



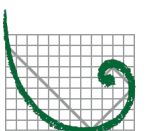
**Monthly EM&A Report for Contaminated**  
**Mud Pits to the East of Sha Chau and the**  
**South of The Brothers – November 2017**

Revision 0

12 December 2017

**Environmental Resources Management**  
16/F Berkshire House  
25 Westlands Road  
Quarry Bay, Hong Kong  
Telephone (852) 2271 3000  
Facsimile (852) 2723 5660

[www.erm.com](http://www.erm.com)



**ERM**

**Agreement No. CE 63/2016 (EP)  
Environmental Monitoring and Audit for  
Disposal Facility to the East of Sha Chau  
(2017-2020) – Investigation**




**Monthly EM&A Report for Contaminated Mud Pits to  
the East of Sha Chau and the South of The  
Brothers – November 2017**

**Revision 0**

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Management**

16/F  
Berkshire House  
25 Westlands Road  
Quarry Bay  
Hong Kong  
Telephone: (852) 2271 3000  
Facsimile: (852) 2723 5660  
E-mail: post.hk@erm.com  
http://www.erm.com

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Client:  Civil Engineering and Development Department (CEDD)		Project No:  0400720			
Summary:  This document presents the Monthly EM&A Report for <i>Environmental Monitoring and Audit for Disposal Facility to the East of Sha Chau and the South of The Brothers.</i>		Date: 12 December 2017			
		Approved by:   Craig A. Reid Partner			
v0	Monthly EM&A Report for ESC CMPs and SB CMPs	RC	JT	CAR	12/11/17
Revision	Description	By	Checked	Approved	Date
<p>This report has been prepared by Environmental Resources Management the trading name of 'ERM Hong-Kong, Limited', with all reasonable skill, care and diligence within the terms of the Contract with the client, incorporating our General Terms and Conditions of Business and taking account of the resources devoted to it by agreement with the client.</p> <p>We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.</p> <p>This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at their own risk.</p>		<p>Distribution</p> <p><input type="checkbox"/> Internal</p> <p><input checked="" type="checkbox"/> Public</p> <p><input type="checkbox"/> Confidential</p> <div style="text-align: right;">    </div>			

**Dredging, Management and Capping of Contaminated Sediment Disposal  
Facility at Sha Chau and to the South of The Brothers**

**Environmental Certification Sheet  
EP-312/2008/A & EP-427/2011/A**


**Reference Document/Plan**

Document/Plan to be Certified/ Verified:	Monthly EM&A Report for Contaminated Mud Pits to the East of Sha Chau and the South of The Brothers - November 2017
Date of Report:	12 December 2017
Date prepared by ET:	12 December 2017
Date received by IA:	12 December 2017

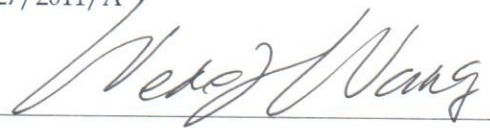
**Reference EP Condition**

Environmental Permit Condition:  Condition 3.4 of EP-312/2008/A and Condition 4.4 of EP-427/2011/A: 4 hard copies and 1 electronic copy of monthly EM&A Report shall be submitted to the Director within 2 weeks 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 certified by the ET Leader and verified by the Independent Auditor. Additional copies of the submission shall be provided to the Director upon request by the Director.
--

**ET Certification**

I hereby certify that the above referenced document/plan complies with the above referenced condition of EP-312/2008/A and EP-427/2011/A	
Jovy Tam, Environmental Team Leader:	 Date: 12/12/2017

**IA Verification**

I hereby verify that the above referenced document/plan complies with the above referenced condition of EP-312/2008/A and EP-427/2011/A	
Dr Wang Wen Xiong, Independent Auditor:	 Date: 12/12/2017

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**Agreement No. CE 63/2016 (EP)**  
**Environmental Monitoring and Audit**  
**for Disposal Facility to the East of Sha Chau (2017-2020) - Investigation**

**MONTHLY EM&A REPORT FOR NOVEMBER 2017**

**1.1 BACKGROUND**

- 1.1.1 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 South of The Brothers (SB) and to the East of Sha Chau (ESC) for the disposal of contaminated sediment, and 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. Two Environmental Permits (EPs), EP-312/2008/A and EP-427/2011/A, were issued by the Environmental Protection Department (EPD) to the CEDD, the Permit Holder, on 28 November 2008 and 23 December 2011 for the Dredging, Management and Capping of Contaminated Sediment Disposal Facilities at ESC CMP V and SB CMPs, respectively.
- 1.1.2 Under the requirements of the two EPs for ESC CMP V and SB CMPs, 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 and SB. 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 <sup>(1)</sup> <sup>(2)</sup>. The current programme will assess the impacts resulting from dredging, disposal and capping operations of CMP V as well as capping operations of SB CMPs.
- 1.1.3 The present EM&A programme under *Agreement No. CE 63/2016 (EP)* covers the dredging, disposal and capping operations of the ESC CMP V as well as the capping operations of the SB CMPs (see *Annex A* for the EM&A programme). Detailed works schedule for ESC CMP V and SB CMPs is shown in *Figure 1.1*. In November 2017, the following work was being undertaken:

- Disposal of contaminated mud 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.

Figure 1.1 Works Schedule for ESC CMP V and SB CMPs

Pit	Operation	2017					2018					2019					2020					2021																	
		A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M		
ESC CMP V	Dredging																																						
	Disposal																																						
	Capping																																						
SB CMP 2	Dredging																																						
	Disposal																																						
	Capping																																						

1.2 REPORTING PERIOD

1.2.1 This Monthly EM&A Report for November 2017 covers the EM&A activities for the reporting month of November 2017.

1.3 DETAILS OF SAMPLING AND LABORATORY TESTING ACTIVITIES

1.3.1 The following monitoring activities were undertaken for ESC CMP V in November 2017:

- Pit Specific Sediment Chemistry of ESC CMP Vd was undertaken on 6 November 2017;
- Water Column Profiling of ESC CMP Vd was undertaken on 7 November 2017; and
- Routine Water Quality Monitoring of ESC CMP V was undertaken on 8 November 2017.

1.3.2 No monitoring activities were scheduled to be undertaken for SB CMPs in November 2017.

1.4 DETAILS OF OUTSTANDING SAMPLING AND/OR ANALYSIS

1.4.1 No outstanding sampling and analysis remained for November 2017.

1.5 BRIEF DISCUSSION OF THE MONITORING RESULTS FOR ESC CMP V

1.5.1 Brief discussion of the monitoring results of the following activities for ESC CMP V is presented in this Monthly EM&A Report for November 2017:

- Water Column Profiling of ESC CMP Vd in November 2017;
- Routine Water Quality Monitoring of ESC CMP V in November 2017; and
- Pit Specific Sediment Chemistry of ESC CMP Vd in November 2017.

1.5.2 *Water Column Profiling of ESC CMP Vd - November 2017*

1.5.3 *Water Column Profiling* was undertaken at a total of two sampling stations (Upstream and Downstream stations) on 7 November 2017. 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 2007 - 2016 from stations in the Northwestern Water Control Zone (WCZ), where the ESC CMPs are located <sup>(1)</sup>. 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 Annex B* for details).

*In-situ Measurements*

1.5.4 Analyses of results for November 2017 indicated that levels of DO, Salinity and pH complied with the WQOs at both Downstream and Upstream stations (*Table B2 of Annex B*). In addition, levels of DO and Turbidity at all stations complied with the Action and Limit Levels (*Tables B1 and B2 of Annex B*).

*Laboratory Measurements for Suspended Solids (SS)*

1.5.5 Analyses of results for November 2017 indicated that the SS levels were higher than the WQO at Downstream station. However, both Upstream and Downstream stations complied with the Action and Limit Levels (*Tables B1 and B2 of Annex B*).

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

<sup>(1)</sup> <http://epic.epd.gov.hk/EPICRIVER/marine/?lang=en>

1.5.7 ***Routine Water Quality Monitoring of ESC CMP V – November 2017***

1.5.8 *Routine Water Quality Monitoring of ESC CMP V* was undertaken on 8 November 2017. The monitoring results have been assessed for compliance with the WQOs (see *Section 1.5.3* for details). The monitoring results are shown in *Tables B3 and B4 of Annex B* and *Figures 1 - 10 of Annex C*. A total of ten (10) monitoring stations were sampled in November 2017 as shown in *Figure 1.2*.

