
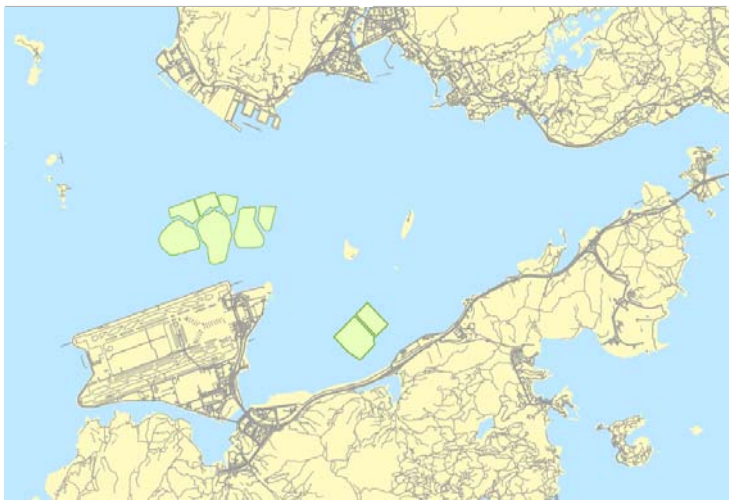




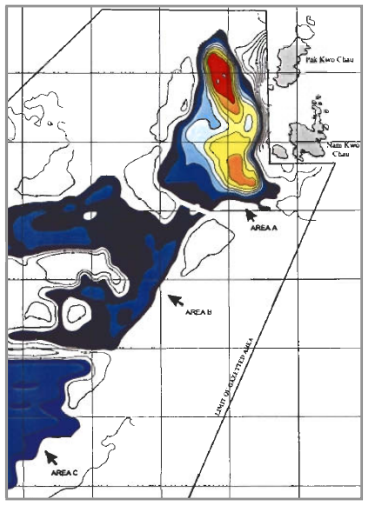





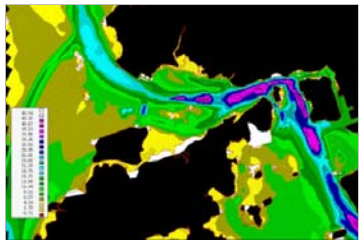

CEDD 土木工程拓展署
Civil Engineering and Development Department

Environmental Monitoring and Audit for Contaminated Mud Pits to the South of The Brothers and at East Sha Chau (2012-2017) – Investigation

Agreement No. CE 23/2012(EP)

26th Monthly Progress Report for Contaminated Mud Pits to the South of The Brothers and at East Sha Chau – October 2014

Revision 0

14 November 2014

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Document Code: 0175086 Monthly Oct_v0.doc

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Client:	Project No:
Civil Engineering and Development Department (CEDD)	0175086
Summary: This document presents the 26th monthly progress report for Contaminated Mud Pits at the South of The Brothers and at East Sha Chau.	Date: 14 November 2014 Approved by:  Craig A. Reid *Partner*

Revision	Description	By	Checked	Approved	Date
v0	26th Monthly Progress Report for ESC CMPs and SB CMPs	RC	JT	CAR	14/11/14

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Dredging, Management and Capping of Contaminated Sediment Disposal Facility to the South of The Brothers

Environmental Certification Sheet
EP-427/2011/A

Reference Document/Plan

Document/~~Plan~~ to be ~~Certified~~/ Verified:	26th Monthly Progress Report for Contaminated Mud Pits to the South of The Brothers and at East Sha Chau - October 2014
Date of Report:	14 November 2014
Date prepared by ET:	14 November 2014
Date received by IA:	14 November 2014

Reference EP Condition

Environmental Permit Condition: Condition No.: 4.4

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.

