EVALUATION OF MEASUREMENT UNCERTAINTY (MU)

SGS INDUSTRIES & ENVIROMENT, ENVIRONMENTAL TESTING:

NOTTING HILL LABORATORY, VIC

Evaluation of measurement uncertainty (MU) was calculated at the 95% confidence interval, coverage factor k = 2 using batch control sample results. The following MU values are derived from as mentioned batch control samples ranging from 10 to 100 times the limit of reporting (LOR). As analyte results decrease and approach the LOR, estimated MU will increase. At concentrations < 5xLOR, MU will be reported as the LOR concentration. i/s indicates insufficient data for MU Evaluation.

Microbiological measurement uncertainty (MU) is evaluated by analysis of client unknowns and PT samples by a minimum of two analysts and calculated from the standard deviation of the reproducibility of the final results which is then used to evaluate the uncertainty associated with the method.

Last Review Date: 26/03/2025

Method Number	Method Description	Test/Analyte	Water	Water	Soil	Air
			Relative MU % unless stated otherwise.	Relative MU % unless stated otherwise.	Relative MU % unless stated otherwise.	Relative MU % unless stated otherwise.
AN101	**pH soil sludge sed water**	pH soil sludge sed water	0.2 pH units		0.2 pH units	
AN106	**Conductivity and TDS by Calculation**	Conductivity	4.3			
AN113	**TDS & TS by Gravimetric**	TDS	14.3			
		TS	13.1			
AN114	**TSS by Gravimetric**	TSS	17.5			
AN135	**Alkalinity in Aqueous Solution**	Alkalinity	8.6			
APHA4500-S2 D	**Sulphide by Methylene Blue**	H2S	18.6			
		Sulphide	19.7			
MA1117	**TOC by NDIR**	TOC / NPOC	11.7			
AN240	**Redox Potential (Eh)**	Redox Potential (Eh)	4.5			
AN171	**Total Nitrogen**	Total Nitrogen	13.8			
AN181	**Chemical Oxygen Demand UV**	COD	9.8			
AN274	**Chloride**	Cl	10.0		11.7	
AN275	**Sulfate**	Sulfate	11.9		12.2	
AN276	**Nitrite and Nitrate as Nitrogen by DA**	NOx-N	11.6			
		NO_2-N	8.5			

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AN278	**Soluble Reactive P by DA**	FRP	8.9			
AN158	**Total Phosphorus**	TP	5.1			
AN280	**Ammonia by DA**	Ammonia	13.4			
AN285	**True Colour by DA**	True Colour	20.7			
AN245	**Anions by IC**	Iodide	9.1			
		Bromide	5.4			
AN270	**Reactive Silica (DA)**	Silica (Si02)	11.3			
		Silicon (Si)	17.0			
AN226	**Formaldehyde**	Formaldehyde	19.6			
	by Spectroquant					
MA1127.2	**Fluoride**	F	9.9		10.2	
MA1102	**Total and WAD CN by DA**					
		WADCN	12.4			
		TOTAL CN	16.2		14.8	
MA1223	**Ferrous Iron**	Ferrous Iron	16.6			
MA1400	**Metals by ICP-MS**		**Soluble**	**Total**		
	(USEPA6020A)	Aluminium	11.7	11.5	14.7	
		Antimony	15.7	15.8	14.1	
		Arsenic	10.3	9.1	9.8	9.5
		Barium	8.8	7.8	9.5	
		Beryllium	14.4	16.7	17.3	
		Boron	14.9	14.0	15.3	
		Cadmium	5.6	6.0	9.1	5.0
		Chromium	10.5	10.1	13.0	15.2
		Cobalt	12.9	10.9	16.7	14.0

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		Copper	13.1	11.1	15.1	10.5
		Iron	13.5	12.9	19.1	16.9
		Lead	12.7	12.3	14.8	16.1
		Manganese	6.6	7.5	7.8	3.9
		Molybdenum	6.5	7.0	7.3	5.9
		Nickel	8.3	12.1	11.2	4.7
		Selenium	7.7	9.5	10.5	
		Silver			21.0	
		Strontium	13.3	9.9		
		Tin	10.3	10.4	9.1	
		Thallium	10.8	9.2		
		Titanium	7.3	7.2		
		Uranium			12.3	
		Vanadium	11.8	12.0	16.4	
		Zinc	8.4	7.0	10.1	7.2
		Mercury	12.0	12.2	13.3	
MA1410	**Hex Chrom by Colorimetric**	Hexavalent Chromium	10.5		11.5	
MA1427-02	**TBT by LC-QQQ**	Tri-butyl tin (TBT)	27.6		32.7	
MA1456	**Isocyanates by LC-QQQ**	1,6-Hexamethylene diisocyanate				33.0
		2,4-Toluene diisocyanate				24.2
		2,6-Toluene diisocyanate				23.0
		4,4-Methylenediphenyl diisocyanate				33.1
		Ethyl isocyanate				23.9
		HDI-Biuret				24.0
		HDI-Isocyanurate				22.9
		HDI-Uretidone				26.7
		Isophorone diisocyanate (I)				25.5
		Isophorone diisocyanate (II)				25.9
		MDI Tetramers				29.2
		MDI Trimer				30.3
		Methyl isocyanate				19.0
		Phenyl isocyanate				22.5
		Propyl isocyanate				19.4

