



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 – April 2017

Revision 0

16 May 2017

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



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 -**April 2017**

Revision 0

Client

Document Code: 0400720_Monthly April 2017_v0.doc

Environmental Resources 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

Client:		Projec	ct No) :		
Civil Eng	gineering and Development Department (CEDD)	0400	720)		
Summary		Date:				
_		16 M	lav 2	2017		
		Appro				
Monitorin	ument presents the Inception Report for Environmental g and Audit for Disposal Facility to the East of Sha Chau South of The Brothers.	1	/		2.	7
		Craig Partne	_	Reid		
v0	Monthly EM&A Report for ESC CMPs and SB CMPs	RC	;	JT	CAR	16/5/17
Revision	Description	Ву		Checked	Approved	Date
name of 'El within the to	has been prepared by Environmental Resources Management the trading RM Hong-Kong, Limited', with all reasonable skill, care and diligence erms of the Contract with the client, incorporating our General Terms and of Business and taking account of the resources devoted to it by agreement ent.	Distrib		on rnal	OHSAS Certificate N	18001:2007 No. OHS 515956
	n any responsibility to the client and others in respect of any matters scope of the above.	⊠ F	Pub	olic	(BSI
nature to th	is confidential to the client and we accept no responsibility of whatsoever ird parties to whom this report, or any part thereof, is made known. Any elies on the report at their own risk.		Cor	nfidential	ISO 9 Certificate	001 : 2008 • No. FS 32515







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 - April

2017

Date of Report:

16 May 2017

Date prepared by ET:

16 May 2017

Date received by IA:

16 May 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/ $\frac{1}{plan}$ complies with the above referenced condition of EP-312/2008/A and EP-427/2011/A

Jovy Tam,

Environmental Team Leader:

Date:

16/5/2017

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:

16/5/2017

CONTENTS

1.1	BACKGROUND	1
1.2	REPORTING PERIOD	2
1.3	DETAILS OF SAMPLING AND LABORATORY TESTING ACTIVITIES	2
1.4	DETAILS OF OUTSTANDING SAMPLING AND/OR ANALYSIS	3
1.5	BRIEF DISCUSSION OF THE MONITORING RESULTS FOR ESC CMPS	3
1.6	ACTIVITIES SCHEDULED FOR THE NEXT MONTH	6
1.7	STUDY PROGRAMME	6
	ANNEXES	
	ANNEX A SAMPLING SCHEDULE	

ANNEX A	SAMPLING SCHEDULE
ANNEX B	WATER QUALITY MONITORING RESULTS
ANNEX C	GRAPHICAL PRESENTATIONS
ANNEX D	STUDY PROGRAMME

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 APRIL 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 opensea 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)(3)(4)(5). 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.

ERM (2013) Environmental Monitoring and Audit for Contaminated Mud Pit V at East of Sha Chau. Final Report. For CEDD.

⁽²⁾ ERM (2014) Environmental Monitoring and Audit for Contaminated Mud Pit V at East of Sha Chau (2012 - 2017). Final First Annual Review Report. For CEDD.

⁽³⁾ ERM (2015) Environmental Monitoring and Audit for Contaminated Mud Pit V at East of Sha Chau (2012 - 2017). Final Second Annual Review Report. For CEDD.

⁽⁴⁾ ERM (2016) Environmental Monitoring and Audit for Contaminated Mud Pit V at East of Sha Chau (2012 - 2017). Final Third Annual Review Report. For CEDD.

⁽⁵⁾ ERM (2017) Environmental Monitoring and Audit for Contaminated Mud Pit V at East of Sha Chau (2012 - 2017). Final Fourth Annual Review Report. For CEDD.

- 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 April 2017, the following works were being undertaken:
 - Disposal of contaminated mud at ESC CMP Vd.

Figure 1.1 Works Schedule for ESC CMP V and SB CMPs

Pit	Onorotion					20	01	7				1						-	20	18													20	019	9												2	202	20							20	02	1
PIL	Operation	Α	M	J	١,	J .	Α	S	О	Ν	1 0)	J	F	M	Α	N	1	J	J	Α	S	; (2	N	D	J	F		М	Α	M	J	J	J	Α :	s	0	N	D) ,	J	F	M	Α	N	1	J	J	Α	S	0	N	1 [)	J	F	M
	Dredging																																																									
ESC CMP V	Disposal																																																									
	Capping																																																									
	Dredging																																																									
SB CMP 2	Disposal					I							Ī	Ī				I				Γ		Ī					ſ	Ī																Γ										Ī		
	Capping																																																									

1.2 REPORTING PERIOD

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

1.3 DETAILS OF SAMPLING AND LABORATORY TESTING ACTIVITIES

- 1.3.1 The following monitoring activities were undertaken for ESC CMP V in April 2017:
 - Water Column Profiling of ESC CMP Vd was undertaken on 11 April 2017;
 - Routine Water Quality Monitoring of ESC CMP V was undertaken on 12 April 2017; and
 - Pit Specific Sediment Chemistry of ESC CMP Vd was undertaken on 13 April 2017.
- 1.3.2 No monitoring activities were scheduled to be undertaken for SB CMPs in April 2017.

- 1.4 DETAILS OF OUTSTANDING SAMPLING AND/OR ANALYSIS
- 1.4.1 No outstanding sampling and analysis remained for April 2017.
- 1.5 Brief Discussion of the Monitoring Results for ESC CMPs
- 1.5.1 Brief discussion of the monitoring results of the following activities for ESC CMPs is presented in this *Monthly EM&A Report for April 2017*:
 - Water Column Profiling of ESC CMP Vd in April 2017;
 - Routine Water Quality Monitoring of ESC CMP V in April 2017; and
 - Pit Specific Sediment Chemistry of ESC CMP Vd in April 2017.
- 1.5.2 Water Column Profiling of ESC CMP Vd April 2017
- 1.5.3 Water Column Profiling was undertaken at a total of two sampling stations (Upstream and Downstream stations) on 11 April 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 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 April 2017 indicated that levels of DO and pH complied with the WQOs at both Downstream and Upstream stations (*Table B2* of *Annex B*). In addition, 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)