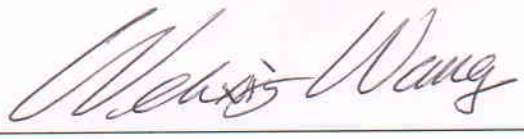
ET Certification

I hereby certify that the above referenced document/~~plan~~ complies with the above referenced condition of EP-427/2011/A

Craig A. Reid,
Environmental Team Leader:  Date: 14/11/2014

IA Verification

I hereby verify that the above referenced document/~~plan~~ complies with the above referenced condition of EP-427/2011/A

Dr Wang Wen Xiong,
Independent Auditor:  Date: 14/11/2014

CONTENTS

ANNEXES

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) - Investigation

26TH MONTHLY PROGRESS REPORT FOR OCTOBER 2014

1.1 BACKGROUND

1.1.1 Since early 1990s, contaminated sediment (1) arising from various construction works (e.g. dredging and reclamation projects) in Hong Kong has been disposed of at a series of seabed pits at East of Sha Chau (ESC). In late 2008, a review indicated that the existing and planned facilities at ESC would not be able to meet the disposal demand after 2012. In order to meet this demand, the Hong Kong Special Administrative Region Government (HKSARG) decided to implement a new contained aquatic disposal (CAD) (2) facility at the South of The Brothers (SB CMPs) which had been under consideration for a number of years.

1.1.2 The environmental acceptability of the construction and operation of the Project had been confirmed by findings of the associated Environmental Impact Assessment (EIA) study completed in 2005 under *Agreement No. CE 12/2002(EP)* (3). The Director of Environmental Protection (DEP) approved this EIA report under the *Environmental Impact Assessment Ordinance* (*Cap. 499*) (*EIAO*) in September 2005 (*EIA Register No.: AEIAR-089/2005*).

1.1.3 In accordance with the EIA recommendation, prior to commencement of construction works for the SB CMPs, the Civil Engineering and Development Department (CEDD) undertook a detailed review and update of the EIA findings for the SB site (4). Findings of the EIA review undertaken in 2009/ 2010 confirmed that the construction and operation of the SB site had been predicted to be environmentally acceptable.

(1) According to the Management Framework of Dredged/ Excavated Sediment of ETWB TC(W) No. 34/2002, contaminated sediment in general shall mean those sediment requiring Type 2 – Confined Marine Disposal as determined according to this TC(W).

(2) CAD options may involve use of excavated borrow pits, or may involve purpose-built excavated pits. CAD sites are those which involve filling a seabed pit with contaminated mud and capping it with uncontaminated material such that the original seabed level is restored and the contaminated material is isolated from the surrounding marine environment.7

(3) Detailed Site Selection Study for a Proposed Contaminated Mud Disposal Facility within the Airport East/ East of Sha Chau Area (Agreement No. CE 12/2002(EP))

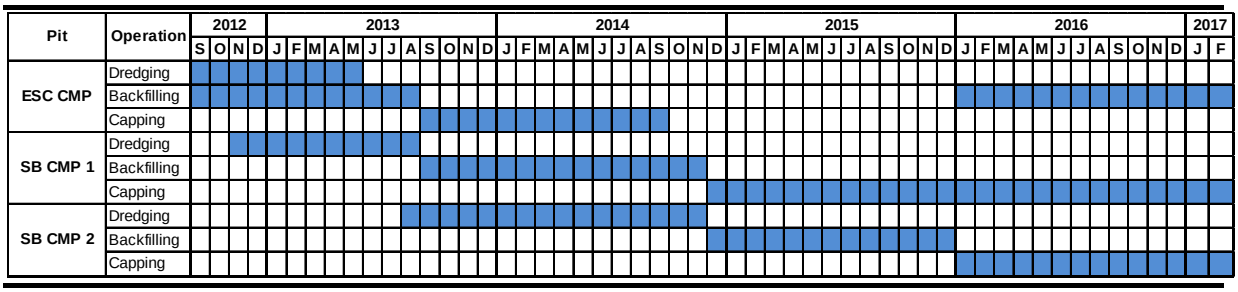
(4) Under the CEDD study *Contaminated Sediment Disposal Facility to the South of The Brothers (Agreement No. FM 2/2009)*

1.1.4 *Environmental Permits (EPs)* (*EP-312/2008/A* and *EP-427/2011A*) were issued by the Environmental Protection Department (EPD) to the CEDD, the Permit Holder, on 28 November 2008 for ESC CMP V and on 23 December 2011 for SB CMPs, respectively. Under the requirements of the *EPs*, an Environmental Monitoring and Audit (EM&A) programme as set out in the EM&A Manuals (1) (2) is required to be implemented for the CMPs.

1.1.5 The present EM&A programme under *Agreement No. CE 23/2012 (EP)* covers the dredging, disposal and capping operations of the SB CMPs as well as ESC CMPs. Detailed works schedule for both CMPs is shown in *Figure 1.1*. In October 2014, the following works were being undertaken at the CMPs:

- Capping was being undertaken at ESC CMP IVc and CMP Va;
- Disposal of contaminated mud was taking place at SB CMP 1; and
- Dredging operations were taking place at SB CMP 2.