*In-situ Measurements*

1.5.9 Graphical presentation of the monitoring results (Temperature, DO, pH, Salinity and Turbidity) is shown in *Figures 1 - 6 of Annex C*. Analyses of results for November 2017 indicated that the levels of pH, Salinity and DO complied with the WQOs at all stations (Impact, Intermediate, Reference and Ma Wan stations) in November 2017 (*Table B3 of Annex B; Figures 1, 3 and 5 of Annex C*).

1.5.10 The levels of DO and Turbidity complied with the Action and Limit Levels at all stations (*Table B3 of Annex B; Figures 3 and 6 of Annex C*).

1.5.11 Overall, *in-situ* measurement results of the *Routine Water Quality Monitoring* indicated that the disposal operation at ESC CMP Vd did not appear to cause any unacceptable impacts in water quality in November 2017.

*Laboratory Measurements*

1.5.12 Laboratory analysis of November 2017 results indicated that concentrations of Cadmium, Silver and Mercury were below their limit of reporting at all stations. Arsenic, Chromium, Nickel, Lead, Copper and Zinc were detected in November 2017 samples and the concentrations of these metals and metalloids were similar amongst stations (*Table B4 of Annex B; Figure 7 of Annex C*).

1.5.13 For nutrients, concentrations of Total Inorganic Nitrogen (TIN) at all stations in November 2017 were lower than the WQO (0.5 mg/L) (*Table B4 of Annex B; Figure 8 of Annex C*). Concentrations of Ammonia Nitrogen (NH<sub>3</sub>-N) were similar amongst all stations in November 2017 (*Table B4 of Annex B; Figure 8 of Annex C*). Levels of 5-day Biochemical Oxygen Demand (BOD<sub>5</sub>) were relatively similar amongst all stations in November 2017 (*Table B4 of Annex B; Figure 9 of Annex C*).

1.5.14 Analyses of results for November 2017 indicated that the SS levels at all stations were higher than the WQO (12.8 mg/L for dry season), however SS levels complied with the Action and Limit Levels at all stations (*Tables B1 and B4 of Annex B; Figure 10 of Annex C*).



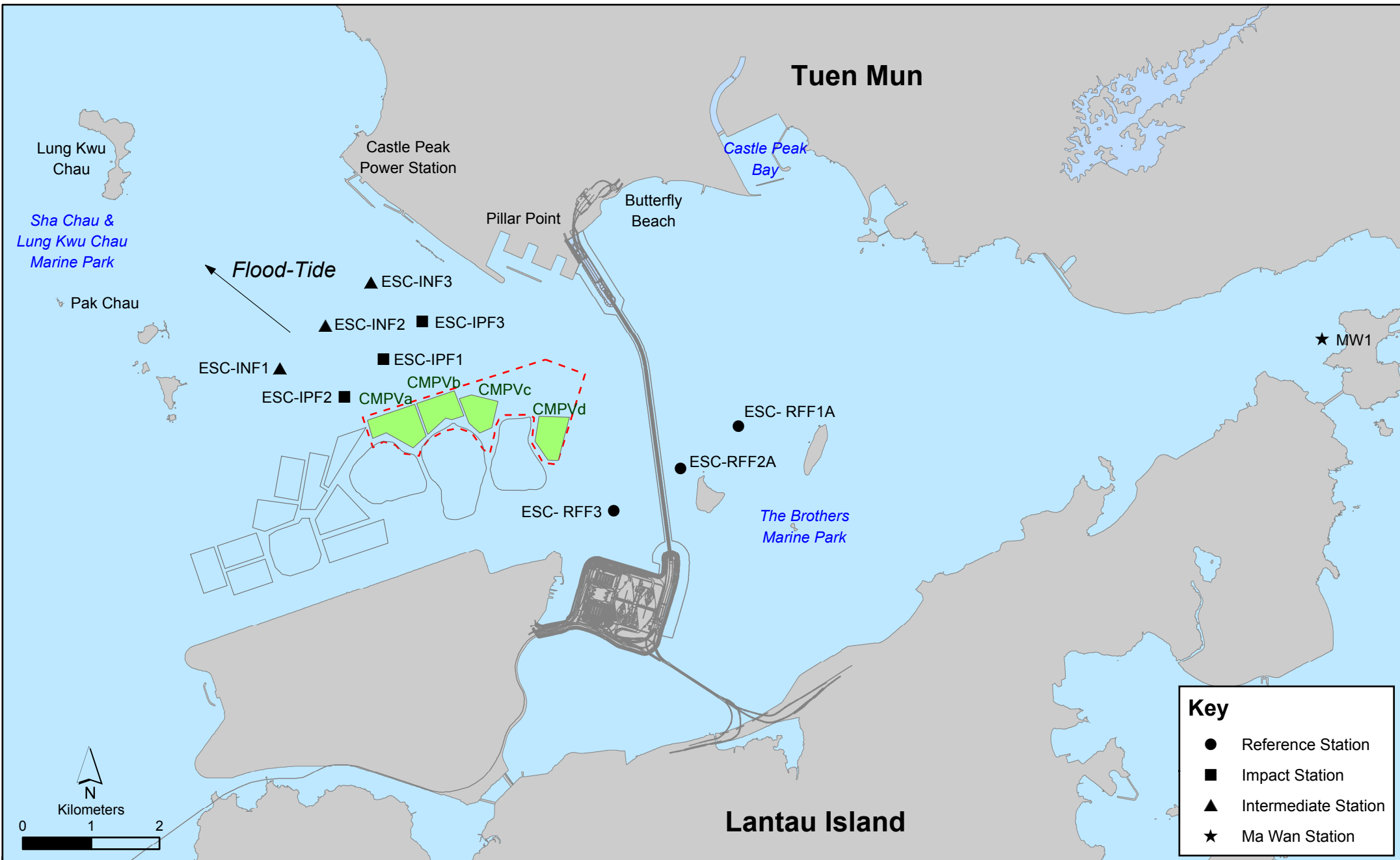


Figure 1.2

Routine & Capping Water Quality Sampling Stations (Flood-Tide) for ESC CMPs

File: T:\GIS\CONTRACT\0175086\Ixd\updated\_20170419\0175086\_R\_C\_WQMS\_flood.mxd  
Date: 25/4/2017

Key	
●	Reference Station
■	Impact Station
▲	Intermediate Station
★	Ma Wan Station

Environmental  
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- 1.5.15 Overall, results of the *Routine Water Quality Monitoring* indicated that the disposal operation at ESC CMP Vd did not appear to cause any unacceptable deterioration in water quality in November 2017. Detailed statistical analysis will be presented in the Quarterly Report to investigate any spatial and temporal trends of potential concern.
- 1.5.16 ***Pit Specific Sediment Chemistry of ESC CMP Vd – November 2017***
- 1.5.17 Monitoring locations for *Pit Specific Sediment Chemistry for ESC CMP Vd* are shown in *Figure 1.3*. A total of six (6) monitoring stations were sampled in November 2017.
- 1.5.18 The concentrations of most inorganic contaminants were lower than the Lower Chemical Exceedance Level (LCEL) at all stations in November 2017, except Copper and Silver (*Figures 15 and 16 of Annex C*). In November 2017, concentrations of Copper and Silver exceeded the LCEL at Active Pit stations ESC-NPAA and ESC-NPAB (*Figures 15 and 16 of Annex C*).
- 1.5.19 Since the Active Pit stations are located within ESC CMP Vd which were receiving contaminated mud during the reporting period, the exceedances of LCEL for Copper and Silver recorded at the Action Pit stations only are not considered as indicating any dispersal of contaminated mud from ESC CMP Vd.
- 1.5.20 For organic contaminants, the concentrations of Total Organic Carbon (TOC) were similar in November 2017 (*Figure 17 of Annex C*). The concentrations of Tributyltin (TBT) were higher at Active Pit stations ESC-NPAA and ESC-NPAB and Near Pit station ESC-NNAA in November 2017 (*Figure 18 of Annex C*). Low and High Molecular Weight Polycyclic Aromatic Hydrocarbons (PAHs), Total Polychlorinated Biphenyls (PCBs), Total dichloro-diphenyl-trichloroethane (DDT) and 4,4'-dichlorodiphenyldichloroethylene (DDE) concentrations were below the limit of reporting at all stations in November 2017.
- 1.5.21 Overall, there is no evidence indicating any unacceptable environmental impacts to sediment quality as a result of the contaminated mud disposal operations at ESC CMP Vd in November 2017. Statistical analysis will be undertaken and presented in the corresponding quarterly report to investigate whether there are any unacceptable impacts in the area caused by the contaminated mud disposal.