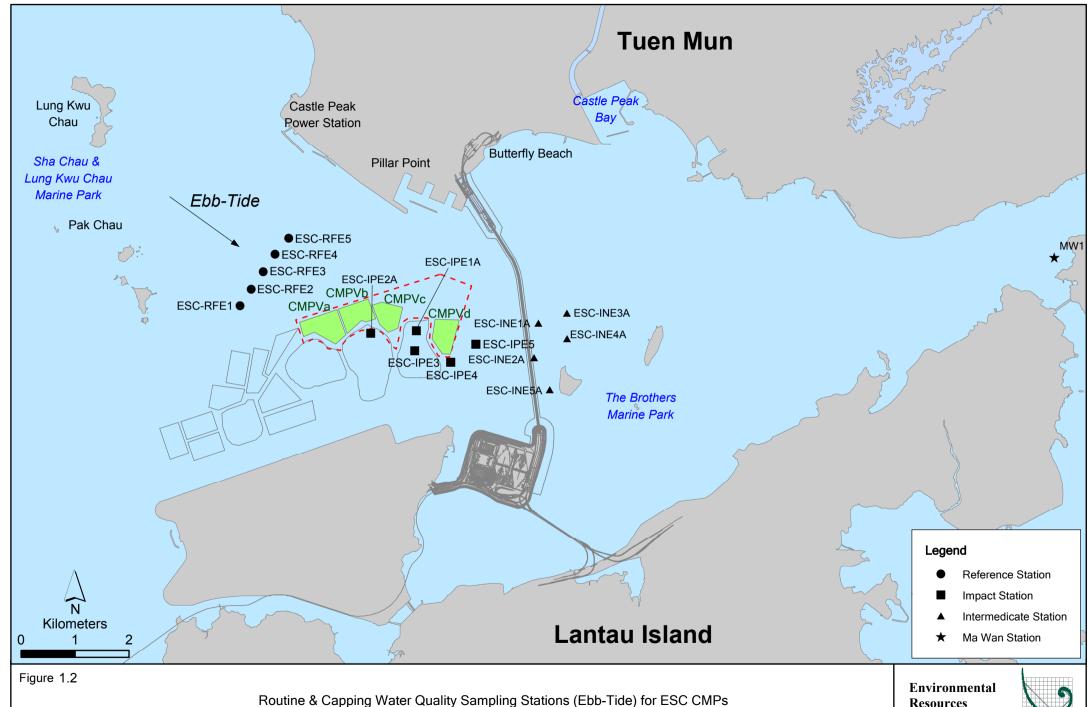
- 1.5.5 Analyses of results for April 2017 indicated that the SS levels complied with the WQO and the Action and Limit Levels at both Upstream and Downstream stations (*Tables B1* and *B2* of *Annex B*).
- 1.5.6 Overall, the monitoring results indicated that the mud disposal operation at ESC CMP Vd did not appear to cause any deterioration in water quality during this reporting period.
- 1.5.7 Routine Water Quality Monitoring of ESC CMP V April 2017
- 1.5.8 Routine Water Quality Monitoring of ESC CMP V was undertaken on 12 April 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 sixteen (16) monitoring stations were sampled in April 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 April 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 April 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 April 2017.

Laboratory Measurements

1.5.12 Laboratory analysis of April 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 April 2017 samples and the concentrations of these metals and metalloids were similar amongst stations (*Table B4* of *Annex B*; *Figure 7* of *Annex C*).



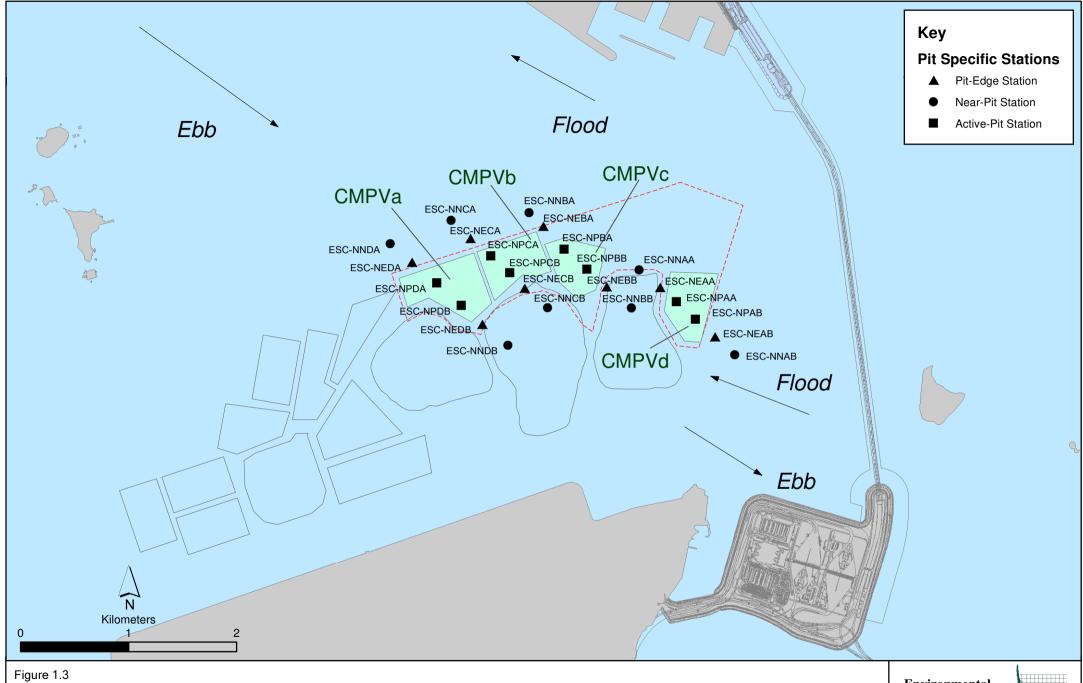
File: T:\GIS\CONTRACT\0175086\Mxd\updated_20170419\0175086_R_C_WQMS_ebb.mxd

Resources Management



- 1.5.13 For nutrients, concentrations of Total Inorganic Nitrogen (TIN) at all stations in April 2017 were higher than the WQO (0.5 mg/L) (*Table B4* of *Annex B*; *Figure 8* of *Annex C*). It should be noted that due to the effect of Pearl River, the North Western WCZ has historically experienced higher levels of TIN (1). Therefore, the exceedances of TIN WQO at these stations are unlikely to be caused by the disposal operation at ESC CMP Vd. Concentrations of Ammonia Nitrogen (NH₃-N) were relatively similar amongst all stations in April 2017 (*Table B4* of *Annex B*; *Figure 8* of *Annex C*). Levels of 5-day Biochemical Oxygen Demand (BOD₅) were relatively similar amongst all stations in April 2017 (*Table B4* of *Annex B*; *Figure 9* of *Annex C*).
- 1.5.14 Analyses of results for April 2017 indicated that the SS levels were higher than the WQO (11.0 mg/L for wet season) at Impact and Intermediate stations. However, the SS levels complied with the Action and Limit Levels at all stations (*Tables B1 and B4* of *Annex B*; *Figure 10* of *Annex C*).
- 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 April 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 April 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 April 2017.
- 1.5.18 The concentrations of all inorganic contaminants were lower than the Lower Chemical Exceedance Level (LCEL) at all stations in April 2017 (*Figures 11* and 12 of *Annex C*).
- 1.5.19 For organic contaminants, the concentrations of Total Organic Carbon (TOC) were similar amongst the stations in April 2017 (*Figure 13* of *Annex C*). The concentrations of Tributyltin (TBT) were higher at Active Pit station ESC-NPAA in April 2017 (*Figure 14* 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 April 2017.
- 1.5.20 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 April 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⁾ http://www.epd.gov.hk/epd/misc/marine_quality/1986-2005/textonly/eng/index.htm



File: T:\GIS\CONTRACT\0400720\Mxd\0400720_SQMS_pit specific.mxd Date: 9/5/2017

Pit Specific Sediment Quality Monitoring Stations for CMPV



1.6 ACTIVITIES SCHEDULED FOR THE NEXT MONTH

- 1.6.1 The following monitoring activities will be conducted in the next monthly period of May 2017 for ESC CMP V (see *Annex A* for the sampling schedule):
 - Water Column Profiling of ESC CMP Vd;
 - Routine Water Quality Monitoring of ESC CMP V; 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 May 2017 for SB CMPs (see *Annex A* for the sampling schedule):
 - Water Quality Monitoring During Capping 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

