

**Agreement No. CE 59/2020 (EP)
Environmental Monitoring and
Audit for Disposal Facility to the
East of Sha Chau (2021-2026)
– Investigation**

Monthly EM&A Report for
Contaminated Mud Pits to the East of Sha Chau
– November 2024

December 2024

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Monthly EM&A Report for
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– November 2024

December 2024

Dredging, Management and Capping of Contaminated Sediment Disposal

Facility at Sha Chau

Environmental Certification Sheet

Environmental Permit No. EP-312/2008/A


Reference Document /Plan

Document/Plan to be Certified/ Verified:	Monthly EM&A Report for Contaminated Mud Pits to the East of Sha Chau – November 2024
Date of Report:	10 December 2024
Date prepared by ET:	10 December 2024
Date received by IA:	10 December 2024


Reference EP Condition

Environmental Permit Condition: Condition 3.4 of EP-312/2008/A: 4 hard copies and 1 electronic copy of monthly EM&A Report shall be submitted to the Director within 10 working days after the end of the reporting month. The EM&A Reports shall include a summary of all non-compliance (exceedances) of the environmental quality performance limits (Action and Limit Levels). The submissions shall be verified by the Independent Auditor. Additional copies of the submission shall be provided to the Director upon request by the Director.
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ET Certification

I hereby certify that the above referenced document/plan complies with the above referenced condition of EP-312/2008/A.	
Ir Thomas Chan, Environmental Team Leader (ETL): 	Date: 10 December 2024

IA Verification

I hereby verify that the above referenced document/plan complies with the above referenced condition of EP-312/2008/A.	
Dr Wang Wen Xiong, Independent Auditor (IA): 	Date: 10 December 2024

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1 Introduction

1.1 Background

The Civil Engineering and Development Department (CEDD) is managing a number of marine disposal facilities in Hong Kong waters, including the Contaminated Mud Pits (CMPs) to the East of Sha Chau (ESC) for the disposal of contaminated sediment, and various open-sea disposal grounds located to the South of Cheung Chau (SCC), East of Tung Lung Chau (ETLC) and East of Ninepins (ENP) for the disposal of uncontaminated sediment.

Environmental Permits (EPs) (Ref. No. EP-312/2008/A) was issued by the Environmental Protection Department (EPD) to the CEDD, the Permit Holder, on 28 November 2008 for the Project - Disposal of Contaminated Sediment – Dredging, Management and Capping of Sediment Disposal Facility at Sha Chau.

Under the requirements of the EP, EM&A programmes which encompass water and sediment chemistry, fisheries assessment, tissue and whole body analysis, sediment toxicity and benthic recolonisation studies as set out in the EM&A Manuals are required to be implemented. EM&A programmes have been continuously carried out during the operation of the CMPs at ESC. A review of the collection and analysis of such environmental data from the monitoring programme demonstrated that there had not been any adverse environmental impacts resulting from disposal activities.^{1,2} The current programme will assess the impacts resulting from dredging, disposal and capping operations of CMP V.

A proposal on the change of number of sample replication of water quality and sediment monitoring as well as combination of routine water quality monitoring and water quality monitoring during capping operation was submitted to EPD and agreed by EPD on 3 December 2020. The proposed changes have been effective for the EM&A activities since December 2020. In early 2022, after implementing the Phase 1 optimisation for at least one year, a further data review was conducted. The monitoring data has been reviewed and demonstrated that the data robustness and representativeness are maintained. Therefore, a technical note presenting the data review results served as a supplementary information was submitted to EPD and presented that Phase 2 optimization of sample replication of water quality and sediment monitoring for the Project will be implemented in 2022. EPD expressed no comment on the review and note the implementation of Phase 2 optimization of sample replication on 18 May 2022, and thus this optimization has been effective for the EM&A activities since July 2022.

The latest sampling schedule is provided in **Appendix A**.

The present EM&A programme under Agreement No. CE 59/2020 (EP) covers the dredging, disposal and capping operations of the ESC CMP V (see **Appendix A** for the EM&A programme.) Detailed works schedule for ESC CMP V is shown in **Table 1.1**. In November 2024, the following works were undertaken:

- Disposal of contaminated mud at ESC CMP Vb; and
- Capping operations at ESC CMP Vd.

¹ ERM (2013) Final Report. Submitted under Agreement No. CE 4/2009 (EP) Environmental Monitoring and Audit for Contaminated Mud Pit at East Sha Chau. For CEDD.

² ERM (2017) Final Report. Submitted under Agreement No. CE 23/2012 (EP) Environmental Monitoring and Audit for Contaminated Mud Pits to the South of The Brothers and at East Sha Chau (2012 - 2017). For CEDD.

2 Brief Discussion of Monitoring Results for ESC CMP V

2.1 Introduction

This section presents a brief discussion of the results obtained from the following monitoring activities for ESC CMP V during the reporting period:

- Water Column Profiling of ESC CMP Vb;
- Routine Water Quality Monitoring of ESC CMPs;
- Pit Specific Sediment Chemistry of ESC CMP Vb; and
- Sediment Chemistry after a Major Storm of ESC CMP V.

2.2 Water Column Profiling of ESC CMP Vb – in November 2024

Water Column Profiling was undertaken at a total of two sampling stations (Upstream and Downstream stations) on 5 November 2024. The monitoring results have been assessed for compliance with the Water Quality Objectives (WQOs) set by Environmental Protection Department (EPD). This consists of a review of the EPD routine water quality monitoring data for the dry season period (November to March) of 2014 – 2023 from stations in the North Western Water Control Zone (WCZ), where the ESC CMPs are located.³ For Salinity, the averaged value obtained from the Reference (Upstream) station was used for the basis as the WQO. Levels of Dissolved Oxygen (DO) and Turbidity were also assessed for compliance with the Action and Limit Levels (see **Table B1** of **Appendix B** for details).

2.2.1 In-situ Measurements

Analyses of results for November 2024 indicated that levels of Salinity, pH and DO complied with the WQOs at both Downstream and Upstream stations (**Table B2** of **Appendix B**). Levels of DO and Turbidity at all stations complied with the Action and Limit Levels (**Tables B1 and B2** of **Appendix B**).

2.2.2 Laboratory Measurements for Suspended Solids (SS)

Analyses of results for November 2024 indicated that the SS level at both Upstream and Downstream stations complied with the WQO and the Action and Limit Levels (**Tables B1 and B2** of **Appendix B**).

Overall, the monitoring results indicated that the mud disposal operation at ESC CMP Vb did not appear to cause any deterioration in water quality during this reporting period.

2.3 Routine Water Quality Monitoring of ESC CMPs – in October 2024

Further to Section 2.3.2 of the *Monthly EM&A Report for Contaminated Mud Pits to the East of Sha Chau – October 2024*, laboratory analysis data of dissolved metals and metalloid, except mercury, of Routine Water Quality Monitoring of ESC CMPs conducted in October 2024 has been presented in the aforementioned report. The laboratory analysis data of Mercury has been presented in **Tables B3** of **Appendix B** and **Figures 2** of **Appendix C**. For sake of completeness, the laboratory analysis data of other dissolved metals and metalloid in October 2024 is presented

³ <http://epic.epd.gov.hk/EPICRIVER/marine/?lang=en>

again in **Tables B3** of **Appendix B** and **Figures 1 to 2** of **Appendix C** for easy reference. The concentrations of Mercury remains in low level with no significant trends.

Laboratory analysis data of Nutrients and Suspended Solid in Routine Water Quality Monitoring of ESC CMPs in October 2024 is presented again in **Table B4** of **Appendix B** for easy reference.

Based on the above data analysis, the conclusion drew in the *Monthly EM&A Report for Contaminated Mud Pits to the East of Sha Chau – October 2024* is still valid, where the results of the Routine Water Quality Monitoring which indicated that the disposal and capping operation at ESC CMPs did not appear to cause any unacceptable deterioration in water quality in October 2024. Detailed statistical analysis will be presented in the Quarterly EM&A Report to investigate any spatial and temporal trends of potential concern.

2.4 Routine Water Quality Monitoring of ESC CMPs – in November 2024

Routine Water Quality Monitoring of ESC CMPs was undertaken on 6 November 2024. The monitoring results have been assessed for compliance with the WQOs (see **Section 2.2** above for details). The monitoring results are shown in **Tables B5 to B7** of **Appendix B** and **Figures 3 to 13** of **Appendix C**. A total of ten (10) monitoring stations were sampled in November 2024 as shown in **Figure 2.1**.

2.4.1 In-situ Measurements

Graphical presentation of the monitoring results (Temperature, DO, pH, Salinity and Turbidity) is shown in **Figures 3 to 8** of **Appendix C**. Analyses of results indicated that the levels of pH, and DO complied with the WQOs at all stations in November 2024.

The levels of DO and Turbidity complied with the Action and Limit Levels at all stations (**Table B5** of **Appendix B**; **Figures 5 and 8** of **Appendix C**).

Overall, *in-situ* measurement results of the Routine Water Quality Monitoring indicated that the disposal and capping operation at ESC CMPs did not appear to cause any unacceptable impacts in water quality in November 2024.

2.4.2 Laboratory Measurements

Laboratory analysis of samples obtained in November 2024 indicated that the concentrations of Arsenic, Cadmium, Chromium, Copper, Mercury, Nickel and Zinc were detected in the samples at some/ all stations and their concentrations were generally similar across stations; except the concentrations of Mercury were only detected at Intermediate station. (**Table B6** of **Appendix B**; **Figure 9 and 10** of **Appendix C**).

