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Certificate of Analysis

Metals in Sandy Loam Soil CRM

ISO 17034 | ISO/IEC 17025 | ISO 9001

Product No.: VHG-DS1-100G **Lot No.:** 711821568 ***Expiration Date:** 31 October 2026

Matrix: Sandy Loam Soil

Intended Use: This material is intended for use as a certified reference material for trace metals in sandy loam soil, using US EPA Methods or other related procedures. It is suitable for use with digestion methods US EPA 3050, 3051, or equivalent methods. This product consists of contaminated sediment from a site located in the Western United States. The sample has been heat sterilized.

Certification & Traceability: VHG standards are manufactured and certified under a quality management system that is accredited to **ISO 17034 and ISO 17025**. The balances used in the preparation of this standard are calibrated regularly with traceability to NIST. All dilutions were performed gravimetrically. The certified values are the statistical mean as determined by a round-robin inter-laboratory study, and are traceable to the specified NIST SRMs (where available). The uncertainty associated with each certified value represents the expanded uncertainty at the 95% confidence level using a coverage factor of k=2. The standard deviations are the statistical standard deviations from the inter-laboratory study. Confidence intervals and prediction intervals were calculated from the means, standard deviations, and standard deviations of the means generated in analysis of the inter-laboratory study results.

Analyte	Units	Certified Value & Uncertainty	NIST SRM	Suggested Acceptance Windows	Standard Deviation
Aluminum, Al	mg/kg	2730 ± 184	3101a	1098 – 4362	544
Antimony, Sb	mg/kg	4950 ± 792	3102a	0.00 – 11970	2340
Arsenic, As	mg/kg	24.8 ± 2.5	3103a	3.02 – 46.6	7.26
Barium, Ba	mg/kg	586 ± 9	3104a	509 – 663	25.7
Cadmium, Cd	mg/kg	1.20 ± 0.09	3108	0.408 – 1.99	0.264
Calcium, Ca	mg/kg	5430 ± 154	3109a	4065 – 6795	455
Chromium, Cr (total)	mg/kg	10.7 ± 1.0	3112a	1.58 – 19.8	3.04
Copper, Cu	mg/kg	4790 ± 216	3114	2879 – 6701	637
Iron, Fe	mg/kg	6480 ± 484	3126a	2190 – 10770	1430
Manganese, Mn	mg/kg	171 ± 6	3132	118 – 224	17.8
Mercury, Hg	mg/kg	4.70 ± 0.18	3133	3.12 – 6.28	0.528
Nickel, Ni	mg/kg	12.6 ± 0.9	3136	4.68 – 20.5	2.64
Potassium, K	mg/kg	1010 ± 39	3141a	662 – 1358	116
Silver, Ag	mg/kg	6.50 ± 0.40	3151	2.93 – 10.1	1.19
Sodium, Na	mg/kg	380 ± 27	3152a	138 – 321	80.5
Zinc, Zn	mg/kg	546 ± 17	3168a	397 – 695	49.5

*ND= not detected

Instructions for Use: Recommended storage condition is 18°C (room temperature) in a dry, dark location. Determination of the percent moisture content of the material is required during sample preparation. Report all results on a dry weight basis. It is recommended that approximately one gram of the CRM be digested for metals analysis. To achieve the highest accuracy, the analyst should: (1) use only pre-cleaned containers and transferware, (2) make dilutions using calibrated balances or certified volumetric class A flasks and pipettes, (3) never pour used product back into the original container, and (4) replace cap after sub-sampling and store remaining sample at 18°C. Do not heat or expose to direct sunlight. Minimize exposure to moisture or high humidity.

Period of Validity: LGC Standards ensures the accuracy of this solution until the date shown above or ***12 Months** from the date opened, provided the instructions for use are followed. During the period of validity, the purchaser will be notified if this product is recalled due to any significant changes in the stability of the solution.

Chuck Goudreau

Chuck Goudreau, Certifying Officer

5 June 2023
Certification Date

Date Opened

ACCREDITED

ISO 17034 Accredited: Reference Materials Producer, Certificate # 2848.02
ISO/IEC 17025 Accredited: Chemical Testing, Certificate # 2848.01

Conditions of Sale and Supply: All CRMs & RMs sold are subject to applicable LGC Standard Terms and Conditions of Sale.