Table A - East of Sha Chau Environ	mental Monito	ring and Audit Sampling So	chedule fo	r CIVII	- (Арни 201	17 - A	<i>p.m</i> =v=1,																											
	Code	Frequency	A M	J	2017 J A S	S C) N D	J	F M	A		018 J	A S	0	N D	J	F M	I A		2019 J J	A	S O	N	D	J F	M A	M	2020 J	J A	S	O N	D)21 M A
Active-Pit	ESC-NPDA ESC-NPDB	Monthly Monthly	12 12 12 12		12 12 1 12 12 1		2 12 12 2 12 12				12 12 12 12		12 12 12 12		12 12 12 12		12 12 12 12			12 12 12 12						12 12 12 12		12 1 12 1		12 1			12 12 12 12	
Pit-Edge	ESC-NEDA	Monthly	12 12	12	12 12 1	.2 12	2 12 12	2 12	12 12	12	12 12	12	12 12	12	12 12	12	12 12	2 12	12	12 12	12	12 12	12	12 1	2 12	12 12	2 12	12 1	2 12	12 1	12 12	12	12 12	12 1
Near-Pit	ESC-NEDB ESC-NNDA	Monthly			12 12 1 12 12 1				12 12 12 12																					12 1			12 12 12 12	
	ESC-NNDB	•			12 12 1																													
Cumulative Impact Sediment Cher Near-field Stations	nistry ESC-RNA	4 times per year	A M	J 12	J A S	SC) N D	Í	F M	A	M J 12	J	A S 12	0	N D	J	F M	I A	M	J J	A 12	S O	N	D :	12	M A	M	J]	1 A		O N	D 12	J F 12	M
Mid-field Stations	ESC-RNB	4 times per year		12	12		12		12		12	+ +	12		12	-	12		-	12	12			12	12	-		12	12		\pm	12	12	
Cannod Dit Stations		4 times per year 4 times per year		12 12	12		12		12 12		12 12	+	12 12		12 12	_	12 12		-	12 12	12 12			12 12	12			12 12	12 12	+	\pm	12 12	12 12	-
Capped Pit Stations	ESC-RCA ESC-RCB	4 times per year 4 times per year		12 12	12		12		12 12		12 12	+-+	12 12		12 12	_	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	12	+ +	\perp	12	12	
Ma Wan Station	ESC-RFB MW1	4 times per year 4 times per year		12	12		12		12		12		12		12		12			12	12			12	12			12	12		\pm	12	12	
Sediment Toxicity Tests			A M	J	J A S	SC) N D) J	F M	A	M J	J	A S	0	N D	J	F M	I A	M	JJ	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 ESC-TDB	2 times per year 2 times per year			5				5 5				5				5 5				5			+	5				5	+	+		5	
Reference Stations	ESC-TRA	2 times per year			5				5				5				5				5				5				5	\blacksquare	\pm		5	
Ma Wan Station	ESC-TRB MW1	2 times per year2 times per year			5				5				5 5				5				5				5				5	${}^{+}$	+		5	
Tissue/ Whole Body Sampling Near-Pit Stations		1 7	A M	J	J A S	S C) N D) J	F M	A	M J	J	A S	0	N D	J	F M	I A	M	J J	A	S O	N	D	J F	M A	M	J	J A	S	O N	D	J F	M
ivear-i it Stations	ESC-INA ESC-INB	2 times per year 2 times per year			*				*				*				*				*				*				*		\pm		*	
Reference North	TNA TNB	2 times per year 2 times per year			*			_	*				*				*				*				*	+			*	$\perp \perp$	\pm		*	
Reference South	TSA	2 times per year			*				*				*				*				*				*				*		\pm		*	
Domonal Travilina	TSB	2 times per year	I A I M	1	* *		NID	\L_T	* E M		MI	T .	*		N D	T	*	T A	M	7 7	*	6 0	NT	D.	*		M	T	*		O N	l D l	*	M
Demersal Trawling Near Pit Stations		4 times per year	A M	J	J A S 5 5	SC) N D	5	5	A	1V1 J	J 5	A S 5	0	N D	J 5	F M	I A	M	5	A 5	SO	N		J F 5 5	MA	M	J [S	N	D	J F 5 5	M
Reference North	ESC-INB 1-5	4 times per year			5 5			5	5			5	5			5	5			5	5				5 5				5 5	\prod	#		5 5	
Reference South		4 times per year 4 times per year			5 5 5				5			5	5			5	5			5	5				5 5				5 5	<u></u>	+		5 5 5 5	
	TSA 1-5 TSB 1-5	4 times per year 4 times per year			5 5 5 5			5 5				5 5	5			5 5	5			5	5 5			ļ	5 5			į	5 5 5 5		\pm		5 5 5 5	
Capping Ebb Tide			A M	J	J A S	S C) N D) J	F M	A	M J	J	A S	О	N D	J	F M	I 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
Impact Station Downcurrent		4 times per year									3		3		3		3			3	3			3	3			3	3	\blacksquare	\pm	3	3	
		4 times per year 4 times per year 4 times per year									3 3		3 3		3 3		3 3			3 3	3 3			3 3	3 3			3 3	3 3	+	\pm	3 3	3 3	
Intermediate Station Downcurrent	ESC-IPE5	4 times per year									3		3		3		3			3	3			3	3			3	3	\blacksquare	\pm	3	3	
	ESC-INE2	4 times per year 4 times per year 4 times per year									3 3		3 3		3 3		3 3			3 3	3 3			3 3	3 3			3 3	3 3	+	\pm	3 3	3 3	
	ESC-INE4	4 times per year 4 times per year									3		3 3		3		3			3 3	3			3	3			3	3	\blacksquare	\pm	3	3	
Reference Station Upcurrent		4 times per year 4 times per year									3		3 3		3		3			3 3	3			3	3			3	3	#	\pm	3	3	
	ESC-RFE3 ESC-RFE4	4 times per year 4 times per year									3		3		3		3			3	3			3	3			3	3	\blacksquare	\pm	3	3	
Ma Wan Station	ESC-RFE5 MW1	4 times per year 4 times per year									3		3		3		3			3	3			3	3			3	3	+	+	3	3	
Flood Tide Impact Station Downcurrent																																		
	ESC-IPF1 ESC-IPF2 ESC-IPF3	4 times per year 4 times per year 4 times per year									3 3		3 3		3 3		3 3			3 3	3 3			3 3	3 3			3 3	3 3	\coprod	+	3 3	3 3	
Intermediate Station Downcurrent		4 times per year									3		3		3		3			3	3			3	3			3	3		\pm	3	3	
Reference Station Upcurrent	ESC-INF2 ESC-INF3	4 times per year 4 times per year									3		3		3		3			3	3			3	3			3	3	\coprod	\pm	3	3	
Reference Station Opcurrent		4 times per year 4 times per year									3		3 3		3		3 3			3 3	3			3	3			3	3	\pm	\pm	3	3	
Ma Wan Station	ESC-RFF3 MW1	4 times per year 4 times per year									3		3		3		3			3	3			3	3			3	3	\coprod	\pm	3	3	
Routine Water Quality Monitoring		4 times per year	AM	J	J A 9	s C) N D) J	F M	A	м J	J	A S	0	N D	ј	F M	I 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
Ebb Tide Impact Station Downcurrent	ESC-IPE1	9 Lima og man 2200	0 0		8 8	8	8 8	0	8	8	0	8	8	0	8	8	8	8	8	0	8	8	8		3 8	8	0		3 8	\blacksquare	8 8		8 8	
	ESC-IPE2	8 times per year 8 times per year 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 8	8	8	8	8 8 8 8	1	8 8 8 8		8 8 8 8	8
Intermediate Station Downgurrent	ESC-IPE4 ESC-IPE5	8 times per year 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 8	+		8 8 8 8		8 8 8 8		8 8 8 8	8
Intermediate Station Downcurrent	ESC-INE1 ESC-INE2	8 times per year 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	8		8 8 8 8	8	8	8	8 8 8 8	1	8 8 8 8		8 8 8 8	8
	ESC-INE3 ESC-INE4 ESC-INE5	8 times per year 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 8	8 8	8 8 8	8 8	8 8	8 8 8	8 8 8	8	3	3 8 3 8 3 8	+	8	8	3 8 3 8 3 8	1	8 8 8 8 8 8		8 8 8 8	£ £
Reference Station Upcurrent	ESC-RFE1	8 times per year 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	3 8		8 8		8 8	
	ESC-RFE2 ESC-RFE3 ESC-RFE4	8 times per year 8 times per year 8 times per year	8 8 8 8 8 8	\prod	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	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	1	8 8 8 8 8 8	-	8 8 8 8 8 8	£ £
Ma Wan Station	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	3	8 8		8 8	8
<i>Flood Tide</i> Impact Station Downcurrent	MW1	8 times per year	8 8	<u> </u>	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	1 1	8 8		8 8	
	ESC-INF2	8 times per year 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		8 8		8	8	8 8 8 8	1	8 8 8 8	-	8 8 8 8	8
Intermediate 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
	ESC-IPF2	8 times per year 8 times per year 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 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	1	8 8 8 8 8 8	-	8 8 8 8 8 8	8
Reference Station Upcurrent	ESC-RFF1 ESC-RFF2	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	_		3 8 3 8	+			3 8 3 8		8 8 8 8		8 8 8 8	£
Ma Wan Station	ESC-RFF3	8 times per year 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	3	8 8		8 8	8
Water Calumn D. Cit	MW1	8 times per year	8 8	T	8 8 T	8			Е	8		8	8 S	8	8 N D	8	8 F N	8 1 A	8 M	8	8	8		D	8 8				8 8 I A		8 8 O N		8 8 I E	
Water Column Profiling Plume Stations	WCP1 WCP2	Monthly Monthly	A M 4 4 4 4	4 4	4 4 4	S C 4 4 4 4	N D 4 4 4 4 4		F M 4 4 4 4	4 4	4 4	4 4	A S 4 4 4 4	4	N D 4 4 4 4	4 4	F M 4 4 4 4		4 4	1 4 4 4 4 4	4 4	4 4	1 4 4	4 4	J F 1 4 1 4	4 4	+	J J 4 4 4 4	4 4	4 4 4	O N 4 4 4 4		J F 4 4 4 4	M 4 4 4
Benthic Recolonisation Studies		,	A M	J) N D		F M				A S	0			F M			JJ		S O				M A				S			J F	M A
Capped Contaminated Mud Pits V	CPA CPB	2 times per year 2 times per year			12		12						12 12		12 12		+				12 12			12 12					12 12	`	+	12 12		
Reference Stations	CPC	2 times per year			12		12	2					12		12						12			12					12	!	\pm	12		
	RBA RBB RBC	2 times per year 2 times per year 2 times per year		\prod	12 12 12		12 12	2					12 12 12		12 12 12						12 12 12		+	12 12 12			+	\Box	12 12 12	2	#	12 12 12		
Impact Monitoring for Dredging	ADC.	_ mico pei year	A M	J		S C) N D		F M	A	M J	J		0	N D		F M	I A	M	JJ	12 A	S O	N		J F	MA	M	J		S	0 N	12 D	J F	M A
Upstream Stations	US1	3 times per week																												\prod	-			
Downstream Stations	US2 DS1	3 times per week 3 times per week						+															<u> </u>							<u></u>	+			
	DS2 DS3	3 times per week 3 times per week						1																+					+	\prod	+			
	DS4	3 times per week	1	1 1	-+-	-	+	+		\vdash		\vdash		\vdash	_	\vdash	+	-				+	+	+	+	1	4			44		$oldsymbol{\sqcup}$		\vdash
Ma Wan Station	DS5	3 times per week					_											 			+		 							<u></u>	+			

