Term Contract for Provision of Sampling and Analyzing of Samples for Various Sewage Treatment Facilities in Urban Area, Lantau and Outlying Islands to the Drainage Services Department (2023-2026)

Provision of Effluent Quality Monitoring (EQM) Services

Report for the Month of Oct 2023

Contract No.	:	DE/2022/15
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	:	L0027937(6)
Report Number	:	A00049175(4)
Report Issued Date	:	09 Nov 2023

For and on behalf of
CMA Industrial Development Foundation Limited

Authorized Signature: _____

Lau Yan Kin
Senior Manager
Environmental Division

CMA Industrial Development Foundation Limited
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EXECUTIVE SUMMARY

1. This is the water quality monitoring report prepared by CMA Testing and Certification Laboratory (CMA Testing) for Contract No. DE/2022/15 "Term Contract for Provision of Sampling and Analyzing of Samples for Various Sewage Treatment Facilities in Urban Area, Lantau and Outlying Islands to the Drainage Services Department (2023-2026)''. This report documented the results and findings of Operation Phase Environmental Monitoring works conducted for Effluent Quality Monitoring (EQM) of Project in Oct 2023.

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 1**.

Table 1. Summary Table for Environmental Monitoring Works Conducted in the Reporting Month

Monitoring Parameters	Monitoring Period	Laboratory Testing Parameters
Effluent Quality	18 Oct 2023 (10 a.m.) To 19 Oct 2023 (10 a.m.)	Chlorination by-products (CBPs) and Contaminants of Concern (COCs)

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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 Effluent Quality Monitoring (EQM) of Project on monitoring period.

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2 EFFLUENT QUALITY MONITORING

2.1 Monitoring Requirements

2.1.1 Effluent samples were collected at Disinfection Facilities in a full 24-hour period. 24-hour flow weighted composite effluent samples for subsequent chemical analysis and testing were prepared by CMA Testing according to the following procedures:

- Collect effluent sub-sample by direct grab sampling method at bi-hourly interval over a 24-hour sampling period;
- Obtain flow record of Stonecutters Island Sewage Treatment Works (SCISTW) for the 24-hour sampling period;
- Calculate the volume of each sub-sample for preparing the bi-hourly of 24-hour flow-weighted composite samples; and
- Transfer the appropriate volume of sub-samples to a clean container and mix thoroughly.

2.1.2 Bi-hourly of 24-hour composite sample for Chlorination By-Products (CBPs) and Contaminants of Concern (COCs) tests shall be performed quarterly throughout the contract period.

2.2 Monitoring Location

The sampling locations for effluent from SCISTW were collected at the Disinfection Facilities.

2.3 Monitoring Schedule

The effluent quality monitoring was conducted in the monitoring period shown in **Table 1**. Collection of marine water samples were within the time period of effluent quality monitoring was to be collected.

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2.4 Laboratory Measurement / Analysis

In the reporting month, the bi-hourly of 24-hour flow-weighted composite effluent sample was collected for subsequent laboratory analysis and testing on CBPs and COCs as shown in **Table 2.1.**

Table 2.1 Analytical Methods for Laboratory Analysis for Effluent Samples

Parameters		Analytical Method	Limit of Reporting (µg/L)
Potential CBPs			
Bromoform	Tri-halomethanes (THMs)	USEPA 8260D & In house method TG-ENV-WW-78 & 85 (by Headspace GC/MSD)	0.1
Bromodichloromethane			0.1
Chloroform			0.1
Dibromochloromethane			5
Bromoacetic acid	Haloacetic Acids (HAAs)	In house method TG-ENV-WW-79 (by GC-ECD)	2
Chloroacetic acid			2
Dibromoacetic acid			2
Dichloroacetic acid			2
Trichloroacetic acid			2
Contaminants of Concern (COCs)			
Methylene chloride	Halogenated Aliphatics	ISO 17943:2016 & In house method TG-ENV-WW-78 & 85 (by Headspace GC/MSD)	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			0.5
1,1,2-trichloroethane			0.5
Trichloroethylene			0.5

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Parameters		Analytical Method	Limit of Reporting (µg/L)
2-chlorophenol	Phenols & Haloethers	In house method TG-ENV-WW-80, 84 & 86 (by GC-MSD)	0.5
2,4-dichlorophenol			0.5
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	In house method TG-ENV-WW-78 (by Headspace GC-MSD) & In house method TG-ENV-WW-86 (by GC-MSD)	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