Figure 1.1 Works Schedule for ESC CMPs and SB CMPs



1.2 REPORTING PERIOD

1.2.1 This *26th Monthly Progress Report* covers the EM&A activities for the reporting month of October 2014.

(1) ERM (2012) Environmental Monitoring and Audit (EM&A) Manual. Final First Review. Environmental Monitoring and Audit for Contaminated Mud Pits to the South of the Brothers and at East Sha Chau (2012-2017) – Investigation. Agreement No. CE 23/2012(EP). Submitted to EPD in November 2012.

(2) ERM (2010) Environmental Monitoring and Audit (EM&A) Manual. Final Second Review. Environmental Monitoring and Audit for Contaminated Mud Pit at Sha Chau (2009-2013) – Investigation. Agreement No. CE 4/2009(EP). Submitted to EPD in November 2010.

1.3 DETAILS OF SAMPLING AND LABORATORY TESTING ACTIVITIES

1.3.1 No monitoring activity was scheduled to be undertaken for ESC CMPs in October 2014.

1.3.2 The following monitoring activities have been undertaken for SB CMPs in October 2014:

- *Impact Water Quality Monitoring during Dredging Operations* was undertaken for CMP 2 three times per week on 3, 5, 7, 9, 11, 13, 15, 18, 20, 22, 24, 27, 29 and 31 October 2014;
- *Water Column Profiling* for CMP 1 was undertaken on 8 October 2014;
- *Routine Water Quality Monitoring* for CMP 1 was undertaken on 14 October 2014; and
- *Pit Specific Sediment Chemistry* for CMP 1 was undertaken on 16 October 2014.

1.4 DETAILS OF OUTSTANDING SAMPLING AND/OR ANALYSIS

1.4.1 No outstanding sampling remained for October 2014. The following laboratory analyses were still in progress during the preparation of this monthly report and hence are not presented in this monthly report:

- Laboratory analyses of water samples collected for *Routine Water Quality Monitoring of CMP 1* in October 2014.
- Laboratory analyses of sediment samples collected for *Pit Specific Sediment Chemistry of CMP 1* in October 2014.

1.4.2 A summary of field activities conducted are presented in *Annex A*.

1.5 BRIEF DISCUSSION OF THE MONITORING RESULTS FOR SB CMPS

1.5.1 Brief discussion of the monitoring results of the following activities for SB CMPs is presented in this *26th Monthly Progress Report*:

- *Cumulative Impact Sediment Chemistry of CMP 1* conducted in August 2014;
- *Pit Specific Sediment Chemistry of CMP 1* conducted in September 2014;
- *Sediment Chemistry after a Major Storm for CMP 1* conducted in September 2014;
- *Impact Water Quality Monitoring during Dredging Operations of CMP 2* conducted in October 2014; and
- *Water Column Profiling of CMP 1* conducted on 8 October 2014.

1.5.2 Cumulative Impact Sediment Chemistry of CMP 1 – August 2014

1.5.3 Monitoring locations for *Cumulative Impact Sediment Chemistry for CMP 1* are shown in *Figure 1.2*. A total of eleven (11) monitoring stations were sampled in August 2014.

1.5.4 Analyses of results for the *Cumulative Impact Sediment Chemistry Monitoring* indicated that the concentrations of most inorganic contaminants, except Arsenic, were below the Lower Chemical Exceedance Level (LCEL) in August 2014 (*Figures 1* and *2* of *Annex B*). Concentration of Arsenic exceeded the LCEL at Capped Pit station SB-RCA.

1.5.5 Whilst the average concentration of Arsenic in the Earth's crust is generally ~2mg/kg, significantly higher Arsenic concentrations (median = 14 mg/kg) have been recorded in Hong Kong's onshore sediments [1]. It is presumed that the natural concentrations of Arsenic are similar in onshore and offshore sediments [2], and relatively high Arsenic levels may thus occur throughout Hong Kong. Therefore, the LCEL exceedances of Arsenic are unlikely to be caused by the disposal operations at CMP 1 but rather as a result of naturally occurring deposits.

