

This document is copyright & strictly confidential. The recipient must not copy, distribute or pass to a third party without permission of The Envirolab Group Executive Management.

Estimated Measurement Uncertainty – mandated by ISO17025 for results where known guidelines exist.

MPL (part of the Envirolab Group) will use a combination of either control charts, proficiency testing data and method validation to evaluate the uncertainty of measurement. This data is used to evaluate bias and precision of the measurement process. Note, the values used to calculate the estimated measurement uncertainty are generally $\geq 10 \times \text{PQL}$ (reporting limits) and therefore measurement uncertainty estimates only reflect these concentration ranges. Theoretically, as results approach the PQL the statistical error will increase.

The measurement uncertainty interval determined is at the 95% confidence interval which is common practice, labelled as $\text{MU}_{95\%}$. A table of Measurement Uncertainty Estimates relating to Chemistry tests in **Water** with regulatory limits are given below:-

	PQL (mg/L)	Estimated $\text{MU}_{95\%}$ at $\geq 10 \times \text{PQL}$
INORGANICS		
Alkalinity	5	16%
Anions (Cl^- , F^- , I^- , SO_4^{2-})	1, 0.1, 0.1, 1	12-20%
Cyanides	0.004	12-20%
Colour	5 Pt/Co or HZU	17%
NO_x/NH_3	0.005	12-14%
pH	0.1 pH units	± 0.2 pH units
Sulphide Low Level	0.01	20%
TDS/TSS	5	18%
Turbidity	0.1 NTU	15%
METALS	Various - sub $\mu\text{g/L}$ to mg/L	10-20%
ORGANICS		
VOCs	Various - sub $\mu\text{g/L}$ to sub mg/L	15-35%
HAAs		15-24%
Phenols - substituted		30-42%
Trace Pesticides		30-40%
Benzo(a)pyrene		43%
TBTs		19%

Note: where a range exists the use of the higher percentage would be the most conservative – please contact the lab for analyte specific $\text{MU}_{95\%}$.

For example: - If a level of 0.20mg/L is found for a Free Cyanide, then statistically there is 95% confidence that the true result lies between 0.16-0.24mg/L (conservatively $\pm 20\%$ at $MU_{95\%}$).

Estimated $MU_{95\%}$ is calculated from the following equation:-

$$U_{X(95\%)} = 2((s_x^2 + B^2)^{1/2})$$

Where:

$U_{X(95\%)}$ Measurement Uncertainty with 95% level of confidence.

s_x Standard Deviation of multiple observations.

B Bias, the deviation between the average value of the multiple measurements and the true value being measured

For further information contact the laboratory, see the website for contact details
<https://www.envirolab.com.au/>

CURRENT AS OF JANUARY 2026