土木工程拓展署
Civil Engineering and Development Department

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 – September 2017

Revision 1

2 November 2017

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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 – September 2017
Date of Report:	13 October 2017
Date prepared by ET:	13 October 2017
Date received by IA:	13 October 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.

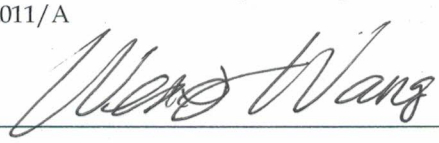
ET Certification

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: 13/10/2017

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: 13/10/2017

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 – September 2017

Revision 1

Document Code: 0400720_Monthly September 2017_v1.doc

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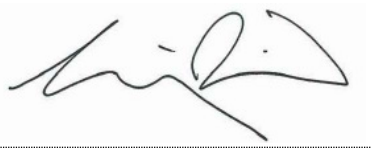
Client: Civil Engineering and Development Department (CEDD)	Project No: 0400720
Summary: This document presents the Monthly EM&A Report for *Environmental Monitoring and Audit for Disposal Facility to the East of Sha Chau and the South of The Brothers*.	Date: 2 November 2017 Approved by:  Craig A. Reid *Partner*

Revision	Description	By	Checked	Approved	Date
v1	Monthly EM&A Report for ESC CMPs and SB CMPs	RC	JT	CAR	2/11/17
v0	Monthly EM&A Report for ESC CMPs and SB CMPs	RC	JT	CAR	13/10/17

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ANNEXES

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 SEPTEMBER 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 (1) (2). 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.

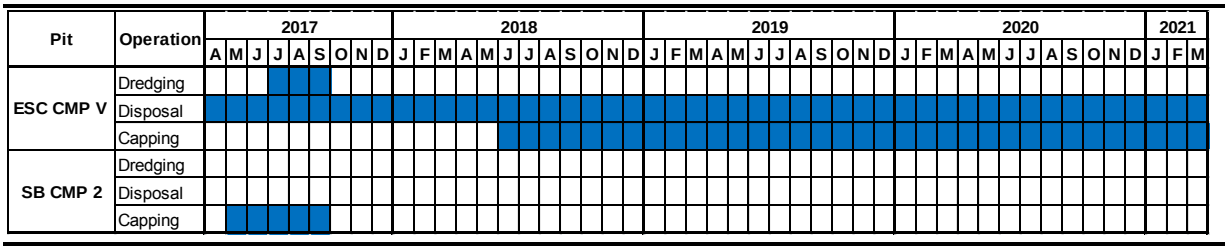
1.1.3 The present EM&A programme under *Agreement No. CE 63/2016 (EP)* covers the dredging, disposal and capping operations of the ESC CMP V as well as the capping operations of the SB CMPs (see *Annex A* for the EM&A programme). Detailed works schedule for ESC CMP V and SB CMPs is shown in *Figure 1.1*. In September 2017, the following works were being undertaken:

- Dredging operation at ESC CMP Vb;
- Disposal of contaminated mud at ESC CMP Vd; and
- Capping operation at SB CMP 2.

(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



1.2 REPORTING PERIOD

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

1.3 DETAILS OF SAMPLING AND LABORATORY TESTING ACTIVITIES

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

- *Water Quality Monitoring during Dredging of ESC CMP Vb* was undertaken on 1, 6, 8, 11, 13, 15, 18, 20, 22 and 25 September 2017;
- *Water Column Profiling of ESC CMP Vd* was undertaken on 7 September 2017; and
- *Pit Specific Sediment Chemistry of ESC CMP Vd* was undertaken on 12 September 2017.

1.3.2 The following monitoring activities were undertaken for SB CMPs in September 2017:

- *Water Quality Monitoring During Capping of SB CMPs* was undertaken on 29 September 2017.

1.4 DETAILS OF OUTSTANDING SAMPLING AND/OR ANALYSIS

1.4.1 No outstanding sampling remained for September 2017.

1.4.2 The following laboratory analyses are in progress during the preparation of this monthly report and will be presented in the next monthly report once the data are available:

- Laboratory analyses of sediment samples collected for *Pit Specific Sediment Chemistry of ESC CMP Vd* in September 2017; and
- Laboratory analyses of water samples collected for *Water Quality Monitoring During Capping of SB CMPs* in September 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 September 2017*:

- *Water Quality Monitoring During Dredging of ESC CMP Vb* in September 2017; and
- *Water Column Profiling of ESC CMP Vd* in September 2017.

1.5.2 ***Impact Water Quality Monitoring during Dredging Operations of ESC CMP Vb – September 2017***

1.5.3 Dredging activities were carried out on 1 – 2, 4 – 16, 18 – 25 September 2017 during this reporting period and monitoring was conducted on 1, 6, 8, 11, 13, 15, 18, 20, 22 and 25 September 2017. During each survey day, monitoring was conducted during both mid-ebb and mid-flood tides at two Reference (Upstream) stations and five Impact (Downstream) stations around the dredging operations at ESC CMP Vb. Monitoring was also conducted at one Sensitive Receiver station situated in Ma Wan. A total of eight (8) stations were monitored and locations of the sampling stations are shown in *Figure 1.2*. Levels of Dissolved Oxygen (DO), Turbidity and Suspended Solid (SS) were assessed for compliance with the Action and Limit Levels (see *Table B1* of *Annex B* for details) set in the Baseline Monitoring Report (1).

1.5.4 Monitoring results are presented in *Table B2* of *Annex B*. Daily dredging volume in September 2017 is reported in *Annex C*. Levels of DO, Turbidity and SS generally complied with the Action and Limit Levels (see *Table B1* of *Annex B* for details) set in the *Baseline Monitoring Report* (2), except for the following occasions discussed in *Table 1.1* below.

1.5.5 The results indicated that the dredging operations at ESC CMP Vb did not appear to cause any unacceptable deterioration in water quality during this reporting period. Therefore, no further action, except for those recommended in the Environmental Permit (*EP-312/2008/A*), are considered necessary for the dredging operations.

(1) ERM - Hong Kong, Ltd (2009) Baseline Monitoring Report. For the Civil Engineering & Development Department, Hong Kong SAR Government.

(2) ERM - Hong Kong, Ltd (2009) Baseline Monitoring Report. For the Civil Engineering & Development Department, Hong Kong SAR Government.

