>5</sup>	soils <sup>6</sup>	EC <sup>7</sup>	Threshold <sup>8</sup>
Main elements [wt.%]																
Al	7.29	<b>11.78<sup>9</sup></b>	9.54	9.18	<b>13.80</b>	8.27	7.59	1.97	7.74	0.78	1.19				8.1	
Ca	0.15	<u>1.64</u>	0.52	0.52	0.66	1.95	0.75	0.16	0.56	0.54	0.07			0.32 <sup>10</sup>	3.6	
Fe	2.84	<b>6.54</b>	5.32	4.17	4.19	5.31	3.75	0.47	3.36	0.23	2.4			0.30 <sup>10</sup>	5.1	
K	1.99	1.83	2.23	2.16	<u>2.31</u>	1.75	1.76	0.72	1.75	0.06	0.21			0.74 <sup>11</sup>	2.4	
Na	0.30	<u>0.51</u>	0.37	0.37	0.34	0.36	0.23	0.36	0.35	0.02	0.01			0.01	2.6	
Mg	0.56	<u>1.23</u>	0.91	0.80	1.04	1.00	0.67	0.11	0.67	0.24	0.18			0.13	2.1	
P	0.05	<u>0.14</u>	0.10	0.08	0.06	0.09	0.10	0.02	0.07	0.02	0.03	0.03		0.02	0.11	
S	<b>0.20</b>	<b>0.40</b>	<b>0.20</b>	<b>0.50</b>	<b>0.20</b>	<b>1.00</b>	<b>0.20</b>	<b>2.20</b>	0.54	0.16	1.7			0.12	0.04	
Ti	0.30	0.42	<u>0.46</u>	0.40	0.44	0.31	0.39	0.10	0.32	0.10	0.02	0.09			0.48	
Trace elements [ppm]																
Ag	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50		0.12	0.38	0.10			0.09	
As	6.0	<b>22</b>	<b>17</b>	<b>14</b>	<b>10</b>	<b>12</b>	<b>20</b>	<5.0	(13) <sup>12</sup>	6.9	8.6	9.0	5.7		2.6	100 <sup>13</sup>
Ba	580	<b>1650</b>	<b>805</b>	597	559	258	<b>1940</b>	65	550	108	76	150	509		619	3000 <sup>13</sup>
Be	3.0	<b>7.0</b>	6.0	6.0	6.0	5.0	4.0	<1.0	(5.1)	5.9	3.0	2.0	2.9	3.0 <sup>10</sup>	2.7	
Bi	<5.0	<5.0	<5.0	<b>5.0</b>	<5.0	<5.0	<5.0	<5.0		0.90	0.69	1.1	<0.10	0.30 <sup>10</sup>	0.14	
Cd	0.50	<0.40	<0.40	<0.40	<0.40	<0.40	<b>2.0</b>	0.40		0.25	1.2	0.20	<0.10	0.04	0.17	30 / 15 <sup>13</sup>
Co	9.0	22	20	13	11	17	19	2.0	12	7.3	6.2	6.0	15	2.5 <sup>10</sup>	22	200 <sup>13</sup>
Cr	56	86	93	80	84	66	<u>102</u>	24	69	17	17	17		11 <sup>10</sup>	121	1000 <sup>13</sup>
Cu	39	<b>103</b>	<b>80</b>	<b>86</b>	65	59	63	11	54	42	26	16	25	22	51	1000 <sup>13</sup>
La	25	<b>57</b>	30	25	<b>61</b>	26	30	9.0	27	5.5	9.2	11	27		24	
Mn	325	956	940	529	509	<b>1050</b>	560	83	499	82	264	71		244	988	
Mo	<2.0	3.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		11	0.33	2.1	(0.84)	0.79	1.5	250 <sup>13</sup>
Nb	9.0	<u>14</u>	13	12	13	10	12	3.0	9.9	2.9	0.26	4.0	8.3		22	
Ni	29	61	57	47	44	45	<u>64</u>	9.0	39	12	14	17	23	0.39	73	500 <sup>13</sup>
Pb	<b>39</b>	<b>58</b>	<b>63</b>	<b>64</b>	<b>57</b>	<b>51</b>	<b>57</b>	31	51	24	44	9.0	1.6	11	15	500 / 1000 <sup>13</sup>

Sb	<5.0	<b>8.0</b>	<b>8.0</b>	<b>7.0</b>	<b>7.0</b>	<b>6.0</b>	<u>12</u>	<5.0	(7.8)	0.50	0.72	1.0	0.89	1.7 <sup>10</sup>	0.48	
Sc	10	<u>22</u>	15	14	<b>21</b>	13	15	3.0	15	2.4	2.6	3.7			14	
Sn	8.0	13	11	<u>18</u>	14	10	6.0	<2.0	11	2.1	10	1.4	(4.3)		12	350 <sup>13</sup>
Sr	109	<b>406</b>	194	178	203	235	240	40	170	77	30	100	231		346	
Th	12	<b>22</b>	16	12	<u>27</u>	10	13	3.0	12	7.3	3.2	3.2	9.7		11	
U	<20	<20	<20	<20	<20	<20	<20	<20		6.9	1.1	1.9	5.9		2.8	
V	67	<u>154</u>	139	116	114	99	127	21	92	135	31	28	95	9.4	121	
W	<4.0	<b>5.0</b>	<4.0	<4.0	<4.0	<b>11</b>	<4.0	<4.0		0.80	0.13	0.99	3.5		1.3	
Y	17	<u>49</u>	25	21	42	27	23	6.0	23	7.0	6.2	8.2	28		33	
Zn	72	<u>118</u>	123	124	111	119	<b>340</b>	40	111	42	108	28	16	21	82	20 (400) / 2000 <sup>13</sup>
Zr	65	<u>117</u>	71	72	112	60	83	25	69	18	6.0	36		108	170	

<sup>1</sup> – geometric mean; <sup>2</sup> – mean USCB coal concentrations (from: Parzenty et al., 1999; Lewińska-Preis et al., 2008; Juda-Rezler and Kowalczyk, 2013; Smoliński et al., 2014; own data); <sup>3</sup> – mean USCB shale concentrations (from: Parzenty, 1994; Parzenty et al., 1999; Kokowska-Pawłowska, 2015; own data); <sup>4</sup> – Coal Clarke values (Ketrís and Yudovich, 2009); <sup>5</sup> – geometric mean for local heap pyrometamorphic rocks ( $n = 8$ ; Kruszewski, 2018); <sup>6</sup> – typical mean soil concentrations (Kabata-Pendias and Pendias, 1989 – most elements; Mocek, 2015 – Ca, K, Mg, Na, P, and S data); Co, Cu, Fe, Mn, Mo, Zn – additional data from Mocek (2015); Na – additional data from IUNG – [http://www.gios.gov.pl/chemizm\\_gleb/](http://www.gios.gov.pl/chemizm_gleb/); <sup>7</sup> – mean Earth's Crust (including continental crust and igneous rocks) values (from Parker, 1967); <sup>8</sup> – soil threshold values (from Mocek, 2015; zinc data: toxic concentrations given in parentheses); <sup>9</sup> – outstanding values (as compared to EC) are given in bold, while the highest-observed ones are underlined; <sup>10</sup> – given by yearly input/output from various soils; <sup>11</sup> – data for plant-available K: 0.01% (geometric mean basis); <sup>12</sup> – data for <8 samples cases given in brackets; <sup>13</sup> – maximum allowable values according to Polish Environment Ministry Ordinance of 05.09.2016