



WEPAL-QUASIMEME

Certificate of Analysis



International Soil-Analytical Exchange

REFERENCE MATERIAL

ISE sample 835

2026-Jul-30



General Information

In this report an overview is given of analytical data for this sample collected in our proficiency testing program. The consensus values are calculated using a robust statistical model. With this NDA model, the mean and standard deviation are calculated using all reported data when at least 4 results are left after removal of reported 'lower than' (<) and 0 (= zero) values. No outliers are removed.

This report is divided into two sections: Consensus Values and Indicative Values. The division is made on the reliability of the data. Consensus Values are based on at least 8 results and a maximum relative uncertainty of 6.25%. Indicative Values are based on a maximum relative uncertainty of 35% and a minimum of 4 and maximum of 7 results, or a relative uncertainty greater than 6.25% when there are at least 8 results.

For each measurand the following parameters are given: mean, standard deviation, coefficient of variation, number of results, median, MAD (Median of Absolute Deviation), the uncertainty of the mean (consensus or indicative) value and the relative uncertainty.

Please note: Most WEPAL-QUASIMEME reference materials are found to be stable over the long term (>10 years) for most measurand/matrix combinations. There are a few exceptions known to us as being less stable over the long term. These are organotins in sediment (MS6), ASP in shellfish (BT7), some PAHs and PCBs in sediment (SETOC) and N-NH₄ (as N) & N-NO₃ (as N) in clay soils (ISE).

All values, expressed on a weight basis (kg or %), are reported as oven-dried (105°C) material. Moisture is reported in the material as received.

Sample information

WEPAL reference materials are from natural sources only. There is no spiking, mixing or other alterations of the samples. For sample preparation, the ISE samples are dried at 40°C and milled to pass a 0.5 mm sieve.

This ISE sample 835 of Gleysol, from Latvia, is prepared for the WEPAL proficiency programs. The sample has been used in 4 rounds. The results on which the values in this report are based were taken from the rounds given in the following table:

Year	Round	Number
2026	2	3
2025	3	4
2024	1	2
2021	4	1



Consensus Values ISE 835



Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	g/kg	25.0	1.89	7.6	59	24.9	1.00	0.307	1.23
Ba	mg/kg	307	27.0	8.8	48	309	13.7	4.88	1.59
Br	mg/kg	4.69	1.06	22.5	25	4.90	0.900	0.264	5.63
Ca	g/kg	3.20	0.365	11.4	60	3.22	0.200	0.059	1.84
Co	mg/kg	1.57	0.445	28.4	35	1.58	0.318	0.094	6.00
Cr	mg/kg	24.5	7.32	29.9	62	25.2	4.10	1.16	4.75
Fe	g/kg	6.33	0.632	10.0	68	6.40	0.385	0.096	1.51
K	mg/kg	15409	1090	7.1	73	15271	519	159	1.03
Mg	mg/kg	1076	197	18.3	59	1090	98.0	32.1	2.98
Mn	mg/kg	151	28.8	19.0	64	149	18.5	4.49	2.97
Na	mg/kg	4061	360	8.9	48	4024	231	64.9	1.60
P	mg/kg	778	88.0	11.3	60	790	53.2	14.2	1.83
Pb	mg/kg	13.3	2.40	18.1	59	13.3	1.29	0.390	2.94
Rb	mg/kg	45.1	2.66	5.9	34	45.1	1.45	0.570	1.26
S	mg/kg	215	74.3	34.5	53	220	45.9	12.8	5.92
Si	g/kg	399	13.0	3.3	50	397	5.56	2.29	0.576
Sr	mg/kg	66.5	6.52	9.8	45	66.7	4.10	1.21	1.83
Y	mg/kg	12.9	2.09	16.2	28	12.8	1.00	0.493	3.83
Zn	mg/kg	15.3	4.19	27.4	64	15.5	2.95	0.654	4.29
Zr	mg/kg	382	42.0	11.0	36	386	29.2	8.74	2.29
C-elementary	g/kg	22.4	1.60	7.1	121	22.4	1.00	0.181	0.811
Tl	mg/kg	0.303	0.031	10.3	16	0.301	0.016	0.010	3.22
V	mg/kg	17.1	3.41	20.0	51	17.1	1.90	0.597	3.49
Ti	mg/kg	1783	183	10.3	49	1794	108	32.7	1.83
N - elementary	g/kg	1.74	0.146	8.4	196	1.74	0.081	0.013	0.747
Ce	mg/kg	31.2	6.60	21.2	27	32.1	4.47	1.59	5.09
La	mg/kg	14.8	3.19	21.6	24	14.9	2.56	0.815	5.52
Th	mg/kg	5.04	0.700	13.9	22	5.04	0.350	0.187	3.70
Hg	µg/kg	33.7	4.08	12.1	60	34.0	2.10	0.659	1.95