[1] Sewell RJ (1999) Geochemical Atlas of Hong Kong. Geotechnical Engineering Office, Government of the Hong Kong Special Administrative Region

[2] Whiteside PGD (2000) Natural geochemistry and contamination of marine sediments in Hong Kong. In: The Urban Geology of Hong Kong (ed Page A & Reels SJ). Geological Society of Hong Kong Bulletin No. 6, p109-121

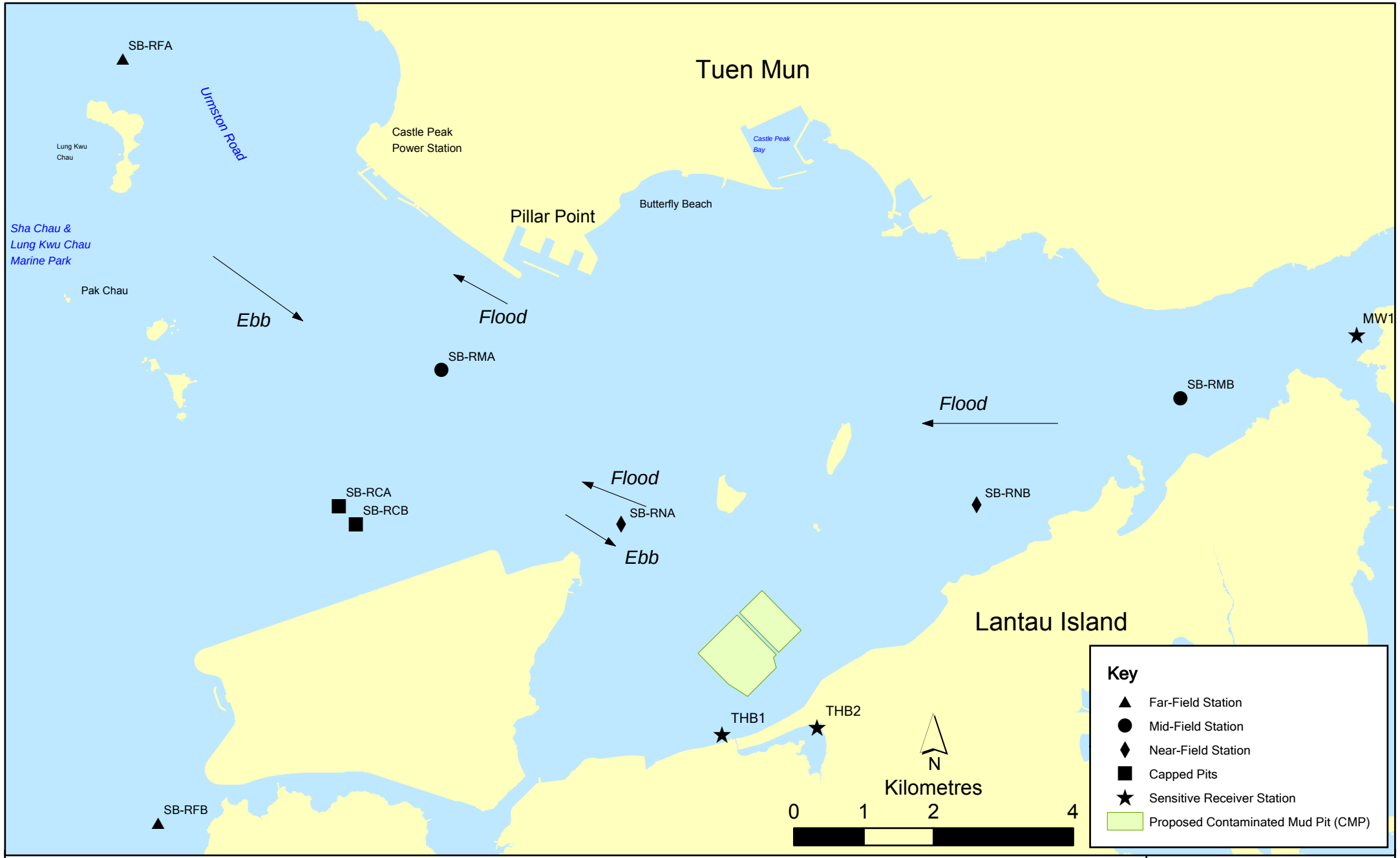


Figure 1.2

Cumulative Impacts Sediment Quality Monitoring Stations for South Brothers Facility

