



**CMA Testing
and Certification
Laboratories**

廠商會檢定中心

**Term Contract for Provision of Sampling and Analyzing of
Wastewater and Sludge for Various Sewage Treatment Facilities in
Urban Area, Lantau and Outlying Islands to the
Drainage Services Department**

Contract No. : DE/2016/12

Applicant : SEWAGE TREATMENT DIVISION 2
ELECTRICAL AND MECHANICAL BRANCH
DRAINAGE SERVICES DEPARTMENT

Address : STONECUTTERS ISLAND SEWAGE TREATMENT WORKS.,
NGONG SHUNG ROAD, NGONG SHUEN CHAU,
KOWLOON, HONG KONG

Application Number : LV034607(9)

Report Number : AW0016395(2)

Report Issued Date : 16 Mar 2018

For and on behalf of
CMA Industrial Development Foundation Limited

Authorized Signature : _____

Lau Yan Kin
Senior Manager
Environmental Division

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CMA Industrial Development Foundation Limited

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CMA Testing and Certification Laboratories

廠商會檢定中心

Report No.: AW0016395(2)

Term Contract for Provision of Sampling and Analyzing of Wastewater and Sludge Samples for Various and Sludge Samples for Various Sewage Treatment Facilities in Urban Area, Lantau and Outlying Islands to the Drainage Services Department

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Report No.: AW0016395(2)

Term Contract for Provision of Sampling and Analyzing of Wastewater
and Sludge Samples for Various Sewage Treatment Facilities in Urban Area, Lantau and Outlying Islands to
the Drainage Services Department

EXECUTIVE SUMMARY

1. This is the water quality monitoring report prepared by CMA Testing and Certification Laboratory (CMA Testing) for Contract No. DE/2016/12 “Term Contract for Provision of Sampling and analysing of Wastewater and Sludge Samples for Various Sewage Treatment Facilities in Urban Area, Lantau and Outlying Islands to the Drainage Services Department (2017-2019)”. This report documented the results and findings of Operation Phase Environmental Monitoring works conducted for Marine Water Quality Monitoring (MWQM) of Project in Jan 2018.
2. In accordance with the Final EM&A Manual, environmental monitoring has been conducted in the reporting month with a Quarterly Basis for various parameters as summarized in **Table I**.

Table I Summary Table for Environmental Monitoring Works Conducted in the Reporting Month

Monitoring Parameters	Monitoring Date	Laboratory Testing Parameters
Marine Water Quality	23 Jan 2018	E.coli, Total Residual Chlorine (TRC), Chlorination by-products (CBPs) and Contaminants of Concern (COCs)



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and Sludge Samples for Various Sewage Treatment Facilities in Urban Area, Lantau and Outlying Islands to
the Drainage Services Department

1. INTRODUCTION

- 1.1. CMA Testing was commissioned by Drainage Services Department (DSD) to undertake the operation phase environmental monitoring for Advance Disinfection Facilities (ADF) at Stonecutters Island Sewage Treatment Works (SCISTW) (thereafter called the “the Services”).
- 1.2. The operation phase monitoring, which include effluent quality monitoring, marine water quality monitoring and emergency discharge monitoring, is to monitor the effluent and marine water quality impact of ADF during its operation phase.
- 1.3. This is the water quality monitoring report prepared by CMA Testing that documented the results and findings of Operation Phase Water Quality Monitoring works conducted for Marine Water Quality Monitoring (MWQM) of Project on 23 Jan 2018.



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Report No.: AW0016395(2)

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2. MARINE WATER QUALITY MONITORING

Monitoring Requirements

- 2.1. Monitoring was taken at three water depths, namely, 1m below water surface, mid-depth and 1m above sea bed, except where the water depth is less than 6m, in which case the mid-depth station may be omitted. If the water depth be less than 3m, only the mid-depth station will be monitored.
- 2.2. Six samples (replicates) at each monitoring stations were collected by collecting the same amount of water sample at each depth.
- 2.3. One grab sample was collected at each water depth for E.coli analysis.

Monitoring Locations

- 2.4. Six monitoring stations were designated for the marine water quality monitoring programme. The locations are summarized in Table 3.1 and shown on **Figure 2**.

Table 3.1 Proposed Marine Water Quality Monitoring Stations

Station	Description	Coordinates	
		Easting	Northing
1	Edge of Mixing Zone (northwest of effluent diffuser)	829762.00	819604.47
2	Edge of ZID (northwest of effluent diffuser)	830117.99	819251.93
3	Edge of ZID (southeast of effluent diffuser)	830186.21	819184.37
4	Edge of Mixing Zone (southeast of effluent diffuser)	830525.00	818848.87
SM6	Control Station	826179.81	805902.89
SM12	Control Station	819524.19	808420.40

Monitoring Schedule

- 2.5. The marine water quality monitoring was conducted coincide with effluent quality monitoring on 23 Jan 2018.

Monitoring Equipment

- 2.6. The equipment used in the marine water quality monitoring in the reporting month is summarized in Table 3.2. Copies of calibration certificates are shown in **Appendix II-Report no. AW0016394(1)**.