For nutrients, concentrations of Total Inorganic Nitrogen (TIN) were lower than the WQO (0.5 mg/L) at all stations. (**Table B7** of **Appendix B**; **Figure 11** of **Appendix C**). The concentrations of Ammonia Nitrogen (NH₃-N) were only detected at Intermediate (INF) and Ma Wan stations. The concentrations of Biochemical Oxygen Demand (BOD₅) were only detected at Reference (RFF), Impact (IPF) and Intermediate (INF) stations. (**Table B7** of **Appendix B**; **Figure 11 and 12** of **Appendix C**)

Analyses of results for the reporting period indicated that the SS levels complied with the dry season WQO (13.0 mg/L) and Action and Limit Levels at all stations. (**Tables B1 and B7** of **Appendix B**; **Figure 13** of **Appendix C**).

Based on the available results of the Routine Water Quality Monitoring which indicated that the disposal and capping operation at ESC CMPs did not appear to cause any unacceptable deterioration in water quality during the reporting period. Detailed statistical analysis will be

presented in the Quarterly EM&A Report to investigate any spatial and temporal trends of potential concern.

2.5 Pit Specific Sediment Chemistry of ESC CMP Vb – in November 2024

Monitoring locations for Pit Specific Sediment Chemistry for ESC CMP Vb are shown in **Figure 2.2**. A total of six (6) monitoring stations were sampled on 4 November 2024.

The concentrations of all inorganic contaminants were lower than the Lower Chemical Exceedance Levels (LCELs) at all stations. (**Figures 14 and 15 of Appendix C**).

For organic contaminants, the concentrations of Total Organic Carbon (TOC) were higher at Active-Pit station ESC-NPCB. (**Figure 16 of Appendix C**). The concentrations of Low Molecular Weight Polycyclic Aromatic Hydrocarbons (PAHs) were higher at Pit-Edge station ESC-NECA. (**Figures 17 of Appendix C**).

For High Molecular Weight Polycyclic Aromatic Hydrocarbons (PAHs), the concentrations were higher at Pit-Edge station ESC-NECA, where the concentration is higher than LCEL. (**Figures 17 of Appendix C**).

The concentrations of Tributyltin (TBT), Total Polychlorinated Biphenyls (PCBs), Total dichloro-diphenyl-trichloroethane (DDT) and 4,4'-dichlorodipenyldichloroethylene (DDE) were below the limit of reporting at all stations during the reporting period.

It is observed that the elevated level concentrations of High Molecular Weight PAHs (i.e. higher than LCEL) only occurred within Pit-Edge station NECA, but the concentrations of other organic and all inorganic contaminants were lower than the LCELs at the Pit-Edge station.

The slightly elevated level of High Molecular Weight PAH at Pit-Edge station are possible induced by external factors rather than disposal operations. Therefore, there is no evidence indicating any unacceptable environmental impacts to sediment quality outside the pit area as a result of the contaminated mud disposal operations at ESC CMP Vb during the reporting period.

Statistical analysis will be undertaken and presented in the corresponding Quarterly EM&A Report to investigate whether there are any unacceptable impacts in the area caused by the contaminated mud disposal.

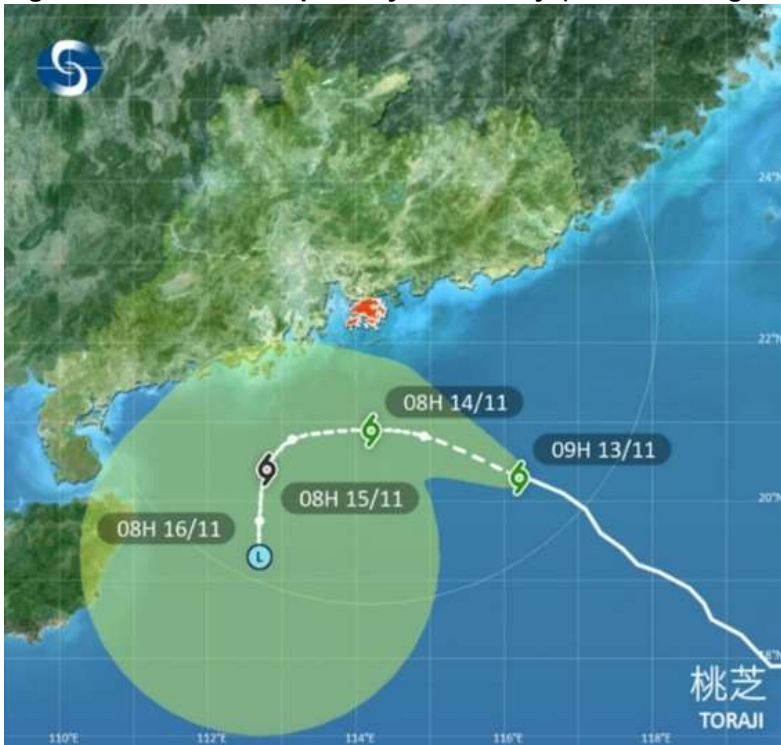
2.6 Sediment Chemistry after a Major Storm of ESC CMP V – in November 2024

Tropical Cyclone Warning Signal No. 8 has been hoisted for Typhoon Toraji on 13 November 2024. According to the Updated EM&A Manual under Project “Disposal of Contaminated Sediment – Dredging, Management and Capping of Sediment Disposal Facility at Sha Chau” (EP-312/2008/A), a Post-storm Sediment Sampling would be held within one week of the major storm event.

Since several sampling stations are encroached into the North Lantau Marine Park (NLMP) which is newly established on 1 November 2024, extra permit is required for the sampling works under Marine Parks and Marine Reserves Regulation (CAP. 476A). The permit application was submitted to Agriculture, Fisheries and Conservation Department (AFCD) on 13 November 2024 and approved on 22 November 2024. Therefore, the sampling for Sediment Chemistry after a Major Storm Event was conducted on 26 November 2024 after permit approval.

The sampling was conducted at nine (9) monitoring stations (see **Figure 2.3** for the locations of the monitoring stations). The tracks of Toraji are shown in **Figure 2.4**.

Figure 2.4: Track of Tropical Cyclone Toraji (Source: Hong Kong Observatory)



Refer to **Section 1.4**, laboratory analysis data of Sediment Chemistry after a Major Storm of ESC CMP V in November 2024 are still under consolidation, which will be presented in the Monthly EM&A Report of the next reporting period.

3 Future Key Issues

3.1 Activities Scheduled for the Next Reporting Period

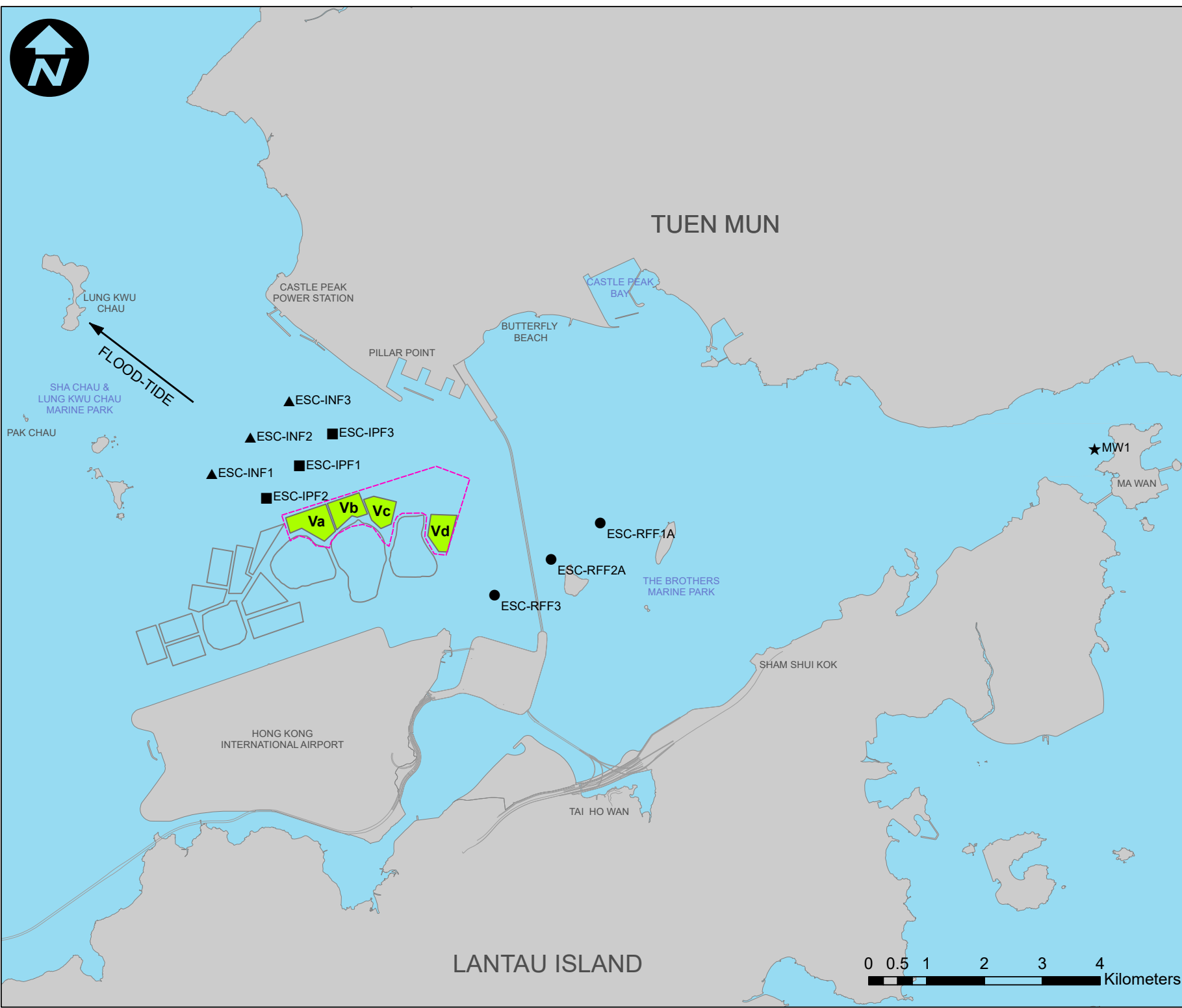
The following monitoring activities will be conducted in the next reporting period of December 2024 for ESC CMP V (see **Appendix A** for the sampling schedule):

- Water Column Profiling of ESC CMP Vb;
- Routine Water Quality Monitoring of ESC CMPs;
- Pit Specific Sediment Chemistry of ESC CMP Vb; and
- Cumulative Impact Sediment Chemistry of ESC CMPs.