File: T:\GIS\CONTRACT\0175086\Mxd\0175086_4.2_SQMS_cum impact.mxd
Date: 11/12/2012

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1.5.6 For organic contaminants, concentration of Total Organic Carbon (TOC) at Tai Ho Bay Station 2 (THB2) was recorded to be higher than other stations (*Figure 3* of *Annex B*). Concentrations of Tributyltin (TBTs) were recorded to be higher at Near-field station SB-RNB and Mid-field station SB-RMB (*Figure 4* of *Annex B*). Total Dichloro-Diphenyl-Trichloroethane (DDT), 4,4'-Dichloro-Diphenyl-Dichloroethylene (4,4'-DDE), Total Polychlorinated Biphenyls (PCBs) as well as Low and High Molecular Weight Polycyclic Aromatic Hydrocarbons (MW PAHs) were recorded below the limit of reporting at all stations.

1.5.7 Overall, there is no evidence indicating any unacceptable environmental impacts to sediment quality as a result of the contaminated mud disposal operations at CMP 1 in August 2014.

1.5.8 Pit Specific Sediment Chemistry of CMP 1 – September 2014

1.5.9 Monitoring locations for *Pit Specific Sediment Chemistry for CMP 1* are shown in *Figure 1.3*. A total of six (6) monitoring stations were sampled in September 2014.

1.5.10 The concentrations of all inorganic contaminants were lower than the LCEL at all stations in September 2014 (*Figures 5* and *6* of *Annex B*).

1.5.11 For organic contaminants, the concentrations of TOC and TBTs were observed to be higher at Active Pit station SB-NPAB (*Figures 7* and *8* of *Annex B*). Low MW PAHs, High MW PAHs, Total DDT, 4,4'-DDE and Total PCBs were recorded below the limit of reporting at all stations in September 2014.

1.5.12 As higher TOC and TBTs concentrations were recorded within the Active Pit station only which were receiving contaminated mud during the reporting month, there is no evidence indicating any dispersal of contaminants from the active pit.

1.5.13 Overall, there is no evidence indicating any unacceptable environmental impacts to sediment quality as a result of the contaminated mud disposal operations at CMP 1 in September 2014.

1.5.14 Sediment Chemistry after a Major Storm of CMP 1 – September 2014

1.5.15 Sampling for Sediment Chemistry after a Major Storm Event was conducted at eleven (11) monitoring stations (*Figure 1.2*) on 19 September 2014 after the visit of Typhoon Kalmaegi, which led to the issue of Gale or Storm Wind Signal No.8 on 16 September 2014. The track of Doksuri is shown in *Figure 1.4*.