## **1.6 ACTIVITIES SCHEDULED FOR THE NEXT MONTH**

1.6.1 The following monitoring activities will be conducted in the next monthly period of December 2017 for ESC CMP V (see *Annex A* for the sampling schedule):

- *Water Column Profiling of ESC CMP Vd;*

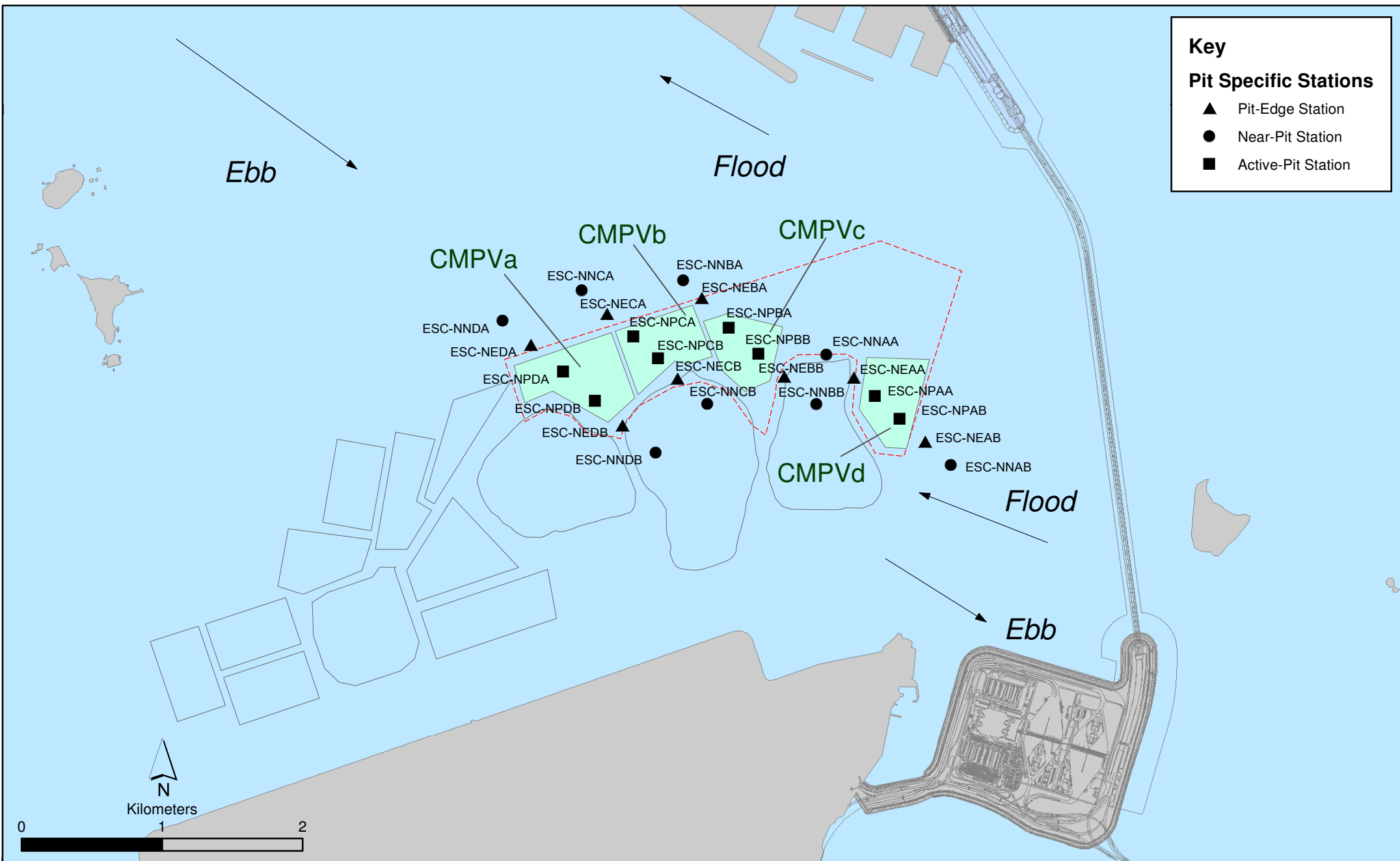


Figure 1.3

Pit Specific Sediment Quality Monitoring Stations for CMPV

- *Cumulative Impact Sediment Chemistry of ESC CMPs; and*
- *Pit Specific Sediment Chemistry of ESC CMP Vd.*

1.6.2 The following monitoring activities will be conducted in the next monthly period of December 2017 for SB CMPs (see *Annex A* for the sampling schedule):

- *Benthic Recolonisation Studies of SB CMPs.*

## **1.7 STUDY PROGRAMME**

1.7.1 A summary of the Study programme is presented in *Annex D*.

Annex A

## Sampling Schedule

Pit Specific Sediment Chemistry	Code	Frequency	2017												2018												2019												2020												2021											
			A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M
Active-Pit	ESC-NPAA	Monthly	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12			
Pit-Edge	ESC-NPAB	Monthly	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12			
Near-Pit	ESC-NEAA	Monthly	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12			
	ESC-NEAB	Monthly	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12			
	ESC-NNAA	Monthly	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12			
	ESC-NNAB	Monthly	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12			

... (The rest of the table follows a similar pattern with varying frequencies and numbers of replicates for different stations and codes.)

Notes:  
The number shown in each cell represents the numbers of replicates per monitoring station  
Impact Monitoring for Dredging will be scheduled when dredging operations commence.  
Benthic Recolonisation Studies for CMP V will be scheduled when capping operation for CMP V is completed.

Annex A2 - Environmental Monitoring and Audit Sampling Schedule for South of The Brothers (April 2017 - December 2018)

			2017												2018											
			A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D			
<b>Capping Water Quality Monitoring</b>																										
<i>Ebb Tide</i>																										
Impact Stations Downcurrent	SB-IPE1	4 times per year			3	3																				
	SB-IPE2	4 times per year			3	3																				
	SB-IPE3	4 times per year			3	3																				
	SB-IPE4	4 times per year			3	3																				
	SB-IPE5	4 times per year			3	3																				
Intermediate Stations Downcurrent	SB-INE1	4 times per year			3	3																				
	SB-INE2	4 times per year			3	3																				
	SB-INE3	4 times per year			3	3																				
	SB-INE4	4 times per year			3	3																				
	SB-INE5	4 times per year			3	3																				
Reference Stations Upcurrent	SB-RFE1	4 times per year			3	3																				
	SB-RFE2	4 times per year			3	3																				
	SB-RFE3	4 times per year			3	3																				
	SB-RFE4	4 times per year			3	3																				
	SB-RFE5	4 times per year			3	3																				
Sensitive Receiver Stations	MW1	4 times per year			3	3																				
	THB1	4 times per year			3	3																				
	THB2	4 times per year			3	3																				
	WSR45C	4 times per year			3	3																				
	WSR46	4 times per year			3	3																				
<i>Flood Tide</i>																										
Impact Stations Downcurrent	SB-IPF1	4 times per year			3	3																				
	SB-IPF2	4 times per year			3	3																				
	SB-IPF3	4 times per year			3	3																				
Intermediate Stations Downcurrent	SB-INF1	4 times per year			3	3																				
	SB-INF2	4 times per year			3	3																				
	SB-INF3	4 times per year			3	3																				
Reference Stations Upcurrent	SB-RFF1	4 times per year			3	3																				
	SB-RFF2	4 times per year			3	3																				
	SB-RFF3	4 times per year			3	3																				
Sensitive Receiver Stations	MW1	4 times per year			3	3																				
	THB1	4 times per year			3	3																				
	THB2	4 times per year			3	3																				
	WSR45C	4 times per year			3	3																				
	WSR46	4 times per year			3	3																				
<b>Benthic Recolonisation Studies</b>																										
Capped Contaminated Mud Pits	SB-CPA	2 times per year					12					12							12				12			
	SB-CPB	2 times per year					12					12							12				12			
Reference Stations	RBA	2 times per year					12					12							12				12			
	RBB	2 times per year					12					12							12				12			
	RBC	2 times per year					12					12							12				12			

Notes:  
 The number shown in each cell represents the numbers of replicates per monitoring station  
 Capping works are planned to be conducted between May and December 2017.