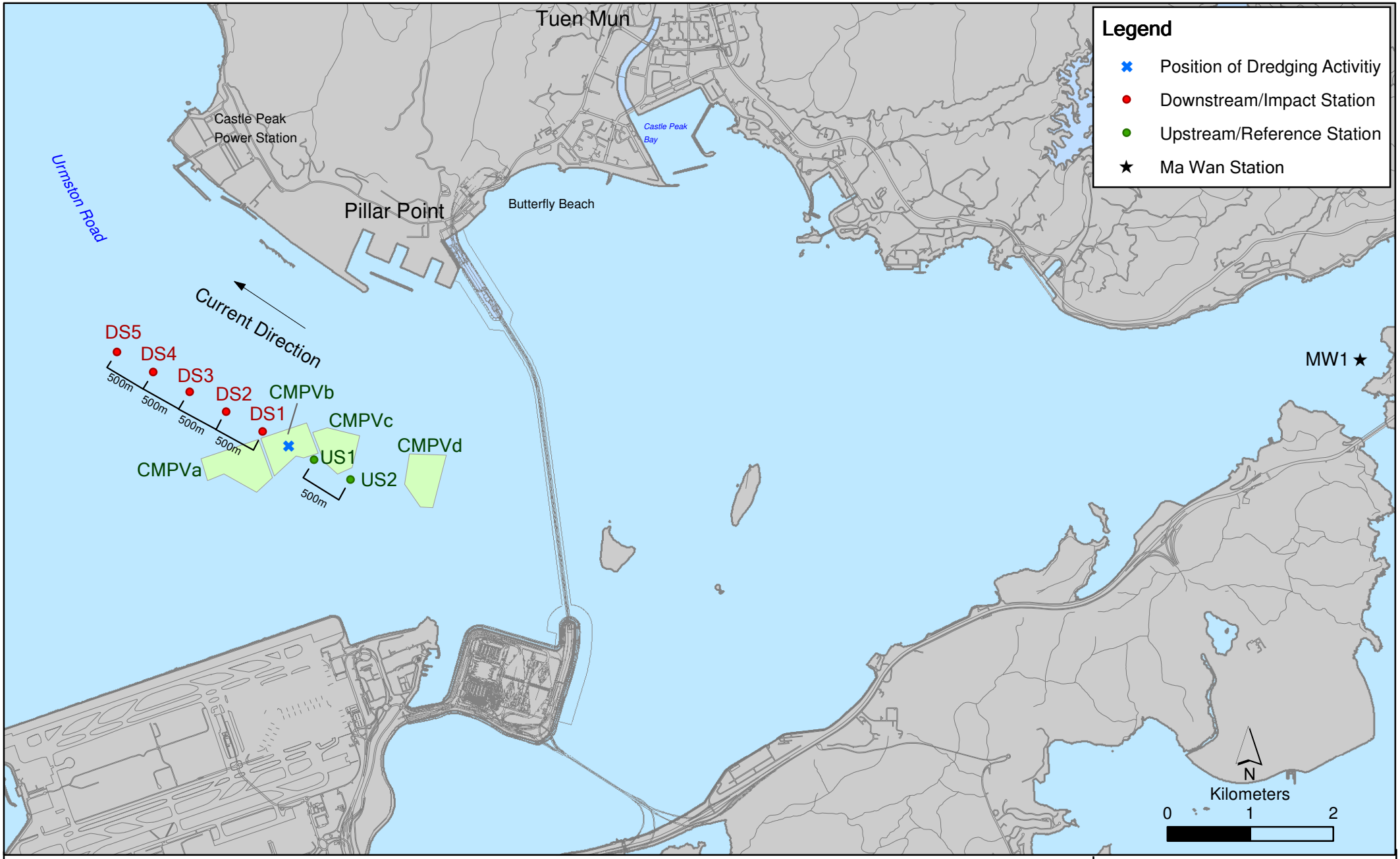


Figure 1.2

Indicative Dredging Impact Sampling Stations for CMPV

Note: The locations of sampling stations will be determined on site based on current direction and position of dredging activities.

File: T:\GIS\CONTRACT\0400720\Mxd\0400720_modelling_stations_2017.mxd
Date: 19/6/2017

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Table 1.1 Details of Exceedances Recorded at ESC CMP Vb between 1 and 25 September 2017

Date	Tide	Parameter	Station	Type of Exceedance	Remarks
8 September 2017	Mid-Ebb	Turbidity	DS4	Action	These exceedances were not considered as indicating any unacceptable impacts from the dredging operations to WSRs outside the works area due to the following reasons: • The exceedance was not considered as indicating any unacceptable impacts from the dredging operations to Water Sensitive Receivers (WSRs) outside the works area because Stations DS4 and DS5 are located further away from the works area of CMP Vb when compared to stations DS1 at which the levels of Turbidity did not exceed the Action and Limit Levels during the same tidal period. • In addition, levels of SS at all stations complied with the Action and Limit levels. Therefore, it is considered that the dredging operations did not cause adverse water quality impact in terms of SS levels, which are more representative to determine the effects of dredging operation to nearby sensitive receivers (e.g. fisheries).
8 September 2017	Mid-Ebb	Turbidity	DS5	Limit	
22 September 2017	Mid-Ebb	Turbidity	DS4	Action	
22 September 2017	Mid-Flood	Turbidity	DS1	Limit	These exceedances were not considered as indicating any unacceptable impacts from the dredging operations to WSRs outside the works area due to the following reasons: • The exceedances of Limit Levels were only recorded within a limited range at Impact stations DS1, DS2 and DS3 which are within ~1 km distance downstream from the dredging operation during one tidal period and exceedances were not recorded at any WSR stations. In addition, the dredging rate was well within the limit as specified under the EP. As such, there did not appear to be any evidence of unacceptable water quality impact as a result of the dredging operations at the CMP Vb. • In addition, levels of SS at all stations complied with the Action and Limit levels. Therefore, it is considered that the dredging operations did not cause adverse water quality impact in terms of SS levels, which are more representative to determine the effects of dredging operation to nearby sensitive receivers (e.g. fisheries).
22 September 2017	Mid-Flood	Turbidity	DS2	Limit	
22 September 2017	Mid-Flood	Turbidity	DS3	Limit	

1.5.6 ***Water Column Profiling of ESC CMP Vd – September 2017***

1.5.7 *Water Column Profiling* was undertaken at a total of two sampling stations (Upstream and Downstream stations) on 7 September 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 wet season period (April to October) of 2006 - 2015 from stations in the Northwestern Water Control Zone (WCZ), where the ESC CMPs are located [1]. For Salinity, the averaged value obtained from the Reference (Upstream) station was used for the basis as the WQO. Levels of 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

1.5.8 Analyses of results for September 2017 indicated that levels of DO, Salinity and pH complied with the WQOs at both Downstream and Upstream stations (*Table B3* of *Annex B*). In addition, levels of DO and Turbidity at all stations complied with the Action and Limit Levels (*Tables B1* and *B3* of *Annex B*).

Laboratory Measurements for Suspended Solids (SS)

1.5.9 Analyses of results for September 2017 indicated that the SS levels complied with the WQO and the Action and Limit Levels at both Upstream and Downstream stations (*Tables B1* and *B3* of *Annex B*).

1.5.10 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.

1.6 BRIEF DISCUSSION OF THE MONITORING RESULTS FOR SB CMPS

1.6.1 Brief discussion of the monitoring results of the following activities for SB CMPs is presented in this *Monthly EM&A Report for September 2017*:

- *Water Quality Monitoring during Capping Operations of SB CMPs* in September 2017.

[1] http://epic.epd.gov.hk/EPICRIVER/marine/?lang=en

1.6.2 ***Water Quality Monitoring during Capping of SB CMPs – September 2017***

1.6.3 Capping works at SB CMP 2 were conducted in September 2017 to supplement and revert the portion of consolidated capping layer to design level and was completed in September 2017. Post-water quality monitoring was then conducted on 29 September 2017 after the completion of capping works at SB CMP 2. The monitoring results obtained have been assessed for compliance with the WQOs (see *Section 1.5.7* for details). Levels of DO and Turbidity were also assessed for compliance with the Action and Limit Levels (see *Table B4* of *Annex B* for details). A total of fourteen (14) monitoring stations were sampled in September 2017 as shown in *Figure 1.3*. Graphical presentation of the monitoring results is shown in *Figures 1 - 6* of *Annex D*.

In-situ Measurements

1.6.4 The levels of pH at all stations in September 2017 complied with the WQO (*Table B5* of *Annex B*; *Figure 1* of *Annex D*). The levels of Turbidity at all stations complied with the Action and Limit levels in September 2017 (*Table B5* of *Annex B; Figure 2* of *Annex D*). The levels of DO at all stations complied with the WQO and the Action and Limit levels in September 2017 (*Table B5* of *Annex B; Figure 4* of *Annex D*). The levels of Salinity at Intermediate, Ma Wan, Sham Shui Kok and Tai Mo To stations are higher than the WQO_{max} in September 2017 (*Table B5* of *Annex B; Figure 6* of *Annex D*). The Salinities at these stations were higher than the WQO_{max} as they were located further away from the Tai Ho Bay and Reference stations, thus experiencing less freshwater runoff from the nearby streams. The levels of Salinity at Tai Ho Bay 2 station are lower than the WQO_{min} in September 2017 (*Table B5* of *Annex B; Figure 6* of *Annex D*). The lower Salinity levels at Tai Ho Bay 2 station are likely to be caused by the freshwater runoff from the nearby streams.

1.7 ACTIVITIES SCHEDULED FOR THE NEXT MONTH

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

- *Routine Water Quality Monitoring of ESC CMP Vd;*
- *Water Column Profiling of ESC CMP Vd*; and
- *Pit Specific Sediment Chemistry of ESC CMP Vd.*