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3 RESULTS AND OBSERVATIONS

3.1 Effluent Quality

The results of effluent quality monitoring conducted during the monitoring period shown in **Table 1.**, whereas the laboratory testing and QC report are shown in **Appendix I.**

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Appendix I

Report for Laboratory Test(s)

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TEST REPORT

Report No.	:	A00049176(5)	Date: 09 Nov 2023
Application No.	:	L0027937(6)	
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	

Contract No.	:	DE/2022/15
Project Name	:	Term Contract for Provision of Sampling and Analyzing of Samples for Various Sewage Treatment Facilities in Urban Area, Lantau and Outlying Islands to the Drainage Services Department
Sample Description	:	Bi-hourly of 24-hour flow-weighted composite effluent sample was collected by the staff of CMA Industrial Development Foundation Limited. Sample was refrigerated during delivery.
Sample ID	:	Refer to Sample ID on page 3 - 4.
Sampling Location	:	SCISTW- Disinfection Facilities
Sampling Date	:	18 Oct 2023 to 19 Oct 2023.
Date Received	:	19 Oct 2023.
Test Period	:	23 Oct 2023 to 30 Oct 2023.

For and on behalf of
CMA Industrial Development Foundation Limited

Authorized Signature : _____

Lau Yan Kin
Senior Manager
Environmental Division

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TEST REPORT

Report No. : A00049176(5) Date: 09 Nov 2023

Application No. : L0027937(6)

Test Requested :

1. Bromoform
2. Bromodichloromethane
3. Chloroform
4. Dibromochloromethane
5. Bromoacetic acid
6. Chloroacetic acid
7. Dibromoacetic acid
8. Dichloroacetic acid
9. Trichloroacetic acid
10. Methylene chloride
11. Carbon tetrachloride
12. 1,1-dichloroethane
13. 1,2-dichloroethane
14. 1,1-dichloroethylene
15. 1,2-dichloropropane
16. Tetrachloroethlyene
17. 1,1,1-trichloroethane
18. 1,1,2-trichloroethane
19. Trichloroethylene
20. 2-chlorophenol
21. 2,4-dichlorophenol
22. p-chloro-m-cresol
23. Pentachlorophenol
24. 2,4,6-trichlorophenol
25. Bis(2-chloroethoxy) methane
26. Chlorobenzene
27. 1,4-dichlorobenzene
28. Hexachlorobenzene
29. Hexachlorocyclopentadiene
30. Hexachloroethane
31. 1,2,4-trichlorobenzene
32. Alpha-BHC
33. Beta-BHC
34. Gamma-BHC

Test Method :

1-4. USEPA 8260D & In house method TG-ENV-WW-78 & 85 (by Headspace GC/MSD)
5-9. TG-ENV-WW-79 (by GC-ECD)
10-19. ISO 17943:2016 & In house method TG-ENV-WW-78 & 85 (by Headspace GC/MSD)
20-25. In house method TG-ENV-WW-80, 84 & 86 (by GC-MSD)
26-34. In house method TG-ENV-WW-78 (by Headspace GC-MSD) & In house method TG-ENV-WW-86 (by GC-MSD)

Test Result : Refer to results on page 3 - 4.

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TEST REPORT

Report No. : A00049176(5) Date: 09 Nov 2023

Application No. : L0027937(6)

Effluent Water Quality

Application No:.	L0027937(6)	
Sampling Date	18-Oct-23 to 19-Oct-23	
Monitoring Location	Chamber 15A	

Parameter	Results (µg/L)	Discharge limit (measured in HATs effluent) (µg/L)
Bromoform	0.2	16,000
Bromodichloromethane	<0.1	1,000
Chloroform	1.3	560
Dibromochloromethane	<5	1,500
Bromoacetic acid	<2	75,000
Chloroacetic acid	<2	1,500,000
Dibromoacetic acid	<2	32,000
Dichloroacetic acid	<2	10,000
Trichloroacetic acid	<2	4,300,000

*TRC is 0.1mg/L by reference to Chamber 15A Sampling Tanks Daily Monitoring result on 18 Oct 2023.

