Reference Material - Data Summary Sheet

GP Batch: 988-C-1

Product Type: Soil

Issue Date: 18 July 2025

Expiry Date: 31 March 2027

Test Name	n Labs	n Values	Mean	Uncertainty of Mean [1]	k	Methods
Acid P (mg/kg)	4	8	45.6	+/- 2.4	2.36	9G1, 9G2
Aqua Regia Aluminium (mg/kg)	7	11	29380	+/- 4805	2.23	17B1, 17B2, 17C1, 17A2
Aqua Regia Arsenic (mg/kg)	5	9	2.39	+/- 0.58	2.31	17B1, 17B2, 17C1, 17A2
Aqua Regia Cadmium (mg/kg)	5	8	0.122	+/- 0.054	2.36	17B1, 17B2, 17C1, 17A2
Aqua Regia Calcium (mg/kg)	7	12	1654	+/- 75	2.20	17B1, 17B2, 17C1, 17A2
Aqua Regia Chromium (mg/kg)	8	14	268	+/- 17	2.16	17B1, 17B2, 17C1, 17A2
Aqua Regia Cobalt (mg/kg)	6	11	115	+/- 8	2.23	17B1, 17B2, 17C1, 17A2
Aqua Regia Copper (mg/kg)	7	11	67.6	+/- 3.4	2.23	17B1, 17B2, 17C1, 17A2
Aqua Regia Iron (mg/kg)	7	12	101345	+/- 8347	2.20	17B1, 17B2, 17C1, 17A2
Aqua Regia Lead (mg/kg)	7	12	11.1	+/- 1.6	2.20	17B1, 17B2, 17C1, 17A2
Aqua Regia Magnesium (mg/kg)	7	12	580	+/- 64	2.20	17B1, 17B2, 17C1, 17A2
Aqua Regia Manganese (mg/kg)	7	10	6789	+/- 240	2.26	17B1, 17B2, 17C1, 17A2
Aqua Regia Molybdenum (mg/kg)	5	9	1.77	+/- 0.37	2.31	17B1, 17B2, 17C1, 17A2
Aqua Regia Selenium (mg/kg)	5	8	1.47	+/- 1.02	2.36	17B1, 17B2, 17C1, 17A2
Aqua Regia Sodium (mg/kg)	6	9	127	+/- 25	2.31	17B1, 17B2, 17C1, 17A2
Aqua Regia Zinc (mg/kg)	6	11	151	+/- 17	2.23	17B1, 17B2, 17C1, 17A2
Bray P (mg/kg)	5	8	6.12	+/- 0.36	2.36	9E1, 9E2
CaCl2 Extractable B (mg/kg)	6	12	1.16	+/- 0.12	2.20	12C1, 12C2
Colwell P (mg/kg)	8	14	54.3	+/- 2.3	2.16	9B1, 9B2
Exch Calcium (cmol+/kg)	7	12	6.37	+/- 0.21	2.20	15A1 *
Exch Calcium (cmol+/kg)	7	13	6.22	+/- 0.14	2.18	15D3