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

							2017												2018				
Capping Water Quality Monitoring			Α	M	J	J	Α	s	О	N	D	J	F	M	A	M	J	J	Α	s	О	N	D
Ebb Tide				Г												\neg				\Box			$\overline{}$
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							ш	<u> </u>					<u> </u>	
	SB-IPE5	4 times per year		3	3		3		3							ш	<u> </u>	<u> </u>		<u> </u>		Щ.	<u> </u>
Intermediate Stations Downcurrent			<u> </u>	<u> </u>	Ш											ш	<u> </u>	<u> </u>	Ш	<u> </u>	Ш	Щ.	<u> </u>
	SB-INE1	4 times per year	-	3	3		3		3							₩	<u> </u>	<u> </u>	\vdash	لصا	ш	₩	<u> </u>
	SB-INE2	4 times per year	-	3	3		3		3							\vdash	_	<u> </u>	ш	\vdash	ш	Ь.	ـــــ
	SB-INE3 SB-INE4	4 times per year	-	3	3		3		3							\vdash	₩		\vdash	لصا	\vdash	-	₩
	SB-INE4 SB-INE5	4 times per year	-	3	3		3		3							\vdash	<u> </u>	-	\vdash	\vdash	\vdash	-	⊢
D. C Civilian II	SB-IIVES	4 times per year	-	3	3		3		3							\vdash	┢	-	\vdash	┝	\vdash		₩
Reference Stations Upcurrent	SB-RFE1	4 times per year	-	3	3		3		3							\vdash	\vdash		\vdash	\vdash	 	1	┢
	SB-RFE2	4 times per year 4 times per year	1	3	3		3		3		H					\vdash	\vdash	 	\vdash	\vdash	₩		⊢
	SB-RFE3	4 times per year 4 times per year	\vdash	3	3		3		3		H					\vdash	\vdash	\vdash	\vdash	\vdash	\vdash	\vdash	\vdash
	SB-RFE4	4 times per year	\vdash	3	3		3		3		\vdash					Н	\vdash		\vdash		┢	 	\vdash
	SB-RFE5	4 times per year	1	3	3		3		3		H						\vdash			—	\vdash		—
Sensitive Receiver Stations		oper year	\vdash	Ť			Ť		Ŭ		H					г	\vdash	\vdash	\Box	_	\vdash	\vdash	\vdash
	MW1	4 times per year		3	3		3		3							\vdash				\Box	\vdash		\vdash
	THB1	4 times per year		3	3		3		3							\vdash				\Box	\vdash		\vdash
	THB2	4 times per year		3	3		3		3											Γ,			
	WSR45C	4 times per year		3	3		3		3											Γ,			
	WSR46	4 times per year		3	3		3		3														
Flood Tide			1																				
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																ш	<u> </u>						
	SB-INF1	4 times per year		3	3		3		3							ldot	<u> </u>	<u> </u>	ш	L			<u> </u>
	SB-INF2	4 times per year		3	3		3		3							ldot	<u> </u>	<u> </u>	ш	L			<u> </u>
	SB-INF3	4 times per year	<u> </u>	3	3		3		3							ш	<u> </u>	<u> </u>	Ш	<u> </u>	Ш	Щ.	<u> </u>
Reference Stations Upcurrent			<u> </u>	₩.	ш											╙	<u> </u>	<u> </u>	ш	<u> </u>	ш	╙	ــــ
	SB-RFF1	4 times per year	<u> </u>	3	3		3		3							╙	<u> </u>	<u> </u>	ш	<u> </u>	ш	╙	ــــ
	SB-RFF2 SB-RFF3	4 times per year	<u> </u>	3	3		3		3							\vdash	<u> </u>		Ш	<u> </u>	ш	<u> </u>	₽
Constitution Breath and Charles	SD-KFF3	4 times per year	-	3	3		3		3							\vdash	₩		\vdash	لصا	\vdash	-	₩
Sensitive Receiver Stations	MW1	4 *************************************	-	3	3		3		3							\vdash	┢	-	\vdash	┝	\vdash		₩
	THB1	4 times per year 4 times per year	\vdash	3	3		3		3		\vdash			\vdash		\vdash	⊢		\vdash	اسا	\vdash	\vdash	₩
	THB2	4 times per year 4 times per year	1	3	3		3		3		H					\vdash	Н	 	\vdash	\vdash	\vdash	 	\vdash
	WSR45C	4 times per year 4 times per year	\vdash	3	3		3		3		H					\vdash	\vdash	\vdash	\vdash	\vdash	\vdash	\vdash	\vdash
	WSR46	4 times per year	1	3	3		3		3		H						H				 		—
<u> </u>			1																				ь—
Benthic Recolonisation Studies			Α	M	I	I	Α	S	0	N	D				Α	M	I	I	Α	S	0	N	D
Capped Contaminated Mud Pits			T															Ť					
	SB-CPA	2 times per year	I	 	\vdash		12				12					П	\vdash		12	Γ	\vdash		12
	SB-CPB	2 times per year	\vdash	H	\vdash		12		1		12					г	\vdash	\vdash	12	_	\vdash	\vdash	12
		r - y	I	t^{-}	\vdash		Ħ				Ħ					П	H		Ħ	\Box	\vdash	\vdash	Ť
Reference Stations				T												\Box	М						
	RBA	2 times per year		\vdash	\vdash		12				12								12				12
	KDA																						
	RBB	2 times per year		\vdash			12				12								12				12