Annex B

## Water Quality Monitoring Results



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

<b>Parameter</b>	<b>Action Level</b>	<b>Limit Level</b>
Dissolved Oxygen (DO) <sup>(1)</sup>	<u>Surface and Mid-depth</u> <sup>(2)</sup> 5%-ile of baseline data for surface and middle layer = <b>3.76 mg L<sup>-1</sup></b>	<u>Surface and Mid-depth</u> <sup>(2)</sup> 1%-ile of baseline data for surface and middle layer = <b>3.11 mg L<sup>-1</sup></b> <sup>(3)</sup>
	and	and
	Significantly less than the reference stations mean DO (at the same tide of the same day)	Significantly less than the reference stations mean DO (at the same tide of the same day)
	<u>Bottom</u> 5%-ile of baseline data for bottom layers = <b>2.96 mg L<sup>-1</sup></b>	<u>Bottom</u> The average of the impact station readings are <b>&lt;2 mg/L<sup>-1</sup></b>
	and	and
	Significantly less than the reference stations mean DO (at the same tide of the same day)	Significantly less than the reference stations mean DO (at the same tide of the same day)
Depth-averaged Suspended Solids (SS) <sup>(4)(5)</sup>	95%-ile of baseline data for depth average = <b>37.88 mg L<sup>-1</sup></b>	99%-ile of baseline data for depth average = <b>61.92 mg L<sup>-1</sup></b>
	and	and
	120% of control station's SS at the same tide of the same day	130% of control station's SS at the same tide of the same day
Depth-averaged Turbidity (Tby) <sup>(4)(5)</sup>	95%-ile of baseline data = <b>28.14 NTU</b>	99%-ile of baseline data = <b>38.32 NTU</b>
	and	and
	120% of control station's Tby at the same tide of the same day	130% of control station's Tby at the same tide of the same day

**Notes:**

- (1) For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
- (2) The Action and Limit Levels for DO for Surface & Middle layers were calculated from the combined pool of baseline surface layer data and baseline middle layer data.
- (3) Given the Action Level for DO for Surface & Middle layers has already been lower than 4 mg L<sup>-1</sup>, it is proposed to set the Limit Level at 3.11 mg L<sup>-1</sup> which is the first percentile of the baseline data.
- (4) "Depth-averaged" is calculated by taking the arithmetic means of reading of all three depths.
- (5) 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 Vd in November 2017*

Stations	Temp (°C)	Salinity (ppt)	Turbidity (NTU)	Dissolved Oxygen (%) (mg L <sup>-1</sup> )		pH	Suspended Solids (mg L <sup>-1</sup> )
WCP 1 (Downstream)	24.75	32.27	17.81	91.85	6.35	8.09	13.13
WCP 2 (Upstream)	24.76	32.56	8.27	91.61	6.32	8.08	8.58
WQO (Dry season)	N/A	29.31 – 35.82 <sup>#</sup>	N/A	N/A	>4	6.5-8.5	12.8

**Note:**  
<sup>#</sup>Not exceeding 10% of natural ambient level which is the result obtained from the Reference Station.  
 Cell shaded yellow / red indicate value exceeding the Action/Limit levels.  
 Cell shaded grey indicate value exceeding the WQO.

**Table B3** *In-situ Monitoring Results for Routine Water Quality Monitoring of ESC CMPs in November 2017*

Sampling Period	Stations	Temp (°C)	Salinity (ppt)	Turbidity (NTU)	Dissolved Oxygen (%) (mg L <sup>-1</sup> )		pH (mg L <sup>-1</sup> )
November 2017	RFE (Reference)	24.52	31.90	20.33	91.99	6.39	8.08
	IPE (Impact)	24.59	31.46	22.36	92.68	6.45	8.08
	INE (Intermediate)	24.59	31.25	18.75	92.19	6.42	8.07
	Ma Wan	24.84	32.44	22.49	87.52	6.03	8.04
	WQO	N/A	28.71 – 35.09 <sup>#</sup>	N/A	N/A	>4	6.5-8.5

**Notes:**

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

**Table B4** *Laboratory Results for Routine Water Quality Monitoring of ESC CMPs in November 2017*

Sampling Period	Stations	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)	NH <sub>3</sub> (mg/L)	TIN (mg/L)	BOD <sub>5</sub> (mg/L)	SS (mg/L)
November 2017	RFE	1.34	<0.5	0.65	3.17	1.67	<0.5	1.19	<1	42.60	0.11	0.31	2.93	19.72
	IPE	1.84	<0.5	0.92	0.73	3.38	<0.5	0.96	<1	39.66	0.11	0.32	1.17	21.09
	INE	1.77	<0.5	0.55	1.23	1.63	<0.5	1.23	<1	38.92	0.15	0.44	1.24	20.65
	Ma Wan	1.58	<0.5	0.93	3.38	1.15	<0.5	0.82	<1	51.93	0.18	0.36	2.53	30.59

WQO of TIN: 0.5 mg/L  
 Dry Season WQO of SS : 12.8 mg/L

**Notes:**

Cell shaded yellow / red indicate value exceeding the Action/Limit levels.  
 Cell shaded grey indicate value exceeding the WQO.

Annex C

## Graphical Presentations

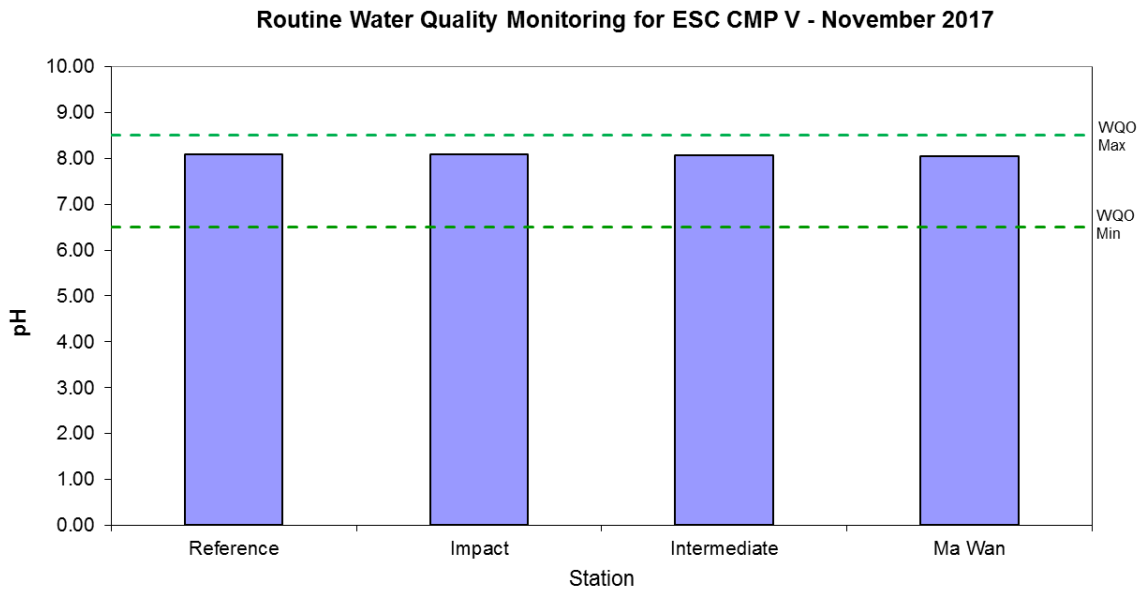


Figure 1: Level of pH recorded during Routine Water Quality Monitoring for disposal operations at ESC CMP V in November 2017.

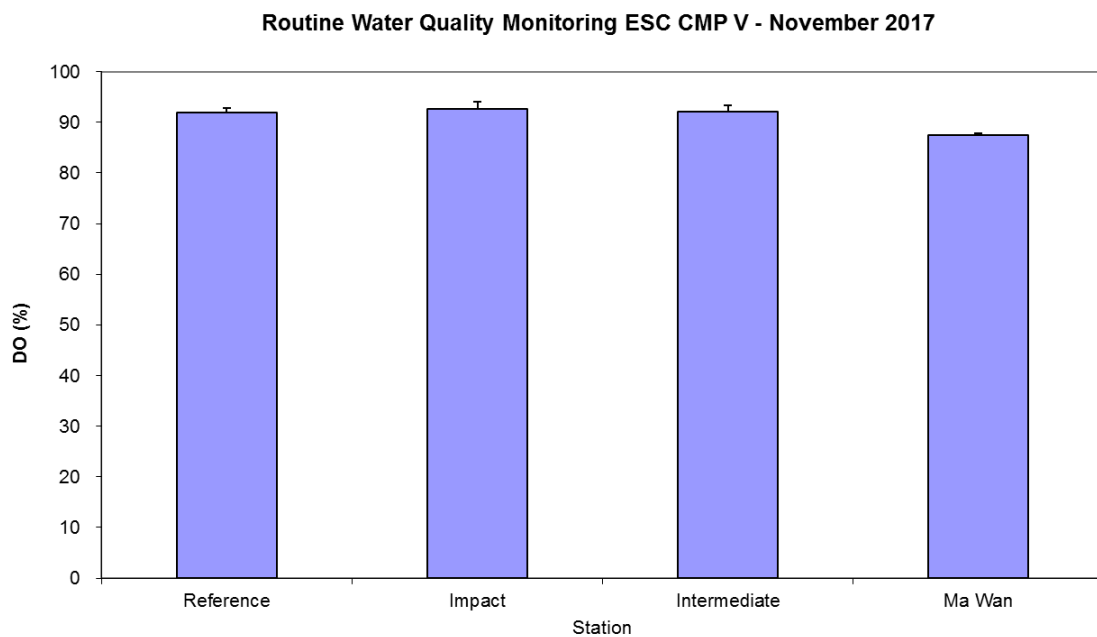


Figure 2: Level of Dissolved Oxygen (DO) (% saturation; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at ESC CMP V in November 2017.