3.2 Study Programme

A summary of the Study Programme is presented in **Appendix D**.

Figures



Notes:

Key to symbols:

LEGEND

- ESC CMP V
- ESC USABLE AREA 1
- WATER QUALITY SAMPLING STATIONS**
- IMPACT STATION
- INTERMEDIATE STATION
- REFERENCE STATION
- MA WAN STATION

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P1	APR 2021	KN			

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FOR DISPOSAL FACILITY
TO THE EAST OF SHA CHAU (2021-2026)
- INVESTIGATION**

**ROUTINE & CAPPING WATER QUALITY
SAMPLING STATIONS (FLOOD-TIDE)
FOR ESC CMPS**

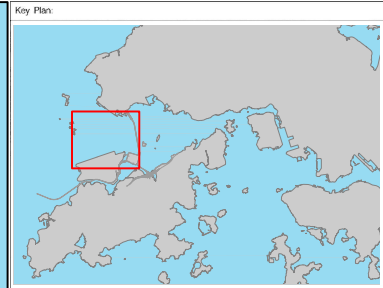
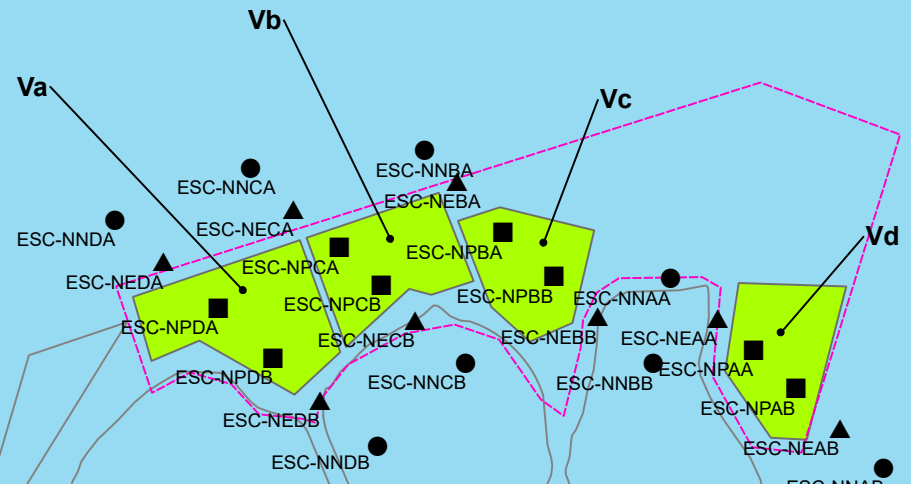
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EBB-TIDE

FLOOD-TIDE



Notes:

Key to symbols:

LEGEND

- ESC CMP V
- ESC USABLE AREA 1
- ACTIVE-PIT STATION
- PIT-EDGE STATION
- NEAR-PIT STATION

PIT SPECIFIC SEDIMENT MONITORING STATIONS

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- INVESTIGATION**

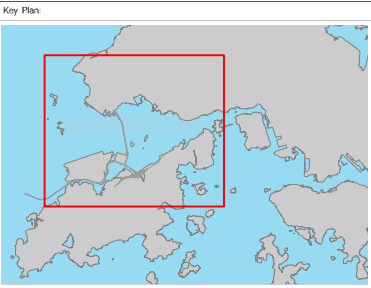
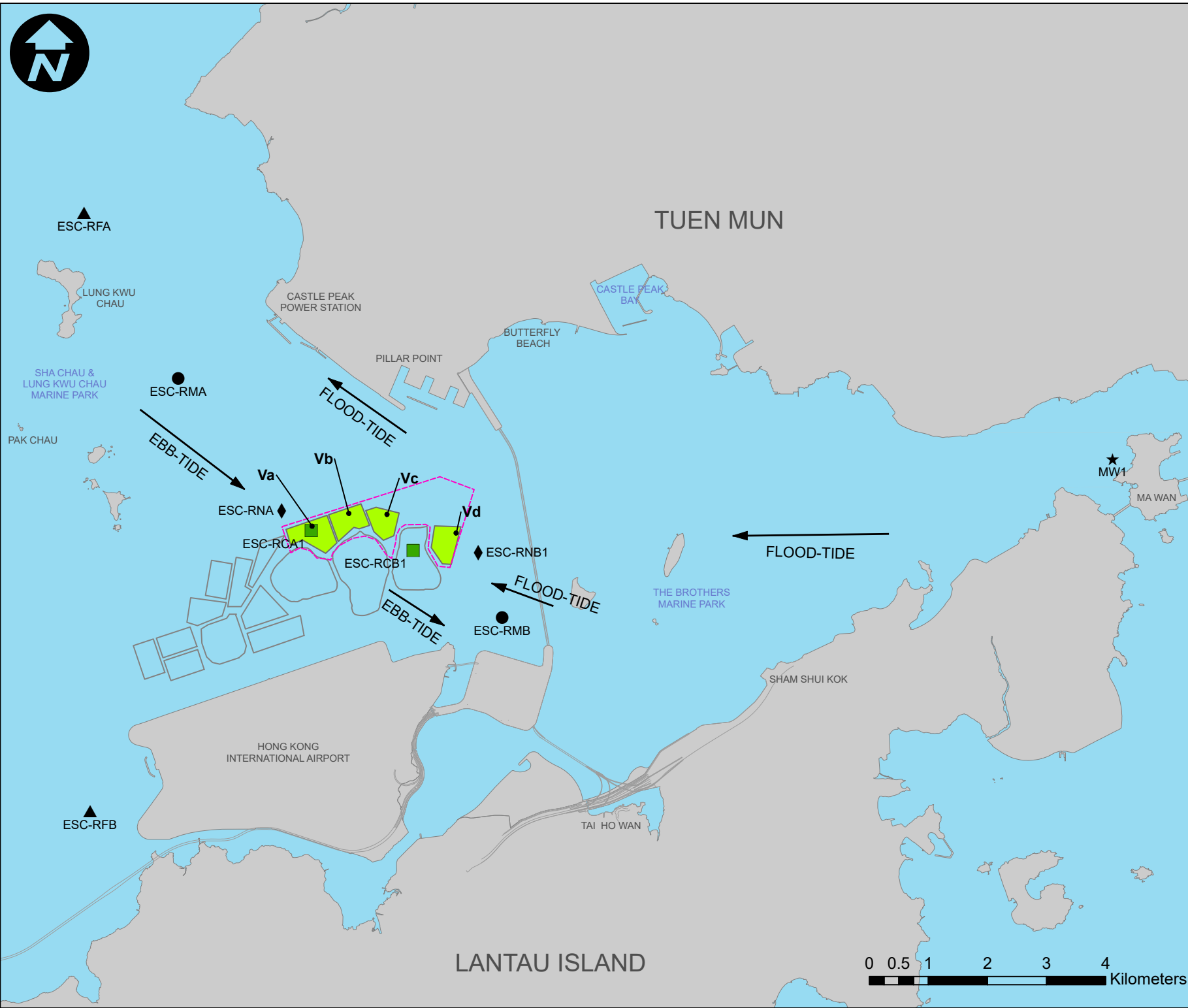
PIT SPECIFIC SEDIMENT QUALITY MONITORING STATIONS FOR CMP V

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HONG KONG
INTERNATIONAL AIRPORT





Notes:

Key to symbols:

LEGEND

- ESC CMP V
- ESC USABLE AREA 1

MONITORING STATIONS

- CAPPED PIT STATION
- NEAR-FIELD STATION
- MID-FIELD STATION
- FAR-FIELD STATION
- MA WAN STATION

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Project **AGREEMENT NO. CE 59/2020 (EP) ENVIRONMENTAL MONITORING AND AUDIT FOR DISPOSAL FACILITY TO THE EAST OF SHA CHAU (2021-2026) – INVESTIGATION**

Title **SEDIMENT CHEMISTRY AFTER A MAJOR STORM MONITORING STATIONS FOR ESC CMPS**

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Appendices

- Appendix A Sampling Schedule
- Appendix B Water Quality Monitoring Results
- Appendix C Graphical Presentations
- Appendix D Study Programme

Appendix A. Sampling Schedule

Appendix B. Water Quality Monitoring Results

Table B1: Action and Limit Levels of Water Quality for Dredging, Disposal and Capping Activities at ESC CMP V