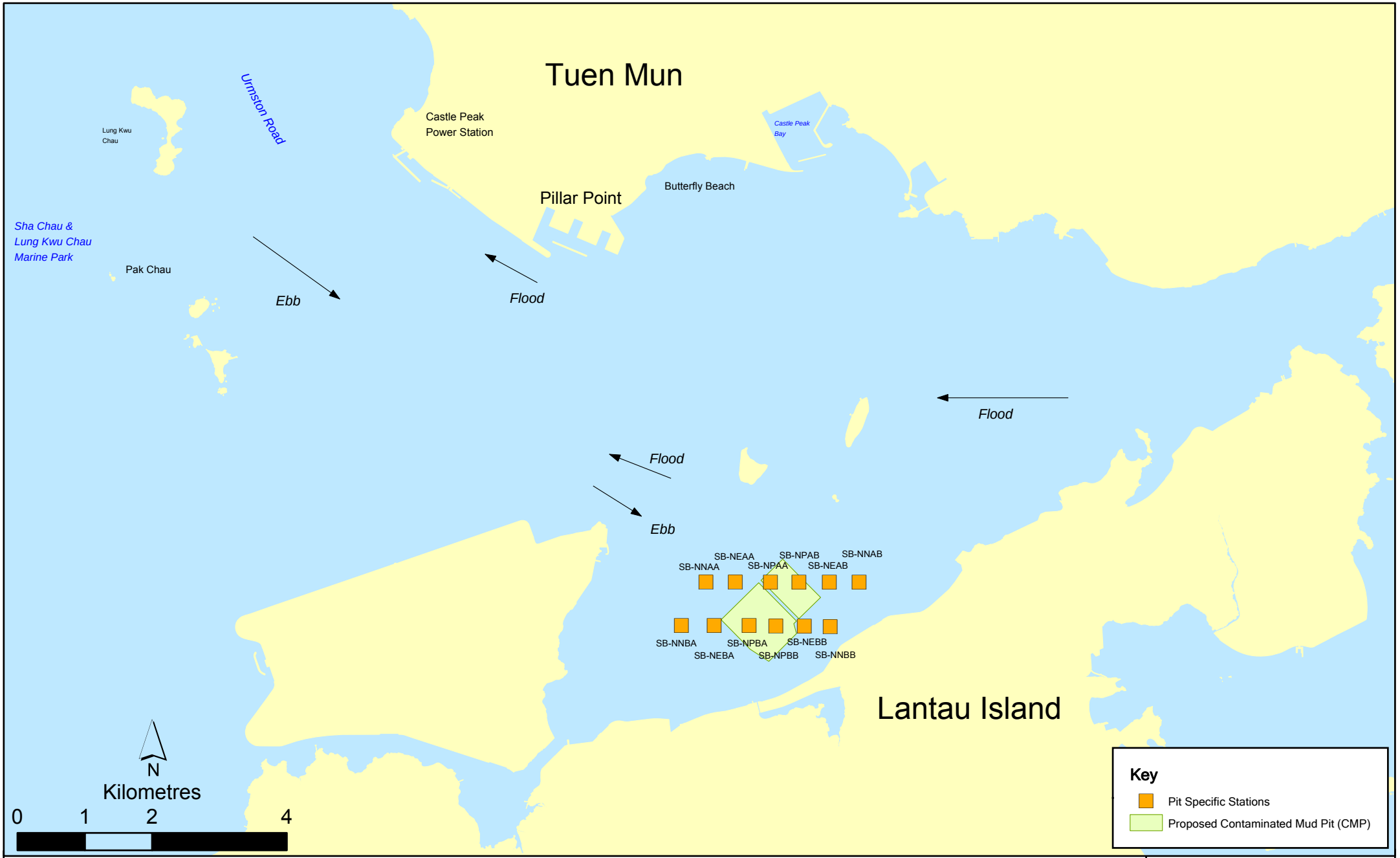

Figure 1.3

Pit Specific Sediment Quality Monitoring Stations for South Brothers Facility

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Date: 12/12/2012

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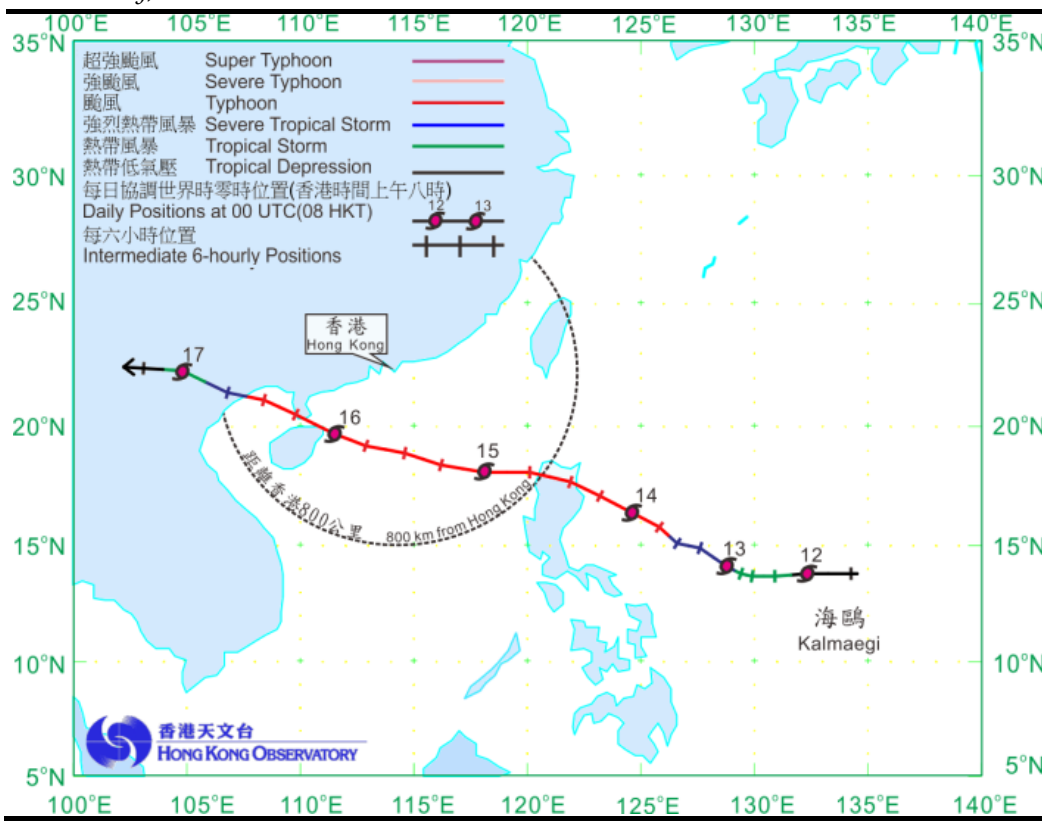
Figure 1.4 ***Track of Typhoon Kalmaegi from 12 to 17 September 2014*** ***(Source: Hong Kong Observatory)***