Notes:
"*" = Number of replicates depends on parameters
Naming of stations are tentative only and will be subjected to changes

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)	Surface and Mid-depth (2)
	5%-ile of baseline data for surface and	1%-ile of baseline data for surface and
	middle layer = 3.76 mg L ⁻¹	middle layer = 3.11 mg L^{-1} (3)
	and	and
	Significantly less than the reference	Significantly less than the reference
	stations mean DO (at the same tide of	stations mean DO (at the same tide of
	the same day)	the same day)
	Bottom	Bottom
	5%-ile of baseline data for bottom	The average of the impact station
	layers = 2.96 mg L -1	readings are <2 mg/L ⁻¹
	and	and
	Significantly less than the reference	Significantly less than the reference
	stations mean DO (at the same tide of the same day)	stations mean DO (at the same tide of the same day)
Depth-averaged Suspended	95%-ile of baseline data for depth	99%-ile of baseline data for depth
Solids (SS) (4) (5)	average = 37.88 mg L-1	average = 61.92 mg L -1
	and	
		and
	120% of control station's SS at the same	130% of control station's SS at the same
	tide of the same day	tide of the same day
Depth-averaged Turbidity (Tby) (4) (5)	95%-ile of baseline data = 28.14 NTU	99%-ile of baseline data = 38.32 NTU
•	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-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 Water Column Profiling Results for ESC CMP Vd in April 2017

Stations	Temp	Salinity	Turbidity	Ox	solved ygen	рН	Suspended Solids
	(°C)	(ppt)	(NTU)	(%)	(mg L-1)	(mg L-1)	(mg L-1)
WCP 1 (Downstream)	21.93	26.40	9.73	88.66	6.66	7.88	5.80
WCP 2 (Upstream)	22.18	25.43	12.99	88.09	6.62	7.88	9.90
WQO (Wet season)	N/A	22.89 - 27.97#	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 B3 In-situ Monitoring Results for Routine Water Quality Monitoring of ESC CMPs in April 2017

Sampling	Stations	Temp	Salinity	Turbidity	Dissolve	d Oxygen	pН
Period	Stations	(°C)	(ppt)	(NTU)	(%)	(mg L-1)	(mg L-1)
A rowil 2017	RFE (Reference)	22.15	25.59	8.25	90.43	6.80	7.93
April 2017	IPE (Impact)	22.17	25.22	12.26	93.81	7.06	8.00
	INE (Intermediate)	22.15	25.52	10.69	92.68	6.97	8.02
	Ma Wan	22.01	26.71	4.59	91.19	6.83	8.03
	WOO	N/A	23.03 -	N/A	N/A	>4	6.5-8.5
	WQO	IN/A	28.14#	IN/A	IN/A	74	0.5-6.5

Notes:

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 April 2017

Sampling	Stations	As	Cd	Cr	Cu	Pb	Hg	Ni	Ag	Zn	NH ₃	TIN	BOD ₅	SS
Period	Stations	(μg/L)	(μg/L)	(μg/L)	(μg/L)	(μg/L)	(μg/L)	(μg/L)	(μg/L)	(μg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
April	RFE	2.10	<lor< td=""><td>1.98</td><td>7.82</td><td>0.76</td><td><lor< td=""><td>2.27</td><td><lor< td=""><td>46.53</td><td>0.18</td><td>1.31</td><td>1.42</td><td>10.85</td></lor<></td></lor<></td></lor<>	1.98	7.82	0.76	<lor< td=""><td>2.27</td><td><lor< td=""><td>46.53</td><td>0.18</td><td>1.31</td><td>1.42</td><td>10.85</td></lor<></td></lor<>	2.27	<lor< td=""><td>46.53</td><td>0.18</td><td>1.31</td><td>1.42</td><td>10.85</td></lor<>	46.53	0.18	1.31	1.42	10.85
2017	IPE	2.05	<lor< td=""><td>0.64</td><td>8.91</td><td>1.03</td><td><lor< td=""><td>1.37</td><td><lor< td=""><td>37.14</td><td>0.20</td><td>1.80</td><td>1.29</td><td>13.34</td></lor<></td></lor<></td></lor<>	0.64	8.91	1.03	<lor< td=""><td>1.37</td><td><lor< td=""><td>37.14</td><td>0.20</td><td>1.80</td><td>1.29</td><td>13.34</td></lor<></td></lor<>	1.37	<lor< td=""><td>37.14</td><td>0.20</td><td>1.80</td><td>1.29</td><td>13.34</td></lor<>	37.14	0.20	1.80	1.29	13.34
	INE	1.99	<lor< td=""><td>1.20</td><td>5.50</td><td>0.64</td><td><lor< td=""><td>1.86</td><td><lor< td=""><td>28.18</td><td>0.18</td><td>1.17</td><td>1.27</td><td>14.50</td></lor<></td></lor<></td></lor<>	1.20	5.50	0.64	<lor< td=""><td>1.86</td><td><lor< td=""><td>28.18</td><td>0.18</td><td>1.17</td><td>1.27</td><td>14.50</td></lor<></td></lor<>	1.86	<lor< td=""><td>28.18</td><td>0.18</td><td>1.17</td><td>1.27</td><td>14.50</td></lor<>	28.18	0.18	1.17	1.27	14.50
	Ma Wan	2.04	<lor< td=""><td>3.43</td><td>6.08</td><td>2.81</td><td><lor< td=""><td>3.37</td><td><lor< td=""><td>43.21</td><td>0.27</td><td>1.18</td><td>1.09</td><td>6.15</td></lor<></td></lor<></td></lor<>	3.43	6.08	2.81	<lor< td=""><td>3.37</td><td><lor< td=""><td>43.21</td><td>0.27</td><td>1.18</td><td>1.09</td><td>6.15</td></lor<></td></lor<>	3.37	<lor< td=""><td>43.21</td><td>0.27</td><td>1.18</td><td>1.09</td><td>6.15</td></lor<>	43.21	0.27	1.18	1.09	6.15

WQO of TIN: 0.5 mg/L

Wet Season WQO of SS: 11.0 mg/L

Notes:

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

Cell shaded grey indicate value exceeding the WQO.

