



**WAGENINGEN EVALUATING PROGRAMS
FOR ANALYTICAL LABORATORIES**

Certificate of Analysis



International Soil-Analytical Exchange

REFERENCE MATERIAL

ISE sample 856



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 determinand 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.

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 856 of sandy soil, from Netherlands, is prepared for the WEPAL proficiency programs. The sample has been used in 4 periods (or rounds). The results on which the values in this report are based were taken from the periods given in the following table:

Year	Round	Number
2024	2	2
2022	2	3
2019	3	3
2016	3	1



Consensus Values ISE 856



Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	g/kg	15.1	1.22	8.1	69	15.2	0.900	0.184	1.22
As	mg/kg	3.06	0.560	18.3	39	3.03	0.351	0.112	3.67
Ba	mg/kg	199	14.5	7.3	64	202	7.84	2.27	1.14
Br	mg/kg	9.70	2.08	21.5	31	9.70	1.40	0.467	4.82
Ca	g/kg	2.89	0.285	9.9	69	2.90	0.180	0.043	1.48
Cd	mg/kg	0.790	0.092	11.7	38	0.795	0.058	0.019	2.37
Co	mg/kg	2.09	0.364	17.4	43	2.09	0.170	0.069	3.32
Cr	mg/kg	70.1	10.8	15.5	75	70.7	6.60	1.57	2.23
Cu	mg/kg	21.1	3.47	16.4	63	21.3	2.18	0.547	2.59
Fe	g/kg	3.41	0.343	10.1	71	3.40	0.197	0.051	1.49
K	mg/kg	8884	643	7.2	81	8860	435	89.3	1.00
Li	mg/kg	13.2	1.48	11.2	10	13.2	0.923	0.585	4.42
Mg	mg/kg	591	124	21.0	54	604	71.5	21.1	3.57
Mn	mg/kg	145	20.2	14.0	70	144	11.5	3.02	2.09
Mo	mg/kg	2.35	0.675	28.7	37	2.49	0.493	0.139	5.89
Na	mg/kg	1687	336	19.9	56	1637	205	56.1	3.32
Ni	mg/kg	19.3	4.02	20.8	66	20.1	2.55	0.619	3.21
P	mg/kg	1492	224	15.0	69	1480	150	33.8	2.26
Pb	mg/kg	27.1	3.25	12.0	66	26.9	1.93	0.500	1.85
Rb	mg/kg	38.0	1.98	5.2	48	38.0	1.05	0.358	0.941
S	mg/kg	277	63.3	22.8	65	278	38.0	9.82	3.54
Si	g/kg	417	9.59	2.3	59	416	4.89	1.56	0.375
Sr	mg/kg	37.0	3.05	8.2	54	37.0	1.85	0.519	1.40
Y	mg/kg	6.59	1.49	22.6	33	6.80	1.20	0.325	4.93
Zn	mg/kg	85.0	8.69	10.2	74	85.1	5.08	1.26	1.49
Zr	mg/kg	206	25.6	12.4	40	205	16.0	5.05	2.46
C-elementary	g/kg	22.0	1.71	7.8	133	21.8	1.13	0.185	0.842
Tl	mg/kg	0.287	0.034	11.7	10	0.290	0.023	0.013	4.64
V	mg/kg	19.8	2.39	12.1	62	19.9	1.41	0.380	1.91
Ti	mg/kg	962	113	11.7	68	961	64.1	17.1	1.78
N - elementary	g/kg	1.56	0.185	11.9	207	1.57	0.130	0.016	1.03
La	mg/kg	8.06	2.08	25.7	28	8.20	1.56	0.490	6.08
Nd	mg/kg	6.34	1.04	16.5	16	6.61	0.461	0.326	5.14
Hg	µg/kg	38.0	5.14	13.5	49	37.6	3.60	0.918	2.41