Table 3.2 Marine Water Quality Monitoring Equipment

Equipment	Model and Make	Qty
Water Sampler	Kahlsico Water Sampler	1
Water Depth Detector	Seafarer 700	1
Positioning System	Global Positioning System (GPS)	1
Multi-parameter Water Quality System	Model YSI 6920 V2	1



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Monitoring Parameters and Frequency

- 2.7. Marine Water sampling on E.coli, Total Residual Chlorine (TRC), Chlorination By-Products (CBPs) shall and the Contaminants of Concern (COCs) shall be performed quarterly throughout the contract period.
- 2.8. The list of parameters to be analysed as well as the corresponding analytical methods and detection limit are listed in Table 3.3

Table 3.3 Analytical Methods for Laboratory Analysis for Marine Water Samples

Parameters		Analytical Method	Limit of Reporting (µg/L)
TRC and Potential CBPs			
Total residual Chlorine		APHA 21ed 4500 Cl G	10
Bromoform	Tri-halomethanes (THMs)	TG-ENV-WW-78 (Headspace GC-MS)	0.1
Bromodichloromethane			0.1
Chloroform			0.1
Dibromochloromethane			5
Bromoacetic acid	Haloacetic Acids (HAAs)	TG-ENV-WW-79 (GC-ECD)	2
Chloroacetic acid			2
Dibromoacetic acid			2
Dichloroacetic acid			2
Trichloroacetic acid			2
Bacteria			
E.coli		Environmental Monitoring Laboratory Test Method Manual TM09/EC/10/097 Issue 3, Environmental Protection Department, HK.	1 cfu/100ml
Contaminants of Concern (COCs)			
Methylene chloride	Halogenated Aliphatics	TG-ENV-WW-78 (Headspace GC-MS)	20
Carbon tetrachloride			0.5
1,1-dichloroethane			0.5
1,2-dichloroethane			0.5
1,1-dichloroethylene			0.5
1,2-dichloropropane			0.5
Tetrachloroethylene			0.5
1,1,1-trichloroethane	Halogenated Aliphatics		0.5
1,1,2-trichloroethane			0.5
Trichloroethylene			0.5
2-chlorophenol	Phenols & Haloethers	TG-ENV-WW-80 (GC-MS)	0.5
2,4-dichlorophenol			0.5



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p-chloro-m-cresol			0.5
Pentachlorophenol			0.5
2,4,6-trichlorophenol			0.5
Bis(2-chloroethoxy) methane			0.5
Chlorobenzene	Chlorinated Hydrocarbons & Organochlorine Pesticides	TG-ENV-WW-78 (Headspace GC-MS)	0.5
1,4-dichlorobenzene			0.5
Hexachlorobenzene		0.01	
Hexachlorocyclopentadiene		2.5	
Hexachloroethane		0.5	
1,2,4-trichlorobenzene		0.5	
Alpha-BHC		0.01	
Beta-BHC		0.01	
Gamma-BHC		0.01	
			USEPA 625

3. RESULTS AND OBSERVATIONS

Weather and Sea Condition

- 3.1. The weather condition was Fine while the sea condition was moderate during the sampling period 23 Jan 2018 in the reporting month.

Marine Water Quality

- 3.2. The in-situ measurement results including dissolved oxygen, turbidity, salinity, pH and temperature of the marine water monitoring. Also, the results of marine water quality monitoring conducted on 19 Oct 2017 and QC report are shown in **Appendix II – Report no. AW0016394(1)**.



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Report No.: AW0016395(2)

Term Contract for Provision of Sampling and Analyzing of Wastewater
and Sludge Samples for Various Sewage Treatment Facilities in Urban Area, Lantau and Outlying Islands to
the Drainage Services Department

