

Proficiency Testing Program
Organised by
Center for Laboratory Proficiency Testing
Department of Science Service,
Ministry of Science and Technology, Bangkok, Thailand
Heavy metals (As, Cd, Cr, Cu, Fe, Mn, Ni, Pb, Se and Zn) in water
PTEN - W02 - 1901
29 March 2019

SUMMARY SHEET

Laboratory Name : Technical Training and Support Service, Center for Scientific and Technological Equipment, Walailak University

Laboratory Code : W02 - 1901 - 141

Test item (mg/L)	Number of results	Assigned value		Standard deviation for proficiency assessment (σ_{pt})	Lab's result		z-score
		x_{pt}	MU		Value	MU	
Arsenic (As)	123	0.069	0.003	0.010	0.075	-	0.60
Cadmium (Cd)	143	0.295	0.007	0.030	0.28	-	-0.50
Chromium (Cr)	132	0.069	0.001	0.010	0.067	-	-0.20
Copper (Cu)	164	0.248	0.006	0.025	0.23	-	-0.72
Iron (Fe)	179	1.482	0.008	0.104	1.46	-	-0.21
Manganese (Mn)	176	0.243	0.002	0.024	0.24	-	-0.13
Nickel (Ni)	137	0.584	0.005	0.058	0.59	-	0.10
Lead (Pb)	141	0.075	0.002	0.011	0.070	-	-0.45
Selenium (Se)	103	0.584	0.012	0.058	0.54	-	-0.76
Zinc (Zn)	158	0.089	0.003	0.013	0.080	-	-0.69

Note

- Assigned values (x_{pt})
 - For As, Cd, Cu, Pb and Zn; the assigned values are the reference values determined by the reference laboratory (National Institute of Metrology, Thailand).
 - For Cr, Fe, Mn, Ni and Se; the assigned values are the robust averages of the participant results in this round, calculated by using Algorithm A (ISO 13528: 2015).
- Standard deviations for proficiency assessment (σ_{pt}) are the target standard deviations from previous rounds and expert judgement.
- MU is measurement uncertainty at 95% confidence level.
- Each z-score marked with "A" is an outlier ($|z| \geq 3.0$). Therefore, laboratory which is marked with "A" shall investigate the result. Laboratory is also encouraged to review the result which has an absolute z-score value between two and three ($2.0 < |z| < 3.0$) marked with "W".
- This summary sheet shall be read in conjunction with the final report.

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