Consensus Values ISE 856

Method: Acid extractable (So-called totals)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	g/kg	4.57	1.20	26.3	48	4.60	0.757	0.217	4.75
As	mg/kg	2.14	0.365	17.1	44	2.20	0.179	0.069	3.22
Ba	mg/kg	15.6	3.55	22.8	41	15.3	2.70	0.693	4.44
Ca	g/kg	2.72	0.262	9.6	63	2.74	0.150	0.041	1.52
Cd	mg/kg	0.811	0.082	10.1	78	0.810	0.052	0.012	1.42
Co	mg/kg	1.83	0.278	15.2	64	1.86	0.175	0.043	2.37
Cr	mg/kg	56.1	10.1	18.0	85	55.8	7.30	1.37	2.44
Cu	mg/kg	20.2	2.19	10.8	101	19.8	1.60	0.272	1.35
Fe	g/kg	2.85	0.410	14.4	61	2.82	0.273	0.066	2.30
K	mg/kg	604	209	34.6	63	607	139	32.9	5.45
Mg	mg/kg	409	81.6	20.0	62	408	54.2	13.0	3.17
Mn	mg/kg	131	16.2	12.4	68	132	10.5	2.46	1.87
Mo	mg/kg	2.49	0.309	12.4	54	2.48	0.180	0.052	2.11
N	g/kg	1.47	0.185	12.6	107	1.48	0.120	0.022	1.52
Ni	mg/kg	19.6	2.60	13.3	85	19.8	1.59	0.353	1.80
P	mg/kg	1462	169	11.6	78	1456	113	24.0	1.64
Pb	mg/kg	22.6	2.53	11.2	87	22.6	1.60	0.339	1.50
S	mg/kg	280	34.8	12.4	53	280	20.1	5.97	2.14
Sn	mg/kg	1.24	0.267	21.4	28	1.27	0.233	0.063	5.06
Sr	mg/kg	11.1	1.84	16.6	13	11.1	1.30	0.637	5.75
Zn	mg/kg	83.6	9.34	11.2	101	83.0	6.20	1.16	1.39
V	mg/kg	13.6	2.06	15.1	45	13.6	1.21	0.384	2.82
Sb	mg/kg	0.446	0.059	13.3	11	0.466	0.066	0.022	5.00
Be	mg/kg	0.106	0.019	17.6	22	0.111	0.011	0.005	4.70
Hg	µg/kg	39.0	8.81	22.6	37	39.0	6.00	1.81	4.64

Method: Aqua Regia (ISO 11466)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	g/kg	4.37	0.644	14.7	84	4.45	0.410	0.088	2.01
As	mg/kg	2.06	0.293	14.2	95	2.07	0.190	0.038	1.83
Ba	mg/kg	15.0	2.97	19.9	44	15.2	1.97	0.560	3.75
Be	mg/kg	0.099	0.016	16.6	26	0.101	0.011	0.004	4.07
Ca	g/kg	2.64	0.246	9.3	86	2.65	0.158	0.033	1.26
Cd	mg/kg	0.831	0.088	10.6	121	0.821	0.051	0.010	1.21
Co	mg/kg	1.88	0.202	10.7	92	1.88	0.146	0.026	1.40
Cr	mg/kg	54.6	5.72	10.5	127	54.9	3.50	0.635	1.16
Cu	mg/kg	20.7	1.90	9.1	132	20.7	1.33	0.206	0.994



Consensus Values ISE 856



Method: Aqua Regia (ISO 11466)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Fe	g/kg	2.84	0.248	8.7	100	2.84	0.144	0.031	1.09
Hg	µg/kg	38.9	8.90	22.9	51	39.8	5.10	1.56	4.01
K	mg/kg	572	96.0	16.8	82	576	52.4	13.3	2.32
Li	mg/kg	2.96	0.717	24.3	26	2.94	0.425	0.176	5.95
Mg	mg/kg	400	42.6	10.7	90	402	25.0	5.61	1.40
Mn	mg/kg	129	9.44	7.3	101	129	5.60	1.17	0.912
Mo	mg/kg	2.55	0.270	10.6	70	2.53	0.154	0.040	1.58
Ni	mg/kg	19.9	2.08	10.4	133	20.0	1.30	0.226	1.13
P	mg/kg	1476	132	9.0	78	1480	85.8	18.7	1.27
Pb	mg/kg	23.1	2.33	10.1	133	23.0	1.48	0.253	1.09
S	mg/kg	270	26.6	9.9	62	268	16.2	4.22	1.56
Sb	mg/kg	0.426	0.070	16.4	28	0.437	0.053	0.016	3.87
Sn	mg/kg	1.17	0.185	15.8	26	1.16	0.100	0.045	3.86
Sr	mg/kg	10.9	1.87	17.1	35	10.9	1.10	0.395	3.62
Tl	mg/kg	0.064	0.014	22.4	21	0.063	0.010	0.004	6.12
U	mg/kg	0.513	0.046	9.0	22	0.518	0.022	0.012	2.39
V	mg/kg	13.7	1.44	10.5	59	13.7	0.800	0.234	1.71
Zn	mg/kg	85.0	6.00	7.1	132	85.4	3.89	0.653	0.768