1.7.2 No monitoring activities are scheduled in the next monthly period of October 2017 for SB CMPs.

1.8 STUDY PROGRAMME

1.8.1 A summary of the Study programme is presented in *Annex E.*

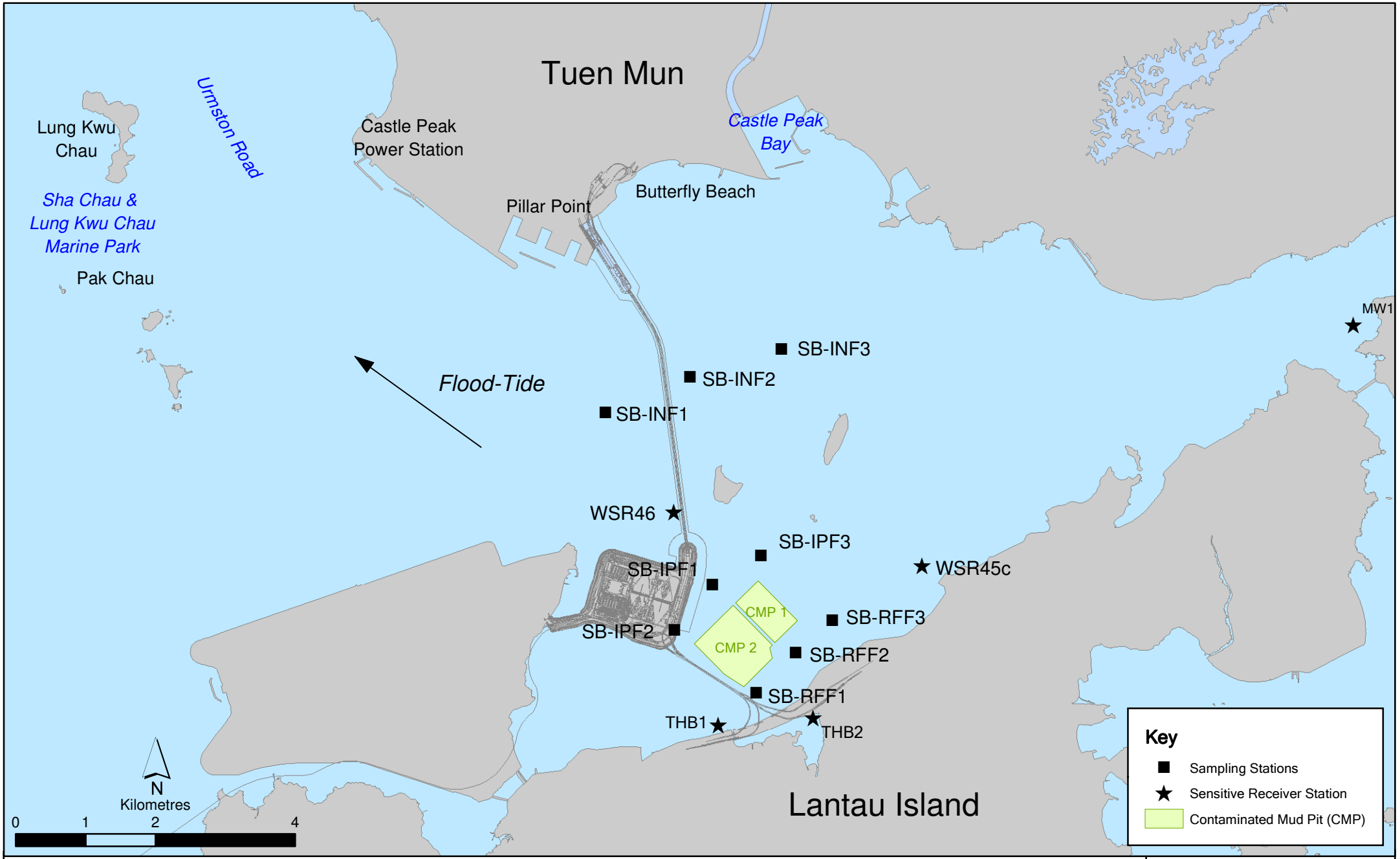

Figure 1.3

Routine & Capping Water Quality Sampling Stations (Flood-Tide) for South Brothers Facility

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Date: 6/7/2017

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Annex A

Sampling Schedule

Annex A1 - East of Sha Chau Environmental Monitoring and Audit Sampling Schedule for CMP (April 2017 - March 2021)

			2017									2018												2019												2020												2021		
Pit Specific Sediment Chemistry	**Code**	**Frequency**	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
	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
Pit-Edge																																																		
	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
	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
Near-Pit																																																		
	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
	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

Cumulative Impact Sediment Chemistry			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
Near-field Stations																																																		
	ESC-RNA	4 times per year			12		12				12		12				12		12				12		12				12		12				12		12				12		12				12		12	
	ESC-RNB1	4 times per year			12		12				12		12				12		12				12		12				12		12				12		12				12		12				12		12	
Mid-field Stations																																																		
	ESC-RMA	4 times per year			12		12				12		12				12		12				12		12				12		12				12		12				12		12				12		12	
	ESC-RMB	4 times per year			12		12				12		12				12		12				12		12				12		12				12		12				12		12				12		12	
Capped Pit Stations																																																		
	ESC-RCA1	4 times per year			12		12				12		12				12		12				12		12				12		12				12		12				12		12				12		12	
	ESC-RCB1	4 times per year			12		12				12		12				12		12				12		12				12		12				12		12				12		12				12		12	
Far-Field Stations																																																		
	ESC-RFA	4 times per year			12		12				12		12				12		12				12		12				12		12				12		12				12		12				12		12	
	ESC-RFB	4 times per year			12		12				12		12				12		12				12		12				12		12				12		12				12		12				12		12	
Ma Wan Station																																																		
	MW1	4 times per year			12		12				12		12				12		12				12		12				12		12				12		12				12		12				12		12	

Sediment Toxicity Tests			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
Near-Pit Stations																																																		
	ESC-TDA	2 times per year					5						5						5						5						5						5						5						5	
	ESC-TDB1	2 times per year					5						5						5						5						5						5						5						5	
Reference Stations																																																		
	ESC-TRA	2 times per year					5						5						5						5						5						5						5						5	
	ESC-TRB	2 times per year					5						5						5						5						5						5						5						5	
Ma Wan Station																																																		
	MW1	2 times per year					5						5						5						5						5						5						5						5	

Tissue/ Whole Body Sampling			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
Near-Pit Stations																																																		
	ESC-INA	2 times per year					*						*						*						*						*						*						*						*	
	ESC-INB	2 times per year					*						*						*						*						*						*						*						*	
Reference North																																																		
	TNA	2 times per year					*						*						*						*						*						*						*						*	
	TNB	2 times per year					*						*						*						*						*						*						*						*	
Reference South																																																		
	TSA	2 times per year					*						*						*						*						*						*						*						*	
	TSB	2 times per year					*						*						*						*						*						*						*						*	

Demersal Trawling			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
Near Pit Stations																																																		
	ESC-INA	4 times per year				5	5					5	5					5	5					5	5					5	5					5	5					5	5					5	5	
	ESC-INB	4 times per year				5	5					5	5					5	5					5	5					5	5					5	5					5	5					5	5	
Reference North																																																		
	TNA	4 times per year				5	5					5	5					5	5					5	5					5	5					5	5					5	5					5	5	
	TNB	4 times per year				5	5					5	5					5	5					5	5					5	5					5	5					5	5					5	5	
Reference South																																																		
	TSA	4 times per year				5	5					5	5					5	5					5	5					5	5					5	5					5	5					5	5	
	TSB	4 times per year				5	5					5	5					5	5					5	5					5	5					5	5					5	5					5	5	

Capping			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
Ebb Tide																																																		
Impact Station Downcurrent																																																		
	ESC-IPE1A	4 times per year															3		3				3		3				3		3				3		3				3		3				3		3	
	ESC-IPE2A	4 times per year															3		3				3		3				3		3				3		3				3		3				3		3	
	ESC-IPE3	4 times per year															3		3				3		3				3		3				3		3				3		3				3		3	
	ESC-IPE4	4 times per year															3		3				3		3				3		3				3		3				3		3				3		3	
	ESC-IPE5	4 times per year															3		3				3		3				3		3				3		3				3		3				3		3	
Intermediate Station Downcurrent																																																		
	ESC-INE1A	4 times per year															3		3				3		3				3		3				3		3				3		3				3		3	
	ESC-INE2A	4 times per year															3		3				3		3				3		3				3		3				3		3				3		3	
	ESC-INE3A	4 times per year															3		3				3		3				3		3				3		3				3		3				3		3	
	ESC-INE4A	4 times per year															3		3				3		3				3		3				3		3				3		3				3		3	
	ESC-INE5A	4 times per year															3		3				3		3				3		3				3		3				3		3				3		3	
Reference Station Upcurrent																																																		
	ESC-RFE1	4 times per year															3		3				3		3				3		3				3		3				3		3				3		3	
	ESC-RFE2	4 times per year															3		3				3		3				3		3				3		3				3		3				3		3	
	ESC-RFE3	4 times per year															3		3				3		3				3		3				3		3				3		3				3		3	
	ESC-RFE4	4 times per year															3		3				3		3				3		3				3		3				3		3				3		3	
	ESC-RFE5	4 times per year															3		3				3		3				3		3				3		3				3		3				3		3	
Ma Wan Station																																																		
	MW1	4 times per year															3		3				3		3				3		3				3		3				3		3				3		3	
Flood Tide																																																		
Impact Station Downcurrent																																																		
	ESC-IPF1	4 times per year															3		3				3		3				3		3				3		3				3		3				3		3	
	ESC-IPF2	4 times per year															3		3				3		3				3		3				3		3				3		3				3		3	
	ESC-IPF3	4 times per year															3		3				3		3				3		3				3		3				3		3				3		3	
Intermediate Station Downcurrent																																																		
	ESC-INF1	4 times per year															3		3				3		3				3		3				3		3				3		3				3		3	
	ESC-INF2	4 times per year															3		3				3		3				3		3				3		3				3		3				3		3	
	ESC-INF3	4 times per year															3		3				3		3				3		3				3		3				3		3				3		3	
Reference Station Upcurrent																																																		
	ESC-RFF1A	4 times per year															3		3				3		3				3		3				3		3				3		3				3		3	
	ESC-RFF2A	4 times per year															3		3				3		3				3		3				3		3				3		3				3		3	
	ESC-RFF3	4 times per year															3		3				3		3				3		3				3		3				3		3				3		3	
Ma Wan Station																																																		
	MW1	4 times per year															3		3				3		3				3		3				3		3				3		3				3		3	