Method: Acid extractable (So-called totals)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	g/kg	5.70	1.19	21.0	52	5.69	0.740	0.207	3.63
As	mg/kg	1.75	0.312	17.8	47	1.79	0.233	0.057	3.25
Ba	mg/kg	16.7	3.44	20.6	44	16.2	2.13	0.649	3.89
Ca	g/kg	1.29	0.189	14.7	62	1.30	0.122	0.030	2.33
Cd	mg/kg	0.061	0.019	31.5	45	0.064	0.014	0.004	5.87



Consensus Values ISE 835



Method: Acid extractable (So-called totals)

(cont.)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Co	mg/kg	1.09	0.162	14.9	52	1.09	0.103	0.028	2.58
Cr	mg/kg	12.4	2.71	21.8	87	12.3	1.76	0.364	2.92
Cu	mg/kg	3.29	0.449	13.7	83	3.34	0.286	0.062	1.88
Fe	g/kg	4.48	0.736	16.4	62	4.48	0.443	0.117	2.61
Mg	mg/kg	638	112	17.6	60	641	76.6	18.1	2.83
Mn	mg/kg	77.4	17.7	22.9	68	78.3	12.1	2.68	3.47
N	g/kg	1.70	0.183	10.8	99	1.70	0.111	0.023	1.35
Ni	mg/kg	3.48	0.600	17.2	69	3.48	0.400	0.090	2.59
P	mg/kg	707	85.8	12.1	79	706	59.0	12.1	1.71
Pb	mg/kg	6.95	0.820	11.8	85	7.02	0.470	0.111	1.60
S	mg/kg	233	25.8	11.1	50	233	17.5	4.56	1.96
Sr	mg/kg	12.9	2.33	18.0	17	13.1	1.10	0.705	5.45
Zn	mg/kg	11.1	1.84	16.6	84	11.1	1.11	0.251	2.26
V	mg/kg	9.58	1.94	20.3	46	9.67	1.21	0.358	3.74
Hg	µg/kg	32.3	8.64	26.7	41	31.7	5.69	1.69	5.22

Method: Aqua Regia (ISO 54321) (replacing former ISO 11466)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	g/kg	5.39	0.672	12.5	84	5.39	0.409	0.092	1.70
As	mg/kg	1.71	0.346	20.2	87	1.70	0.200	0.046	2.71
Ba	mg/kg	16.9	2.42	14.3	38	17.3	1.45	0.491	2.91
Be	mg/kg	0.160	0.013	7.9	22	0.158	0.011	0.003	2.11
Ca	g/kg	1.26	0.144	11.4	75	1.26	0.070	0.021	1.65
Cd	mg/kg	0.059	0.015	25.2	71	0.061	0.009	0.002	3.74
Co	mg/kg	1.11	0.182	16.5	78	1.12	0.129	0.026	2.33
Cr	mg/kg	11.9	1.92	16.2	125	11.9	1.20	0.215	1.81
Cu	mg/kg	3.43	0.573	16.7	111	3.50	0.390	0.068	1.98
Fe	g/kg	4.38	0.440	10.0	89	4.38	0.260	0.058	1.33
K	mg/kg	549	120	21.8	74	549	65.5	17.4	3.17
Mg	mg/kg	633	75.9	12.0	80	625	48.9	10.6	1.67
Mn	mg/kg	72.3	10.1	13.9	102	73.6	6.70	1.25	1.72
Mo	mg/kg	0.469	0.069	14.6	48	0.478	0.040	0.012	2.64
Ni	mg/kg	3.51	0.471	13.4	111	3.50	0.290	0.056	1.59
P	mg/kg	718	55.7	7.8	71	721	35.7	8.26	1.15
Pb	mg/kg	7.06	0.844	11.9	123	7.05	0.520	0.095	1.35
S	mg/kg	220	19.2	8.7	50	219	10.1	3.39	1.54
Sb	mg/kg	0.102	0.020	19.2	17	0.107	0.015	0.006	5.82



