

Proficiency Testing Program  
Organised by  
Center for Laboratory Proficiency Testing  
Department of Science Service,  
Ministry of Science and Technology, Bangkok, Thailand  
Total hardness (as CaCO<sub>3</sub>) and Chlorides (as Cl) in water  
PTEN - W08 - 1801  
16 March 2018

SUMMARY SHEET

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

Laboratory Code : W08 - 1801 - 117

Test items (mg/L)	Sample	No. of results	Assigned value ( $x_{pt}$ )	Standard deviation for proficiency assessment ( $\sigma_{pt}$ )	Lab's result	MU	z-score
Total hardness (as CaCO <sub>3</sub> )	A	248	50.19	2.51	48.7	1.06	-0.59
	B	247	133.3	5.3	131	1.3	-0.43
Chlorides (as Cl)	A	224	89.65	5.38	-	-	-
	B	225	164.8	9.9	-	-	-

**Note**

- Assigned values ( $x_{pt}$ ) are the robust averages of the participant results in this round, calculated by using Algorithm A (ISO 13528: 2015).
- Standard deviations for proficiency assessment ( $\sigma_{pt}$ ) are the target standard deviations from previous rounds and expert judgement.
- Each z-score marked with "A" is an outlier ( $|z| \geq 3.0$ ). Therefore, laboratory which is marked with "A" shall investigate result. Laboratory is also encouraged to review result which has an absolute z-score value between two and three ( $2.0 < |z| < 3.0$ ) or marked with "W".
- This summary sheet should be read in conjunction with the final report.

Reported by



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Approved by



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