Method: Extraction with boiling 2M HNO₃

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Cd	mg/kg	0.828	0.087	10.5	58	0.829	0.043	0.014	1.72
Co	mg/kg	1.38	0.131	9.5	52	1.37	0.065	0.023	1.64
Cr	mg/kg	19.1	1.43	7.5	61	19.1	0.840	0.228	1.19
Cu	mg/kg	19.6	1.55	7.9	61	19.5	0.900	0.248	1.27
Hg	µg/kg	34.2	4.60	13.4	45	34.5	2.50	0.856	2.51
Mo	mg/kg	0.514	0.103	20.0	46	0.519	0.069	0.019	3.69
Ni	mg/kg	4.80	0.502	10.4	60	4.88	0.285	0.081	1.69
Pb	mg/kg	22.7	1.79	7.9	60	22.6	0.960	0.289	1.28
Zn	mg/kg	81.2	5.99	7.4	61	81.8	3.50	0.958	1.18

Method: Extraction with 0.1M NaNO₃

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Cd	µg/kg	3.94	0.577	14.7	11	3.90	0.322	0.218	5.53
Cu	µg/kg	134	12.9	9.6	24	134	8.50	3.30	2.46
Ni	µg/kg	32.4	2.77	8.5	24	32.4	1.70	0.706	2.18
Zn	µg/kg	376	54.7	14.5	23	381	39.8	14.3	3.79



Consensus Values ISE 856



Method: Extraction with 0.01M CaCl2 1:10

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
K	mg/kg	107	7.45	6.9	28	108	4.25	1.76	1.64
Mg	mg/kg	83.8	6.11	7.3	20	83.9	4.06	1.71	2.04
Mn	mg/kg	14.6	0.981	6.7	13	14.4	0.600	0.340	2.34
N - NH4 (as N)	mg/kg	10.2	1.70	16.6	32	10.0	1.13	0.375	3.66
N - NO3 (as N)	mg/kg	9.18	1.14	12.4	26	9.20	0.725	0.279	3.04
Na	mg/kg	10.4	0.632	6.1	19	10.5	0.300	0.181	1.74
P	mg/kg	5.76	1.39	24.1	27	6.30	1.19	0.334	5.79

Method: Soil characteristics

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
pH - H2O	...	6.53	0.237	3.6	363	6.53	0.150	0.016	0.238
pH - KCl	...	6.18	0.217	3.5	172	6.18	0.140	0.021	0.335
pH - CaCl2	...	6.05	0.171	2.8	123	6.05	0.120	0.019	0.319
Fraction < 2 µm	%	3.70	1.64	44.4	114	3.90	1.24	0.192	5.19
EC-SC (ISO 11265)	mS/m	12.4	2.27	18.3	138	12.5	1.47	0.241	1.95
Fraction < 63 µm	%	19.6	4.77	24.3	77	20.4	3.45	0.680	3.46
Fraction > 63 µm	%	80.3	3.67	4.6	70	79.5	2.56	0.548	0.683
Org.matter (L.O.I.)	%	4.12	0.294	7.1	139	4.10	0.180	0.031	0.756
TC=Total C (org.+inorg.)	g/kg	21.7	1.51	7.0	149	21.7	1.00	0.154	0.713
TOC=Total Org. C	g/kg	20.8	1.90	9.1	157	20.8	1.20	0.190	0.909
C - org others (W&B a.o.)	g/kg	20.8	3.45	16.6	190	21.0	2.40	0.313	1.50

Method: Other determinations

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Moisture-content	%	0.974	0.188	19.3	174	0.990	0.110	0.018	1.83
delta 13C	‰ V-PDB	-26.7	0.273	1.0	17	-26.7	0.200	0.083	0.310
delta 15N	‰ Air	7.40	0.330	4.5	17	7.39	0.220	0.100	1.35

Method: Fluoride (Swiss standard procedure)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
F - Total	mg/kg	99.5	16.5	16.6	14	96.8	7.75	5.51	5.54

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	8.39	1.45	17.3	123	8.43	0.870	0.164	1.95
Na	cmol+/kg	0.066	0.033	49.3	149	0.070	0.020	0.003	5.05