Consensus Values ISE 835



Method: Aqua Regia (ISO 54321) (replacing former ISO 11466)

(cont.)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Sn	mg/kg	0.419	0.080	19.1	15	0.436	0.076	0.026	6.17
Sr	mg/kg	13.2	1.91	14.5	21	13.2	0.943	0.522	3.95
Tl	mg/kg	0.064	0.013	20.8	18	0.065	0.008	0.004	6.12
U	mg/kg	0.549	0.043	7.9	13	0.551	0.035	0.015	2.75
V	mg/kg	9.79	1.07	10.9	55	9.74	0.660	0.180	1.83
Zn	mg/kg	11.5	1.35	11.8	120	11.4	0.860	0.155	1.35

Method: Extraction with boiling 2M HNO₃

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Cd	mg/kg	0.057	0.012	20.4	44	0.059	0.007	0.002	3.85
Co	mg/kg	0.834	0.089	10.6	47	0.838	0.048	0.016	1.94
Cr	mg/kg	6.08	0.554	9.1	62	6.12	0.365	0.088	1.45
Cu	mg/kg	3.16	0.354	11.2	61	3.12	0.222	0.057	1.80
Hg	µg/kg	30.0	6.09	20.3	46	30.0	3.55	1.12	3.74
Mo	mg/kg	0.181	0.041	22.6	36	0.183	0.023	0.009	4.72
Ni	mg/kg	2.04	0.233	11.4	54	2.06	0.157	0.040	1.94
Pb	mg/kg	6.40	0.684	10.7	64	6.42	0.405	0.107	1.67
Tl	mg/kg	0.039	0.005	13.4	12	0.040	0.003	0.002	4.83
Zn	mg/kg	9.40	1.18	12.5	61	9.40	0.602	0.188	2.01

Method: Extraction with 0.01M CaCl₂ 1:10

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
K	mg/kg	29.3	2.98	10.2	28	29.8	1.58	0.705	2.40
Mg	mg/kg	75.9	5.28	7.0	20	75.6	3.33	1.48	1.94
Mn	mg/kg	6.22	0.484	7.8	14	6.25	0.253	0.162	2.60
N - NO ₃ (as N)	mg/kg	15.0	1.56	10.4	32	15.0	0.874	0.345	2.30
Na	mg/kg	3.23	0.645	20.0	19	3.36	0.396	0.185	5.73

Method: Soil characteristics

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
pH - H ₂ O	...	5.83	0.213	3.7	365	5.84	0.140	0.014	0.239
pH - KCl	...	5.02	0.140	2.8	163	5.01	0.080	0.014	0.273
pH - CaCl ₂	...	5.17	0.084	1.6	113	5.18	0.060	0.010	0.191
Fraction < 2 µm	%	4.28	1.83	42.6	112	4.48	1.11	0.216	5.04
EC-SC (ISO 11265)	mS/m	5.99	1.20	20.0	146	6.00	0.715	0.124	2.07
Fraction < 63 µm	%	30.8	5.02	16.3	71	30.6	3.24	0.745	2.42
Fraction > 63 µm	%	68.8	3.97	5.8	64	68.4	2.53	0.620	0.902



Consensus Values ISE 835



Method: Soil characteristics

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Org.matter (L.O.I.)	%	4.49	0.291	6.5	159	4.49	0.190	0.029	0.643
TC=Total C (org.+inorg.)	g/kg	22.3	1.60	7.2	168	22.2	0.985	0.154	0.691
TOC=Total Org. C	g/kg	21.9	1.99	9.1	204	21.8	1.20	0.174	0.793
C - org others (W&B a.o.)	g/kg	21.4	3.06	14.3	173	21.2	2.08	0.291	1.36

(cont.)