Routine Water Quality Monitoring			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
Ebb Tide																																																		
Impact Station Downcurrent																																																		
	ESC-IPE1A	8 times per year	8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8	
	ESC-IPE2A	8 times per year	8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8	
	ESC-IPE3	8 times per year	8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8	
	ESC-IPE4	8 times per year	8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8	
	ESC-IPE5	8 times per year	8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8	
Intermediate Station Downcurrent																																																		
	ESC-INE1A	8 times per year	8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8	
	ESC-INE2A	8 times per year	8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8	
	ESC-INE3A	8 times per year	8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8	
	ESC-INE4A	8 times per year	8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8	
	ESC-INE5A	8 times per year	8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8	
Reference Station Upcurrent																																																		
	ESC-RFE1	8 times per year	8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8	
	ESC-RFE2	8 times per year	8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8	
	ESC-RFE3	8 times per year	8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8	
	ESC-RFE4	8 times per year	8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8	
	ESC-RFE5	8 times per year	8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8	
Ma Wan Station																																																		
	MW1	8 times per year	8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8	
Flood Tide																																																		
Impact Station Downcurrent																																																		
	ESC-IPF1	8 times per year	8	8		8	8		8	8					8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8	
	ESC-IPF2	8 times per year	8	8		8	8		8	8					8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8	
	ESC-IPF3	8 times per year	8	8		8	8		8	8					8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8	
Intermediate Station Downcurrent																																																		
	ESC-INF1	8 times per year	8	8		8	8		8	8					8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8	
	ESC-INF2	8 times per year	8	8		8	8		8	8					8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8	
	ESC-INF3	8 times per year	8	8		8	8		8	8					8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8	
Reference Station Upcurrent																																																		
	ESC-RFF1A	8 times per year	8	8		8	8		8	8					8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8	
	ESC-RFF2A	8 times per year	8	8		8	8		8	8					8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8	
	ESC-RFF3	8 times per year	8	8		8	8		8	8					8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8	
Ma Wan Station																																																		
	MW1	8 times per year	8	8		8	8		8	8					8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8	

Water Column Profiling			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
Plume Stations	WCP1	Monthly	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	WCP2	Monthly	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4

Benthic Recolonisation Studies			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
Capped Stations at CMPV																																																		
	ESCV-CPA	2 times per year																																																
	ESCV-CPB	2 times per year																																																
	ESCV-CPC	2 times per year																																																
	ESCV-CPD	2 times per year																																																
Reference Stations																																																		
	RBA	2 times per year																																																
	RBB	2 times per year																																																
	RBC1	2 times per year																																																

Impact Monitoring for Dredging			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
Upstream Stations																																																		
	US1	3 times per week				2	2	2																																								
	US2	3 times per week				2	2	2																																								
Downstream Stations																																																		
	DS1	3 times per week				2	2	2																																								
	DS2	3 times per week				2	2	2																																								
	DS3	3 times per week				2	2	2																																								
	DS4	3 times per week				2	2	2																																								
	DS5	3 times per week				2	2	2																																								
Ma Wan Station																																																		
	MW1	3 times per week				2	2	2																																								

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										
Capping Water Quality Monitoring			**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Ebb Tide																							
Impact Stations Downcurrent																							
	SB-IPE1	4 times per year		3	3		3	3															
	SB-IPE2	4 times per year		3	3		3	3															
	SB-IPE3	4 times per year		3	3		3	3															
	SB-IPE4	4 times per year		3	3		3	3															
	SB-IPE5	4 times per year		3	3		3	3															
Intermediate Stations Downcurrent																							
	SB-INE1	4 times per year		3	3		3	3															
	SB-INE2	4 times per year		3	3		3	3															
	SB-INE3	4 times per year		3	3		3	3															
	SB-INE4	4 times per year		3	3		3	3															
	SB-INE5	4 times per year		3	3		3	3															
Reference Stations Upcurrent																							
	SB-RFE1	4 times per year		3	3		3	3															
	SB-RFE2	4 times per year		3	3		3	3															
	SB-RFE3	4 times per year		3	3		3	3															
	SB-RFE4	4 times per year		3	3		3	3															
	SB-RFE5	4 times per year		3	3		3	3															
Sensitive Receiver Stations																							
	MW1	4 times per year		3	3		3	3															
	THB1	4 times per year		3	3		3	3															
	THB2	4 times per year		3	3		3	3															
	WSR45C	4 times per year		3	3		3	3															
	WSR46	4 times per year		3	3		3	3															
Flood Tide																							
Impact Stations Downcurrent																							
	SB-IPF1	4 times per year		3	3		3	3															
	SB-IPF2	4 times per year		3	3		3	3															
	SB-IPF3	4 times per year		3	3		3	3															
Intermediate Stations Downcurrent																							
	SB-INF1	4 times per year		3	3		3	3															
	SB-INF2	4 times per year		3	3		3	3															
	SB-INF3	4 times per year		3	3		3	3															
Reference Stations Upcurrent																							
	SB-RFF1	4 times per year		3	3		3	3															
	SB-RFF2	4 times per year		3	3		3	3															
	SB-RFF3	4 times per year		3	3		3	3															
Sensitive Receiver Stations																							
	MW1	4 times per year		3	3		3	3															
	THB1	4 times per year		3	3		3	3															
	THB2	4 times per year		3	3		3	3															
	WSR45C	4 times per year		3	3		3	3															
	WSR46	4 times per year		3	3		3	3															

Benthic Recolonisation Studies			**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
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

Parameter	Action Level	Limit Level
Dissolved Oxygen (DO) (1)	Surface and Mid-depth (2) 5%-ile of baseline data for surface and middle layer = **3.76 mg L^{-1}** and Significantly less than the reference stations mean DO (at the same tide of the same day)	Surface and Mid-depth (2) 1%-ile of baseline data for surface and middle layer = **3.11 mg L^{-1}** (3) and Significantly less than the reference stations mean DO (at the same tide of the same day)
	Bottom 5%-ile of baseline data for bottom layers = **2.96 mg L^{-1}** and Significantly less than the reference stations mean DO (at the same tide of the same day)	Bottom The average of the impact station readings are **<2 mg/L^{-1}** and Significantly less than the reference stations mean DO (at the same tide of the same day)
Depth-averaged Suspended Solids (SS) (4) (5)	95%-ile of baseline data for depth average = **37.88 mg L^{-1}** and 120% of control station's SS at the same tide of the same day	99%-ile of baseline data for depth average = **61.92 mg L^{-1}** and 130% of control station's SS at the same tide of the same day
Depth-averaged Turbidity (Tby) (4) (5)	95%-ile of baseline data = **28.14 NTU** and 120% of control station's Tby at the same tide of the same day	99%-ile of baseline data = **38.32 NTU** and 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^{-1}, it is proposed to set the Limit Level at 3.11 mg L^{-1} 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 ***Summary Table of DO, Turbidity and SS Levels Recorded in September 2017 for Impact Water Quality Monitoring during Dredging Operations of ESC CMP Vb***