Consensus Values ISE 856

Method: Pot. CEC using 1M NH ₄ -acetate at pH=7									(cont.)
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
K	cmol+/kg	0.422	0.056	13.2	194	0.422	0.032	0.005	1.19
Mg	cmol+/kg	0.793	0.129	16.2	191	0.795	0.079	0.012	1.47
Ca	cmol+/kg	7.23	1.44	19.9	182	7.20	0.896	0.133	1.84
Method: Pot. CEC using 1M or 0.1M BaCl ₂ -TEA at pH=8.1 (ISO 13536 OR BZE)									
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
CEC	cmol+/kg	15.1	1.81	12.0	15	15.5	1.20	0.585	3.86
Method: Pot. CEC using 1M NH ₄ Cl (BZE)									
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
K	cmol+/kg	0.452	0.064	14.2	16	0.460	0.037	0.020	4.42
Mg	cmol+/kg	0.852	0.068	7.9	16	0.860	0.041	0.021	2.48
Ca	cmol+/kg	7.96	1.12	14.1	16	8.17	0.691	0.350	4.40
Method: Act. CEC using 0.01M BaCl ₂ (ISO 11260)									
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Ca	cmol+/kg	8.18	1.13	13.8	8	8.33	0.465	0.500	6.11
Method: Act. CEC using 0.1M BaCl ₂ (UNEP-UN/EC 91065A)									
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
K	cmol+/kg	0.382	0.045	11.7	9	0.377	0.023	0.019	4.86
Ca	cmol+/kg	7.57	0.630	8.3	8	7.51	0.472	0.278	3.67
Mg	cmol+/kg	0.787	0.074	9.4	8	0.788	0.037	0.033	4.17
Fe	cmol+/kg	0.229	0.032	13.8	8	0.237	0.017	0.014	6.09
Method: Act. CEC using cobaltihexamine (AFNOR NFX 31 130)									
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
CEC	cmol+/kg	7.07	1.08	15.3	37	7.10	0.700	0.223	3.15
Na	cmol+/kg	0.048	0.009	19.0	27	0.049	0.006	0.002	4.56
K	cmol+/kg	0.338	0.034	10.0	30	0.345	0.022	0.008	2.28
Ca	cmol+/kg	5.96	0.707	11.9	30	5.99	0.538	0.161	2.71
Mg	cmol+/kg	0.689	0.090	13.0	30	0.694	0.052	0.020	2.97
Mn	cmol+/kg	0.049	0.005	9.7	9	0.050	0.003	0.002	4.03



Consensus Values ISE 856



Method: Mehlich-3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Ca	mg/kg	1914	175	9.1	83	1916	105	24.0	1.25
Cu	mg/kg	4.39	1.28	29.2	80	4.37	0.800	0.179	4.08
Fe	mg/kg	776	109	14.0	81	773	72.0	15.1	1.94
K	mg/kg	179	14.4	8.1	82	178	8.31	1.99	1.11
Mg	mg/kg	107	10.5	9.9	82	108	6.98	1.45	1.36
Mn	mg/kg	51.8	6.94	13.4	81	52.0	4.45	0.964	1.86
Na	mg/kg	15.7	4.36	27.8	51	15.8	2.80	0.762	4.87
P	mg/kg	998	118	11.8	99	989	69.0	14.8	1.48
Zn	mg/kg	46.8	4.41	9.4	82	47.0	2.70	0.609	1.30
Al	mg/kg	1342	105	7.8	46	1341	57.5	19.3	1.44

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	3.99	0.960	24.1	66	4.16	0.599	0.148	3.70
Mn	mg/kg	37.9	8.71	23.0	68	37.2	4.95	1.32	3.49
Zn	mg/kg	28.7	4.70	16.4	67	28.6	2.93	0.717	2.50

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

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
N - NH ₄ (as N)	mg/kg	13.4	1.79	13.4	42	13.2	1.18	0.346	2.58
N - NO ₃ (as N)	mg/kg	9.32	1.92	20.5	50	9.28	1.28	0.339	3.63

Method: Phosphorus and related analysis

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
P - Olsen (as P)	mg/kg	153	31.7	20.7	144	152	18.8	3.30	2.16
Al - Ox	mg/kg	1626	119	7.3	14	1651	73.0	39.9	2.45
Fe - Ox	mg/kg	1511	111	7.4	14	1536	60.5	37.1	2.46
P - Ox	mg/kg	1289	125	9.7	14	1302	61.5	41.7	3.23
P - AL (as P)	mg/kg	644	100	15.6	35	647	60.7	21.2	3.29