Method: Other determinations

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Moisture-content	%	1.07	0.170	16.0	177	1.08	0.100	0.016	1.50
delta 13C	‰ V-PDB	-28.3	0.152	0.5	15	-28.3	0.070	0.049	0.173
delta 15N	‰ Air	6.40	0.423	6.6	15	6.49	0.220	0.136	2.13

Method: Fluoride (Swiss standard procedure)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
F - Total	mg/kg	105	7.58	7.3	12	104	3.50	2.74	2.62

Method: Pot. CEC using 1M NH4-acetate at pH=7

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
CEC	cmol+/kg	7.23	1.49	20.7	118	7.21	0.995	0.172	2.38
K	cmol+/kg	0.127	0.027	21.2	197	0.129	0.019	0.002	1.89
Mg	cmol+/kg	0.725	0.094	13.0	195	0.731	0.061	0.008	1.16
Ca	cmol+/kg	3.28	0.647	19.7	185	3.30	0.390	0.059	1.81

Method: Pot. CEC using 1M NH4Cl (BZE)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
K	cmol+/kg	0.141	0.010	7.3	11	0.145	0.012	0.004	2.74
Mg	cmol+/kg	0.748	0.082	11.0	11	0.790	0.112	0.031	4.16
Ca	cmol+/kg	3.18	0.326	10.3	11	3.34	0.420	0.123	3.86

Method: Act. CEC using 0.01M BaCl2 (ISO 11260)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Mg	cmol+/kg	0.710	0.090	12.6	11	0.716	0.054	0.034	4.75
Ca	cmol+/kg	3.53	0.364	10.3	11	3.60	0.150	0.137	3.88

Method: Act. CEC using cobaltihexamine (AFNOR NFX 31 130)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
CEC	cmol+/kg	3.55	0.687	19.3	34	3.50	0.284	0.147	4.14
K	cmol+/kg	0.094	0.017	18.3	26	0.098	0.012	0.004	4.50

Method: Act. CEC using cobaltihexamine (AFNOR NFX 31 130)									(cont.)
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Ca	cmol+/kg	2.71	0.288	10.6	29	2.77	0.213	0.067	2.46
Mg	cmol+/kg	0.634	0.089	14.0	29	0.632	0.058	0.021	3.26
Mn	cmol+/kg	0.011	0.001	14.0	8	0.011	0.001	0.001	6.18

Method: Mehlich-3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Ca	mg/kg	757	87.0	11.5	72	748	50.2	12.8	1.69
Cu	mg/kg	0.894	0.214	24.0	68	0.924	0.124	0.032	3.63
Fe	mg/kg	364	58.0	15.9	84	361	36.4	7.92	2.17
K	mg/kg	51.7	8.08	15.6	72	50.8	4.98	1.19	2.30
Mg	mg/kg	96.7	9.98	10.3	74	95.5	5.50	1.45	1.50
Mn	mg/kg	16.5	4.03	24.4	84	16.6	2.46	0.549	3.33
P	mg/kg	234	34.1	14.5	101	235	22.3	4.24	1.81
Zn	mg/kg	1.46	0.330	22.6	75	1.49	0.217	0.048	3.27
Al	mg/kg	1503	146	9.7	44	1490	95.7	27.6	1.84

Method: Extraction with 0.01M CaCl2 - 0.005M DTPA 1:10 (w/v)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Cu	mg/kg	0.488	0.153	31.4	62	0.500	0.095	0.024	4.98
Fe	mg/kg	112	22.7	20.4	74	110	14.4	3.31	2.96
Mn	mg/kg	8.47	3.06	36.2	68	8.74	1.95	0.465	5.48
Zn	mg/kg	0.760	0.220	28.9	65	0.790	0.150	0.034	4.48

Method: Extraction with 1M KCl 1:10 (w/v)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
N - NH4 (as N)	mg/kg	7.19	2.31	32.1	51	7.36	1.58	0.405	5.63
N - NO3 (as N)	mg/kg	14.4	2.47	17.2	63	14.0	1.50	0.389	2.70