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average SS Level (mg/L)
			Bottom	Surface and Mid Depth		
2017/09/01	Mid-Ebb	DS1	4.59	5.12	8.77	9.45
		DS2	4.57	4.94	7.15	8.13
		DS3	4.75	5.42	5.46	7.45
		DS4	4.65	5.01	9.15	7.62
		DS5	4.53	5.05	8.17	10.53
		US1	4.70	5.37	5.39	7.13
		US2	4.77	5.12	7.11	7.27
		MW1	4.86	5.61	4.33	7.80
	Mid-Flood	DS1	4.70	5.74	9.99	10.32
		DS2	4.94	5.84	8.05	10.03
		DS3	5.14	6.04	11.85	11.17
		DS4	5.16	6.03	7.17	7.50
		DS5	5.15	5.77	7.08	7.68
		US1	5.10	6.08	7.70	8.27
		US2	5.43	5.76	9.38	10.75
		MW1	4.94	5.22	6.76	7.72
2017/09/06	Mid-Ebb	DS1	5.11	5.21	17.34	14.73
		DS2	5.13	5.23	17.99	20.10
		DS3	5.19	5.28	16.96	14.98
		DS4	4.75	5.16	21.11	16.53
		DS5	5.17	5.20	18.87	22.32
		US1	5.11	5.19	20.43	14.65
		US2	5.09	5.14	23.23	13.93
		MW1	4.84	5.29	6.61	8.18
	Mid-Flood	DS1	4.99	5.07	11.82	13.37
		DS2	4.99	5.05	10.03	10.85
		DS3	5.01	4.98	13.94	15.22
		DS4	4.96	4.93	9.95	12.12
		DS5	4.86	4.89	9.82	10.88
		US1	4.92	5.12	12.77	13.38
		US2	4.78	5.09	14.61	21.43
		MW1	4.69	4.74	15.34	14.02
2017/09/08	Mid-Ebb	DS1	4.85	4.92	31.47	24.62
		DS2	4.78	4.90	29.19	21.68
		DS3	4.80	4.93	26.22	21.50
		DS4	4.39	4.86	38.19	16.82
		DS5	4.80	4.88	40.65	22.57
		US1	4.84	5.00	25.30	16.88
		US2	4.83	4.88	28.10	15.87
		MW1	4.71	4.88	7.00	8.38
	Mid-Flood	DS1	4.60	4.76	15.36	12.38
		DS2	4.49	4.70	30.15	13.60
		DS3	4.53	4.74	19.81	16.25
		DS4	4.62	4.81	25.45	14.55
		DS5	4.74	4.92	22.55	15.97
		US1	4.60	4.76	29.45	14.85
		US2	4.51	4.76	21.89	29.03
		MW1	4.36	4.71	8.87	8.55

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average SS Level (mg/L)
			Bottom	Surface and Mid Depth		
2017/09/11	Mid-Ebb	DS1	4.67	4.86	19.73	13.92
		DS2	4.64	4.80	12.02	9.78
		DS3	4.63	4.77	15.99	11.32
		DS4	4.09	4.64	15.62	12.38
		DS5	4.63	4.72	17.86	11.73
		US1	4.59	4.84	19.74	9.73
		US2	4.61	4.70	18.09	10.55
		MW1	4.37	5.10	3.57	4.78
	Mid-Flood	DS1	4.39	4.59	8.51	10.75
		DS2	4.34	4.59	11.73	11.13
		DS3	4.48	4.73	13.69	8.68
		DS4	4.68	4.73	8.00	9.68
		DS5	4.59	4.53	19.30	12.25
		US1	4.40	4.60	13.46	9.97
		US2	4.73	4.79	5.03	6.53
		MW1	4.05	4.51	8.10	8.97
2017/09/13	Mid-Ebb	DS1	4.27	4.35	8.48	9.42
		DS2	4.29	4.58	7.92	8.40
		DS3	4.31	4.86	6.95	7.53
		DS4	3.86	4.45	8.92	9.88
		DS5	4.39	4.98	7.26	7.15
		US1	4.42	4.67	9.23	9.70
		US2	4.38	4.72	11.19	8.65
		MW1	3.96	4.46	4.61	4.45
	Mid-Flood	DS1	4.34	4.65	12.06	8.73
		DS2	4.76	5.14	6.53	7.53
		DS3	4.69	4.94	12.15	9.57
		DS4	4.60	4.78	7.82	9.65
		DS5	4.30	4.74	6.47	7.05
		US1	4.59	4.63	7.05	5.92
		US2	4.43	4.66	7.36	10.17
		MW1	3.88	4.34	4.18	10.07
2017/09/15	Mid-Ebb	DS1	5.05	5.34	6.06	6.93
		DS2	5.09	5.30	5.71	5.95
		DS3	5.00	5.25	8.40	6.95
		DS4	3.86	4.91	8.00	6.77
		DS5	4.79	5.25	6.11	5.98
		US1	4.92	5.43	9.29	7.77
		US2	4.85	5.28	7.45	8.60
		MW1	3.99	5.35	3.91	3.53
	Mid-Flood	DS1	4.39	5.33	8.57	7.48
		DS2	4.98	5.38	8.60	7.63
		DS3	4.96	5.26	11.54	13.48
		DS4	4.98	5.40	5.68	7.63
		DS5	4.74	5.21	6.48	4.73
		US1	5.18	5.79	9.77	8.45
		US2	5.19	6.00	7.40	8.55
		MW1	4.32	4.57	8.63	9.02
2017/09/18	Mid-Ebb	DS1	4.86	5.27	8.57	8.02
		DS2	4.49	4.90	12.66	9.25
		DS3	4.71	5.12	11.19	9.38
		DS4	4.63	4.94	12.94	11.57
		DS5	4.59	5.13	14.99	12.90

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average SS Level (mg/L)
			Bottom	Surface and Mid Depth		
		US1	4.77	5.30	11.84	10.70
		US2	4.61	5.04	12.47	9.05
		MW1	4.55	5.34	6.40	6.20
	Mid-Flood	DS1	4.85	5.31	10.58	10.15
		DS2	4.84	5.33	9.33	10.00
		DS3	5.01	5.76	9.63	8.60
		DS4	5.01	5.48	11.55	12.90
		DS5	5.29	5.38	10.60	10.60
		US1	5.70	5.79	13.82	11.97
		US2	4.33	4.95	21.56	16.38
		MW1	4.38	4.60	10.78	9.90
2017/09/20	Mid-Ebb	DS1	4.85	4.96	27.93	19.15
		DS2	4.83	4.93	23.82	15.33
		DS3	4.92	4.92	22.62	13.07
		DS4	4.52	4.82	23.20	16.77
		DS5	4.95	4.87	19.73	20.50
		US1	4.84	4.99	27.78	14.92
		US2	4.99	5.01	19.93	14.78
		MW1	4.64	4.83	7.00	6.85
	Mid-Flood	DS1	4.95	4.74	13.28	12.60
		DS2	4.69	4.85	11.92	15.78
		DS3	4.85	4.83	13.47	12.15
		DS4	4.80	4.81	12.65	12.87
		DS5	4.76	4.81	14.47	13.68
		US1	4.74	4.96	26.85	20.22
		US2	4.74	4.74	49.57	29.87
		MW1	4.54	4.62	16.18	14.20
2017/09/22	Mid-Ebb	DS1	4.89	4.73	18.53	9.08
		DS2	4.76	4.64	15.11	14.78
		DS3	4.82	4.70	15.41	12.12
		DS4	4.87	4.89	30.71	13.70
		DS5	4.91	4.81	22.96	16.02
		US1	4.93	4.69	13.44	11.20
		US2	4.95	4.82	15.91	11.33
		MW1	4.65	4.73	8.52	7.82
	Mid-Flood	DS1	4.57	4.74	63.85	14.87
		DS2	4.53	4.71	59.80	11.12
		DS3	4.56	4.68	45.05	11.08
		DS4	4.86	4.83	22.71	11.38
		DS5	4.72	4.65	14.92	8.63
		US1	4.72	4.76	19.53	15.80
		US2	4.56	4.63	29.92	21.23
		MW1	4.56	4.64	10.70	8.48
2017/09/25	Mid-Ebb	DS1	5.14	5.24	11.08	9.07
		DS2	5.14	5.29	9.85	8.95
		DS3	5.23	5.36	9.35	7.30
		DS4	4.85	5.30	8.07	6.25
		DS5	5.34	5.46	6.82	5.93
		US1	5.25	5.22	11.82	12.17
		US2	5.25	5.18	17.22	11.82
		MW1	4.82	5.00	5.53	5.43
	Mid-Flood	DS1	5.08	5.18	18.74	11.05
		DS2	5.23	5.24	14.61	9.28

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average SS Level (mg/L)
			Bottom	Surface and Mid Depth		
		DS3	5.34	5.37	16.52	9.92
		DS4	5.22	5.21	15.14	8.25
		DS5	5.14	5.18	6.73	5.67
		US1	5.08	5.11	13.07	9.17
		US2	4.96	5.01	13.59	14.00
		MW1	4.71	4.92	8.00	9.55

Notes:

1. Please refer to Table B1 for the Action and Limit Levels for dredging activities.
2. Cell shaded yellow indicated value exceeding the Action Level criteria.
3. Cell shaded red indicated value exceeding the Limit Level criteria.