Appendix I - Location of Monitoring Stations

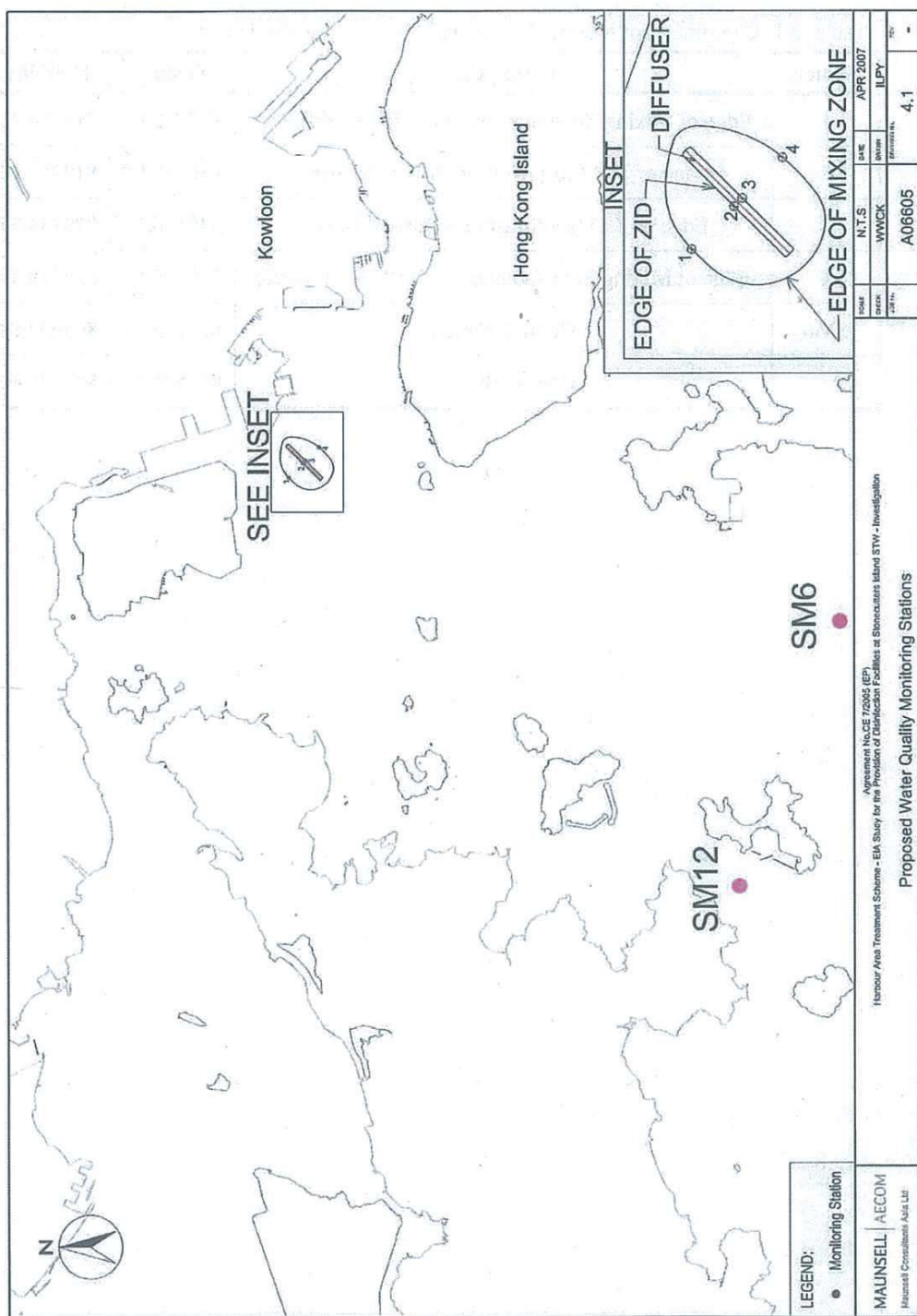


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Appendix II - Report for Laboratory Test(s)



CMA Testing and Certification Laboratories

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TEST REPORT

Report No. : AW0016394(1) Date: 16 Mar 2018

Application No. : LV034607(9)

Applicant : SEWAGE TREATMENT DIVISION 2
ELECTRICAL AND MECHANICAL BRANCH
DRAINAGE SERVICES DEPARTMENT
STONECUTTERS ISLAND SEWAGE TREATMENT WORKS.,
NGONG SHUNG ROAD, NGONG SHUEN CHAU,
KOWLOON, HONG KONG

Contract No. : DE/2016/12

Project Name : Term Contract for Provision of Sampling and Analyzing of Wastewater and Sludge for Various Sewage Treatment Facilities in Urban Area, Lantau and Outlying Islands to the Drainage Services Department

Sample Description : Eighteen (18) marine water samples sampled by the staff of CMA Industrial Development Foundation Limited. Samples were refrigerated during delivery.

Sample ID : Refer to Sample ID on page 4 to 11.

Station	Description	Coordinates	
		Easting	Northing
1	Edge of Mixing Zone (northwest of effluent diffuser)	829762.00	819604.47
2	Edge of ZID (northwest of effluent diffuser)	830117.99	819251.93
3	Edge of ZID (southeast of effluent diffuser)	830186.21	819184.37
4	Edge of Mixing Zone (southeast of effluent diffuser)	830525.00	818848.87
SM6	Control Station	826179.81	805902.89
SM12	Control Station	819524.19	808420.40

For and on behalf of
CMA Industrial Development Foundation Limited

Authorized Signature : _____

Lau Yan Kin
Senior Manager
Environmental Division

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CMA Testing and Certification Laboratories

廠商會檢定中心

TEST REPORT

Report No. : AW0016394(1) Date: 16 Mar 2018

Application No. : LV034607(9)

Sampling Date : 23 Jan 2018.

Date Received : 23 Jan 2018.

Test Period : 23 Jan 2018 to 26 Feb 2018.

Test Requested :

1. Temperature (on-site measurement)
2. pH (on-site measurement)
3. Salinity (on-site measurement)
4. Dissolved Oxygen (DO) (mg/L) (on-site measurement)
5. Dissolved Oxygen (DOS) (% saturation) (on-site measurement)
6. Turbidity (on-site measurement)
7. Total Residual Chlorine (on-site measurement)
8. E. coli count
9. Bromoform
10. Bromodichloromethane
11. Chloroform
12. Dibromochloromethane
13. Bromoacetic acid
14. Chloroacetic acid
15. Dibromoacetic acid
16. Dichloroacetic acid
17. Trichloroacetic acid
18. Methylene chloride
19. Carbon tetrachloride
20. 1,1-dichloroethane
21. 1,2-dichloroethane
22. 1,1-dichloroethylene
23. 1,2-dichloropropane
24. Tetrachloroethylene
25. 1,1,1-trichloroethane
26. 1,1,2-trichloroethane
27. Trichloroethylene
28. 2-chlorophenol
29. 2,4-dichlorophenol
30. p-chloro-m-cresol
31. Pentachlorophenol
32. 2,4,6-trichlorophenol
33. Bis(2-chloroethoxy) methane
34. Chlorobenzene
35. 1,4-dichlorobenzene
36. Hexachlorobenzene
37. Hexachlorocyclopentadiene
38. Hexachloroethane
39. 1,2,4-trichlorobenzene
40. Alpha-BHC
41. Beta-BHC
42. Gamma-BHC



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TEST REPORT

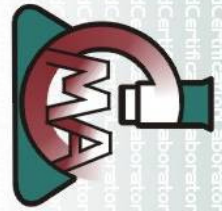
Report No. : AW0016394(1)

Date: 16 Mar 2018

Application No. : LV034607(9)

