

Appendix F Water Quality Equipment Calibration Certificate



REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION

CONTACT:	MR NELSON TSUI	WORK ORDER:	HK1835956
CLIENT:	ACUMEN ENVIRONMENTAL ENG & TECH CO LTD		
ADDRESS:	LOT 11, TAM KON SHAN ROAD, TSING YI (NORTH), N.T. HONG KONG	SUB-BATCH:	0
		LABORATORY:	HONG KONG
		DATE RECEIVED:	26-Jun-2018
		DATE OF ISSUE:	13-Aug-2018

COMMENTS

The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.

The "Tolerance Limit" quoted is the acceptance criteria applicable for similar equipment used by the ALS Hong Kong laboratory or quoted from relevant international standards.

The "Next Calibration Date" is recommended according to best practice principle as practised by the ALS Hong Kong laboratory or quoted from relevant international standards.

Scope of Test:	Dissolved Oxygen, pH Value, Turbidity, Salinity, Redox Potential and Temperature
Equipment Type:	Multifunctional Meter
Brand Name:	HORIBA Water Quality Monitor
Model No.:	U-5000
Serial No.:	BGYP9CKD
Equipment No.:	--
Date of Calibration:	04 July, 2018

NOTES

This is the Final Report and supersedes any preliminary report with this batch number.

Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

Ms. Lin Wai Yu
Assistant Manager - Inorganic

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REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION



WORK ORDER: HK1835956
SUB-BATCH: 0
DATE OF ISSUE: 13-Aug-2018
CLIENT: ACUMEN ENVIRONMENTAL ENG & TECH CO LTD

Equipment Type: Multifunctional Meter
Brand Name: HORIBA Water Quality Monitor
Model No.: U-5000
Serial No.: BGY99CKD
Equipment No.: --
Date of Calibration: 25 July, 2018 **Date of Next Calibration:** 04 October, 2018

PARAMETERS:

Dissolved Oxygen **Method Ref: APHA (21st edition), 4500-O: G**

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
2.90	3.09	+0.19
5.35	5.51	+0.16
7.56	7.62	+0.06
	Tolerance Limit (mg/L)	±0.20

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Ms. Lin Wai Yu
Assistant Manager - Inorganic

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WORK ORDER: HK1835956
SUB-BATCH: 0
DATE OF ISSUE: 13-Aug-2018
CLIENT: ACUMEN ENVIRONMENTAL ENG & TECH CO LTD

Equipment Type: Multifunctional Meter
Brand Name: HORIBA Water Quality Monitor
Model No.: U-5000
Serial No.: BGY9CKD
Equipment No.: --
Date of Calibration: 04 July, 2018 **Date of Next Calibration:** 04 October, 2018

PARAMETERS:

pH Value

Method Ref: APHA (21st edition), 4500H:B

Expected Reading (pH unit)	Displayed Reading (pH unit)	Tolerance (pH unit)
4.0	3.95	-0.05
7.0	6.84	-0.16
10.0	10.08	+0.08
	Tolerance Limit (pH unit)	±0.20

Turbidity

Method Ref: APHA (21st edition), 2130B

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.78	--
4	4.06	+1.5
40	36.1	-9.8
80	78.9	-1.4
400	409	+2.3
800	809	+1.1
	Tolerance Limit (%)	±10.0

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CLIENT: ACUMEN ENVIRONMENTAL ENG & TECH CO LTD

Equipment Type: Multifunctional Meter
Brand Name: HORIBA Water Quality Monitor
Model No.: U-5000
Serial No.: BGY9CKD
Equipment No.: --
Date of Calibration: 04 July, 2018 Date of Next Calibration: 04 October, 2018

PARAMETERS:

Salinity

Method Ref: APHA (21st edition), 2520B

Expected Reading (ppt)	Displayed Reading (ppt)	Tolerance (%)
0	0.00	--
10	9.90	-1.0
20	19.50	-2.5
30	28.30	-5.7
	Tolerance Limit (%)	±10.0

Redox Potential

Method Ref: APHA (21st edition), 2580B
Method Ref: Orion Research Instruction Manual and the Laboratory Manual
the Environmental of Water, Wastewater and Soil (2nd edition), Rump & Krist (1992)

Expected Reading (mV)	Displayed Reading (mV)	Difference of A and B (mV)
Solution A (~234mV)	188	
Solution B (~300mV)	272	+84
	Tolerance Limit (mV)	>66

Temperature

Method Ref: Section 6 of International Accreditation New Zealand Technical
Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

Expected Reading (°C)	Displayed Reading (°C)	Tolerance (°C)
10.5	11.27	+0.8
21.0	21.64	+0.6
40.0	39.43	-0.6
	Tolerance Limit (°C)	±2.0

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WORK ORDER: HK1835956
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DATE OF ISSUE: 13-Aug-2018
CLIENT: ACUMEN ENVIRONMENTAL ENG & TECH CO LTD

Equipment Type: Multifunctional Meter
Brand Name: HORIBA Water Quality Monitor
Model No.: U-5000
Serial No.: BGY99CKD
Equipment No.: --
Date of Calibration: 04 July, 2018

PARAMETERS:

Dissolved Oxygen Method Ref: APHA (21st edition), 4500-O: G

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (%)
3.30	no readable reading	N/A
5.49	no readable reading	N/A
7.80	no readable reading	N/A
	Tolerance Limit (mg/L)	±0.20

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

A handwritten signature in blue ink, appearing to read 'Lin Wai Yu'.

Ms. Lin Wai Yu
Assistant Manager - Inorganic