Table B3 Water Column Profiling Results for ESC CMP Vd in September 2017

Stations	Temp (°C)	Salinity (ppt)	Turbidity (NTU)	Dissolved Oxygen (%)	Dissolved Oxygen (mg L^{-1})	pH	Suspended Solids (mg L^{-1})
WCP 1 (Downstream)	27.69	24.00	16.39	68.67	4.73	7.73	3.83
WCP 2 (Upstream)	27.94	22.29	47.35	69.58	4.82	7.72	7.83
WQO (Wet season)	N/A	20.07 – 24.52#	N/A	N/A	>4	6.5-8.5	11.0

Note:

#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 Action and Limit Levels of Water Quality for Dredging, Backfilling and Capping Activities for SB CMPs

Parameter	Action Level	Limit Level
Dissolved Oxygen (DO) (1)	Surface and Mid-depth (2) The average of the impact, WSR 45C and WSR 46 station readings are < 5%-ile of baseline data for surface and middle layer = **4.32 mg L^{-1}** and Significantly less than the reference stations mean DO (at the same tide of the same day)	Surface and Mid-depth (2) The average of the impact, WSR 45C and WSR 46 station readings are **< 4 mg L^{-1}** and Significantly less than the reference stations mean DO (at the same tide of the same day)
	Bottom The average of the impact, WSR 45C and WSR 46 station readings are < 5%-ile of baseline data for bottom layers = **3.12 mg L^{-1}** and Significantly less than the reference stations mean DO (at the same tide of the same day)	Bottom The average of the impact station, WSR 45C and WSR 46 readings are **< 2 mg L^{-1}** and Significantly less than the reference stations mean DO (at the same tide of the same day)
Depth-averaged Suspended Solids (SS) (3) (4)	The average of the impact, WSR 45C and WSR 46 station readings are > 95%-ile of baseline data for depth average = **21.60 mg L^{-1}** and 120% of control station's SS at the same tide of the same day	The average of the impact, WSR 45C and WSR 46 station readings are > 99%-ile of baseline data for depth average = **40.10 mg L^{-1}** and 130% of control station's SS at the same tide of the same day
Depth-averaged Turbidity (Tby) (3) (4)	The average of the impact, WSR 45C and WSR 46 station readings are > 95%-ile of baseline data = **25.04 NTU** and 120% of control station's Tby at the same tide of the same day	The average of the impact, WSR 45C and WSR 46 station readings are > 99%-ile of baseline data = **32.68 NTU** and 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) "Depth-averaged" is calculated by taking the arithmetic means of reading of all three depths.

(4) For turbidity and SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.

Table B5 Monitoring Results for Water Quality Monitoring during Capping of SB CMP in September 2017

Sampling Period	Stations	Temp (°C)	Salinity (ppt)	Turbidity (NTU)	Dissolved Oxygen (%)	Dissolved Oxygen (mg L^{-1})	pH (mg L^{-1})
September 2017	RFF (Reference)	30.14	23.63	9.04	80.25	5.32	7.92
	IPF (Impact)	30.02	24.61	12.25	79.44	5.25	7.93
	INF (Intermediate)	29.67	28.04	8.38	71.80	4.68	7.97
	Ma Wan	29.52	29.85	6.48	72.62	4.70	8.04
	Sham Shui Kok	29.57	28.06	16.76	64.55	4.21	7.94
	Tai Mo To	29.63	27.44	15.41	64.15	4.20	7.93
	Tai Ho Bay 1	30.73	21.59	7.80	96.21	6.38	7.77
	Tai Ho Bay 2	31.22	19.39	18.28	79.28	5.28	7.85
	WQO	N/A	21.26-25.99*	N/A	N/A	>4	6.5-8.5

Notes:

Not exceeding 2˚C of change of the results from the Reference Station.

#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.

Annex C

Dredging Record for ESC CMP Vb

Table C1 Dredging Record at ESC CMP Vb

Date	Daily Dredging Volume (m^3)	Weekly Dredging Volume (m^3) (From Sunday to Saturday)
01-Sep-2017	3,000	3,500
02-Sep-2017	500	
03-Sep-2017	0	12,500
04-Sep-2017	500	
05-Sep-2017	3,000	
06-Sep-2017	2,000	
07-Sep-2017	2,500	
08-Sep-2017	2,000	
09-Sep-2017	2,500	
10-Sep-2017	3,500	24,500
11-Sep-2017	3,500	
12-Sep-2017	3,500	
13-Sep-2017	3,800	
14-Sep-2017	3,000	
15-Sep-2017	3,600	
16-Sep-2017	3,600	
17-Sep-2017	0	13,200
18-Sep-2017	600	
19-Sep-2017	2,400	
20-Sep-2017	2,400	
21-Sep-2017	3,600	
22-Sep-2017	2,400	
23-Sep-2017	1,800	
24-Sep-2017	600	1,200
25-Sep-2017	600	
26-Sep-2017	0	
27-Sep-2017	0	
28-Sep-2017	0	
29-Sep-2017	0	
30-Sep-2017	0	

Annex D

Graphical Presentations

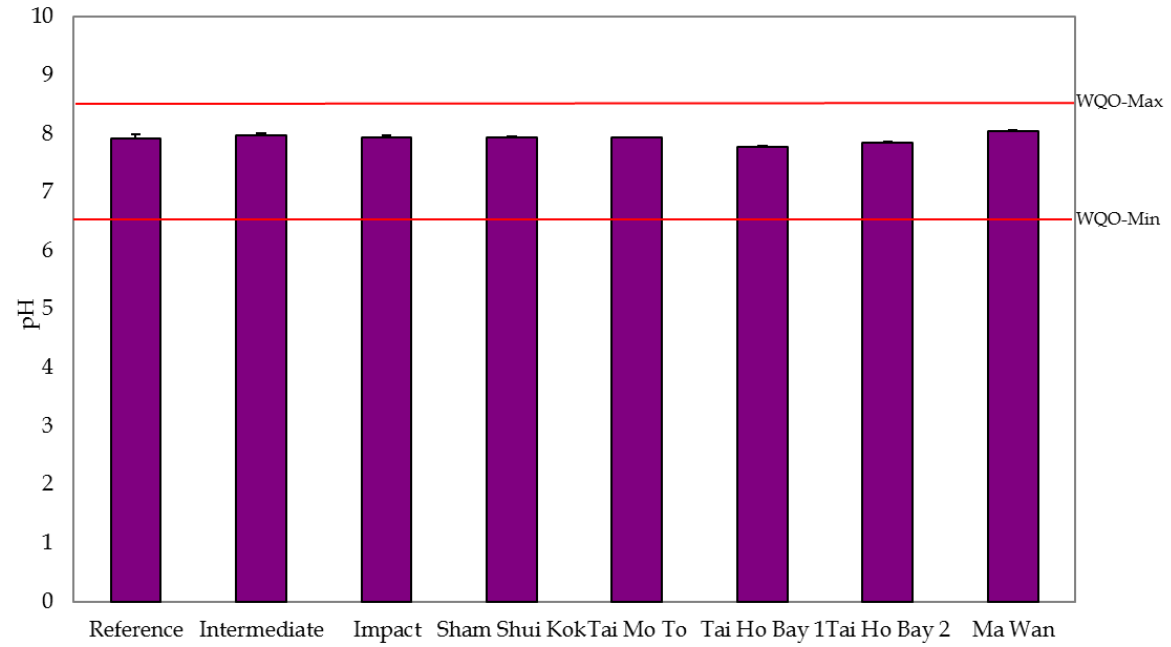


Figure 1: Levels of pH (mean +SD) recorded from Water Quality Monitoring during Capping for SB CMP 2 in September 2017.

