



APEC Proficiency Testing Scheme

Trace Elements in Natural Water



FINAL REPORT SUMMARY

**Asia-Pacific Economic Cooperation
Proficiency Testing Scheme**

**Trace Elements in Natural Water
(APEC PT 2022)**

Coordinated by

Government Laboratory
Government of the HKSAR
Hong Kong, China

May 2023



Summary

1. This APEC Proficiency Testing Scheme (APEC PT 2022) – Trace Elements in Natural Water was organized by the Government Laboratory of Hong Kong, China (GLHK). The aims of the PT scheme were (i) to enable participating laboratories to demonstrate their capabilities on the measurement of the mass fractions of four analytes (arsenic, cadmium, antimony and lead) at $\mu\text{g}/\text{kg}$ levels in a test sample of natural water; and (ii) to identify opportunities for further improvement.
2. A total of 64 laboratories from 23 economies enrolled in the PT scheme and 54 of them returned the Result Proforma to GLHK within the scheduled timeline. Participating laboratories were free to choose any techniques and methodologies for measurement.
3. The reference values provided by up to five metrology institutes with relevant Calibration and Measurement Capabilities (CMCs) published in the BIPM Key Comparison Database (KCDB) were used as the assigned values for evaluating the performance of participants. The standard deviation for proficiency assessment was derived from the Horwitz Equation. The z-scores were used to show the performance of participants with respect to the assigned values of the analytes of interest.
4. The participants' z-scores on the four analytes are summarized as follows:

z-Score	Number of Participants (Percentage)			
	Arsenic	Cadmium	Antimony	Lead
$ z \leq 2.0$	47 (92%)	45 (87%)	33 (83%)	48 (91%)
$2.0 < z < 3.0$	1 (2%)	0 (0%)	2 (5%)	2 (4%)
$ z \geq 3.0$	3 (6%)	7 (13%)	5 (13%)	3 (6%)
Total:	51	52	40	53

Note: The percentages may not add up to 100% due to rounding up of figures.