Parameters	Action	Limit
Dissolved Oxygen (DO) in mg L ⁻¹ (Surface, Middle & Bottom) ⁽¹⁾	Surface and Middle Depth⁽²⁾ 5%-ile of baseline data for surface and middle layer = 3.76 and Significantly less than the reference station's mean DO (at the same tide of the same day)	Surface and Middle Depth⁽²⁾ 1%-ile of baseline data for surface and middle layer = 3.11 ⁽³⁾ and Significantly less than the reference station's mean DO (at the same tide of the same day)
	Bottom 5%-ile of baseline data for surface and middle layer = 2.96 and Significantly less than the reference station's mean DO (at the same tide of the same day)	Bottom The average of the impact station readings are < 2 and Significantly less than the reference station's mean DO (at the same tide of the same day)
Suspended Solids (SS) in mg L ⁻¹ (depth-averaged) ⁽⁵⁾	95%-ile of baseline data for depth-averaged = 37.88 and 120% of control station's SS at the same tide of the same day	99%-ile of baseline data for depth-averaged = 61.92 and 130% of control station's SS at the same tide of the same day
Turbidity in NTU (depth-averaged) ⁽⁴⁾⁽⁵⁾	95%-ile of baseline data = 28.14 and 120% of control station's Turbidity at the same tide of the same day	99%-ile of baseline data = 38.32 and 130% of control station's Turbidity at the same tide of the same day

Notes:

- For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
- Action and Limit Levels for DO for Surface and Middle layers were calculated from the combined pool of baseline surface layer data and baseline middle layer data.
- Given the Action Level for DO for Surface and Middle layers has already been lower than 4 mg L⁻¹, it is proposed to set the Limit Level at 3.11 mg L⁻¹ which is the first percentile of the baseline data.
- "Depth-averaged" is calculated by taking the arithmetic means of reading of all three depths.
- For turbidity and SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.

Table B2: Water Column Profiling Results for ESC CMP Vb in November 2024

Station	Temp. (°C)	Salinity (ppt)	Turbidity (NTU)	Dissolved Oxygen (%)	Dissolved Oxygen (mg L ⁻¹)	pH	Suspended Solids (mg L ⁻¹)
WCP 1 (Downstream)	26.00	32.15	8.64	92.10	6.23	8.05	3.5
WCP 2 (Upstream)	26.08	32.16	4.25	93.08	6.29	8.02	3.5
WQO (Dry Season)	N/A	28.94-35.37 [#]	N/A	N/A	>4	6.5-8.5	13.0

Notes:

- # Not exceeding 10% of natural ambient level which is the result obtained from the Reference Station.
- Cell shaded yellow / red indicates value exceeding the Action/Limit levels.
- Cell shaded grey indicates value exceeding the WQO.

Table B3: Laboratory Results for Dissolved Metals and Metalloid in Routine Water Quality Monitoring of ESC CMPs in October 2024

Station	As (µg/L)	Cd (µg/L)	Cr (µg/L)	Cu (µg/L)	Pb (µg/L)	Hg (µg/L)	Ni (µg/L)	Ag (µg/L)	Zn (µg/L)
RFF	2.09	0.05	0.10	0.43	0.01	ND	0.57	ND	3.63
IPF	2.45	0.12	0.10	0.50	0.02	0.002	0.52	ND	1.35
INF	2.39	0.04	0.12	0.48	0.01	0.001	0.56	0.01	0.51
Ma Wan	2.18	0.04	0.07	0.46	0.01	0.001	0.53	ND	4.86

Note:

- "ND" indicates the concentrations of metals and metalloids are not detected.

Table B4: Laboratory Results for Nutrients and Suspended Solid in Routine Water Quality Monitoring of ESC CMPs in October 2024

Station	NH ₃ (mg/L)	TIN (mg/L)	BOD ₅ (mg/L)	SS (mg/L)
RFF	0.05	0.30	<LOR	12.6
IPF	0.05	0.32	0.63	14.3
INF	0.03	0.34	0.45	9.5
Ma Wan	0.06	0.25	<LOR	5.5

WQO of TIN: 0.5 mg/L
 Wet Season WQO of SS: 11.9 mg/L

Notes:

- "<LOR" indicates the concentrations of contaminants are below the limit of reporting.
- Cell shaded yellow / red indicates value exceeding the Action/Limit levels.
- Cell shaded grey indicates value exceeding the WQO.

Table B5: In-situ Monitoring Results for Routine Water Quality Monitoring of ESC CMPs in November 2024

Station	Temp. (°C)	Salinity (ppt)	Turbidity (NTU)	Dissolved Oxygen		pH
				(%)	(mg L ⁻¹)	
RFF (Reference)	25.93	32.14	8.25	90.07	6.10	8.01
IPF (Impact)	25.92	31.99	10.84	90.17	6.12	7.96
INF (Intermediate)	25.93	31.96	10.27	89.68	6.08	7.95
Ma Wan	26.22	32.50	6.40	81.44	5.48	7.91
WQO (Dry Season)	N/A	28.92-35.35 [#]	N/A	N/A	>4	6.5-8.5

Notes:

- # Not exceeding 10% of natural ambient level which is the result obtained from the Reference Station.

Table B6: Laboratory Results for Dissolved Metals and Metalloid in Routine Water Quality Monitoring of ESC CMPs in November 2024

Station	As (µg/L)	Cd (µg/L)	Cr (µg/L)	Cu (µg/L)	Pb (µg/L)	Hg (µg/L)	Ni (µg/L)	Ag (µg/L)	Zn (µg/L)
RFF	1.85	ND	0.09	0.42	ND	ND	0.47	ND	1.33
IPF	1.94	0.01	0.08	0.52	ND	ND	0.46	ND	0.73
INF	1.97	0.01	0.09	0.42	ND	0.002	0.46	ND	0.80
Ma Wan	1.83	ND	0.09	0.45	ND	ND	0.42	ND	1.80

Note:

- "ND" indicates the concentrations of metals and metalloids are not detected.

Table B7: Laboratory Results for Nutrients and Suspended Solid in Routine Water Quality Monitoring of ESC CMPs in November 2024

Station	NH ₃ (mg/L)	TIN (mg/L)	BOD ₅ (mg/L)	SS (mg/L)
RFF	<LOR	0.26	0.46	10.3
IPF	<LOR	0.26	0.48	8.3
INF	0.01	0.28	0.57	11.8
Ma Wan	0.04	0.29	<LOR	7.0

WQO of TIN: 0.5 mg/L
 Dry Season WQO of SS: 13.0 mg/L

Notes:

4. "<LOR" indicates the concentrations of contaminants are below the limit of reporting.
5. Cell shaded yellow / red indicates value exceeding the Action/Limit levels.
6. Cell shaded grey indicates value exceeding the WQO.

Appendix C. Graphical Presentations

Routine Water Quality Monitoring for ESC CMP V October 2024

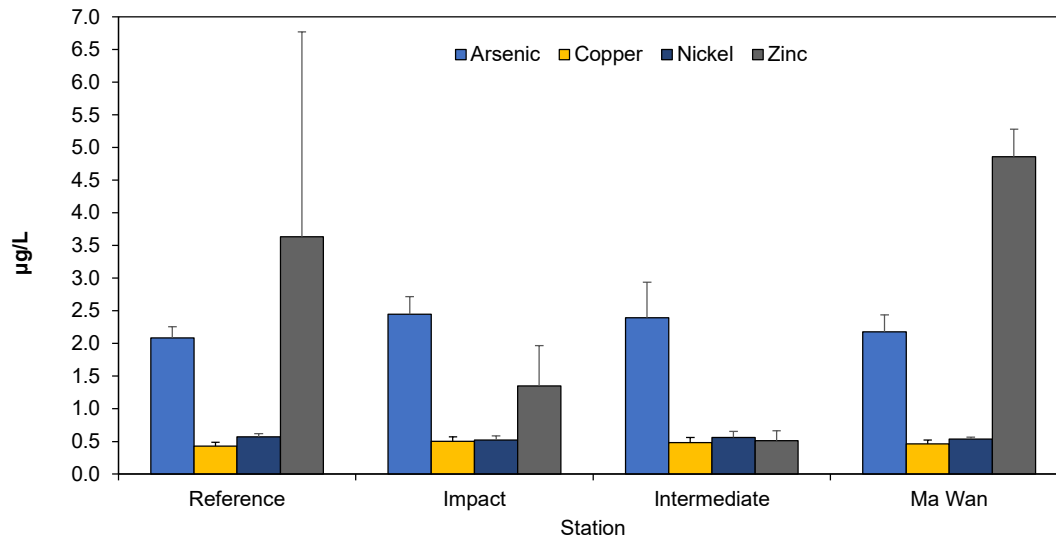


Figure 1: Concentration of Arsenic, Copper, Nickel, and Zinc (µg/L; mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at ESC CMP V in October 2024