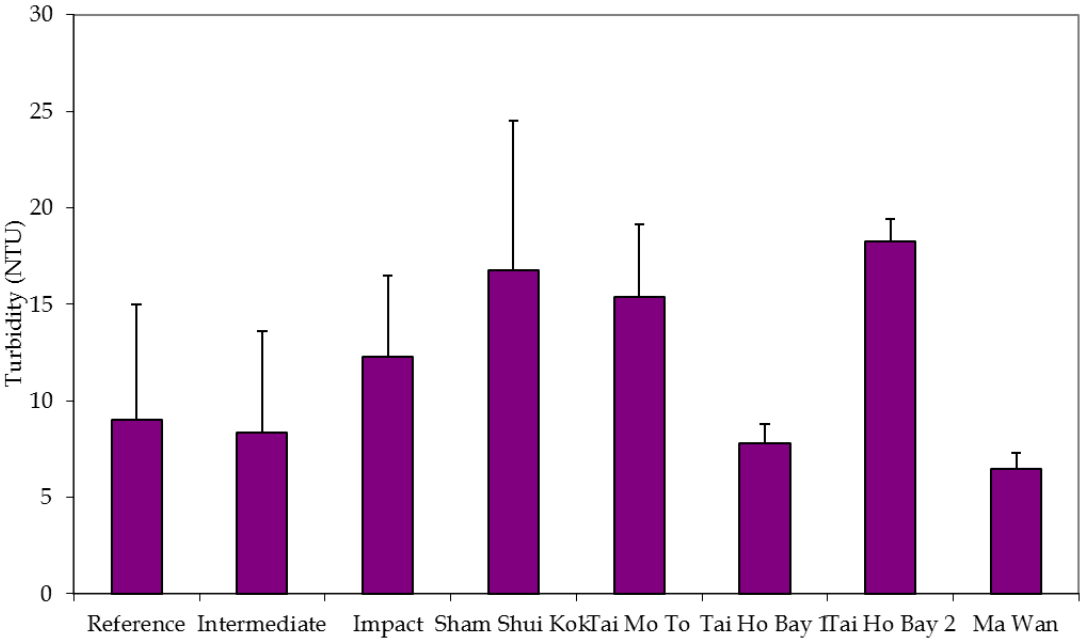


Figure 2: Levels of Turbidity (NTU; mean +SD) recorded from Water Quality Monitoring during Capping for SB CMP 2 in September 2017

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

Date: September 2017

Environmental Resources Management

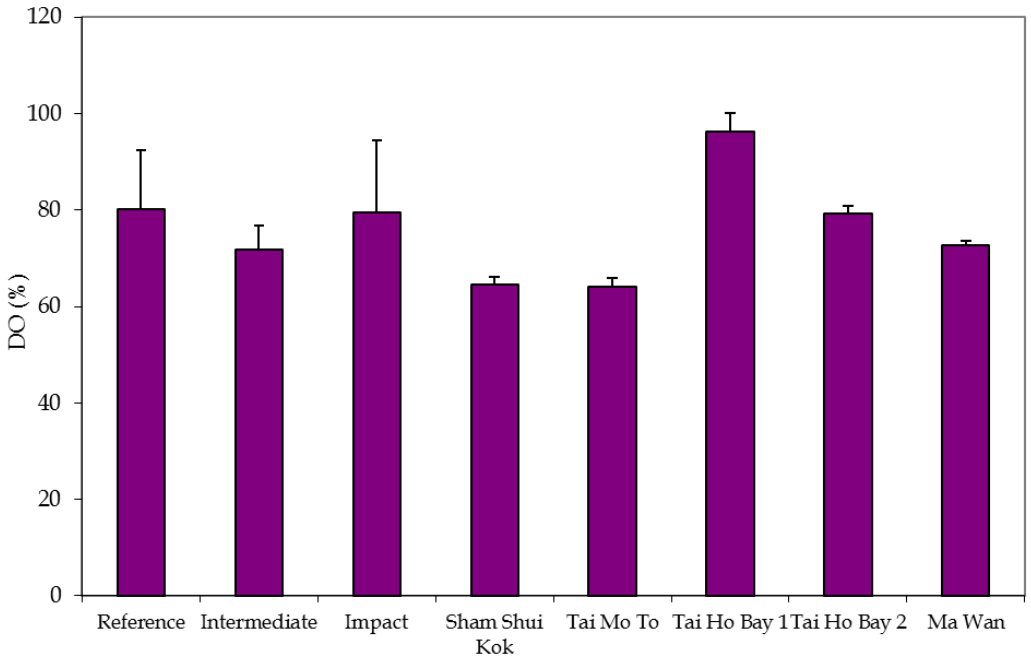


Figure 3: Levels of Dissolved Oxygen (% saturation; mean +SD) recorded from Water Quality Monitoring during Capping for SB CMP 2 in September 2017

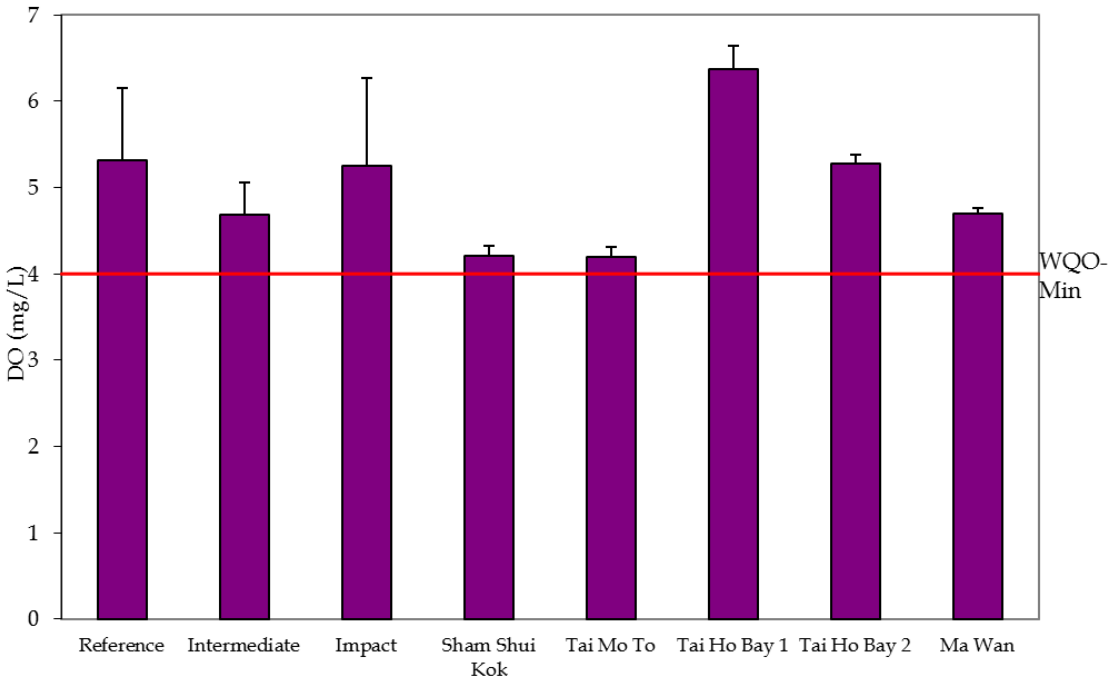


Figure 4: Levels of Dissolved Oxygen (mg/L; mean +SD) recorded from Water Quality Monitoring during Capping for SB CMP 2 in September 2017

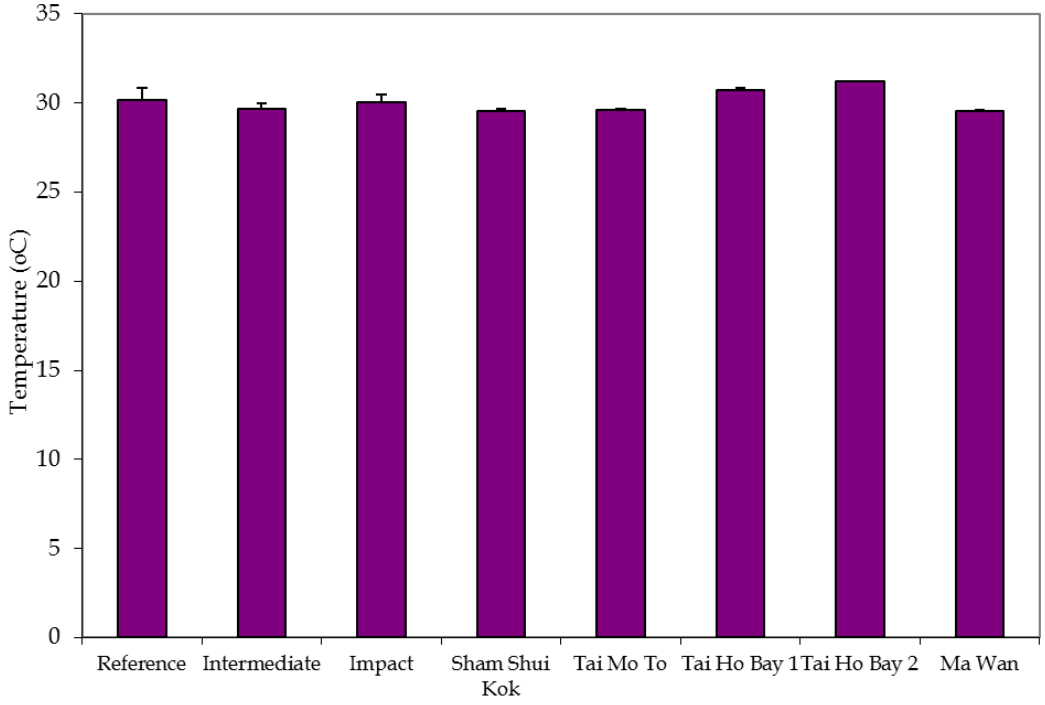


Figure 5: Levels of Temperature (˚C; mean +SD) recorded from Water Quality Monitoring during Capping for SB CMP 2 in September 2017.