Test Method : 1-5. In house method (By multimeter)
6. APHA 2130B
7. APHA 21ed 4500 Cl G
8. Environmental Monitoring Laboratory Test Method Manual
TM09/EC/10/097 Issue 3, Environmental Protection Department,
HK.
9. TG-ENV-WW-78 (Headspace GC-MS)
10. TG-ENV-WW-78 (Headspace GC-MS)
11. TG-ENV-WW-78 (Headspace GC-MS)
12. TG-ENV-WW-78 (Headspace GC-MS)
13. TG-ENV-WW-79 (GC-ECD)
14. TG-ENV-WW-79 (GC-ECD)
15. TG-ENV-WW-79 (GC-ECD)
16. TG-ENV-WW-79 (GC-ECD)
17. TG-ENV-WW-79 (GC-ECD)
18. TG-ENV-WW-78 (Headspace GC-MS)
19. TG-ENV-WW-78 (Headspace GC-MS)
20. TG-ENV-WW-78 (Headspace GC-MS)
21. TG-ENV-WW-78 (Headspace GC-MS)
22. TG-ENV-WW-78 (Headspace GC-MS)
23. TG-ENV-WW-78 (Headspace GC-MS)
24. TG-ENV-WW-78 (Headspace GC-MS)
25. TG-ENV-WW-78 (Headspace GC-MS)
26. TG-ENV-WW-78 (Headspace GC-MS)
27. TG-ENV-WW-78 (Headspace GC-MS)
28. TG-ENV-WW-80 (GC-MS)
29. TG-ENV-WW-80 (GC-MS)
30. TG-ENV-WW-80 (GC-MS)
31. TG-ENV-WW-80 (GC-MS)
32. TG-ENV-WW-80 (GC-MS)
33. TG-ENV-WW-80 (GC-MS)
34. TG-ENV-WW-78 (Headspace GC-MS)
35. TG-ENV-WW-78 (Headspace GC-MS)
36. USEPA 625
37. USEPA 625
38. USEPA 625
39. USEPA 625
40. USEPA 625
41. USEPA 625
42. USEPA 625

Test Result : Refer to results on page 4 to 11.



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TEST REPORT

Report No. : AW0016394(1)

Date: 16 Mar 2018

Application No. : LV034607(9)

Marine Water Quality

Sampling Date 23-Jan-2018

Monitoring Location	Time	Water Depth (m)	Sampling Depth (m)	E.coli (CFU/100mL)	Temperature (°C)		Salinity (ppt)		pH		DO (mg/L)		DOS (%)		Turbidity (NTU)		TRC (mg/L)	
1	11:40	10.5	1.0	560	17.9	17.9	29.2	29.2	8.3	8.3	8.3	8.3	119.2	119.2	3.5	3.5	0.01	0.01
			5.3	240	17.8	17.8	29.6	29.6	8.4	8.4	8.2	8.2	117.7	117.7	3.1	3.1	0.03	0.03
			9.5	270	17.8	17.8	29.7	29.7	8.3	8.3	8.0	8.0	114.9	114.9	3.1	3.1	0.02	0.02
2	11:24	17.8	1.0	170	17.9	17.9	29.5	29.5	8.4	8.4	8.4	8.4	120.6	120.6	2.2	2.2	0.01	0.01
			8.9	200	17.8	17.8	29.6	29.6	8.4	8.4	8.3	8.3	119.2	119.2	2.3	2.3	0.03	0.03
			16.8	200	17.8	17.8	29.6	29.6	8.4	8.4	8.1	8.1	116.3	116.3	3.0	3.0	0.03	0.03
3	11:08	9.8	1.0	310	17.9	17.9	29.5	29.5	8.4	8.4	8.5	8.5	122.1	122.1	2.3	2.3	0.03	0.03
			4.9	950	17.7	17.7	29.7	29.7	8.4	8.4	8.4	8.4	120.6	120.6	2.2	2.2	0.03	0.03
			8.8	930	17.7	17.7	29.0	29.0	8.4	8.4	8.1	8.1	116.3	116.3	2.4	2.4	0.04	0.04
4	10:50	9.8	1.0	180	17.9	17.9	29.5	29.5	8.3	8.3	8.6	8.6	123.5	123.5	1.9	1.9	0.03	0.03
			4.9	70	17.7	17.7	29.6	29.6	8.4	8.4	8.4	8.4	120.6	120.6	1.9	1.9	0.02	0.02
			8.8	310	17.7	17.7	29.7	29.7	8.3	8.3	8.2	8.2	117.7	117.7	1.8	1.8	0.05	0.05
SM6	10:47	14.8	1.0	22	18.0	18.0	30.9	30.9	8.4	8.4	8.4	8.4	120.6	120.6	2.0	2.0	0.03	0.03
			7.4	19	18.0	18.0	30.8	30.8	8.4	8.4	7.8	7.8	112.0	112.0	1.0	1.0	0.05	0.05
			13.8	27	17.8	17.8	31.3	31.3	8.4	8.4	8.3	8.3	119.2	119.2	0.9	0.9	0.04	0.04
SM12	10:15	8.8	1.0	18	18.5	18.5	30.9	30.9	8.4	8.4	8.4	8.4	120.6	120.6	3.9	3.9	0.01	0.01
			4.4	10	18.2	18.2	30.8	30.8	8.5	8.5	7.5	7.5	107.7	107.7	3.3	3.3	0.02	0.02
			7.8	20	18.1	18.1	31.0	31.0	8.4	8.4	7.7	7.7	110.6	110.6	4.7	4.7	0.04	0.04