1.5.16 Analyses of results for the *Sediment Chemistry after a Major Storm* indicated that the concentrations of most inorganic contaminants, except Arsenic, were below the LCEL (*Figures 9* and 10 of *Annex B*). Concentration of Arsenic exceeded the LCEL at Capped Pit stations SB-RCA and SB-RCB. As discussed in *Section 1.5.5*, the slight exceedances of the LCEL for Arsenic are unlikely to be caused by the disposal operations at CMP 1 but rather as a result of naturally occurring deposits.

1.5.17 Overall, there appeared to be no evidence showing the failure of CMPs in retaining disposed mud or causing contamination of sediments after the major storm event in September 2014.

1.5.18 Impact Water Quality Monitoring during Dredging Operations of CMP 2 – October 2014

1.5.19 *Impact Water Quality Monitoring during Dredging Operations of CMP 2* was conducted three times per week from 1 to 31 October 2014 during the reporting period. On each survey day, monitoring was conducted during both mid-ebb and mid-flood tides at two Reference (Upstream) stations and five Impact (Downstream) stations of the dredging operations at CMP 2. Monitoring was also conducted at five Sensitive Receiver Stations situated in Ma Wan, Shum Shui Kok, Tai Mo To and Tai Ho Bay. A total of twelve (12) stations were monitored and locations of the sampling stations are shown in *Figure 1.5*.

1.5.20 Monitoring results are presented in *Table C1* of *Annex C*. Daily dredging volume in October 2014 is reported in *Annex D*. Levels of Dissolved Oxygen (DO), Turbidity and Suspended Solids (SS) generally complied with the Action and Limit Levels (see *Table C2* of *Annex C* for details) set in the *Baseline Monitoring Report* (1), except for the following occasion of exceedances discussed in *Table 1.1* below.

1.5.21 As presented in *Table 1.1*, the results indicated that the dredging operations at CMP 2 did not appear to cause any unacceptable deterioration in water quality during this reporting period. Therefore, no further mitigation measures, except for those recommended in the Environmental Permit (*EP-427/2011/A*), are considered necessary for the dredging operations.

(1) ERM (2012) Baseline Monitoring Report. Environmental Monitoring and Audit for Contaminated Mud Pits to the South of the Brothers and at East Sha Chau (2012-2017) – Investigation. Agreement No. CE 23/2012(EP). Submitted to EPD in October 2012.