 $^{{}^\}sharp Not$ exceeding 10% of natural ambient level which is the result obtained from the Reference Station.

Annex C

Graphical Presentations

Routine Water Quality Monitoring for ESC CMP V - April 2017 10.00 9.00 WQO Max 8.00 7.00 WQO 6.00 5.00 펍 4.00 3.00 2.00 1.00 0.00 Reference Impact Intermediate Ma Wan Station

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

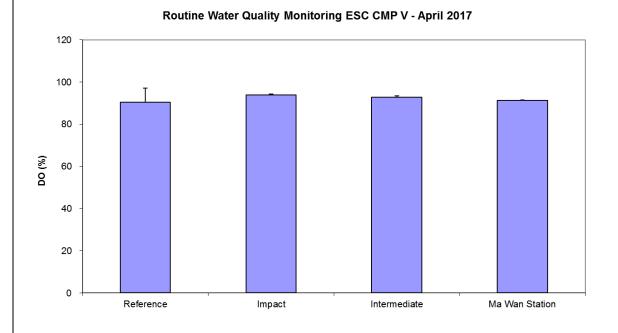


Figure 2: Level of Dissolved Oxygen (DO) (% saturation; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at ESC CMP V in April 2017.

Source: H:\Team\EM\GMS Projects\0400720 CEDD CMP EM&A 2017-2020\02 Deliverable\05 CMP Monthly Report\1st (April 2017)

Date: May 2017



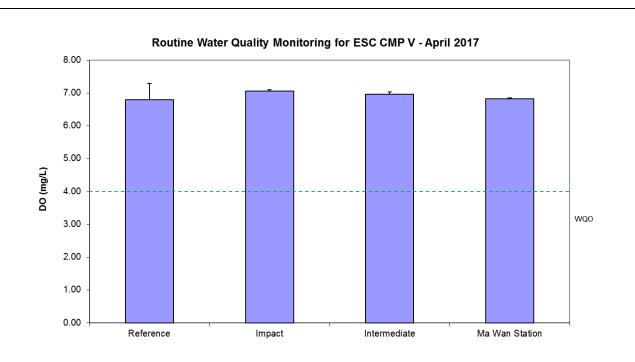


Figure 3: Concentration of Dissolved Oxygen (DO) (mg/L; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at ESC CMP V in April 2017.

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

Source: H:\Team\EM\GMS Projects\0400720 CEDD CMP EM&A 2017-2020\02 Deliverable\05 CMP Monthly Report\1st (April 2017)

Date: May 2017



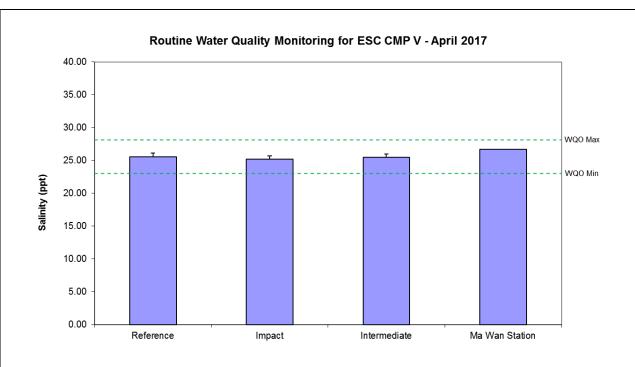


Figure 5: Level of Salinity (ppt; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at ESC CMP V in April 2017.

Routine Water Quality Monitoring for ESC CMP V - April 2017 20.00 18.00 16.00 14.00 Turbidity (NTU) 12.00 10.00 8.00 6.00 4.00 2.00 0.00 Reference Intermediate Ma Wan Station Impact

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

Source: H:\Team\EM\GMS Projects\0400720 CEDD CMP EM&A 2017-2020\02 Deliverable\05 CMP Monthly Report\1st (April 2017)

Date: May 2017



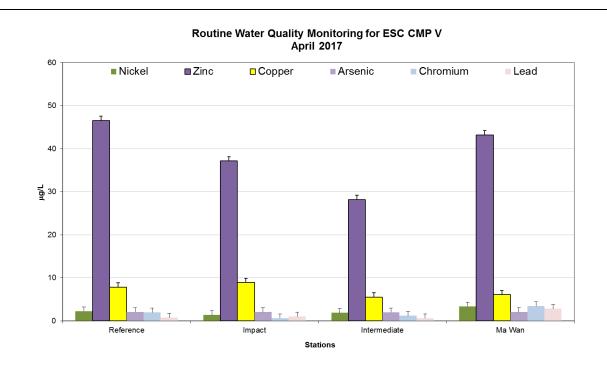


Figure 7: Concentration of Arsenic, Chromium, Nickel, Lead, Copper and Zinc (µg/L; mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at ESC CMP V in April 2017.

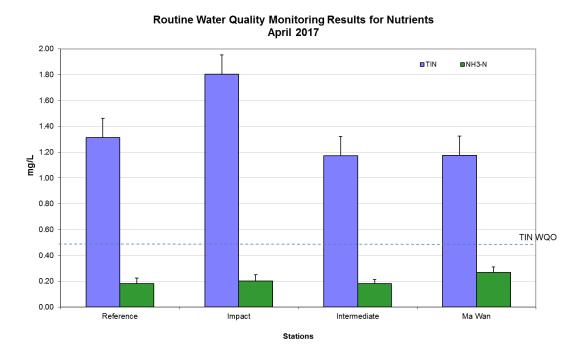
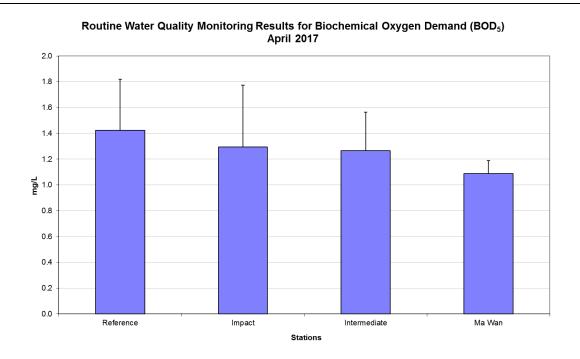


Figure 8: Concentration of Total Inorganic Nitrogen (TIN) and Ammonia Nitrogen (NH3-N) $(\mu g/L; mean + SD)$ in water samples collected from Routine Water Quality Monitoring for disposal operations at ESC CMP V in April 2017.

Source: H:\Team\EM\GMS Projects\0400720 CEDD CMP EM&A 2017-2020\02 Deliverable\05 CMP Monthly Report\1st (April 2017)

Date: May 2017





Level of Biochemical Oxygen Demand (BOD5) (mg/L; mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at ESC CMP V in April 2017.