Source: H:\Team\EM\GMS Projects\0400720 CEDD CMP EM&A 2017-2020\02 Deliverable\05 CMP Monthly Report\November 2017)

Date: December 2017

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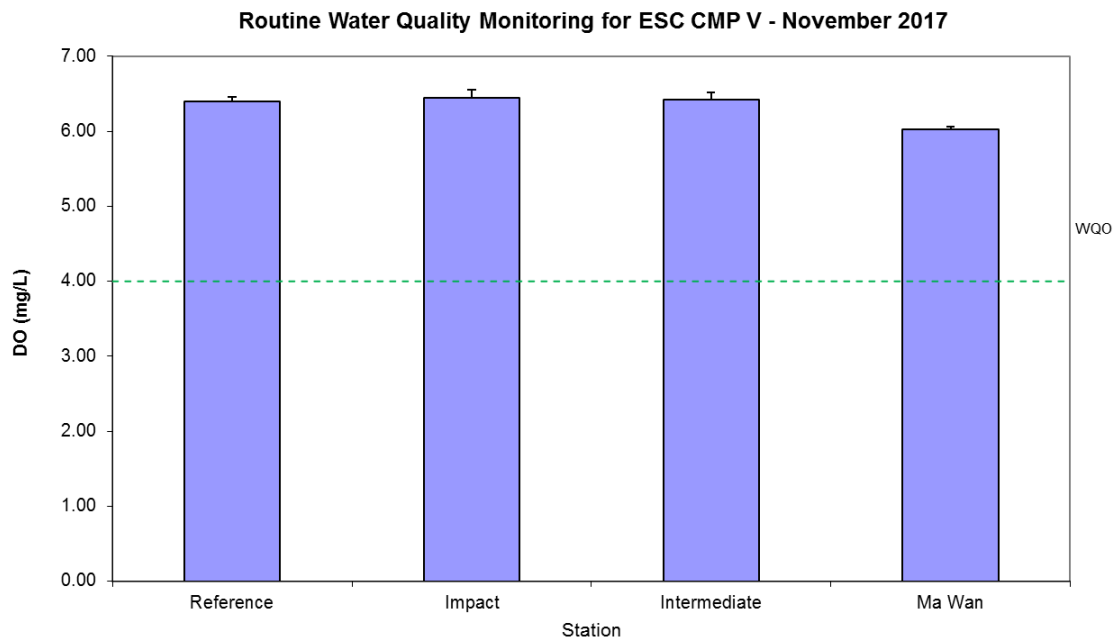


Figure 3: Concentration of Dissolved Oxygen (DO) (mg/L; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at ESC CMP V in November 2017.

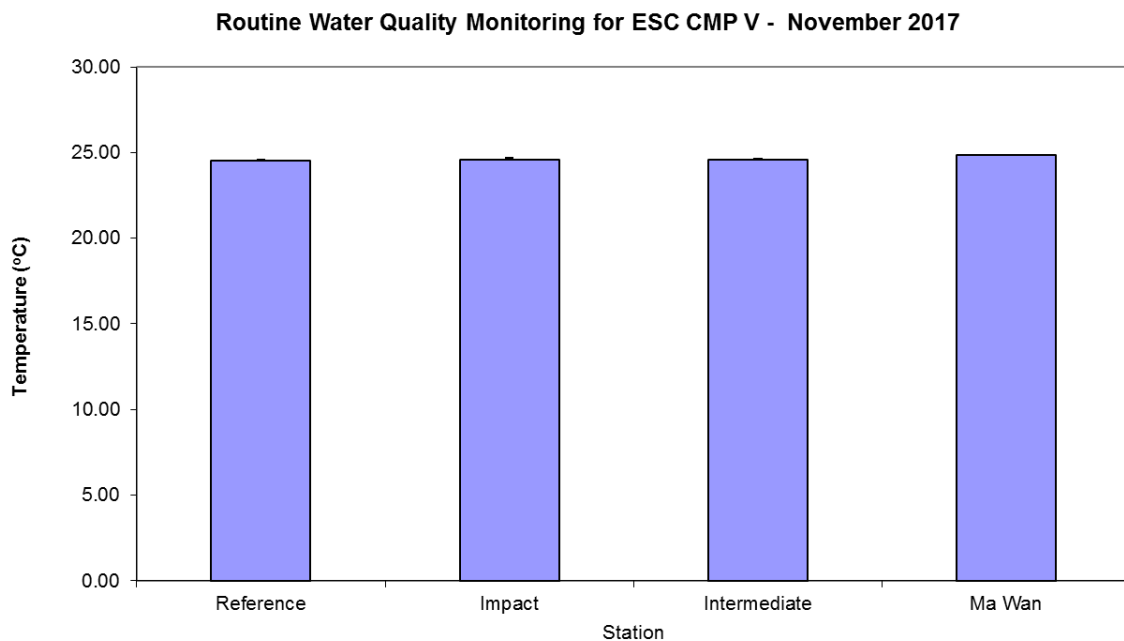


Figure 4: Level of Temperature (°C; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at ESC CMP V in November 2017.

Source: H:\Team\EM\GMS Projects\0400720 CEDD CMP EM&A 2017-2020\02 Deliverable\05 CMP Monthly Report\November 2017)

Date: December 2017

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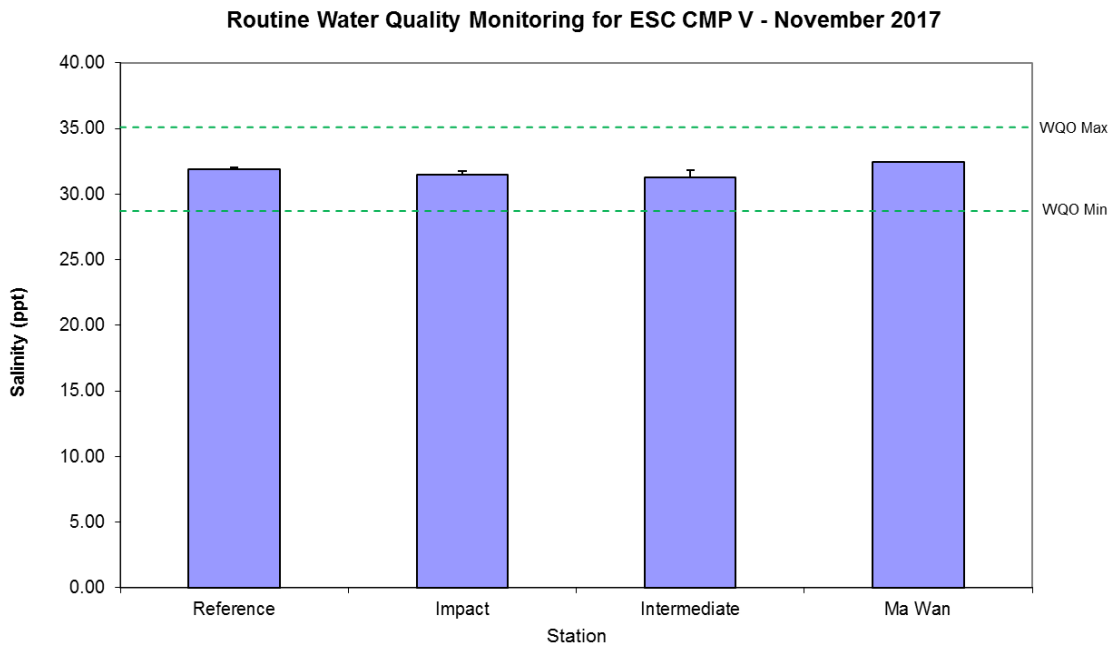


Figure 5: Level of Salinity (ppt; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at ESC CMP V in November 2017.