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TEST REPORT

Report No. : A00049176(5) Date: 09 Nov 2023

Application No. : L0027937(6)

Application No:.	L0027937(6)	
Sampling Date	18-Oct-23 to 19-Oct-23	
Monitoring Location	Chamber 15A	

Parameter	Results (µg/L)
Methylene chloride	<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	<0.5
1,1,2-trichloroethane	<0.5
Trichloroethylene	<0.5
2-chlorophenol	<0.5
2,4-dichlorophenol	<0.5
p-chloro-m-cresol	<0.5
Pentachlorophenol	<0.5
2,4,6-trichlorophenol	<0.5
Bis(2-chloroethoxy) methane	<0.5
Chlorobenzene	<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

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TEST REPORT

Report No. : A00049176(5) Date: 09 Nov 2023

Application No. : L0027937(6)

QC Report

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	91	80-120	85	70-130	10	≤20
Bromodichloromethane	<0.02	<0.02	87	80-120	82	70-130	13	≤20
Chloroform	<0.02	<0.02	94	80-120	100	70-130	15	≤20
Dibromochloromethane	<1	<1	101	80-120	91	70-130	11	≤20
Bromoacetic acid	<0.4	<0.4	95	80-120	83	70-130	14	≤20
Chloroacetic acid	<0.4	<0.4	90	80-120	80	70-130	16	≤20
Dibromoacetic acid	<0.4	<0.4	102	80-120	94	70-130	13	≤20
Dichloroacetic acid	<0.4	<0.4	105	80-120	95	70-130	10	≤20
Trichloroacetic acid	<0.4	<0.4	91	80-120	80	70-130	11	≤20

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TEST REPORT

Report No. : A00049176(5) Date: 09 Nov 2023

Application No. : L0027937(6)

QC Report

Parameter	Method Blank	Acceptance Criteria	QC Recovery	Acceptance Criteria	Spike Recovery	Acceptance Criteria	Duplicate (RPD)	Acceptance Criteria
	(µg/L)	(µg/L)	(%)	(%)	(%)	(%)	(%)	(%)
Methylene chloride	<4	<4	103	80-120	96	70-130	16	≤20
Carbon tetrachloride	<0.1	<0.1	85	80-120	89	70-130	12	≤20
1,1-dichloroethane	<0.1	<0.1	96	80-120	90	70-130	10	≤20
1,2-dichloroethane	<0.1	<0.1	101	80-120	108	70-130	15	≤20
1,1-dichloroethylene	<0.1	<0.1	110	80-120	117	70-130	12	≤20
1,2-dichloropropane	<0.1	<0.1	89	80-120	81	70-130	11	≤20
Tetrachloroethylene	<0.1	<0.1	94	80-120	87	70-130	13	≤20
1,1,1-trichloroethane	<0.1	<0.1	98	80-120	90	70-130	17	≤20
1,1,2-trichloroethane	<0.1	<0.1	103	80-120	96	70-130	12	≤20
Trichloroethylene	<0.1	<0.1	105	80-120	94	70-130	11	≤20
2-chlorophenol	<0.1	<0.1	100	80-120	106	70-130	15	≤20
2,4-dichlorophenol	<0.1	<0.1	95	80-120	88	70-130	10	≤20
p-chloro-m-cresol	<0.1	<0.1	93	80-120	86	70-130	10	≤20
Pentachlorophenol	<0.1	<0.1	104	80-120	97	70-130	14	≤20
2,4,6-trichlorophenol	<0.1	<0.1	110	80-120	102	70-130	9	≤20
Bis(2-chloroethoxy) methane	<0.1	<0.1	97	80-120	104	70-130	13	≤20
Chlorobenzene	<0.1	<0.1	88	80-120	81	70-130	10	≤20
1,4-dichlorobenzene	<0.1	<0.1	113	80-120	106	70-130	16	≤20
Hexachlorobenzene	<0.005	<0.005	101	80-120	93	70-130	12	≤20
Hexachlorocyclopentadiene	<0.5	<0.5	108	80-120	99	70-130	12	≤20
Hexachloroethane	<0.1	<0.1	97	80-120	88	70-130	15	≤20
1,2,4-trichlorobenzene	<0.1	<0.1	103	80-120	97	70-130	11	≤20
Alpha-BHC	<0.005	<0.005	109	80-120	100	70-130	13	≤20
Beta-BHC	<0.005	<0.005	98	80-120	90	70-130	14	≤20
Gamma-BHC	<0.005	<0.005	102	80-120	95	70-130	15	≤20

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

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