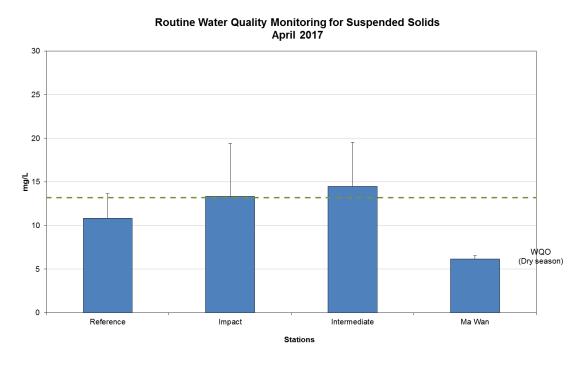


Figure 10: Concentration of Suspended Solids (SS) (mg/L; mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at ESC CMP V in April 2017.

Source: H:\Team\EM\GMS Projects\0400720 CEDD CMP EM&A 2017-2020\02 Deliverable \05 CMP Monthly Report \1st (April 2017)

May 2017 Date:



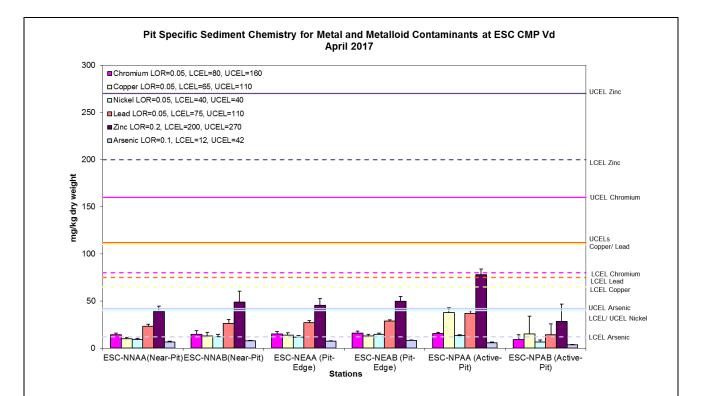


Figure 11: Concentration of Metals and Metalloid (Cr, Cu, Ni, Pb, Zn, As; mg/kg dry weight; mean +SD) in sediment samples collected from Pit Specific Sediment Chemistry Monitoring for ESC CMP Vd in April 2017.

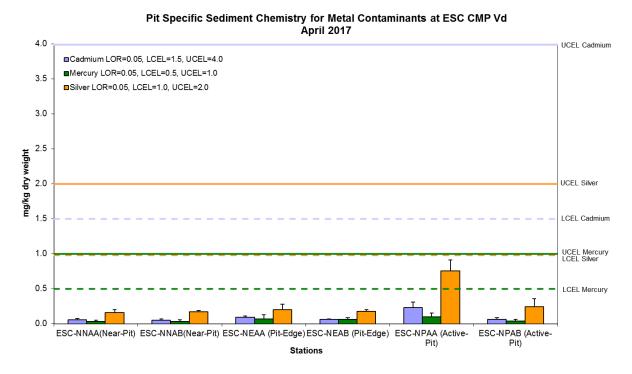


Figure 12: Concentration of Metals (Cd, Hg, Ag; mg/kg dry weight; mean +SD) in sediment samples collected from Pit Specific Sediment Chemistry Monitoring for ESC CMP Vd in April 2017.

Source: H:\Team\EM\GMS Projects\0400720 CEDD CMP EM&A 2017-2020\02 Deliverable\05 CMP Monthly Report\1st (April 2017)

Date: May 2017



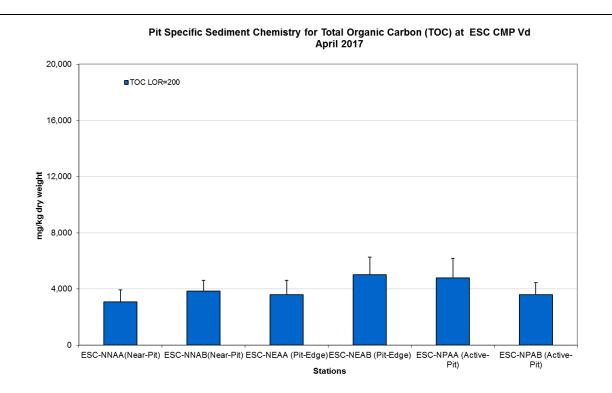


Figure 13: Concentration of Total Organic Carbon (TOC) (mg/kg dry weight; mean +SD) in sediment samples collected from Pit Specific Sediment Chemistry Monitoring for ESC CMP Vd in April 2017.

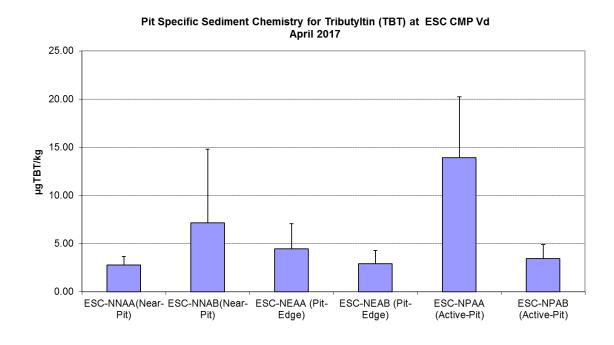


Figure 14: Concentration of Tributyltin (TBT) (μg TBT/kg; mean +SD) in sediment samples collected from Pit Specific Sediment Chemistry Monitoring for ESC CMP Vd in April 2017.

Source: H:\Team\EM\GMS Projects\0400720 CEDD CMP EM&A 2017-2020\02 Deliverable\05 CMP Monthly Report\1st (April 2017)