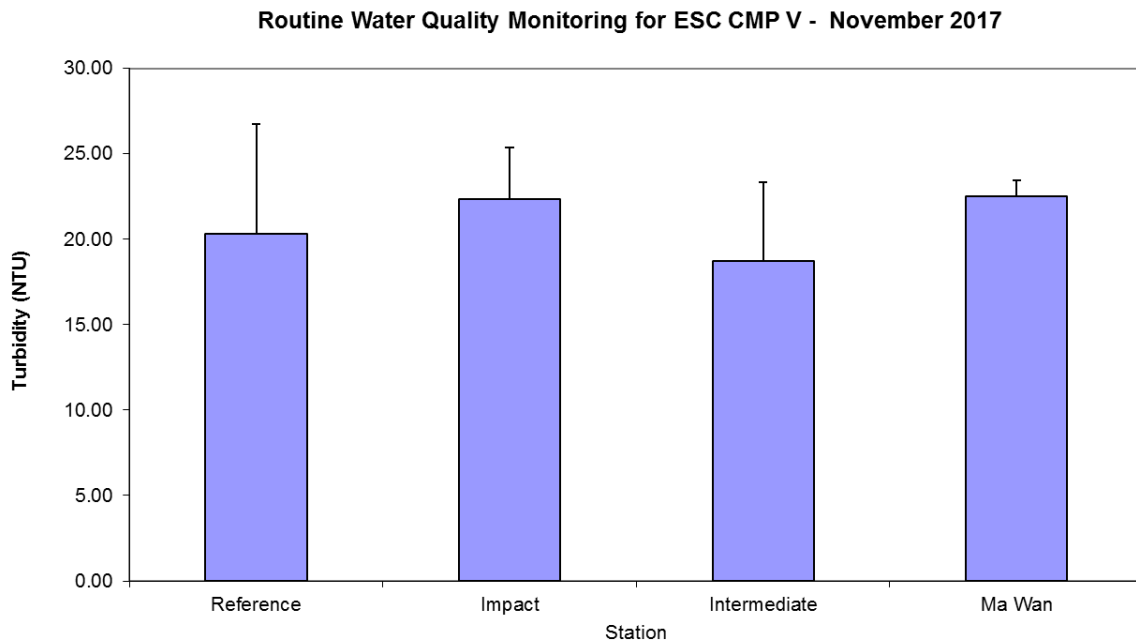


Figure 6: Levels of Turbidity (NTU; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at ESC CMP V in November 2017.

Source: H:\Team\EM\GMS Projects\0400720 CEDD CMP EM&A 2017-2020\02 Deliverable\05 CMP Monthly Report\November 2017)

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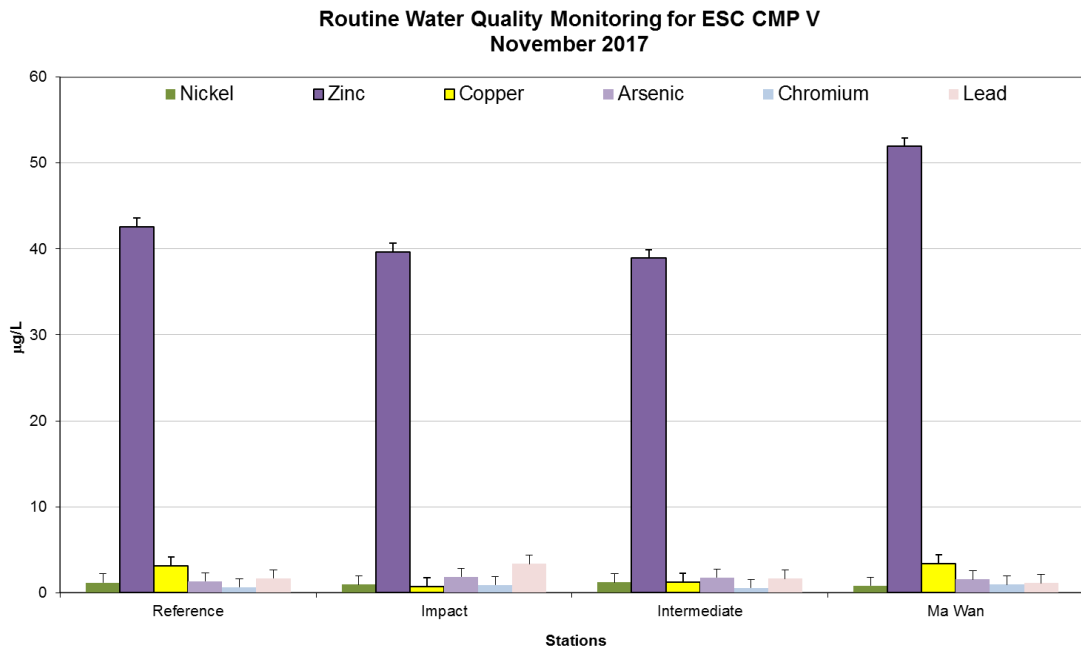


Figure 7: Concentration of Arsenic, Chromium, Nickel, Lead, Copper and Zinc ( $\mu\text{g/L}$ ; mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at ESC CMP V in November 2017.

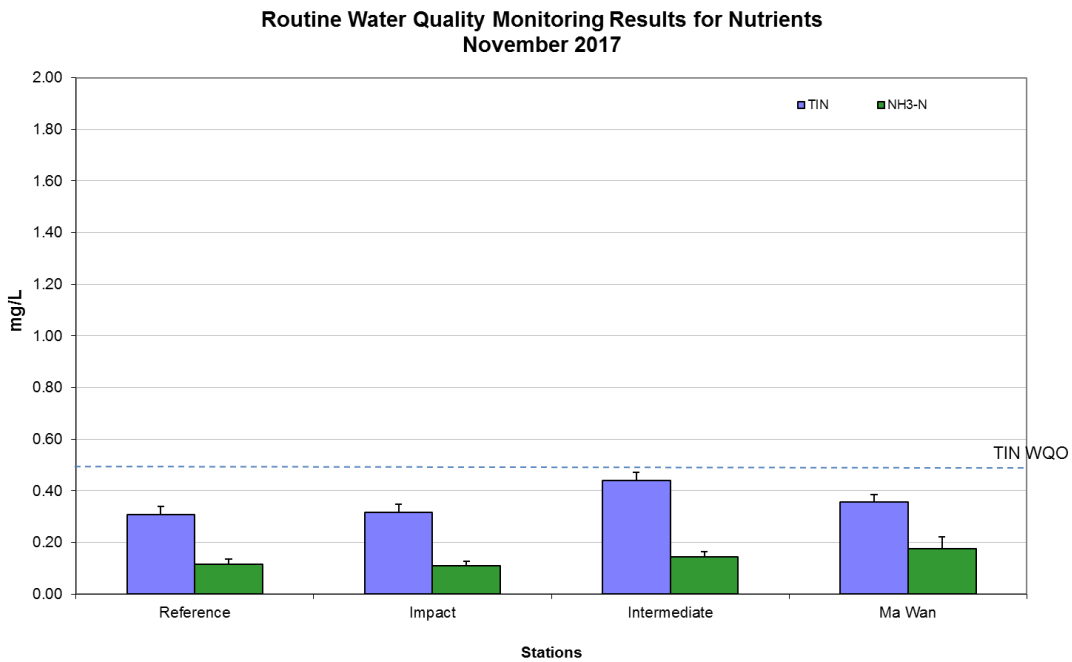


Figure 8: Concentration of Total Inorganic Nitrogen (TIN) and Ammonia Nitrogen ( $\text{NH}_3\text{-N}$ ) ( $\mu\text{g/L}$ ; mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at ESC CMP V in November 2017.