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TEST REPORT

Date: 16 Mar 2018

Report No. : AW0016394(1)

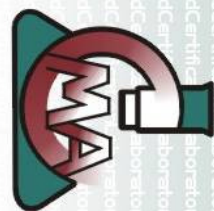
Application No. : LV034607(9)

Marine Water Quality

Sampling Date 23-Jan-2018

Monitoring Location	Time	Water Depth (m)	Sampling Depth (m)	Bromofom (µg/L)		Bromodichloromethane (µg/L)		Chloroform (µg/L)		Dibromochloromethane (µg/L)		Bromacetic acid (µg/L)		Chloroacetic acid (µg/L)		Dibromoacetic acid (µg/L)		
1	11:40	10.5	1.0	0.5	0.5	<0.1	<0.1	0.2	0.2	<5	<5	<2	<2	<2	<2	<2	<2	
			5.3	0.5	0.5	<0.1	<0.1	0.5	0.5	<5	<5	<2	<2	<2	<2	<2	<2	<2
			9.5	0.5	0.5	<0.1	<0.1	0.4	0.4	<5	<5	<2	<2	<2	<2	<2	<2	<2
2	11:24	17.8	1.0	0.4	0.4	<0.1	<0.1	0.3	0.3	<5	<5	<2	<2	<2	<2	<2	<2	
			8.9	0.3	0.3	<0.1	<0.1	0.2	0.2	<5	<5	<2	<2	<2	<2	<2	<2	
			16.8	0.5	0.5	<0.1	<0.1	0.3	0.3	<5	<5	<2	<2	<2	<2	<2	<2	<2
3	11:08	9.8	1.0	0.4	0.4	<0.1	<0.1	0.1	0.1	<5	<5	<2	<2	<2	<2	<2	<2	
			4.9	0.5	0.5	<0.1	<0.1	0.2	0.2	<5	<5	<2	<2	<2	<2	<2	<2	
			8.8	0.5	0.5	<0.1	<0.1	0.1	0.1	<5	<5	<2	<2	<2	<2	<2	<2	<2
4	10:50	9.8	1.0	0.5	0.5	<0.1	<0.1	0.2	0.2	<5	<5	<2	<2	<2	<2	<2	<2	
			4.9	0.4	0.4	<0.1	<0.1	0.3	0.3	<5	<5	<2	<2	<2	<2	<2	<2	
			8.8	0.5	0.5	<0.1	<0.1	0.2	0.2	<5	<5	<2	<2	<2	<2	<2	<2	<2
SM6	10:47	14.8	1.0	0.4	0.4	<0.1	<0.1	<0.1	<0.1	<5	<5	<2	<2	<2	<2	<2	<2	
			7.4	0.7	0.7	<0.1	<0.1	<0.1	<0.1	<5	<5	<2	<2	<2	<2	<2	<2	
			13.8	0.8	0.8	<0.1	<0.1	<0.1	<0.1	<5	<5	<2	<2	<2	<2	<2	<2	<2
SM12	10:15	8.8	1.0	0.4	0.4	<0.1	<0.1	<0.1	<0.1	<5	<5	<2	<2	<2	<2	<2	<2	
			4.4	0.3	0.3	<0.1	<0.1	<0.1	<0.1	<5	<5	<2	<2	<2	<2	<2	<2	
			7.8	0.3	0.3	<0.1	<0.1	<0.1	<0.1	<5	<5	<2	<2	<2	<2	<2	<2	
LRV				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	<5	<2	<2	<2	<2	<2		

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**CMA Testing
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廠商會檢定中心

TEST REPORT

Date: 16 Mar 2018

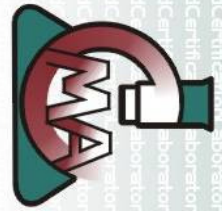
Report No. : AW0016394(1)

Application No. : LV034607(9)

Marine Water Quality

Sampling Date 23-Jan-2018

Monitoring Location	Time	Water Depth (m)	Sampling Depth (m)	Dichloroacetic acid (µg/L)		Trichloroacetic acid (µg/L)	
				1	2	1	2
1	11:40	10.5	1.0	<2	<2	<2	<2
			5.3	<2	<2	<2	<2
			9.5	<2	<2	<2	<2
2	11:24	17.8	1.0	<2	<2	<2	<2
			8.9	<2	<2	<2	<2
			16.8	<2	<2	<2	<2
3	11:08	9.8	1.0	<2	<2	<2	<2
			4.9	<2	<2	<2	<2
			8.8	<2	<2	<2	<2
4	10:50	9.8	1.0	<2	<2	<2	<2
			4.9	<2	<2	<2	<2
			8.8	<2	<2	<2	<2
SM6	10:47	14.8	1.0	<2	<2	<2	<2
			7.4	<2	<2	<2	<2
			13.8	<2	<2	<2	<2
SM12	10:15	8.8	1.0	<2	<2	<2	<2
			4.4	<2	<2	<2	<2
			7.8	<2	<2	<2	<2
			LRV	<2	<2	<2	<2



**CMA Testing
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Laboratories**
廠商會檢定中心

TEST REPORT

Report No. : AW0016394(1)

Date: 16 Mar 2018

Application No. : LV034607(9)

