

Reference Material Description:

Trace Metals

Lot Number:

127880-127684

Expiration Date:

04/2009

Certification Date:

04/2008

Certificate of Analysis

Certified Properties

PROPERTY	CERTIFIED VALUE
Aluminum	209 ± 6.08 ug/L
Antimony	28.4 ± 0.669 ug/L
Arsenic	41.1 ± 0.729 ug/L
Barium	877 ± 11.9 ug/L
Beryllium	1.16 ± 0.0477 ug/L
Boron	839 ± 15.2 ug/L
Cadmium	11.2 ± 0.233 ug/L
Chromium	74.0 ± 1.30 ug/L
Copper	326 ± 4.19 ug/L
Iron	523 ± 11.7 ug/L
Lead	28.5 ± 0.325 ug/L
Manganese	461 ± 6.54 ug/L
Mercury	4.91 ± 0.209 ug/L
Molybdenum	71.0 ± 1.55 ug/L
Nickel	18.5 ± 0.366 ug/L
Selenium	75.1 ± 1.14 ug/L
Silver	70.7 ± 1.31 ug/L
Thallium	3.06 ± 0.0840 ug/L
Vanadium	674 ± 8.72 ug/L
Zinc	1140 ± 18.3 ug/L

Provided as two samples, each in 23mL plastic, screw top vials yielding up to 2 liters of solution per sample.

This material was certified in an interlaboratory study which included 54 laboratories. The Certified Values and associated Uncertainties were calculated from the data developed in this study based upon the requirements of ISO13528. The reported Expanded Uncertainty is based upon a coverage factor of 2.

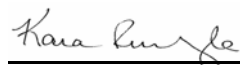
Sample Preparation Instructions are included on the last page.

This reference material is intended for quality assurance purposes associated with environmental testing laboratories such as a quality control sample, method performance verification, or analyst training verification.

Unopened containers are stable for the time period indicated by the expiration date on this certificate. Samples are intended for a single use. After opening reference materials are not to be stored for future preparations or analyses. Specific storage instructions for unopened reference materials, if required, are located in the Sample Preparation Instructions section of this certificate.

Selected samples of the material have been evaluated and found to be homogeneous at the 95% Confidence Level for each certified property. This material was prepared and analyzed by Analytical Products Group, Inc. It was further certified by evaluation in an interlaboratory round-robin program.

The Certified value is the robust mean of participating laboratories. The standard uncertainty is calculated as $U_c = 1.23S^*/\sqrt{p}$ obtained from participating laboratories. The reported expanded uncertainty is based upon a coverage factor of 2.



Laboratory Manager
Kara Ruckriegle

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Informational Values

These 54 laboratories analyzed this material using various methods. This table reports the data developed on the sample from each method. The reported values are calculated based upon ISO13528 but are reported as informational values only. The reported Expanded Uncertainty is based upon a coverage factor of 2.

PROPERTY	NUMBER	METHOD	METHOD VALUE
Aluminum	23	EPA 200.7	203 ± 7.72 ug/L
Arsenic	10	EPA 200.7	41.3 ± 1.81 ug/L
Barium	25	EPA 200.7	886 ± 17.0 ug/L
Beryllium	19	EPA 200.7	1.10 ± 0.0605 ug/L
Boron	16	EPA 200.7	833 ± 20.3 ug/L
Cadmium	22	EPA 200.7	11.2 ± 0.481 ug/L
Chromium	25	EPA 200.7	73.9 ± 2.02 ug/L
Copper	28	EPA 200.7	326 ± 5.92 ug/L
Iron	27	EPA 200.7	527 ± 13.0 ug/L
Manganese	26	EPA 200.7	463 ± 6.71 ug/L
Molybdenum	21	EPA 200.7	71.6 ± 2.76 ug/L
Nickel	25	EPA 200.7	18.6 ± 0.616 ug/L
Silver	20	EPA 200.7	70.2 ± 2.55 ug/L
Vanadium	20	EPA 200.7	673 ± 9.36 ug/L
Zinc	26	EPA 200.7	1150 ± 26.9 ug/L

PROPERTY	NUMBER	METHOD	METHOD VALUE
Aluminum	18	EPA 200.8	209 ± 6.66 ug/L
Antimony	23	EPA 200.8	28.7 ± 0.729 ug/L
Arsenic	23	EPA 200.8	41.4 ± 1.33 ug/L
Barium	23	EPA 200.8	869 ± 14.8 ug/L
Beryllium	23	EPA 200.8	1.19 ± 0.0624 ug/L
Cadmium	23	EPA 200.8	11.1 ± 0.279 ug/L
Chromium	23	EPA 200.8	74.2 ± 1.97 ug/L
Copper	24	EPA 200.8	328 ± 6.33 ug/L
Iron	12	EPA 200.8	508 ± 31.9 ug/L
Lead	23	EPA 200.8	28.4 ± 0.351 ug/L
Manganese	19	EPA 200.8	461 ± 11.3 ug/L
Molybdenum	14	EPA 200.8	70.0 ± 2.19 ug/L
Nickel	22	EPA 200.8	18.5 ± 0.460 ug/L
Selenium	23	EPA 200.8	75.6 ± 1.70 ug/L
Silver	20	EPA 200.8	70.6 ± 2.72 ug/L
Thallium	23	EPA 200.8	3.07 ± 0.0856 ug/L
Vanadium	16	EPA 200.8	674 ± 23.4 ug/L
Zinc	17	EPA 200.8	1140 ± 24.6 ug/L

CERTIFIED REFERENCE MATERIALS

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PROPERTY	NUMBER	METHOD	METHOD VALUE
Mercury	17	EPA 245.1	4.84 ± 0.353 ug/L

PROPERTY	NUMBER	METHOD	METHOD VALUE
Lead	17	SM18/19th3113B	29.4 ± 2.06 ug/L

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Sample Preparation Instructions

Individual vials are prepared separately. Do not combine vials into one sample.

Sample 2 should be tested for Antimony, Boron, and Molybdenum. All other metals listed are contained in Sample 1.

Vial #1

Pipet 1.5 mL of reagent grade Nitric Acid and 10.0 mL of vial #1 into a one (1) Liter volumetric flask and dilute to the mark with laboratory grade water. Label as Sample 1.

Vial #2

Pipet 1.5 mL of reagent grade Nitric Acid and 10.0 mL of vial #2 into a one (1) Liter volumetric flask and dilute to mark with laboratory grade water. Label as Sample 2.