Source: H:\Team\EM\GMS Projects\0400720 CEDD CMP EM&A 2017-2020\02 Deliverable\05 CMP Monthly Report\November 2017)

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**Routine Water Quality Monitoring Results for Biochemical Oxygen Demand (BOD<sub>5</sub>)  
November 2017**

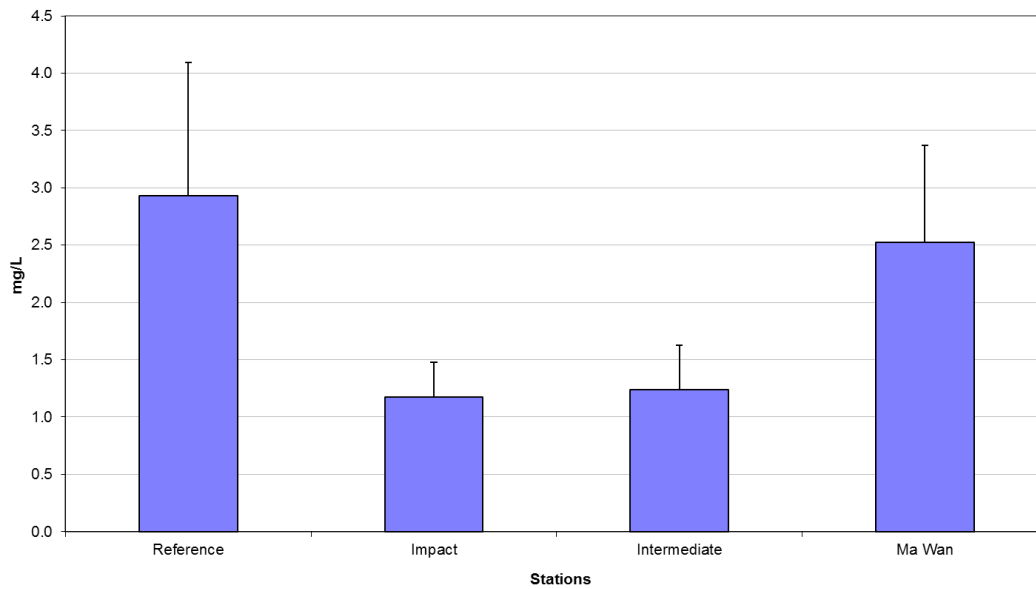


Figure 9: Level of Biochemical Oxygen Demand (BOD<sub>5</sub>) (mg/L; mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at ESC CMP V in November 2017.

**Routine Water Quality Monitoring for Suspended Solids  
November 2017**

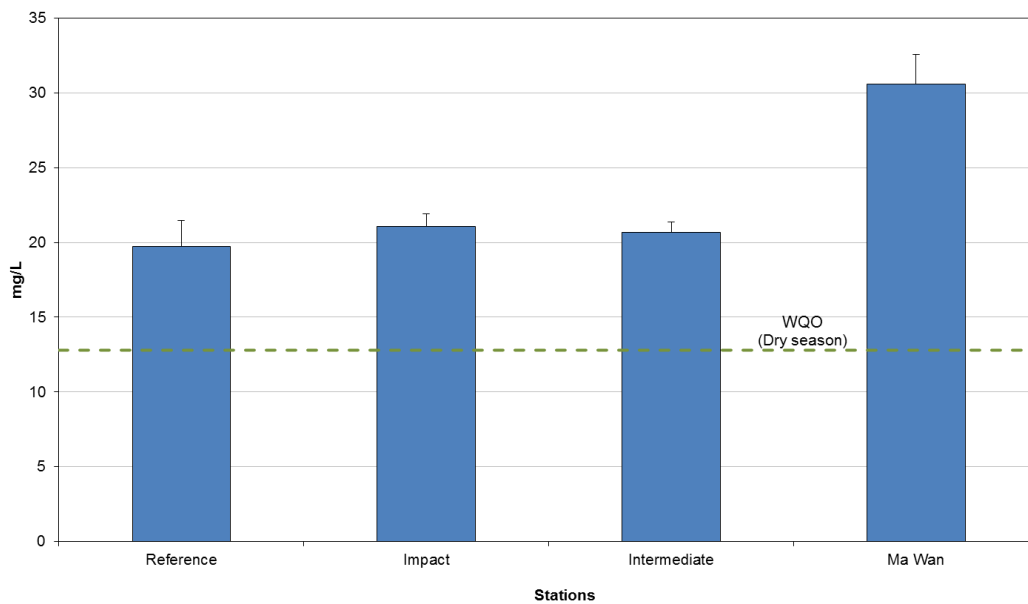


Figure 10: Concentration of Suspended Solids (SS) (mg/L; mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at ESC CMP V in November 2017.

Source: H:\Team\EM\GMS Projects\0400720 CEDD CMP EM&A 2017-2020\02 Deliverable\05 CMP Monthly Report\November 2017)

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**Pit Specific Sediment Chemistry for Metal and Metalloid Contaminants at ESC CMP Vd  
November 2017**

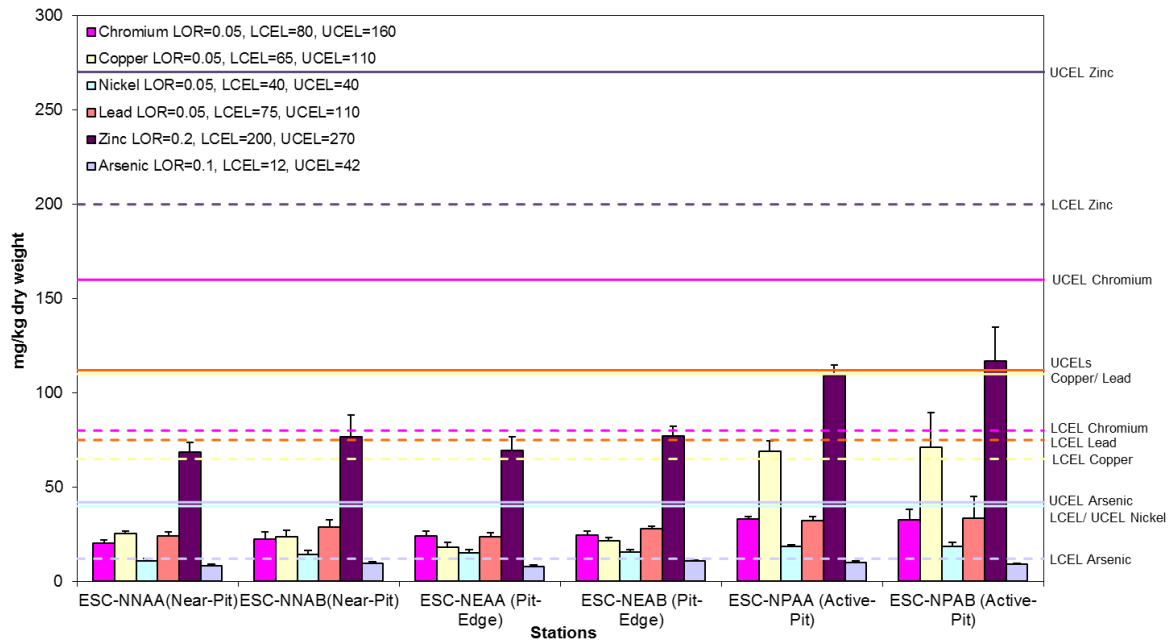


Figure 15: Concentration of Metals and Metalloid (Cr, Cu, Ni, Pb, Zn, As; mg/kg dry weight; mean +SD) in sediment samples collected from Pit Specific Sediment Chemistry Monitoring for ESC CMP Vd in November 2017.

**Pit Specific Sediment Chemistry for Metal Contaminants at ESC CMP Vd  
November 2017**

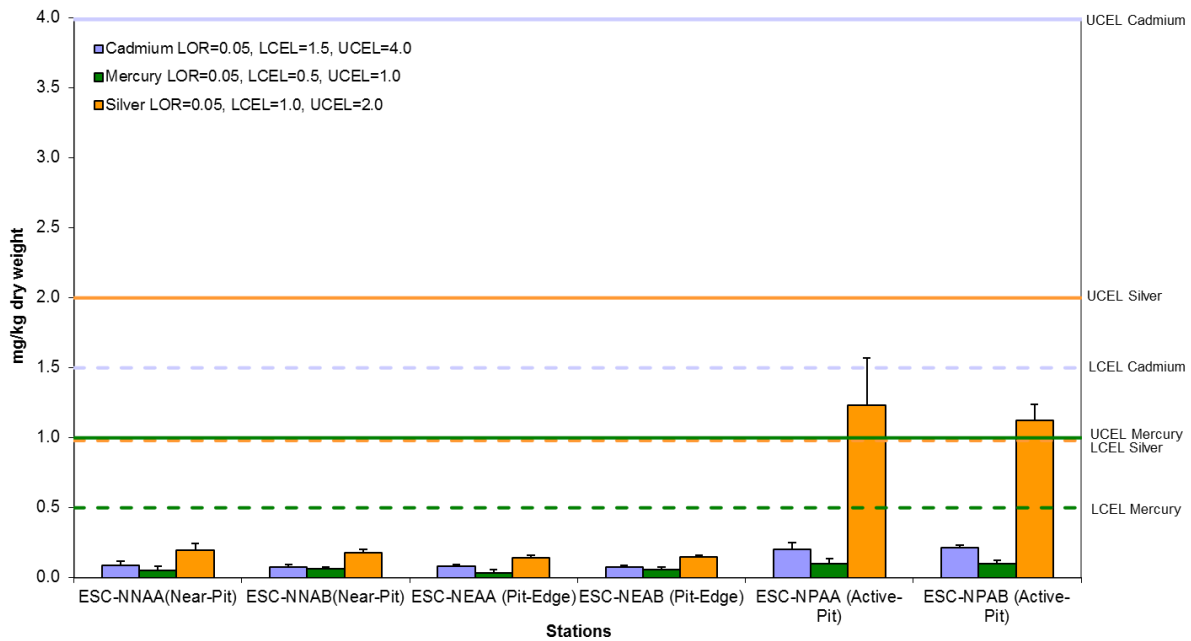


Figure 16: Concentration of Metals (Cd, Hg, Ag; mg/kg dry weight; mean +SD) in sediment samples collected from Pit Specific Sediment Chemistry Monitoring for ESC CMP Vd in November 2017.