Routine Water Quality Monitoring for ESC CMP V October 2024

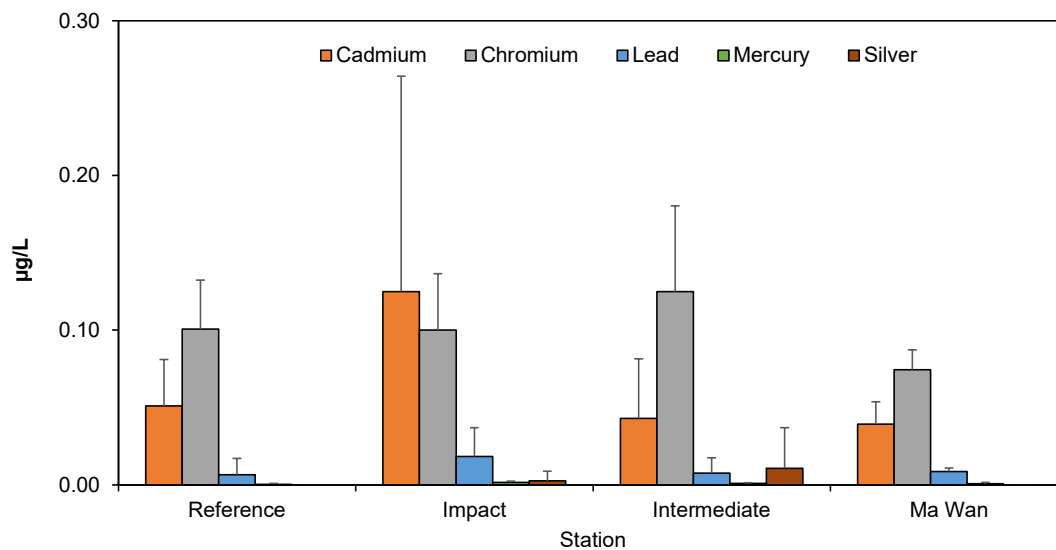


Figure 2: Concentration of Cadmium, Chromium, Lead, Mercury and Silver, (µg/L; mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at ESC CMP V in October 2024

Routine Water Quality Monitoring for ESC CMP V - November 2024

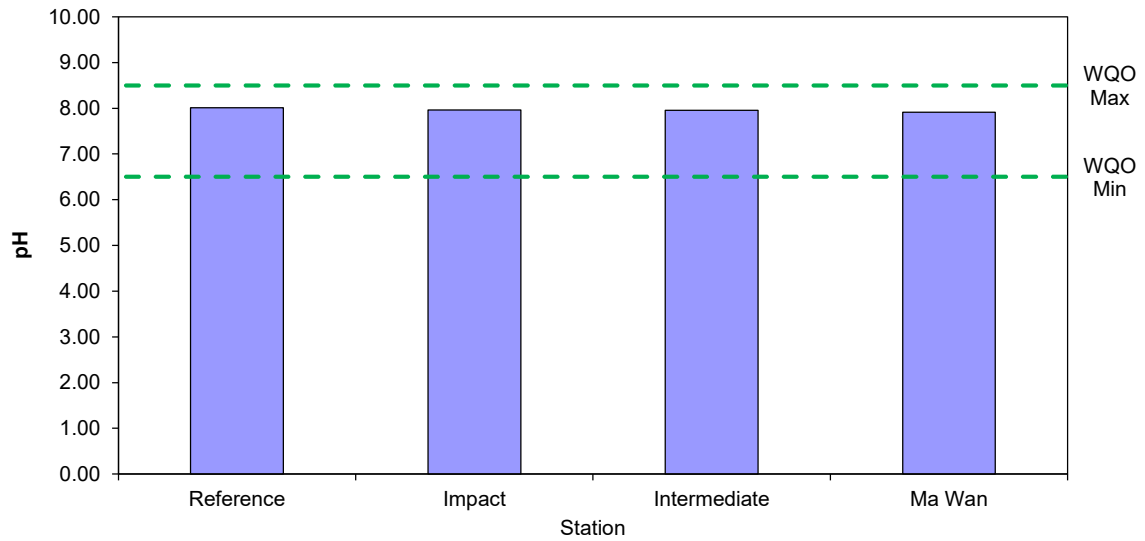


Figure 3: Level of pH recorded during Routine Water Quality Monitoring for disposal operations at ESC CMP V in November 2024

Routine Water Quality Monitoring for ESC CMP V - November 2024

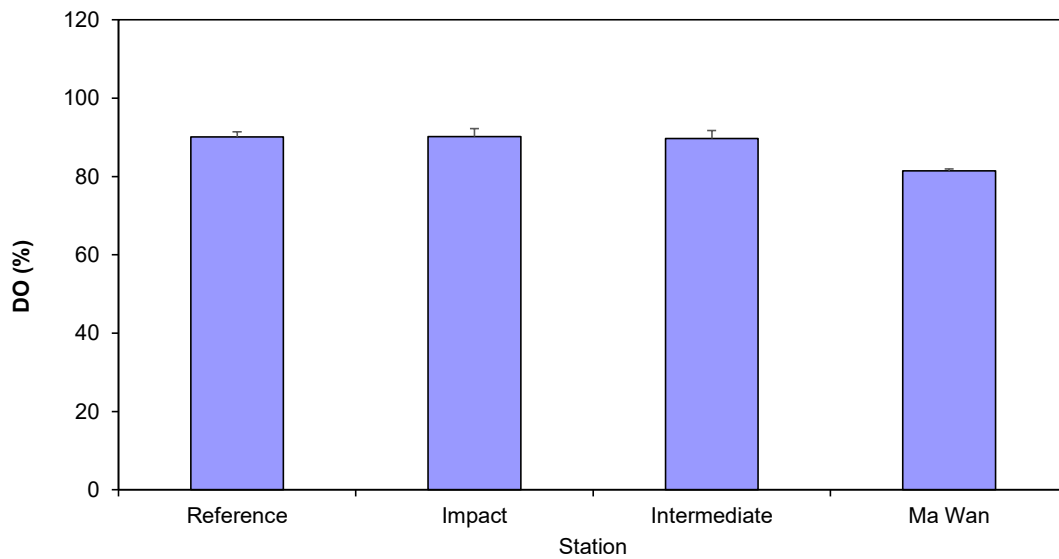


Figure 4: Level of Dissolved Oxygen (DO) (% saturation; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at ESC CMP V in November 2024

¹ The mean and standard deviation (SD) for in-situ data are the mean and SD for water columns within the area.

Routine Water Quality Monitoring for ESC CMP V - November 2024

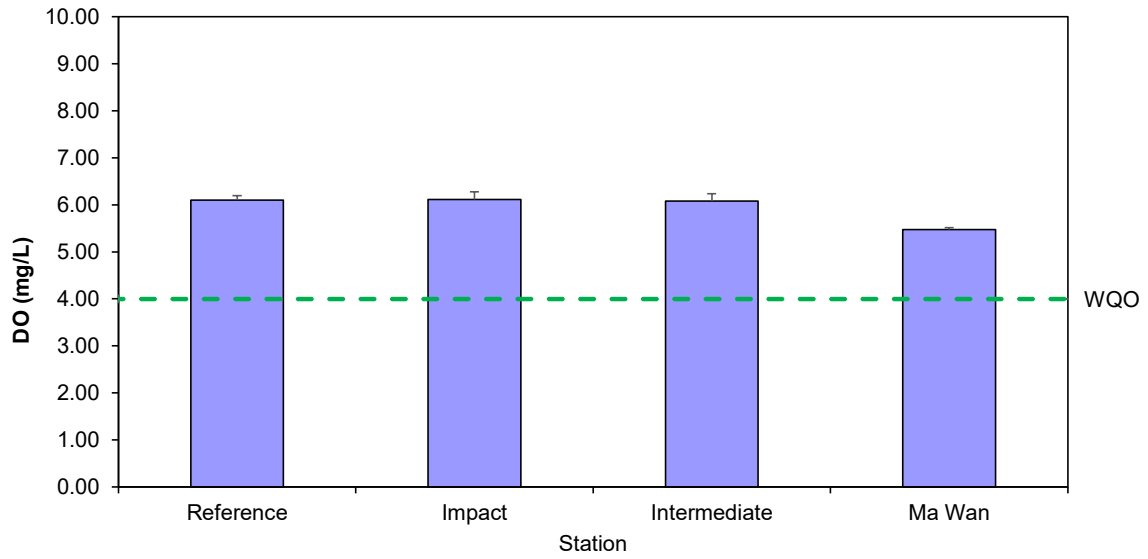


Figure 5: Concentration of Dissolved Oxygen (DO) (mg/L; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at ESC CMP V in November 2024

Routine Water Quality Monitoring for ESC CMP V - November 2024

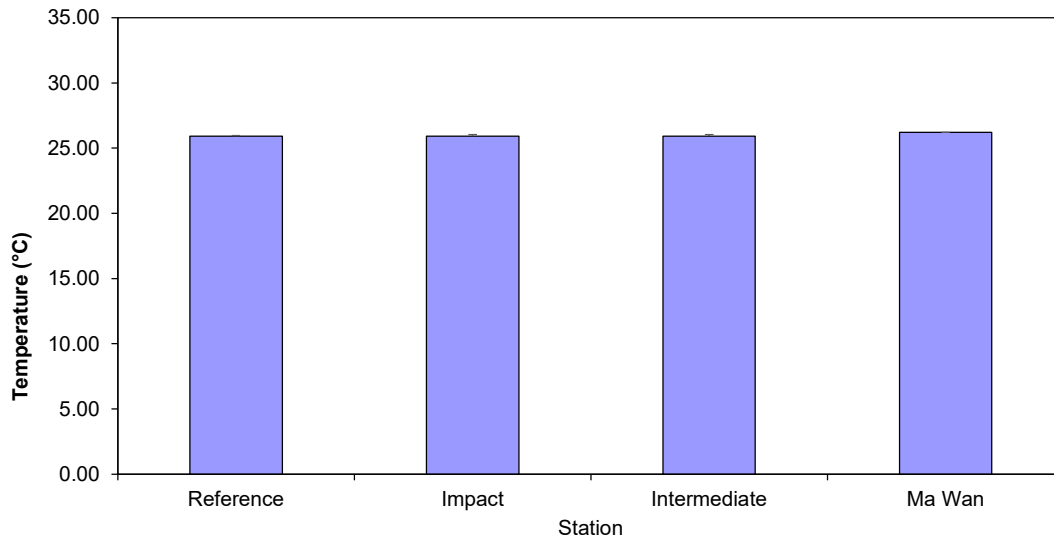


Figure 6: Level of Temperature (°C; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at ESC CMP V in November 2024

¹ The mean and standard deviation (SD) for in-situ data are the mean and SD for water columns within the area.