Marine Water Quality

Sampling Date 23-Jan-2018

Monitoring Location	Time	Water Depth (m)	Sampling Depth (m)	Methylene chloride (µg/L)		Carbon tetrachloride (µg/L)		1,1-dichloroethane (µg/L)		1,2-dichloroethane (µg/L)		1,1-dichloroethylene (µg/L)		1,2-dichloropropane (µg/L)		Tetrachloroethylene (µg/L)		
				<20	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1	11:40	10.5	1.0	<20	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
			5.3	<20	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
			9.5	<20	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2	11:24	17.8	1.0	<20	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
			8.9	<20	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
			16.8	<20	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
3	11:08	9.8	1.0	<20	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
			4.9	<20	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
			8.8	<20	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
4	10:50	9.8	1.0	<20	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
			4.9	<20	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
			8.8	<20	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
SM6	10:47	14.8	1.0	<20	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
			7.4	<20	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
			13.8	<20	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
SM12	10:15	8.8	1.0	<20	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
			4.4	<20	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
			7.8	<20	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
LRV				<20	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		

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CMA Testing and Certification Laboratories
 廠商會檢定中心

TEST REPORT

Report No. : AW0016394(1)

Date: 16 Mar 2018

Application No. : LV034607(9)

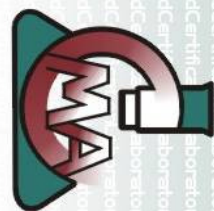
Marine Water Quality

Sampling Date 23-Jan-2018

Monitoring Location	Time	Water Depth (m)	Sampling Depth (m)	1,1,1-trichloroethane (µg/L)		1,1,2-trichloroethane (µg/L)		Trichloroethylene (µg/L)		2-chlorophenol (µg/L)		2,4-dichlorophenol (µg/L)		p-chloro-m-cresol (µg/L)		Pentachlorophenol (µg/L)	
1	11:40	10.5	1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
			5.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
			9.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2	11:24	17.8	1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
			8.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
			16.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
3	11:08	9.8	1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
			4.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
			8.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
4	10:50	9.8	1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
			4.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
			8.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SM6	10:47	14.8	1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
			7.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
			13.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SM12	10:15	8.8	1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
			4.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
			7.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
LRV				<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	

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TEST REPORT

Report No. : AW0016394(1)

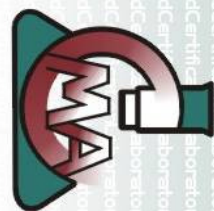
Date: 16 Mar 2018

Application No. : LV034607(9)

Marine Water Quality

Sampling Date 23-Jan-2018

Monitoring Location	Time	Water Depth (m)	Sampling Depth (m)	2,4,6-trichlorophenol (µg/L)		Bis(2-chloroethoxy) methane (µg/L)		Chlorobenzene (µg/L)		1,4-dichlorobenzene (µg/L)		Hexachlorobenzene (µg/L)		Hexachlorocyclopentadiene (µg/L)		Hexachloroethane (µg/L)		
1	11:40	10.5	1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.01	<0.01	<2.5	<2.5	<0.5	<0.5	
			5.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.01	<0.01	<2.5	<2.5	<0.5	<0.5
			9.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.01	<0.01	<2.5	<2.5	<0.5	<0.5
2	11:24	17.8	1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.01	<0.01	<2.5	<2.5	<0.5	<0.5	
			8.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.01	<0.01	<2.5	<2.5	<0.5	<0.5
			16.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.01	<0.01	<2.5	<2.5	<0.5	<0.5
3	11:08	9.8	1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.01	<0.01	<2.5	<2.5	<0.5	<0.5	
			4.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.01	<0.01	<2.5	<2.5	<0.5	<0.5
4	10:50	9.8	1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.01	<0.01	<2.5	<2.5	<0.5	<0.5	
			4.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.01	<0.01	<2.5	<2.5	<0.5	<0.5
			8.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.01	<0.01	<2.5	<2.5	<0.5	<0.5
SM6	10:47	14.8	1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.01	<0.01	<2.5	<2.5	<0.5	<0.5	
			7.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.01	<0.01	<2.5	<2.5	<0.5	<0.5
			13.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.01	<0.01	<2.5	<2.5	<0.5	<0.5
SM12	10:15	8.8	1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.01	<0.01	<2.5	<2.5	<0.5	<0.5	
			4.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.01	<0.01	<2.5	<2.5	<0.5	<0.5
			7.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.01	<0.01	<2.5	<2.5	<0.5	<0.5
			LRV	>0.5		>0.5		<0.5		<0.5		<0.01		>2.5		<0.5		



**CMA Testing
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TEST REPORT

Date: 16 Mar 2018

Report No. : AW0016394(1)

Application No. : LV034607(9)

Marine Water Quality

Sampling Date 23-Jan-2018

Monitoring Location	Time	Water Depth (m)	Sampling Depth (m)	1,2,4-trichlorobenzene (µg/L)		Alpha-BHC (µg/L)		Beta-BHC (µg/L)		Gamma-BHC (µg/L)	
1	11:40	10.5	1.0	<0.5	<0.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
			5.3	<0.5	<0.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
			9.5	<0.5	<0.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
2	11:24	17.8	1.0	<0.5	<0.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
			8.9	<0.5	<0.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
			16.8	<0.5	<0.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
3	11:08	9.8	1.0	<0.5	<0.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
			4.9	<0.5	<0.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
			8.8	<0.5	<0.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
4	10:50	9.8	1.0	<0.5	<0.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
			4.9	<0.5	<0.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
			8.8	<0.5	<0.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SM6	10:47	14.8	1.0	<0.5	<0.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
			7.4	<0.5	<0.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
			13.8	<0.5	<0.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SM12	10:15	8.8	1.0	<0.5	<0.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
			4.4	<0.5	<0.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
			7.8	<0.5	<0.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
			LRV	<0.5	<0.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01