Source: H:\Team\EM\GMS Projects\0400720 CEDD CMP EM&A 2017-2020\02 Deliverable\05 CMP Monthly Report\November 2017)

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**Pit Specific Sediment Chemistry for Total Organic Carbon (TOC) at ESC CMP Vd  
November 2017**

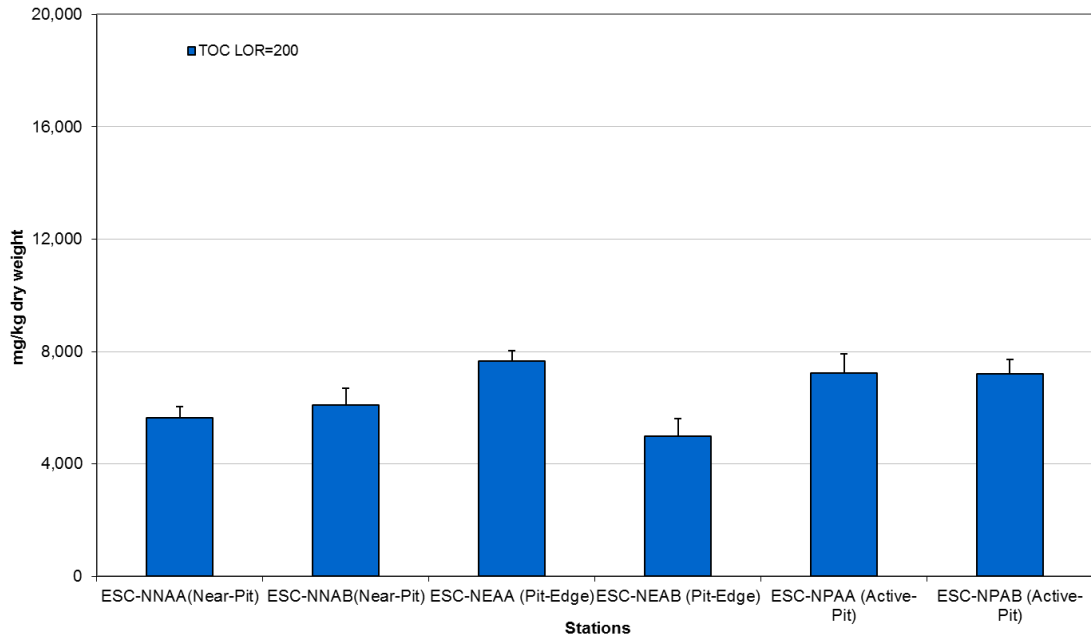


Figure 17: Concentration of Total Organic Carbon (TOC) (mg/kg dry weight; mean +SD) in sediment samples collected from Pit Specific Sediment Chemistry Monitoring for ESC CMP Vd in November 2017.

**Pit Specific Sediment Chemistry for Tributyltin (TBT) at ESC CMP Vd  
November 2017**

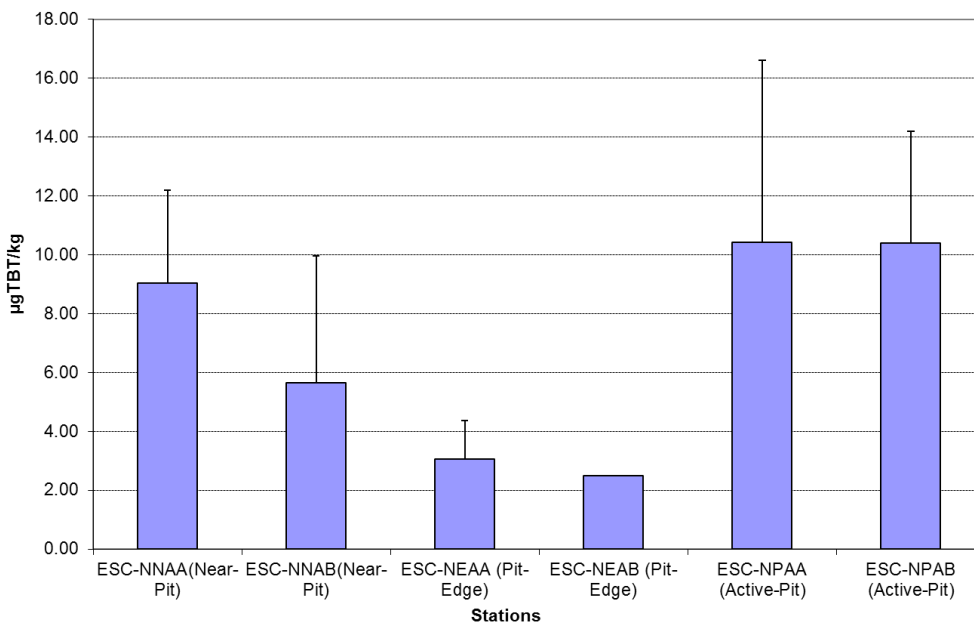


Figure 18: Concentration of Tributyltin (TBT) (µg TBT/kg; mean +SD) in sediment samples collected from Pit Specific Sediment Chemistry Monitoring for ESC CMP Vd in November 2017.

Source: H:\Team\EM\GMS Projects\0400720 CEDD CMP EM&A 2017-2020\02 Deliverable\05 CMP Monthly Report\November 2017)

Date: December 2017

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Annex D

## Study Programme

Task Name	Start	Finish	2017				2018				2019				2020				2021																
			M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N
<b>Commencement of Agreement No. CE 63/2016 (EP)</b>	Sat 1/4/17	Sat 1/4/17	◆	1/4																															
<u>Project Management and General Deliverables</u>	Mon 3/4/17	Mon 5/4/21	◆																																
<u>For the disposal facilities to the East of Sha Chau (ESC) (between 2017 and 2021) and the South of The Brothers (SB) (between 2017 and 2018)</u>	Sat 1/4/17	Fri 1/10/21	◆																																
Draft Report on Review of EM&A Manual	Tue 2/5/17	Tue 2/5/17	◆	2/5																															
Final Report on Review of EM&A Manual	Tue 23/5/17	Tue 23/5/17	◆	23/5																															
Regular Review of EM&A Manual	Wed 2/5/18	Sat 2/5/20						◇					◇						◇																
Regular Site Inspections of CMP Contractors	Sat 1/4/17	Wed 31/3/21	◆																																
Participate in Liaison Group Meetings/ Consultations as required by CEDD	Sat 1/4/17	Wed 31/3/21	◆																																
Submission of Monthly EM&A Report	Sun 14/5/17	Sun 14/3/21		◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	
Submission of Quarterly EM&A Report	Fri 14/7/17	Wed 14/4/21		◇	◇			◇	◇	◇			◇	◇	◇			◇	◇	◇			◇				◇								
Submission of Annual EM&A Report	Sun 14/1/18	Thu 14/1/21						◇						◇					◇								◇								
Submission of Annual Risk Assessment Report	Thu 14/6/18	Mon 14/6/21											◇						◇																
Submission of Draft Final Report (including database of all data collected)	Fri 23/7/21	Fri 23/7/21																														◆	23/7		
Submission of Final Report (including database of all data collected)	Fri 27/8/21	Fri 27/8/21																														◆	27/8		
Submission of Draft Executive Summary	Fri 27/8/21	Fri 27/8/21																														◆	27/8		
Submission of Final Executive Summary	Fri 1/10/21	Fri 1/10/21																														◆	1/10		
<u>For East Tung Lung Chau Disposal Facility (subject to the actual disposal programme to be confirmed by CEDD)</u>	Sun 14/10/18	Fri 14/12/18											◆	◆																					
Submission of Monthly EM&A Report	Sun 14/10/18	Fri 14/12/18											◇	◇																					
Submission of Quarterly EM&A Report	Fri 14/12/18	Fri 14/12/18																														◆	14/12		
Submission of Annual EM&A Report	Fri 14/12/18	Fri 14/12/18																														◆	14/12		

**Study Programme**  
Tue 13/6/17

Task  Milestone  Summary  Rolled Up Milestone 