Routine Water Quality Monitoring for ESC CMP V - November 2024

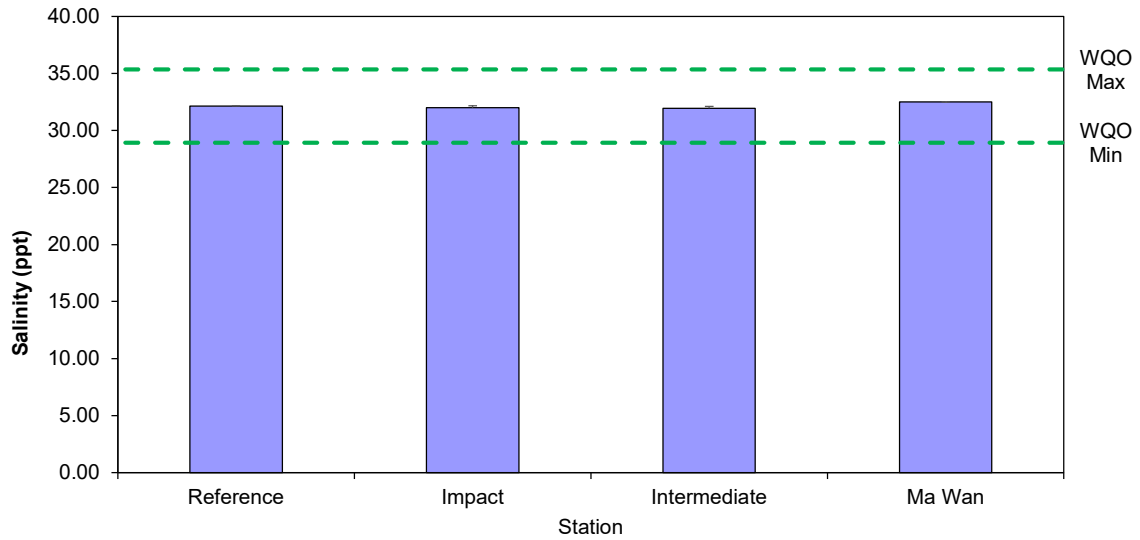


Figure 7: Level of Salinity (ppt; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at ESC CMP V in November 2024

Routine Water Quality Monitoring for ESC CMP V - November 2024

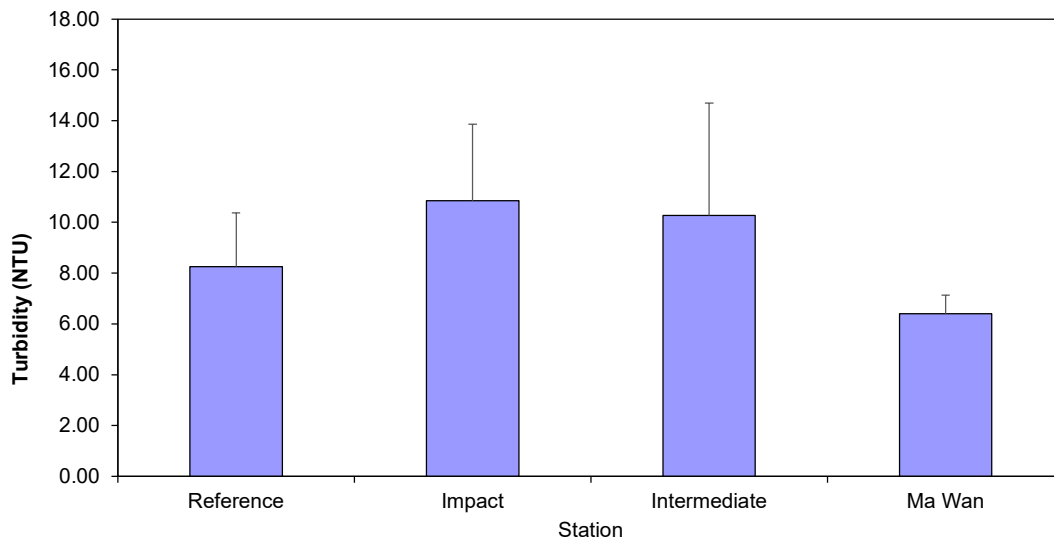


Figure 8: Level of Turbidity (NTU; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at ESC CMP V in November 2024

¹ The mean and standard deviation (SD) for in-situ data are the mean and SD for water columns within the area.

Routine Water Quality Monitoring for ESC CMP V November 2024

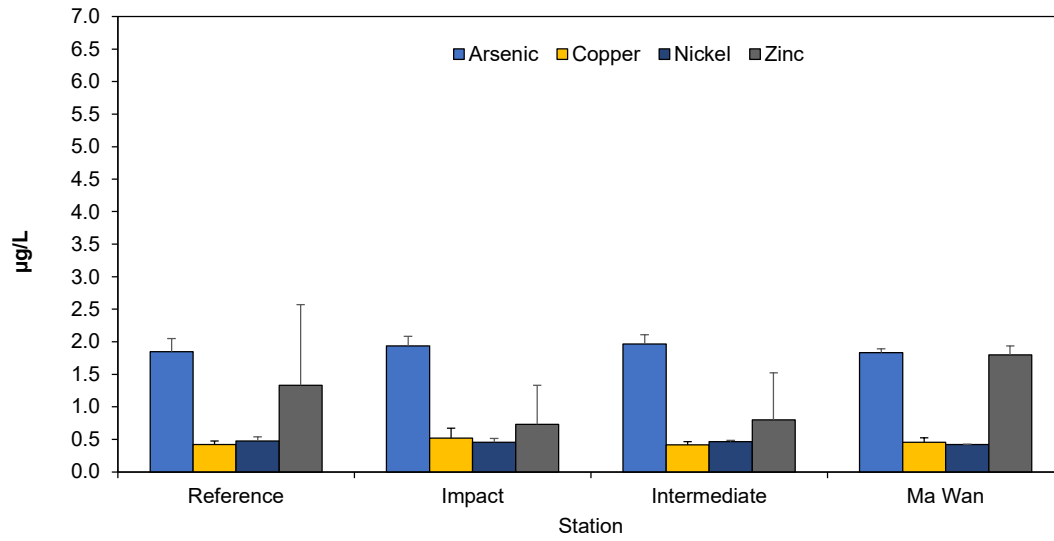


Figure 9: Concentration of Arsenic, Copper, Nickel, and Zinc (µg/L; mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at ESC CMP V in November 2024

Routine Water Quality Monitoring for ESC CMP V November 2024

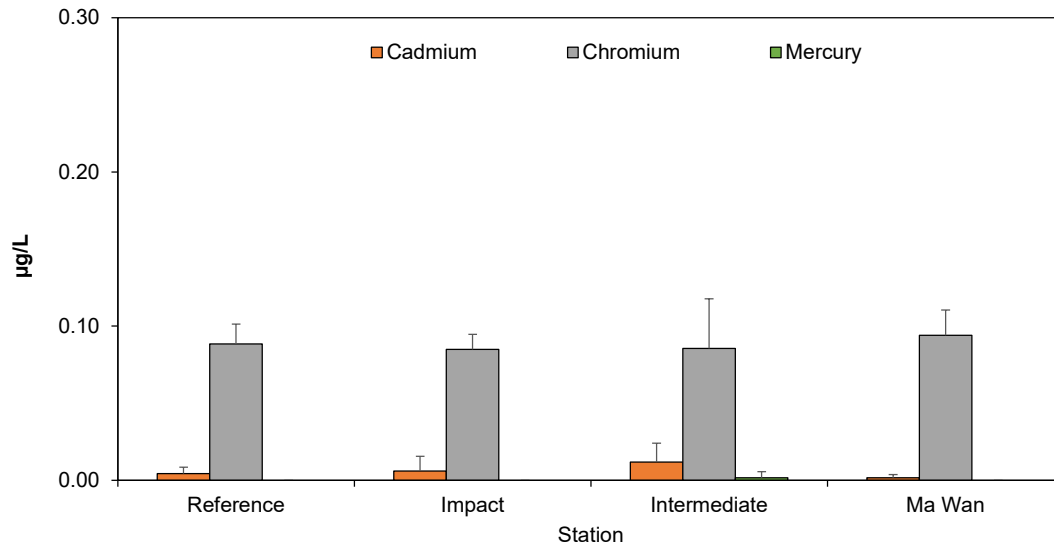


Figure 10: Concentration of Cadmium, Chromium and Mercury (µg/L; mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at ESC CMP V in November 2024