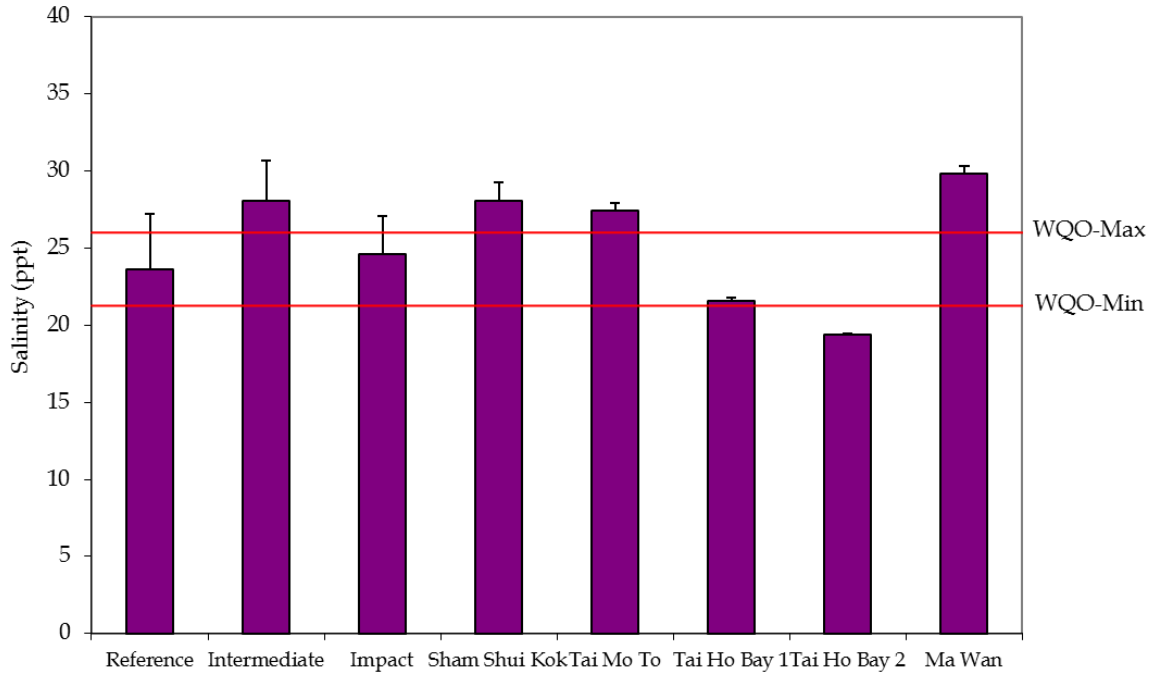
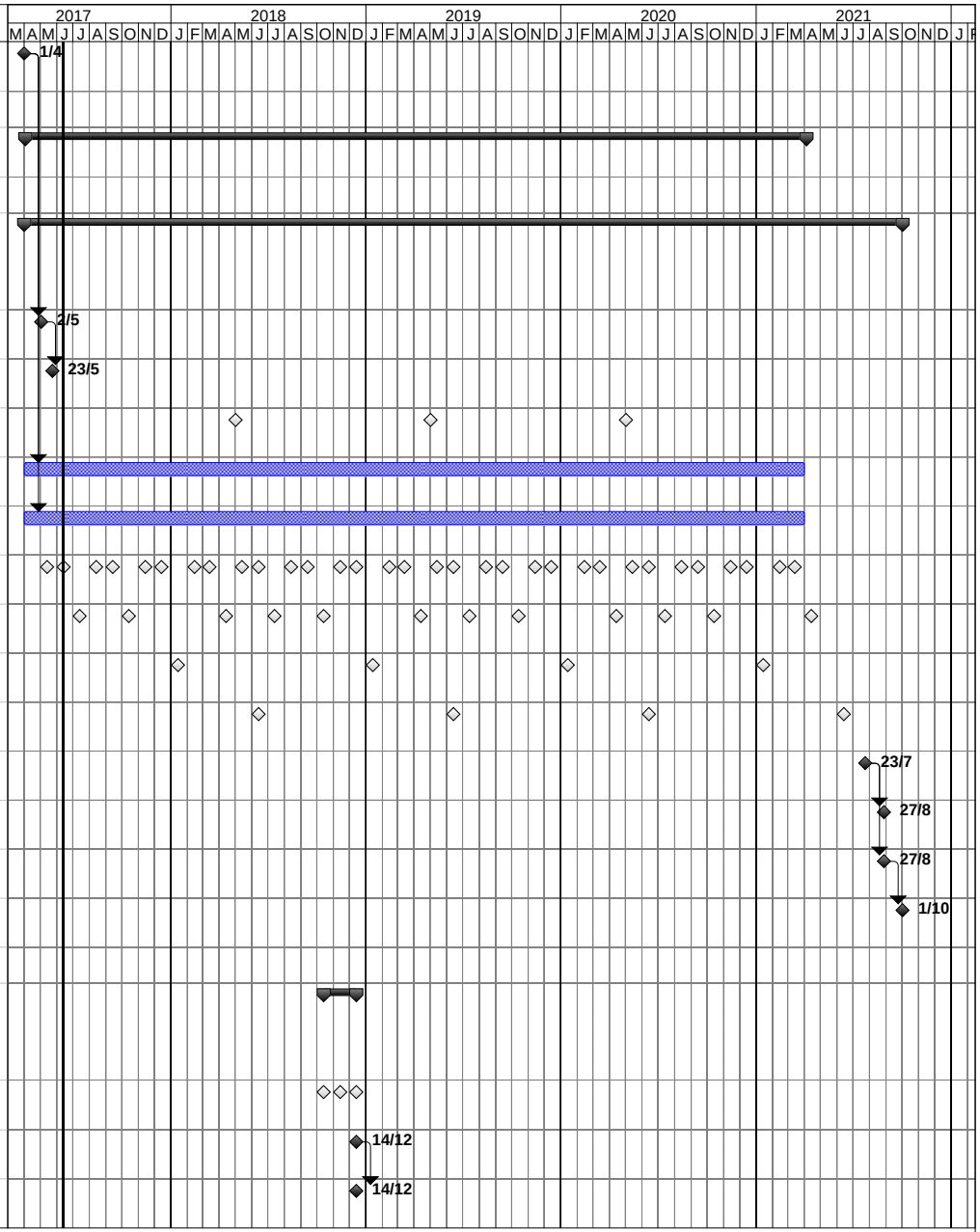


Figure 6: Levels of Salinity (ppt; mean +SD) recorded from Water Quality Monitoring during Capping for SB CMP 2 in September 2017.

Annex E

Study Programme

Task Name	Start	Finish
Commencement of Agreement No. CE 63/2016 (EP)	Sat 1/4/17	Sat 1/4/17
Project Management and General Deliverables	**Mon 3/4/17**	**Mon 5/4/21**
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)	**Sat 1/4/17**	**Fri 1/10/21**
Draft Report on Review of EM&A Manual	Tue 2/5/17	Tue 2/5/17
Final Report on Review of EM&A Manual	Tue 23/5/17	Tue 23/5/17
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
Submission of Final Report (including database of all data collected)	Fri 27/8/21	Fri 27/8/21
Submission of Draft Executive Summary	Fri 27/8/21	Fri 27/8/21
Submission of Final Executive Summary	Fri 1/10/21	Fri 1/10/21
For East Tung Lung Chau Disposal Facility (subject to the actual disposal programme to be confirmed by CEDD)	**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
Submission of Annual EM&A Report	Fri 14/12/18	Fri 14/12/18



Study Programme
Tue 13/6/17

Task | Milestone | Summary | Rolled Up Milestone