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Exch Magnesium (cmol+/kg)	6	11	2.62	+/- 0.08	2.23	15A1 *
Exch Magnesium (cmol+/kg)	7	13	2.59	+/- 0.06	2.18	15D3
Exch Potassium (cmol+/kg)	9	15	0.403	+/- 0.028	2.14	15A1 *
Exch Potassium (cmol+/kg)	7	13	0.397	+/- 0.012	2.18	15D3
Exch Sodium (cmol+/kg)	7	12	0.0987	+/- 0.0338	2.20	15A1 *
Exch Sodium (cmol+/kg)	7	12	0.0694	+/- 0.0091	2.20	15D3
Ext Copper (mg/kg)	6	11	5.33	+/- 0.32	2.23	12A1
Ext Iron (mg/kg)	6	11	23.8	+/- 1.9	2.23	12A1
Ext Manganese (mg/kg)	7	11	216	+/- 17	2.23	12A1
Ext Sulphur (mg/kg)	6	11	20.4	+/- 1.0	2.23	10D1
M3-Aluminium (mg/kg)	6	10	781	+/- 30	2.26	18F1
M3-Boron (mg/kg)	5	8	0.964	+/- 0.171	2.36	18F1
M3-Calcium (mg/kg)	5	9	1271	+/- 33	2.31	18F1
M3-Copper (mg/kg)	6	11	8.38	+/- 0.39	2.23	18F1
M3-Iron (mg/kg)	6	10	79.8	+/- 6.7	2.26	18F1
M3-Magnesium (mg/kg)	5	8	318	+/- 10	2.36	18F1
M3-Manganese (mg/kg)	6	11	548	+/- 60	2.23	18F1
M3-Phosphorus (mg/kg)	5	9	8.69	+/- 0.49	2.31	18F1
M3-Potassium (mg/kg)	5	9	146	+/- 8	2.31	18F1
M3-Sodium (mg/kg)	4	8	14.2	+/- 1.2	2.36	18F1
M3-Sulphur (mg/kg)	5	9	24.5	+/- 1.4	2.31	18F1
M3-Zinc (mg/kg)	6	10	10.3	+/- 0.4	2.26	18F1
Nitrate Nitrogen (mg/kg)	5	9	8.12	+/- 0.31	2.31	7B1, 7B2
Nitrate Nitrogen (mg/kg)	6	12	8.10	+/- 0.44	2.20	7C1, 7C2
Olsen P (mg/kg)	6	11	14.8	+/- 1.1	2.23	9C1, 9C2

Organic Carbon W&B (%)	8	15	1.51	+/- 0.07	2.14	6A1 *
PBI Colwell (L/kg)	7	12	226	+/- 8	2.20	9I2a, 9I2b, 9I2c
pH CaCl2 (pH units)	13	24	5.67	+/- 0.03	2.07	4B1, 4B2, 4B3, 4B4
pH Water (pH units)	18	32	6.24	+/- 0.06	2.04	4A1, 4A3
Total Carbon (%)	16	29	1.82	+/- 0.03	2.05	6B2
Total Nitrogen (%)	7	12	0.164	+/- 0.007	2.20	7A1, 7A2, 7A3 *
Total Nitrogen (%)	14	25	0.178	+/- 0.006	2.06	7A5
Total Organic Carbon (%)	16	27	1.76	+/- 0.05	2.06	6B1, 6B3 *
Total Phosphorus (%)	10	17	0.132	+/- 0.009	2.12	Not Specified *
Water Ext Cl (mg/kg)	6	11	5.81	+/- 2.02	2.23	5A1, 5A2, 5A3

[1] *Uncertainty of Mean is an expanded standard error of the mean (SEM) with a level of confidence of 95%. The coverage factor (k) is the critical value of Student's t distribution with n - 1 degrees of freedom. This uncertainty may only represent the measurement reproducibility of the data used. It does not include all known associated uncertainties and does not suggest that all methods used are statistically equivalent.*

* *These methods should be reported on an oven dried basis (105°C) by using the formula given in method 2A1 of Rayment and Lyons 2011.*

Intended Use: For the verification of analytical methods used to determine attributes of Soil

Description: 150 g+ irradiated, packed in plastic jar

Homogeneity: This reference material has been assessed as homogeneous.

Stability: An expiry period consistent with the shelf life of the unopened product and/or estimated from stability studies has been applied.

Storage: Keep samples dry and at a stable temperature (e.g. in air conditioned storage). Reseal containers immediately after each use. Do not store in sunlight.

Instructions for Use: Sample test portion size must be as stated in the method used in your laboratory; modification could invalidate the Reference values. Due to possible moisture reabsorption, re-dry the sample at 40°C to constant weight prior to analysis

Reference Values: The Mean is the simple mean excluding outliers; *n labs* is the number of laboratories who contributed results, and *n values* is the number of results used to calculate the mean. The uncertainty of the mean is the range within which the true mean of the population can be expected to lie with 95% confidence. This value is derived in accordance with the procedures described in ISO 33405:2024 "Reference materials - Approaches for characterization and assessment of homogeneity and stability".

Quality Statement: The values shown have been generated from data submitted in an inter-laboratory comparison programme (ILCP). The ILCP and reference material production are accredited to ISO/IEC 17043:2023 and ISO 17034:2016 respectively. Generation of this reference material also includes the requirements of ISO 33401 and 33405, which relate to production, characterisation and final product presentation.

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