Method: Phosphorus and related analysis

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
P - Bray (as P)	mg/kg	183	76.4	41.9	94	175	54.1	9.86	5.40
P - Olsen (as P)	mg/kg	48.4	10.8	22.3	134	48.4	6.36	1.16	2.41
Al - Ox	mg/kg	2033	117	5.8	10	2025	67.3	46.4	2.28
Fe - Ox	mg/kg	1739	145	8.3	10	1711	97.8	57.2	3.29
P - Ox	mg/kg	549	18.2	3.3	9	548	12.3	7.59	1.38
P - AL (as P)	mg/kg	149	18.9	12.7	39	151	9.22	3.78	2.54



Consensus Values ISE 835



Method: UK Soil Methods

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
P – NaHCO ₃ (1/20)	mg/l	52.9	7.20	13.6	51	52.6	4.40	1.26	2.38
K - NH ₄ NO ₃ (1/5)	mg/l	60.5	8.04	13.3	56	60.9	4.45	1.34	2.22
Mg - NH ₄ NO ₃ (1/5)	mg/l	106	13.7	12.9	55	105	8.21	2.30	2.18
pH - H ₂ O (2/5)	...	5.77	0.119	2.1	50	5.78	0.075	0.021	0.363

Method: Extraction with dilute nitric acid (0.43 Mol/l) ISO 17586

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Fe	g/kg	0.788	0.121	15.4	10	0.799	0.055	0.048	6.07
K	mg/kg	60.7	5.50	9.1	9	62.0	2.00	2.29	3.78
Mg	mg/kg	109	10.7	9.8	10	112	7.05	4.22	3.88
Mn	mg/kg	36.3	5.72	15.8	11	35.1	3.89	2.16	5.94
Ca	g/kg	1.07	0.103	9.6	10	1.07	0.059	0.041	3.79

Method: PEP-Ammoniumacetate-EDTA extraction

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
AAE10-Ca	mg/kg	817	162	19.8	19	803	84.3	46.4	5.68
AAE10-Mg	mg/kg	88.6	7.92	8.9	19	89.0	6.00	2.27	2.56
AAE10-K	mg/kg	49.8	3.90	7.8	19	50.3	2.02	1.12	2.25
AAE10-P	mg/kg	61.5	9.44	15.4	18	62.6	6.13	2.78	4.52

Method: PEP-Water extraction

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
H ₂ O10-Mg	mg/kg	11.0	0.758	6.9	14	11.0	0.416	0.253	2.30
H ₂ O10-K	mg/kg	16.4	1.77	10.8	14	16.3	1.08	0.590	3.60
H ₂ O10-P	mg/kg	3.95	0.212	5.4	14	3.94	0.115	0.071	1.80

Method: PEP-Test measurements

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
CO ₂ -K	K-test	1.61	0.103	6.4	14	1.62	0.048	0.035	2.14
CO ₂ -P	P-test	5.52	0.833	15.1	14	5.32	0.595	0.278	5.04
CC-Mg	Mg-test	7.48	0.331	4.4	14	7.45	0.195	0.111	1.48
pH-H ₂ O	...	5.92	0.144	2.4	20	5.93	0.075	0.040	0.679
pH-CC	...	5.31	0.115	2.2	8	5.32	0.090	0.051	0.956



Consensus Values ISE 835

Method: PEP-Physical parameters

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Schluff (silt)	%	15.9	2.19	13.8	13	16.3	1.38	0.761	4.80
Sand	%	73.2	2.27	3.1	11	72.7	1.30	0.857	1.17
C-org	%	1.88	0.224	11.9	17	1.90	0.120	0.068	3.61
Humus	%	3.20	0.326	10.2	16	3.25	0.150	0.102	3.19
TOC_400	%	1.93	0.268	13.9	13	1.94	0.123	0.093	4.81

Method: PEP-Cation Exchange Capacity

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Mg	cmol+/kg	0.719	0.053	7.4	8	0.724	0.020	0.023	3.27
H	cmol+/kg	9.98	0.564	5.6	8	10.0	0.374	0.249	2.50
KAK	cmol+/kg	14.0	1.50	10.8	8	13.7	0.842	0.665	4.75