Routine Water Quality Monitoring for Nutrients - November 2024

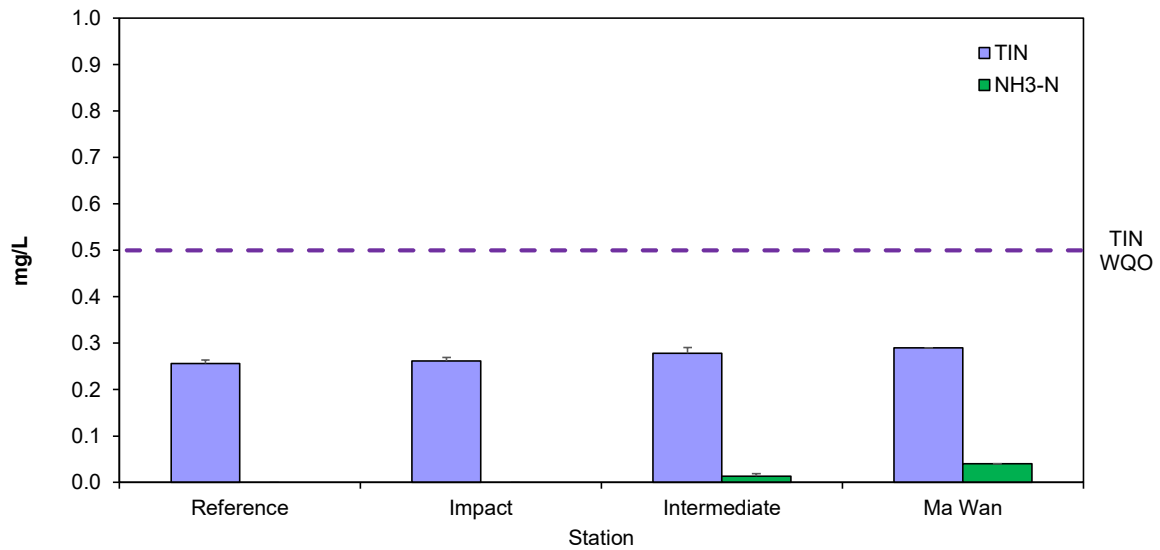


Figure 11: Concentration of Total Inorganic Nitrogen (TIN) and Ammonia Nitrogen (NH3-N) (mg/L; mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at ESC CMP V in November 2024

Routine Water Quality Monitoring for Biochemical Oxygen Demand (BOD5) - November 2024

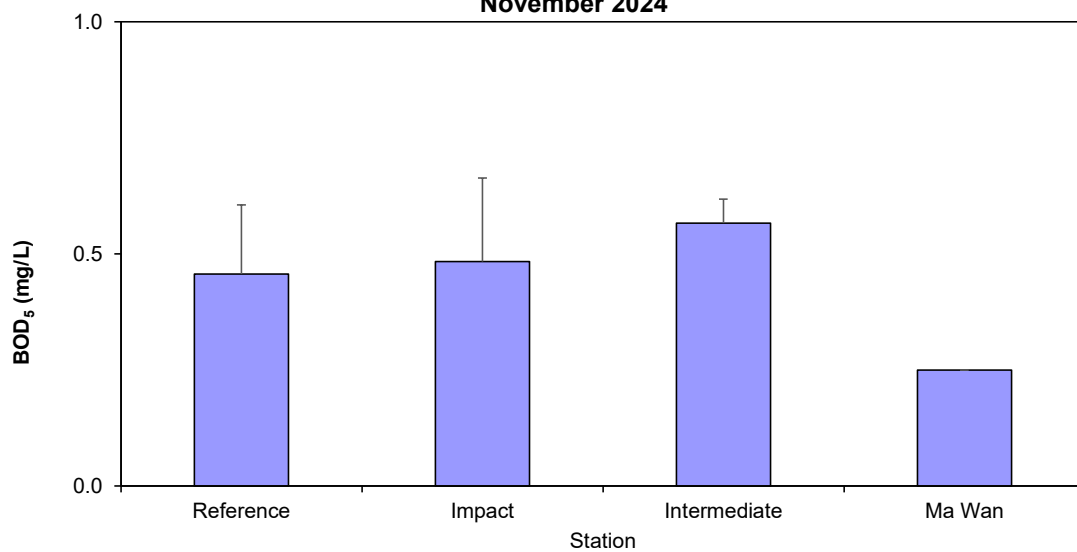


Figure 12: Level of Biochemical Oxygen Demand (BOD5)² (mg/L; mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at ESC CMP V in November 2024

¹ Concentrations of Ammonia Nitrogen (NH3-N) at Reference station and Impact Station are below limit of reporting (LOR).

² Levels of Biochemical Oxygen Demand (BOD5) at Ma Wan station are below limit of reporting (LOR).

Routine Water Quality Monitoring for Suspended Solids - November 2024

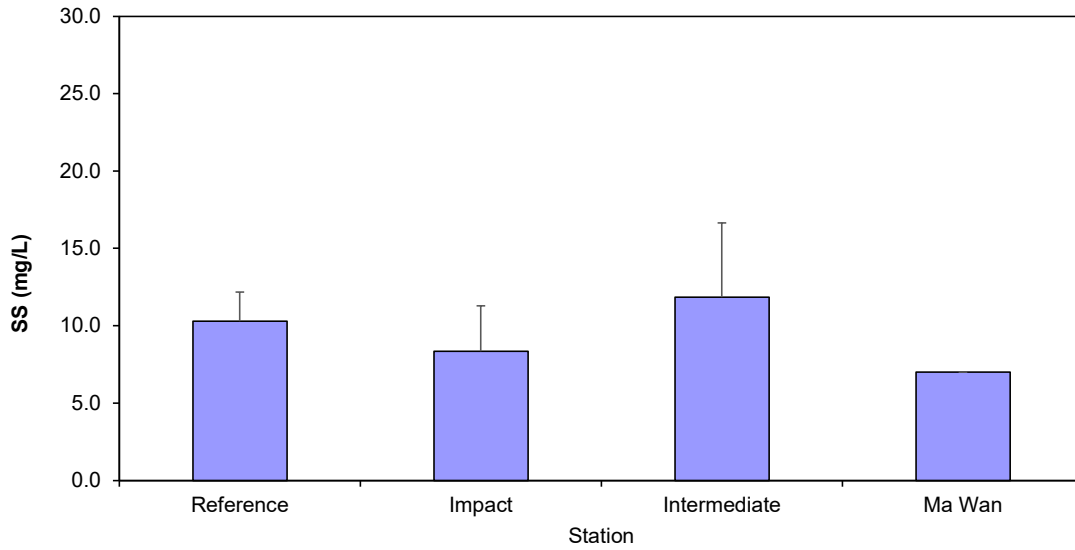


Figure 13 Concentration of Suspended Solids (SS) (mg/L; mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at ESC CMP V in November 2024

Pit Specific Sediment Chemistry for Metal and Metalloid Contaminants at ESC CMP Vb - November 2024

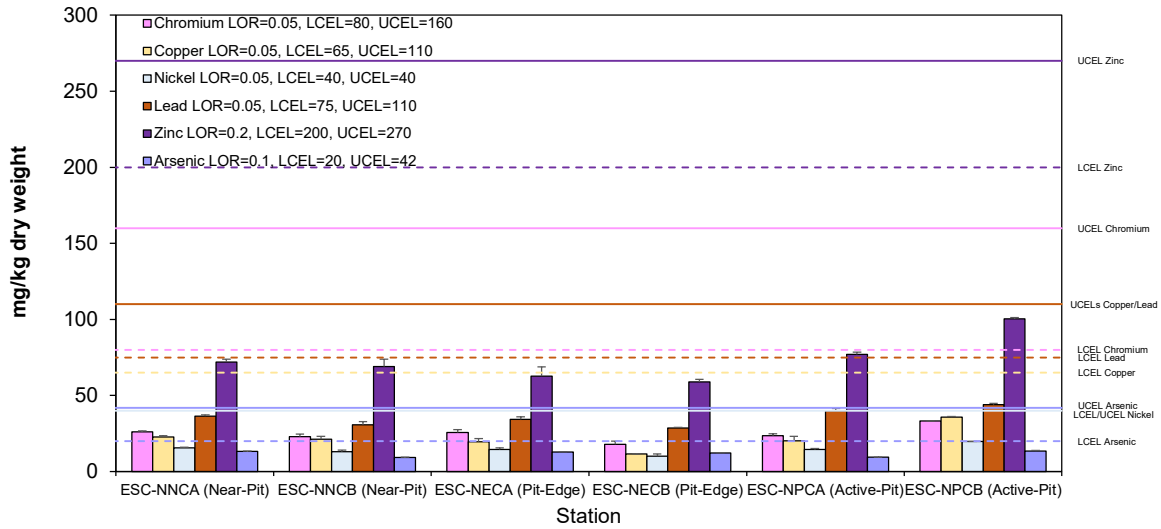


Figure 14: Concentration of Metals and Metalloid¹ (Cr, Cu, Ni, Pb, Zn, As; mg/kg dry weight; mean + SD) in sediment samples collected from Pit Specific Sediment Chemistry Monitoring for ESC CMP Vb in November 2024

¹ The LCEL and UCEL of Cadmium, Mercury and Arsenic have been updated according to the standard promulgated starting from 19 January 2024. https://www.cedd.gov.hk/filemanager/eng/content_80/PAH 2022 Chapter 4 Rev 06_240321_Clean.pdf

Pit Specific Sediment Chemistry for Metal Contaminants at ESC CMP Vb - November 2024