Date: May 2017



Annex D

Study Programme

Task Name	Start	Finish	MAM	2017		J. J.			201	8	اما		I-I-		2019	اما	اردام			20	020		J. J.	I.,_		202	1	
Commencement of Agreement No. CE 63/2016 (EP)	Sat 1/4/17	Sat 1/4/17	M A M	J J /	ISIC	DINID	JF	MA	MJ,	JAS		ND J	I IF IV	1 A IN	JJJ	ASI	ON	DJI	- M/	AMJ	JA	SO	NID	JF	MA	MJ.	IAS	טואוכ
			H	+++	+	+	Н	$\dashv \dashv$	+	+	+	+		+	Н	+	+	+	+	++		+	+	+	+		++	
Project Management and General Deliverables	Mon 3/4/17	Mon 5/4/21		-														\pm		#							Ш	
Submission of Draft Inception Report & Draft Programme	Thu 13/4/17	Thu 13/4/17	1	3/4	Ħ	\Box	П		\top	$\dagger \dagger$		$\dagger \dagger$			Ш	\top			Ħ			Ħ	Ħ	Ħ				
Submission of Final Inception Report & Final Programme	Thu 4/5/17	Thu 4/5/17		4/5	\dagger		Н			+					Ш				+	+++	\top						++	
Submission of Recommendation and necessary Terms and Conditions for appointment of Independent Auditor	Mon 3/4/17	Mon 3/4/17	♦ 3/4	4																								
Submission of Monthly Progress Report for the Assignment	Fri 5/5/17	Mon 5/4/21		>	00	\\\	>0	><	>	00	00	\	$\Diamond \Diamond$	$\Diamond \Diamond$	\\\	>><	> \	>>	× > > > > > > > > > > > > > > > > > > >	>	\$ \$	۵ ۵۰	\	\$\$.	$\Diamond \Diamond$			
Submission of Draft Technical Specifications and Cost Estimates for the succeeding EM&A Sampling and Testing Contracts (Part of Tender Documents)	Wed 2/8/17	Wed 2/8/17			2/8																							
Submission of Final Technical Specifications and Cost Estimates for the succeeding EM&A Sampling and Testing Contracts (Part of Tender Documents)	Wed 23/8/17	Wed 23/8/17		•	23	/8																						
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		2/5	Ħ										Ш				Ħ				П					
Final Report on Review of EM&A Manual	Tue 23/5/17	Tue 23/5/17		23/5	Ħ														Ħ				П					
Regular Review of EM&A Manual	Wed 2/5/18	Sat 2/5/20			Ħ			Ŷ	>					\	Ш				\parallel	♦			П				Ш	
Regular Site Inspections of CMP Contractors	Sat 1/4/17	Wed 31/3/21																								П	Ш	
Participate in Liaison Group Meetings/ Consultations as required by CEDD	Sat 1/4/17	Wed 31/3/21																									Ш	
Submission of Monthly EM&A Report	Sun 14/5/17	Sun 14/3/21	\Diamond	\Diamond	\	$\Diamond \Diamond$	\Diamond	\Diamond	$\Diamond \Diamond$	00	> <	><	00	0	· 🔷	$\Diamond \Diamond$	0	♦	>\	$\Diamond\Diamond$	\diamond	\Q	00	\	×>			
		Wed 14/4/21	+++	0	\Diamond	,		\Q		*	\Diamond	\top	\top	\Diamond	\Q				1		\Diamond	6		\top	\Q			
Submission of Quarterly EM&A Report	Fri 14/7/17				1 1												- 1 1		- 1 - 1			*						
Submission of Quarterly EM&A Report Submission of Annual EM&A Report	Sun 14/1/18	Thu 14/1/21				\parallel	\Diamond				Ħ	\downarrow	>					\Diamond					\parallel	\Diamond				\perp
·		Thu 14/1/21 Mon 14/6/21					\rightarrow		\Q			¢	>		♦			♦		• • • • • • • • • • • • • • • • • • •	>			\Diamond		♦		
Submission of Annual EM&A Report	Sun 14/1/18						♦		\$			¢	>		\$			♦		• • • • • • • • • • • • • • • • • • •	>			\rightarrow			23/7	
Submission of Annual EM&A Report Submission of Annual Risk Assessment Report	Sun 14/1/18 Thu 14/6/18	Mon 14/6/21					♦		\$			\Q	>		\$			♦		¢	>			♦			23/7	
Submission of Annual EM&A Report Submission of Annual Risk Assessment Report Submission of Draft Final Report (including database of all data collected)	Sun 14/1/18 Thu 14/6/18 Fri 23/7/21	Mon 14/6/21 Fri 23/7/21					\rightarrow		♦			***	>		\$			♦		0	>			\rightarrow			Ш	7/8
Submission of Annual EM&A Report Submission of Annual Risk Assessment Report Submission of Draft Final Report (including database of all data collected) Submission of Final Report (including database of all data collected)	Sun 14/1/18 Thu 14/6/18 Fri 23/7/21 Fri 27/8/21	Mon 14/6/21 Fri 23/7/21 Fri 27/8/21					\rightarrow		\rightarrow				>		\$			\langle		0	>			\rightarrow			2	7/8
Submission of Annual EM&A Report Submission of Annual Risk Assessment Report Submission of Draft Final Report (including database of all data collected) Submission of Final Report (including database of all data collected) Submission of Draft Executive Summary	Sun 14/1/18 Thu 14/6/18 Fri 23/7/21 Fri 27/8/21 Fri 27/8/21	Mon 14/6/21 Fri 23/7/21 Fri 27/8/21 Fri 27/8/21							\rightarrow				>		• • • • • • • • • • • • • • • • • • •						>						2	7/8 7/8
Submission of Annual EM&A Report Submission of Annual Risk Assessment Report Submission of Draft Final Report (including database of all data collected) Submission of Final Report (including database of all data collected) Submission of Draft Executive Summary Submission of Final Executive Summary For East Tung Lung Chau Disposal Facility (subject to the actual disposal	Sun 14/1/18 Thu 14/6/18 Fri 23/7/21 Fri 27/8/21 Fri 27/8/21 Fri 1/10/21	Mon 14/6/21 Fri 23/7/21 Fri 27/8/21 Fri 27/8/21 Fri 1/10/21							\langle									\Diamond		• • • • • • • • • • • • • • • • • • •	>						2	7/8 7/8
Submission of Annual EM&A Report Submission of Annual Risk Assessment Report Submission of Draft Final Report (including database of all data collected) Submission of Final Report (including database of all data collected) Submission of Draft Executive Summary Submission of Final Executive Summary For East Tung Lung Chau Disposal Facility (subject to the actual disposal programme to be confirmed by CEDD) Submission of Monthly EM&A Report	Sun 14/1/18 Thu 14/6/18 Fri 23/7/21 Fri 27/8/21 Fri 1/10/21 Sun 14/10/18	Mon 14/6/21 Fri 23/7/21 Fri 27/8/21 Fri 27/8/21 Fri 1/10/21 Fri 14/12/18							\langle					22	\langle			\langle		• • • • • • • • • • • • • • • • • • •	>						2	7/8 7/8
Submission of Annual EM&A Report Submission of Annual Risk Assessment Report Submission of Draft Final Report (including database of all data collected) Submission of Final Report (including database of all data collected) Submission of Draft Executive Summary Submission of Final Executive Summary For East Tung Lung Chau Disposal Facility (subject to the actual disposal programme to be confirmed by CEDD)	Sun 14/1/18 Thu 14/6/18 Fri 23/7/21 Fri 27/8/21 Fri 1/10/21 Sun 14/10/18 Sun 14/10/18	Mon 14/6/21 Fri 23/7/21 Fri 27/8/21 Fri 27/8/21 Fri 1/10/21 Fri 14/12/18							\rightarrow				114/12		\rightarrow			\rightarrow									2	7/8 7/8
Submission of Annual EM&A Report Submission of Annual Risk Assessment Report Submission of Draft Final Report (including database of all data collected) Submission of Final Report (including database of all data collected) Submission of Draft Executive Summary Submission of Final Executive Summary For East Tung Lung Chau Disposal Facility (subject to the actual disposal programme to be confirmed by CEDD) Submission of Monthly EM&A Report Submission of Quarterly EM&A Report	Sun 14/1/18 Thu 14/6/18 Fri 23/7/21 Fri 27/8/21 Fri 27/8/21 Fri 1/10/21 Sun 14/10/18 Fri 14/12/18	Mon 14/6/21 Fri 23/7/21 Fri 27/8/21 Fri 27/8/21 Fri 1/10/21 Fri 14/12/18 Fri 14/12/18							\rightarrow				114/12		\langle			\rightarrow		• • • • • • • • • • • • • • • • • • •	>						2	7/8 7/8
Submission of Annual EM&A Report Submission of Annual Risk Assessment Report Submission of Draft Final Report (including database of all data collected) Submission of Final Report (including database of all data collected) Submission of Draft Executive Summary Submission of Final Executive Summary For East Tung Lung Chau Disposal Facility (subject to the actual disposal programme to be confirmed by CEDD) Submission of Monthly EM&A Report Submission of Quarterly EM&A Report	Sun 14/1/18 Thu 14/6/18 Fri 23/7/21 Fri 27/8/21 Fri 27/8/21 Fri 1/10/21 Sun 14/10/18 Fri 14/12/18	Mon 14/6/21 Fri 23/7/21 Fri 27/8/21 Fri 27/8/21 Fri 1/10/21 Fri 14/12/18 Fri 14/12/18 Fri 14/12/18	Summar						\langle				114/12	2	ne �	,		\rightarrow			>						2	7/8 7/8