Indicative Values ISE 835



Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
As	mg/kg	2.22	1.11	49.8	38	2.46	0.693	0.225	10.1
Cd	mg/kg	0.074	0.041	55.8	24	0.080	0.022	0.011	14.2
Cu	mg/kg	3.86	1.65	42.8	50	4.11	0.902	0.292	7.56
Ga	mg/kg	5.94	1.72	29.0	30	6.00	1.00	0.393	6.61
I	mg/kg	2.47	0.738	29.9	5	2.41	0.300	0.412	16.7
Li	mg/kg	5.85	0.827	14.1	6	5.77	0.340	0.422	7.22
Mo	mg/kg	0.596	0.366	61.5	25	0.632	0.195	0.092	15.4
Ni	mg/kg	4.62	2.48	53.7	55	4.84	1.24	0.418	9.05
Se	mg/kg	0.867	0.727	83.9	11	1.20	0.600	0.274	31.6
Sn	mg/kg	0.936	0.359	38.3	14	1.01	0.229	0.120	12.8
Sb	mg/kg	0.327	0.274	84.0	12	0.260	0.147	0.099	30.3
Be	mg/kg	0.495	0.105	21.3	5	0.530	0.057	0.059	11.9
Bi	mg/kg	0.203	0.499	246.2	9	0.500	0.490	0.208	103
Nb	mg/kg	7.03	1.96	27.9	22	7.00	1.75	0.524	7.45
Nd	mg/kg	12.8	3.23	25.3	17	13.2	1.83	0.980	7.68
Sc	mg/kg	3.45	1.06	30.6	18	3.22	0.750	0.311	9.01
U	mg/kg	1.27	0.484	38.0	20	1.31	0.263	0.135	10.6
W	mg/kg	1.27	0.713	56.2	7	1.50	0.500	0.337	26.5
Sm	mg/kg	1.75	0.720	41.1	6	1.89	0.316	0.367	21.0
Pr	mg/kg	2.30	0.839	36.5	5	2.55	0.550	0.469	20.4
Dy	mg/kg	1.76	0.634	36.0	4	1.90	0.335	0.396	22.5

Method: Acid extractable (So-called totals)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
B	mg/kg	2.66	1.56	58.7	24	3.23	0.860	0.399	15.0
K	mg/kg	550	245	44.4	60	549	167	39.5	7.17
Li	mg/kg	3.20	0.703	22.0	14	3.27	0.441	0.235	7.34
Mo	mg/kg	0.448	0.126	28.2	24	0.454	0.076	0.032	7.20
Na	mg/kg	36.2	21.8	60.4	44	36.1	14.7	4.11	11.4
Rb	mg/kg	6.51	0.150	2.3	5	6.48	0.090	0.084	1.28
Se	mg/kg	0.165	0.123	74.6	17	0.180	0.070	0.037	22.6
Sn	mg/kg	0.456	0.178	39.1	13	0.500	0.100	0.062	13.5
Y	mg/kg	4.00	0.311	7.8	4	4.10	0.165	0.195	4.86
Sb	mg/kg	0.110	0.055	50.2	12	0.117	0.025	0.020	18.1
Be	mg/kg	0.147	0.039	26.5	20	0.152	0.028	0.011	7.39
Tl	mg/kg	0.088	0.028	32.2	11	0.098	0.022	0.011	12.2
Ag	mg/kg	0.024	0.003	13.3	7	0.024	0.002	0.002	6.30



Indicative Values ISE 835

Method: Acid extractable (So-called totals)

(cont.)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Ti	mg/kg	97.6	28.8	29.5	15	102	14.2	9.28	9.51
Ce	mg/kg	24.2	5.32	22.0	4	24.8	2.65	3.33	13.7
La	mg/kg	13.5	0.514	3.8	4	13.4	0.250	0.321	2.38
Sc	mg/kg	0.769	0.044	5.7	4	0.781	0.024	0.027	3.57
U	mg/kg	0.568	0.123	21.7	9	0.590	0.078	0.051	9.04