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MA1523	**Polyfluorinated Surfactants - LC-MS/MS**	PFOA	55.4		40.6	
		PFDA	87.5		43.6	
		PFDOA	90.0		72.0	
		PFNA	67.5		50.4	
		PFOS	75.4		50.8	
		PFUNA	67.7		64.4	
		PFHPA	78.9		58.9	
		PFOSA	94.1		86.2	
		PFTEDA	79.4		53.4	
		PFTRDA	88.3		71.7	
MA1583	**Ethanolamines by LC-QQQ**	MDEA	35.0			
MA1584	**Cationic Surfactants by LC-MS**	Cortron IRN-316	24.1			
MA1585	**EDTA & NTA by LC-MS**	EDTA	32.9			
		NTA	34.0			
MA30	**TPH by GC-FID**	VARIOUS				
	TRH	C10-C36 – Silica Gel	27.5		29.7	
	TRH-Silica	C11-C40			29.2	
		TOTALC10-C36	26.8		19.9	
	TRH-Silica					
	VPH	C6-C10	39.2		34.9	
		C6-C9	39.4		40.2	
MA8270	**SVOC Compounds by GC-MS**	**OC Pesticides**				
		Aldrin	77.4		38.9	
		Gamma BHC	67.4		62.9	
		Dieldren	62.5		54.2	
		Endrin	81.2		63.1	
		Heptachlor	64.2		77.4	
		4,4-DDT	79.1		64.8	
		OP Pesticides:				
		Chlorpyriphos	40.8			
		Dichlorvos	68.1			
		PAH's				

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		Acenaphthene	78.1		66.1	
		Pyrene	54.2		52.8	
		Chloroacetic Acids, Herbicides, Phenols				
		2-Chlorophenol	64.8		49.0	
		4-chloro-3-methylphenol	58.3		77.2	
		Phenol			62.2	
MA1421	**Glyphosate and Polar pesticides by LC-QQQ**					
		Glyphosate	35.3		40.9	
		AMPA	26.6		32.1	
MA1449	**Acrylamide by LC-QQQ**					
		Acrylamide	20.1		26.9	38.7
EPA552.3	**Haloacetic acids**	Bromoacetic acid	35.5			
		Bromochloroacetic acid	65.5			
		Trichloroacetic acid	72.4			
		2,2-Dichloroproprionic acid	40.1			
MA8260	**VOC's Via GC-MS-P&T**	**VOCs:**				
		Bromodichloromethane	16.5			
		Carbon Tetrachloride	27.8			
		Chlorobenzene	24.1			
		Dibromochloromethane	28.9			
		Dibromofluoromethane	12.0			
		Dichloromethane	26.4			
		Tetrachloroethene	26.7			
		Cis-1,2-Dichloroethene	28.3			
		Trans-1,2-Dichloroethene	29.3			
		Tribromomethane	36.8			
		Trichloroethene	17.8		33.8	
		Trichloromethane	18.2		20.1	
		Vinyl chloride	56.0			
		Benzene	24.7		20.8	
		Ethyl Benzene	21.5		21.8	
		m,p-xylene	17.4			
		o-xylene	19.5			
		toluene	22.8		15.5	
		styrene	31.6			

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MA82	**PCB in Oil GC-ECD**					
	(USEPA 8082A)	Arochlor 1260	35.9 (Oil)			
MA-TO15	**TO15 VOCs in Suma Cannisters GC-MS**					
	(USEPA TO-15)	Acrylonitrile				24.2
		Benzene				31.8
		1,2-Dichloroethane				38.0
		1,3-Butadiene				56.5
		Chloroform				24.1
		Dichloromethane				26.1
		Tetrachloroethene				41.7
		Trichloroethene				51.4
		Vinyl Chloride				24.9
MA1105 GC-FID	**Permanent Gases in Water by GC-FID**	Methane	37.9			
MA1105	**Gen Gas analysis by Micro GC**	Butane				18.9
		Carbon Dioxide				10.6
		Ethane				9.3
		Ethene (Ethylene)				11.9
		Nitrogen				44.6
		Propane				7.8
MA1113	**Sulfur Gas Analysis by GC-SCD**	Hydrogen Sulfide				29.7
MA1125	**Glycols by LC-MS**	Diethylene Glycol	39.2		23.6	
		Ethylene Glycol	39.5		21.1	
		Propylene Glycol	40.1		25.1	
		Triethylene Glycol	36.8		27.6	
MA1418	**Ethanol Methanol in Water - GC-FID**	Ethanol	34.6			
		Methanol	31.8			
MA1425	**Carboxylic Acids - LC-MS**	Acetic Acid	30.5			
		Butanoic Acid	29.3			
		Formic Acid	39.1			
		Glycolic Acid	31.2			
		Heptanoic Acid	37.2			

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		Hexanoic Acid	28.0			
		Lactic Acid	33.1			
		Propanoic Acid	30.2			
		Valeric Acid	30.6			
MA1569	**Pesticides & Herbicides - LCMS**	24D	21.4			
		Dicamba	29.0			
		Diuron	11.3		25.2	
		Fipronil	25.9			
		MCPA	23.5			
		Metasulfuron methyl	31.7			
NIOSH2544	**Nicotine in Air**	Nicotine				36.5
NIOSH5026	**Oil Mist in Air by GC-FID**	Oil Mist				21.0
AN701	**Heterotrophic (Std or Total) Plate Count- Pour Plate Technique**	Heterotrophic Plate Count	0.15 log10 cfu/mL			
AN735	**E.coli and Faecal Coliforms by Colilert-18 (Defined Substrate Technology)**	Coliforms	0.19 log10 MPN/100mL			
		E. coli	0.20 log10 MPN/100mL			
		Faecal coliforms	0.24 log10 MPN/100mL			
AN750	**Enterolert Test Kit Enterococci**	Enterococci	0.19 log10 MPN/100mL			