Method: UK Soil Methods

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
P – NaHCO ₃ (1/20)	mg/l	185	30.8	16.7	48	187	21.0	5.56	3.00
K - NH ₄ NO ₃ (1/5)	mg/l	235	21.9	9.3	55	234	15.2	3.70	1.57
Mg - NH ₄ NO ₃ (1/5)	mg/l	122	15.5	12.7	54	122	11.4	2.64	2.16
pH - H ₂ O (2/5)	...	6.38	0.221	3.5	50	6.40	0.150	0.039	0.611



Indicative Values ISE 856



Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Ga	mg/kg	4.78	1.64	34.4	39	4.90	0.950	0.329	6.88
I	mg/kg	2.34	1.01	43.2	10	2.47	0.716	0.401	17.1
Sn	mg/kg	1.69	0.409	24.2	20	1.77	0.270	0.114	6.75
Sb	mg/kg	0.686	0.182	26.5	18	0.711	0.115	0.054	7.82
Be	mg/kg	0.366	0.152	41.5	10	0.375	0.060	0.060	16.4
Ce	mg/kg	16.5	4.80	29.0	30	16.9	2.85	1.09	6.63
Nb	mg/kg	3.88	2.03	52.3	21	3.82	1.08	0.554	14.3
Sc	mg/kg	2.11	0.963	45.6	16	2.00	0.725	0.301	14.3
Th	mg/kg	2.66	0.656	24.7	19	2.80	0.400	0.188	7.08
U	mg/kg	1.06	0.252	23.8	14	1.17	0.137	0.084	7.93
Cs	mg/kg	2.18	0.772	35.4	10	2.50	0.860	0.305	14.0
W	mg/kg	1.11	0.446	40.3	11	1.08	0.300	0.168	15.2

Method: Acid extractable (So-called totals)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
B	mg/kg	3.99	2.26	56.7	24	3.88	1.20	0.578	14.5
Li	mg/kg	3.31	0.810	24.5	13	3.39	0.490	0.281	8.50
Na	mg/kg	41.3	26.0	63.0	41	46.8	20.4	5.08	12.3
Rb	mg/kg	6.45	1.68	26.1	4	6.50	0.932	1.05	16.3
Se	mg/kg	0.286	0.074	25.8	14	0.308	0.038	0.025	8.62
Y	mg/kg	1.19	0.143	12.0	4	1.18	0.065	0.089	7.50
Tl	mg/kg	0.080	0.025	31.7	9	0.079	0.019	0.011	13.2
Ag	mg/kg	0.053	0.009	16.6	6	0.052	0.005	0.004	8.48
Ti	mg/kg	52.4	20.7	39.5	11	48.8	10.7	7.80	14.9
La	mg/kg	4.35	0.210	4.8	5	4.31	0.089	0.117	2.70
U	mg/kg	0.571	0.084	14.8	6	0.576	0.058	0.043	7.55

Method: Aqua Regia (ISO 11466)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Ag	µg/kg	51.6	14.6	28.4	10	53.7	8.90	5.78	11.2
B	mg/kg	3.67	3.39	92.4	19	3.60	2.48	0.973	26.5
Bi	mg/kg	0.078	0.015	18.8	6	0.080	0.007	0.007	9.57
Ce	mg/kg	8.23	0.732	8.9	5	8.27	0.420	0.409	4.97
La	mg/kg	4.02	0.623	15.5	8	4.13	0.315	0.276	6.85
Na	mg/kg	36.0	16.7	46.5	53	36.9	9.90	2.88	7.99
Nd	mg/kg	3.01	0.754	25.0	4	3.02	0.425	0.471	15.6
Rb	mg/kg	3.84	1.27	33.1	5	4.10	0.920	0.710	18.5