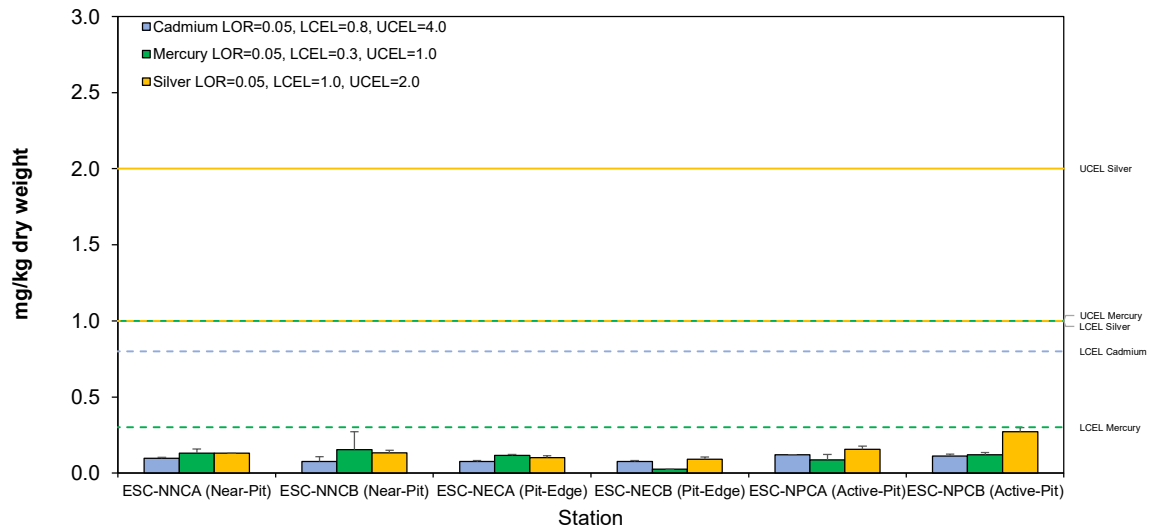


Figure 15: Concentration of Metals (Cd, Hg, Ag; mg/kg dry weight; mean + SD) in sediment samples collected from Pit Specific Sediment Chemistry Monitoring for ESC CMP Vb in November 2024

Pit Specific Sediment Chemistry for Total Organic Carbon (TOC) at ESC CMP Vb - November 2024

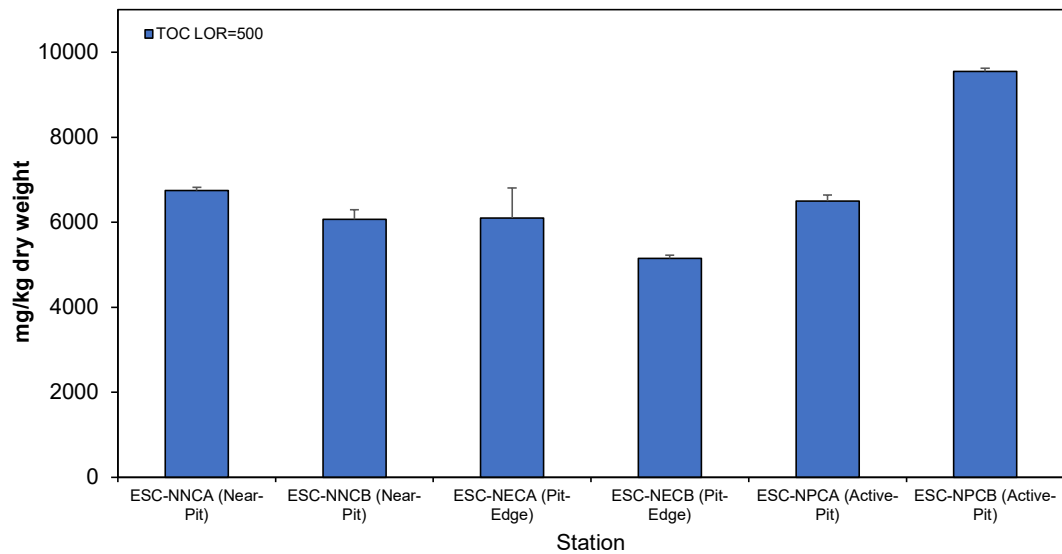


Figure 16: Concentration of Total Organic Carbon (TOC) (mg/kg dry weight; mean + SD) in sediment samples collected from Pit Specific Sediment Chemistry Monitoring for ESC CMP Vb in November 2024

Pit Specific Sediment Chemistry for Low and High Molecular Weight Polycyclic Aromatics Hydrocarbons (PAHs) at ESC CMP Vb - November 2024

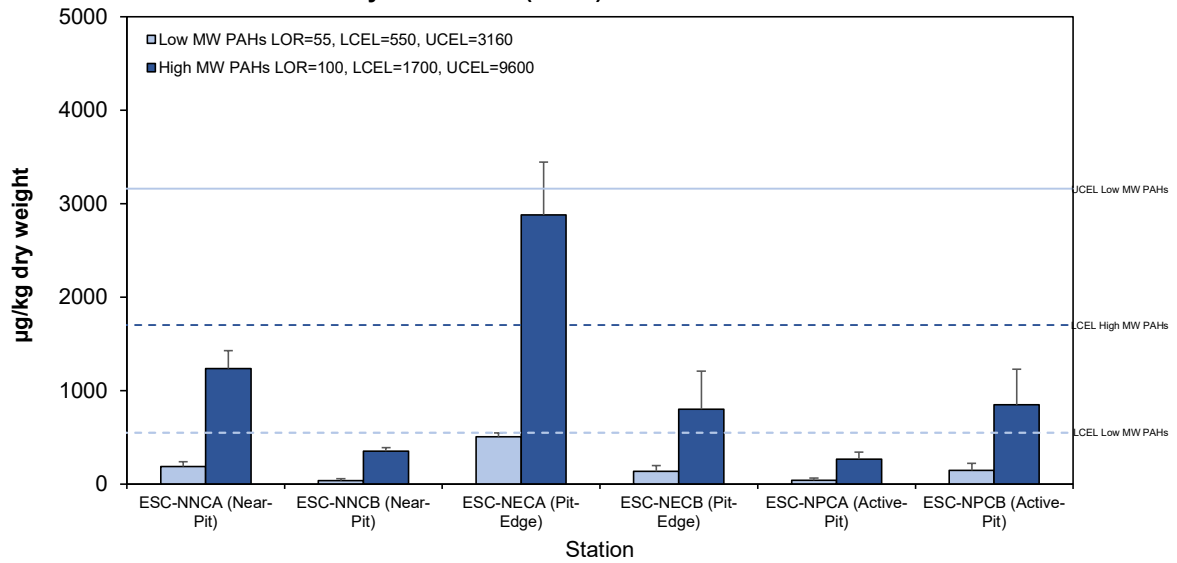


Figure 17: Concentration of Low and High Molecular Weight Polycyclic Aromatic Hydrocarbons (µg/kg dry weight; mean + SD) in sediment samples collected from Pit Specific Sediment Chemistry Monitoring for ESC CMP Vb in November 2024






Appendix D. Study Programme

Study Programme

Agreement No. CE 59/2020 (EP)
Environmental Monitoring and Audit for Disposal Facility
to the East of Sha Chau (2021-2026) - Investigation

Mott MacDonald Hong Kong Limited

ID	Task Name	Start	Finish	Timeline																																																		
				2021	2022	2023	2024	2025	2026																																													
1	COMMENCEMENT OF AGREEMENT NO. CE 59/2020 (EP)	01/04/21		1																																																		
2	EAST OF SHA CHAU CONTAMINATED MUD PITS (ESC CMPs) BETWEEN 2021 & 2026	01/04/21	25/06/26	[Thick blue bar spanning from Q1 2021 to Q3 2026]																																																		
3	Draft Report of First Review of EM&A Manual (for ESC CMPs)		30/04/21																																																			
4	Final Report of First Review of EM&A Manual (for ESC CMPs)		20/05/21																																																			
5	Draft Report of Subsequent Review of EM&A Manual (for ESC CMPs) - annual basis assumed	30/04/22	30/04/25																																																			
10	Final Report of Subsequent Review of EM&A Manual (for ESC CMPs) - annual basis assumed	20/05/22	20/05/25																																																			
15	Regular Site Inspections of CMP Contractors	01/04/21	31/03/26	[Light blue bar spanning from Q1 2021 to Q4 2026]																																																		
16	Monthly EM&A Report	14/05/21	14/04/26	[Row of small blue diamonds from Q2 2021 to Q4 2026]																																																		
77	Quarterly EM&A Report	30/07/21	30/04/26																																																			
98	Annual EM&A Report	30/01/22	30/01/26																																																			
104	Annual Risk Assessment Report	31/05/22	31/05/26																																																			
110	Draft Final Report		30/04/26																																																			
111	Final Report		04/06/26																																																			
112	Draft Executive Summary		04/06/26																																																			
113	Final Executive Summary		25/06/26																																																			
114	EAST OF TUNG LUNG CHAU (ETLC) DISPOSAL FACILITY (MONITORING PERIOD: SEPTEMBER 2021 & MARCH-APRIL 2022)	23/11/21	31/08/22																																																			
115	Monthly EM&A Report	23/11/21	06/06/22																																																			
119	Quarterly EM&A Report	15/07/22	15/07/22																																																			
121	Annual EM&A Report	31/08/22	31/08/22																																																			

Programme Revision: C Date: 11/05/22	Start/End of ET Services		Start of Agreement	
	Location		Submission	
	Repeating Task		Multiple-Occasion Submission	