Method: Aqua Regia (ISO 54321) (replacing former ISO 11466)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Ag	µg/kg	22.9	2.06	9.0	4	23.0	0.950	1.29	5.61
B	mg/kg	4.27	2.18	51.2	23	4.79	1.36	0.569	13.3
Ce	mg/kg	24.8	1.27	5.1	4	24.7	0.565	0.795	3.20
Hg	µg/kg	34.6	11.1	32.3	39	36.5	7.54	2.23	6.46
La	mg/kg	12.9	1.05	8.2	5	12.7	0.591	0.589	4.58
Li	mg/kg	3.36	0.764	22.7	19	3.53	0.407	0.219	6.51
Na	mg/kg	37.9	21.5	56.6	39	39.7	14.2	4.30	11.3
Rb	mg/kg	5.14	0.203	3.9	5	5.15	0.088	0.113	2.21
Sc	mg/kg	0.109	0.034	31.4	5	0.120	0.023	0.019	17.6
Se	mg/kg	0.198	0.153	77.2	22	0.284	0.119	0.041	20.6
Ti	mg/kg	119	59.8	50.0	25	135	46.8	14.9	12.5
Y	mg/kg	3.38	0.062	1.8	4	3.38	0.033	0.039	1.15

Method: Extraction with 0.1M NaNO₃

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Zn	µg/kg	26.0	4.26	16.4	7	27.0	1.99	2.01	7.74

Method: Extraction with 0.01M CaCl₂ 1:10

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
B	µg/kg	51.6	40.4	78.4	8	79.4	30.6	17.9	34.6
Co	µg/kg	23.5	4.89	20.8	7	24.4	2.97	2.31	9.83
Cu	µg/kg	12.7	6.07	47.7	7	11.0	3.40	2.87	22.5
Fe	mg/kg	4.76	1.23	25.9	14	4.90	0.610	0.412	8.67
N total soluble	mg/kg	30.2	1.04	3.4	4	30.2	0.550	0.648	2.15
N - NH ₄ (as N)	mg/kg	4.63	1.43	30.9	34	4.66	0.985	0.307	6.63
P	mg/kg	0.404	0.179	44.4	25	0.420	0.130	0.045	11.1
SO ₄	mg/kg	14.4	5.35	37.2	8	15.2	4.00	2.37	16.4
Zn	µg/kg	168	40.1	23.9	14	165	20.6	13.4	7.98
Ni	µg/kg	21.7	5.73	26.3	6	22.5	2.70	2.92	13.4



Indicative Values ISE 835

Method: Soil characteristics

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
TIC=Tot.Inorg C(as CaCO ₃)	%	0.202	0.285	141.1	56	0.285	0.225	0.048	23.6
Fraction < 16 µm	%	11.3	4.07	36.1	37	12.0	3.10	0.836	7.41
Fraction 2 - 50 µm (USDA)	%	20.7	9.66	46.7	4	21.1	5.26	6.04	29.2

Method: Other determinations

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
B - Hot water	mg/kg	0.293	0.136	46.5	41	0.319	0.081	0.027	9.07

Method: Pot. CEC using 1M NH₄-acetate at pH=7

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Na	cmol+/kg	0.039	0.034	88.2	145	0.044	0.026	0.004	9.16

Method: Pot. CEC using 1M or 0.1M BaCl₂-TEA at pH=8.1 (ISO 13536 OR BZE)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
CEC	cmol+/kg	15.0	3.39	22.6	12	14.8	2.37	1.22	8.16
K	cmol+/kg	0.132	0.019	14.1	4	0.132	0.015	0.012	8.81
Mg	cmol+/kg	0.717	0.187	26.0	5	0.683	0.107	0.104	14.6
Ca	cmol+/kg	4.11	0.874	21.3	5	4.21	0.530	0.488	11.9

Method: Pot. CEC using 1M NH₄Cl (BZE)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Na	cmol+/kg	0.027	0.010	38.0	11	0.031	0.011	0.004	14.3
Al	cmol+/kg	0.151	0.097	64.4	7	0.121	0.068	0.046	30.4
Mn	cmol+/kg	0.058	0.005	9.4	7	0.056	0.002	0.003	4.43
Fe	cmol+/kg	0.059	0.019	31.7	7	0.059	0.010	0.009	15.0

Method: Act. CEC using 0.01M BaCl₂ (ISO 11260)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
CEC	cmol+/kg	5.46	1.52	27.8	8	5.27	0.650	0.670	12.3
Na	cmol+/kg	0.023	0.015	63.5	6	0.030	0.011	0.008	32.4
K	cmol+/kg	0.122	0.090	74.0	9	0.130	0.050	0.037	30.8