Indicative Values ISE 856

Method: Aqua Regia (ISO 11466)									(cont.)
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Se	mg/kg	0.308	0.126	40.9	30	0.322	0.068	0.029	9.34
Ti	mg/kg	57.2	27.8	48.6	30	59.2	16.6	6.34	11.1
Y	mg/kg	0.971	0.138	14.2	4	0.970	0.105	0.086	8.87
Method: Extraction with boiling 2M HNO3									
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Tl	mg/kg	0.038	0.008	22.2	8	0.039	0.005	0.004	9.82
Method: Extraction with 0.01M CaCl2 1:10									
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
B	µg/kg	115	37.7	32.7	12	113	21.6	13.6	11.8
Co	µg/kg	27.9	5.54	19.9	8	28.0	2.40	2.45	8.79
Cu	µg/kg	104	21.4	20.5	12	103	11.6	7.72	7.40
Fe	mg/kg	9.64	2.43	25.2	11	10.0	1.73	0.917	9.51
N total soluble	mg/kg	36.9	1.23	3.3	7	36.3	1.20	0.581	1.57
SO4	mg/kg	36.3	5.35	14.7	5	35.9	3.00	2.99	8.24
Zn	µg/kg	2364	493	20.9	13	2110	426	171	7.23
Method: Soil characteristics									
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
TIC=Tot.Inorg C(as CaCO3)	%	0.280	0.313	111.8	69	0.350	0.236	0.047	16.8
Fraction < 16 µm	%	10.5	4.13	39.2	38	11.1	3.25	0.838	7.95
Method: Other determinations									
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
CN - Total	mg/kg	0.939	0.638	68.0	6	1.11	0.400	0.326	34.7
B - Hot water	mg/kg	0.551	0.319	57.9	40	0.597	0.175	0.063	11.4
Method: Pot. CEC using 1M NH4-acetate at pH=7									
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	cmol+/kg	0.064	0.063	99.3	8	0.075	0.035	0.028	43.9
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. %
K	cmol+/kg	0.469	0.100	21.3	8	0.470	0.081	0.044	9.42
Mg	cmol+/kg	0.821	0.212	25.8	8	0.853	0.100	0.094	11.4
Ca	cmol+/kg	6.77	1.05	15.6	8	6.99	0.540	0.466	6.89



Indicative Values ISE 856

Method: Pot. CEC using 1M NH₄Cl (BZE)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
CEC	cmol+/kg	10.7	0.974	9.1	6	10.4	0.580	0.497	4.67
Na	cmol+/kg	0.058	0.014	24.6	13	0.061	0.011	0.005	8.51
Mn	cmol+/kg	0.090	0.026	28.4	12	0.088	0.015	0.009	10.3
Fe	cmol+/kg	0.110	0.126	114.9	12	0.133	0.083	0.046	41.5

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

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
CEC	cmol+/kg	8.64	0.834	9.6	6	8.85	0.600	0.426	4.92
Na	cmol+/kg	0.053	0.017	31.6	7	0.050	0.010	0.008	14.9
K	cmol+/kg	0.460	0.068	14.8	8	0.470	0.043	0.030	6.52
Mg	cmol+/kg	0.852	0.183	21.4	8	0.850	0.088	0.081	9.47

Method: Act. CEC using 0.1M BaCl₂ (UNEP-UN/EC 91065A)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
CEC	cmol+/kg	9.33	0.870	9.3	7	9.19	0.443	0.411	4.41
Na	cmol+/kg	0.051	0.007	14.4	8	0.050	0.004	0.003	6.38
Mn	cmol+/kg	0.092	0.004	3.9	7	0.092	0.002	0.002	1.82

Method: Mehlich-3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
B	mg/kg	0.437	0.308	70.4	44	0.442	0.171	0.058	13.3
Cd	mg/kg	0.460	0.008	1.8	5	0.461	0.004	0.005	1.00

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	9.60	1.26	13.1	5	9.87	0.830	0.704	7.33

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. %
Fe	mg/kg	282	136	48.2	68	280	98.5	20.6	7.30

Method: Phosphorus and related analysis

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
P - Bray (as P)	mg/kg	635	407	64.1	96	675	342	51.9	8.18
P - w (as P)	mg/l soil	57.1	22.1	38.6	13	58.2	16.7	7.65	13.4



Indicative Values ISE 856

Method: Water soluble 1:10 (w/v) (Neth standard VPR C85-06)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
SO4	mg/kg	30.3	14.5	47.9	8	32.2	12.9	6.41	21.2

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

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Cu	mg/kg	13.7	1.28	9.4	5	13.7	0.690	0.718	5.24
Zn	mg/kg	63.6	4.24	6.7	5	62.7	2.70	2.37	3.73
Fe	g/kg	0.920	0.035	3.8	5	0.926	0.032	0.019	2.10
K	mg/kg	199	20.5	10.3	5	202	10.3	11.5	5.77
Mg	mg/kg	125	17.1	13.6	5	123	10.1	9.54	7.61
Mn	mg/kg	101	2.17	2.1	5	101	1.30	1.21	1.19
P	mg/kg	1127	77.1	6.8	5	1140	45.0	43.1	3.83
Na	mg/kg	18.9	6.92	36.6	5	19.1	4.70	3.87	20.5
S	mg/kg	42.9	10.0	23.4	6	43.6	4.45	5.12	11.9