**CMA Testing
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Laboratories**
廠商會檢定中心

TEST REPORT

Report No. : AW0016394(1)

Date: 16 Mar 2018

Application No. : LV034607(9)

QC Report

Sampling Date 23-Jan-2018

Parameter	Method Blank	Acceptance Criteria	QC Recovery	Acceptance Criteria	Spike Recovery	Acceptance Criteria	Duplicate (RPD)	Acceptance Criteria
	(µg/L)	(µg/L)	(%)	(%)	(%)	(%)	(%)	(%)
Bromoform	<0.02	<0.02	107	80-120	104	70-130	8	≤20
Bromodichloromethane	<0.02	<0.02	93	80-120	92	70-130	8	≤20
Chloroform	<0.02	<0.02	96	80-120	87	70-130	4	≤20
Dibromochloromethane	<1	<1	105	80-120	89	70-130	6	≤20
Bromoacetic acid	<0.4	<0.4	98	80-120	97	70-130	9	≤20
Chloroacetic acid	<0.4	<0.4	92	80-120	105	70-130	4	≤20
Dibromoacetic acid	<0.4	<0.4	97	80-120	106	70-130	3	≤20
Dichloroacetic acid	<0.4	<0.4	101	80-120	84	70-130	7	≤20
Trichloroacetic acid	<0.4	<0.4	95	80-120	98	70-130	5	≤20

Parameter	(µg/L)	(µg/L)	(%)	(%)	(%)	(%)	(%)	(%)
Methylene chloride	<4	>4	94	80-120	95	70-130	6	≤20
Carbon tetrachloride	<0.1	<0.1	93	80-120	91	70-130	3	≤20
1,1-dichloroethane	<0.1	<0.1	108	80-120	97	70-130	8	≤20
1,2-dichloroethane	<0.1	<0.1	108	80-120	96	70-130	7	≤20
1,1-dichloroethylene	<0.1	<0.1	91	80-120	102	70-130	4	≤20
1,2-dichloropropane	<0.1	<0.1	97	80-120	101	70-130	3	≤20
Tetrachloroethylene	<0.1	<0.1	96	80-120	97	70-130	9	≤20
1,1,1-trichloroethane	<0.1	<0.1	92	80-120	106	70-130	6	≤20
1,1,1,2-trichloroethane	<0.1	<0.1	98	80-120	95	70-130	4	≤20
Trichloroethylene	<0.1	<0.1	103	80-120	103	70-130	5	≤20
2-chlorophenol	<0.1	<0.1	95	80-120	86	70-130	3	≤20
2,4-dichlorophenol	<0.1	<0.1	107	80-120	85	70-130	9	≤20
p-chloro-m-cresol	<0.1	<0.1	104	80-120	106	70-130	7	≤20
Pentachlorophenol	<0.1	<0.1	107	80-120	107	70-130	6	≤20
2,4,6-trichlorophenol	<0.1	<0.1	96	80-120	93	70-130	3	≤20
Bis(2-chloroethoxy) methane	<0.1	<0.1	92	80-120	86	70-130	4	≤20
Chlorobenzene	<0.1	<0.1	95	80-120	95	70-130	5	≤20
1,4-dichlorobenzene	<0.1	<0.1	97	80-120	106	70-130	5	≤20
Hexachlorobenzene	<0.005	<0.005	99	80-120	109	70-130	8	≤20
Hexachlorocyclopentadiene	<0.5	<0.5	107	80-120	89	70-130	3	≤20
Hexachloroethane	<0.1	<0.1	104	80-120	95	70-130	9	≤20
1,2,4-trichlorobenzene	<0.1	<0.1	102	80-120	94	70-130	4	≤20
Alpha-BHC	<0.005	>0.005	106	80-120	103	70-130	2	≤20
Beta-BHC	<0.005	>0.005	105	80-120	84	70-130	6	≤20
Gamma-BHC	<0.005	>0.005	108	80-120	98	70-130	7	≤20



CMA Testing and Certification Laboratories

廠商會檢定中心

TEST REPORT

Report No. : AW0016394(1)

Date: 16 Mar 2018

Application No. : LV023396(1)

Calibration Certificate



專業化驗有限公司
QUALITY PRO TEST-CONSULT LIMITED
Unit 10, 14/F, Wah Wai Centre, 38-40 Au Pui Wan St., Fotan, Hong Kong
Email: info@qualityprotest.com; Website: www.qualityprotest.com
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CALIBRATION REPORT

Test Report No. : AG120037
Date of Issue : 12 December 2017
Page No. : 1 of 1

PART A – CUSTOMER INFORMATION

CMA Testing and Certification Laboratories
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung Street,
Fotan, Shatin, N.T., Hong Kong
Attn: Mr. Jason Lau

PART B – SAMPLE INFORMATION

Description of Samples : HACH 2100Q Portable Turbidimeter
Brand Name : HACH
Model Number : 2100Q
Serial Number : 1603C048375
Equipment Number^(a) : ENV026-4
Date of Received : Dec 11, 2017
Date of Calibration : Dec 11, 2017
Date of Next Calibration^(b) : Mar 11, 2017

PART C – CALIBRATION REQUESTED

Parameter	Reference Method
Turbidity	APHA 21e 2130 B

PART D – RESULT^(c)

Calibration range (Formazin standard): 0 to 800 NTU

Reference standard (NTU)	Displayed Reading ^(d) (NTU)	Tolerance ^(e) (%)	Results
Blank	0.08	--	Satisfactory
10	10.7	+7.0	Satisfactory
20	21.1	+5.5	Satisfactory
100	105	+5.0	Satisfactory
800	801	+0.1	Satisfactory

Tolerance limit of turbidity should be less than ± 10.0 (%)

~ END OF REPORT ~

Remarks

^(a) Information provided by the customer

^(b) The "Date of Next Calibration" is recommended according to best practice principals as practiced by Quality Pro Test-Consult Ltd. or quoted from relevant international standards.