Method: Act. CEC using cobaltihexamine (AFNOR NFX 31 130)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Na	cmol+/kg	0.017	0.009	52.8	17	0.020	0.007	0.003	16.0
Al	cmol+/kg	0.101	0.021	21.1	13	0.100	0.014	0.007	7.30

Indicative Values ISE 835

Method: Act. CEC using cobaltihexamine (AFNOR NFX 31 130)									(cont.)
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Fe	cmol+/kg	0.009	0.003	33.6	8	0.009	0.001	0.001	14.8
Method: Mehlich-3									
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
B	mg/kg	0.298	0.180	60.6	42	0.310	0.115	0.035	11.7
Na	mg/kg	6.29	3.82	60.8	48	6.95	2.47	0.690	11.0
Cr	mg/kg	0.442	0.159	35.9	5	0.500	0.080	0.089	20.1
Pb	mg/kg	1.85	0.306	16.6	8	1.87	0.182	0.135	7.33
Co	mg/kg	0.088	0.034	38.7	8	0.107	0.020	0.015	17.1
Method: Extraction with Ca-lactate (VDLUFA, Germany)									
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
K	mg/kg	35.8	6.42	18.0	5	39.4	7.60	3.59	10.0
P	mg/kg	55.9	19.7	35.3	5	56.1	12.1	11.0	19.7
Method: Water soluble 1:10 (w/v) (EN-12457-4)									
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
N - NO ₃ (as N)	mg/kg	13.0	0.721	5.5	7	13.0	0.320	0.341	2.61
Method: Phosphorus and related analysis									
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
P - w (as P)	mg/l soil	6.65	1.52	22.9	10	6.80	0.960	0.600	9.03
K - AL (as K)	mg/kg	45.8	1.52	3.3	5	45.7	0.870	0.850	1.86
Method: Extraction with dilute nitric acid (0.43 Mol/l) ISO 17586									
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
As	mg/kg	0.505	0.075	14.9	5	0.505	0.045	0.042	8.33
B	mg/kg	0.476	0.242	50.9	4	0.534	0.125	0.151	31.8
Cd	mg/kg	0.049	0.005	9.9	6	0.050	0.003	0.002	5.03
Co	mg/kg	0.239	0.030	12.5	6	0.246	0.015	0.015	6.39
Cr	mg/kg	2.28	0.348	15.2	6	2.34	0.166	0.178	7.78
Cu	mg/kg	1.82	0.656	36.1	11	1.90	0.310	0.247	13.6
Ni	mg/kg	0.522	0.125	24.0	6	0.499	0.061	0.064	12.2
Pb	mg/kg	4.26	0.603	14.2	6	4.38	0.265	0.308	7.23
Zn	mg/kg	2.32	0.468	20.1	11	2.29	0.310	0.176	7.59
Al	g/kg	2.10	0.314	14.9	5	2.10	0.170	0.175	8.35
P	mg/kg	332	68.5	20.6	9	348	43.1	28.5	8.60



Indicative Values ISE 835

Method: Extraction with dilute nitric acid (0.43 Mol/l) ISO 17586

(cont.)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Na	mg/kg	7.07	2.50	35.3	8	7.70	1.76	1.10	15.6
S	mg/kg	21.9	4.95	22.6	7	24.0	3.20	2.34	10.7

Method: PEP-Test measurements

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
CaCO ₃	%	0.183	0.191	104.3	8	0.190	0.175	0.085	46.1

Method: PEP-Physical parameters

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Ton (clay)	%	7.47	1.82	24.4	13	7.90	0.900	0.631	8.45
ROC_600	%	0.181	0.070	38.5	7	0.180	0.059	0.033	18.2
TIC_900B	%	0.144	0.024	16.6	5	0.135	0.015	0.013	9.30

Method: PEP-Cation Exchange Capacity

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Ca	cmol+/kg	3.40	1.56	45.8	8	3.35	1.04	0.687	20.2
K	cmol+/kg	0.134	0.021	15.7	8	0.134	0.013	0.009	6.93
S-Wert	cmol+/kg	4.27	1.59	37.1	8	4.21	0.998	0.701	16.4
BAS	%	29.9	8.26	27.6	8	29.1	5.62	3.65	12.2