^(c) The results relate only to the tested sample as received

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

^(e) "Displayed Reading" presents the figures shown on item under calibration; checking regardless of equipment precision or significant figures.

^(f) The "Tolerance Limit" mentioned is the acceptance criteria applicable for similar equipment used by Quality Pro Test-Consult Ltd. or quoted from relevant international standards.



APPROVED SIGNATORY :

FUNG Yuen-ching Aries
Laboratory Manager



CMA Testing and Certification Laboratories

廠商會檢定中心

TEST REPORT

Report No. : AW0016394(1)

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CALIBRATION CERTIFICATION

Report No. : AG110189A
Date of Issue : 08 December, 2017
Page No. : 1 of 2

PART A – CUSTOMER INFORMATION

CMA Testing and Certification Laboratories
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung Street,
Fotan, Shatin, N.T., Hong Kong
Attn: Mr. Jason Lau

PART B – DESCRIPTION

Name of Equipment : Professional Plus (Pro Plus) Multiparameters Instrument
Manufacturer : YSI (a xylem brand)
Serial Number : Meter: 16K101698
Date of Received : Nov 29, 2017
Date of Calibration : Dec 05, 2017
Date of Next Calibration⁽⁶⁾ : Mar 05, 2018

PART C – REFERENCE METHODS/ DOCUMENTS FOR THE CALIBRATION

Parameter	Reference Method
pH at 25°C	APHA 21c 4500-H ⁺ B
Dissolved Oxygen	APHA 21c 4500-O G
Conductivity at 25°C	APHA 21c 2510 B
Oxidation-Reduction Potential (ORP)	APHA 21c 2580 B (Zobell's solution)
Temperature	Section 6 of International Accreditation New Zealand Technical Guide no. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

PART D – CALIBRATION RESULTS^(b,e)

(1) pH at 25°C

Target (pH unit)	Displayed Reading ^(d) (pH Unit)	Tolerance ^(c) (pH Unit)	Results
4.00	4.08	+0.08	Satisfactory
6.86	6.86	+0.00	Satisfactory
7.42	7.42	+0.00	Satisfactory
10.01	10.00	-0.01	Satisfactory

Tolerance of pH should be less than ±0.10 (pH unit)

- CONTINUED ON NEXT PAGE -

Remarks:-

- ^(a) The "Date of Next Calibration" is recommended according to best practice principals as practiced by OPT or quoted from relevant international standards.
- ^(b) The results relate only to the calibrated equipment as received.
- ^(c) The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.
- ^(d) "Displayed Reading" denotes the figure shown on item under calibration/ checking regardless of equipment precision or significant figures.
- ^(e) The "Tolerance Limit" mentioned is the acceptance criteria applicable for similar equipment used by OPT or quoted from relevant international standards.

APPROVED SIGNATORY :

FUNG Yuen-ching Aries
Laboratory Manager

This report supersedes the previous report #AG110189 dated 06 December 2017.



CMA Testing and Certification Laboratories

廠商會檢定中心

TEST REPORT

Report No. : AW0016394(1)

Date: 16 Mar 2018

Application No. : LV023396(1)



專業化驗有限公司
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CALIBRATION CERTIFICATION

Report No. : AG110189A
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PART D -- CALIBRATION RESULTS (Cont'd)

(2) Temperature

Reading of Ref. thermometer (°C)	Displayed Reading (°C)	Tolerance (°C)	Results
13.3	13.5	+0.2	Satisfactory
21.0	21.0	+0.0	Satisfactory
30.4	30.3	+0.1	Satisfactory

Tolerance limit of temperature should be less than ± 2.0 (°C)

(3) Dissolved Oxygen

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)	Results
0.00	0.00	+0.00	Satisfactory
3.72	3.53	-0.19	Satisfactory
8.59	8.75	+0.16	Satisfactory

Tolerance limit of dissolved oxygen should be less than ± 0.20 (mg/L)

(4) Conductivity at 25°C

Expected Reading ($\mu\text{S/cm}$)	Displayed Reading ($\mu\text{S/cm}$)	Tolerance (%)	Results
146.9	157.7	+7.35	Satisfactory
1412	1473	+4.32	Satisfactory
12890	12897	+0.05	Satisfactory
58670	59517	+1.44	Satisfactory
111900	110768	-1.01	Satisfactory

Tolerance limit of conductivity should be less than ± 10.0 (%)

(5) Salinity

Expected Reading (g/L)	Displayed Reading (g/L)	Tolerance (%)	Results
10	9.84	-1.60	Satisfactory
20	19.99	-0.05	Satisfactory
30	30.70	+2.33	Satisfactory

Tolerance limit of conductivity should be less than ± 10.0 (%)

(6) Oxidation-Reduction Potential (ORP)

Expected Reading (mV)	Displayed Reading (mV)	Tolerance (mV)	Results
+228	+225	-3	Satisfactory

Tolerance limit of ORP should be less than ± 10 (mV)

~ END OF REPORT ~

This report supersedes the previous report #AG110189 dated 06 December 2017.

***** End of Report *****

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