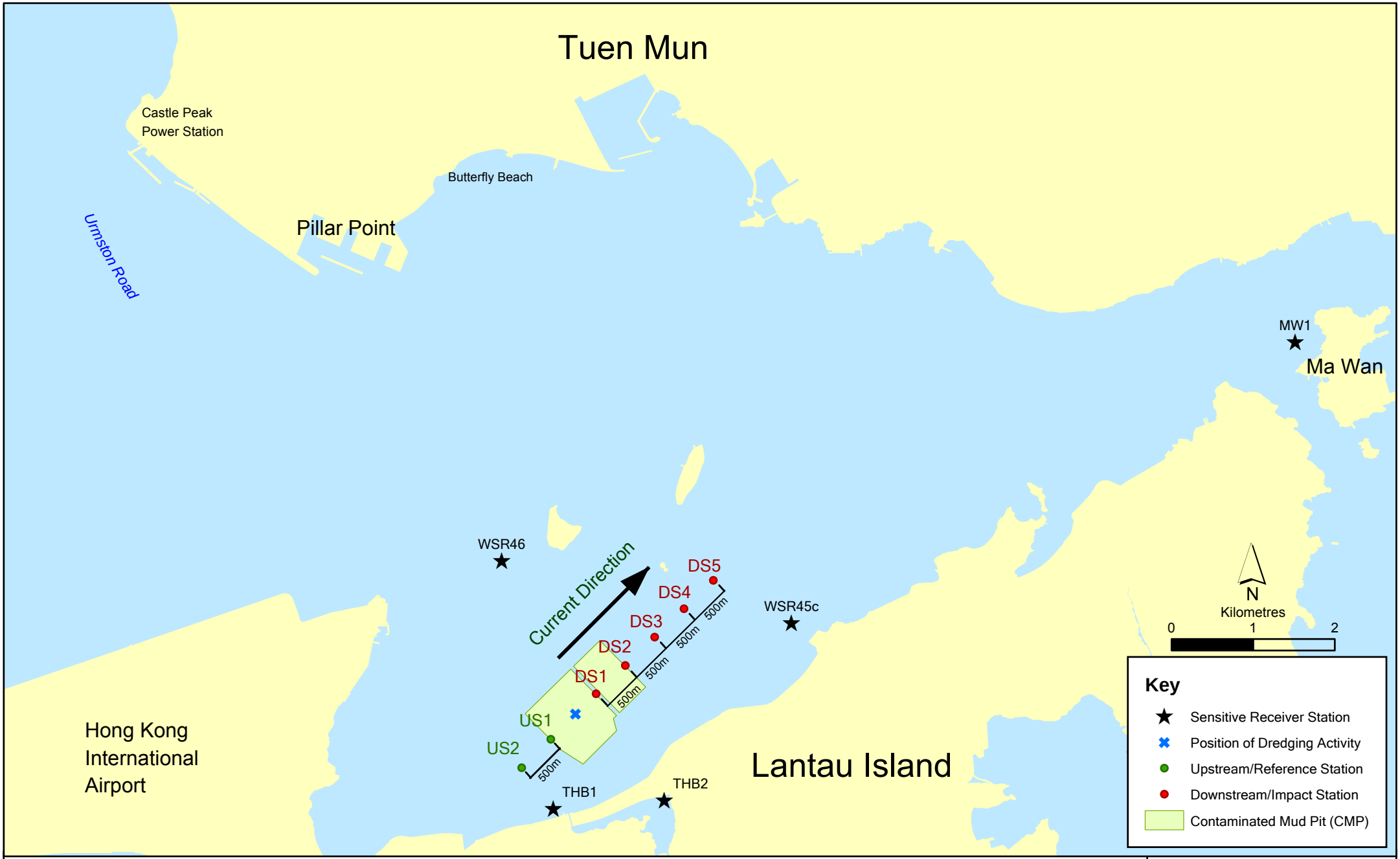


Figure 1.5

Indicative Dredging Impact Sampling Stations for South Brothers Facility

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

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Date: 30/12/2013

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Table 1.1 Details of Exceedances Recorded at CMP 2 between 1 and 31 October 2014

Date	Tide	Parameter	Station	Type	Remarks
7 October 2014	Mid-Flood	Turbidity	DS2	Action	These exceedances were not considered as indicating any unacceptable impacts from the dredging operations to Water Sensitive Receivers (WSRs) outside the works area due to the following reason: • Stations DS2, DS3, WSR45C and WSR46 are located further away from the works area of CMP 2 when compared to station DS1 at which the levels of Turbidity and SS did not exceed the Action and Limit Levels during the same tidal period.
9 October 2014	Mid-Flood	SS	DS3	Action	
9 October 2014	Mid-Flood	Turbidity	WSR45C	Limit	
9 October 2014	Mid-Flood	Turbidity	WSR46	Action	
11 October 2014	Mid-Flood	SS	DS2	Action	
20 October 2014	Mid-Flood	SS	DS2	Action	
20 October 2014	Mid-Flood	SS	DS3	Action	
27 October 2014	Mid-Ebb	SS	DS2	Action	
27 October 2014	Mid-Flood	SS	DS2	Action	
29 October 2014	Mid-Flood	SS	DS2	Action	
22 October 2014	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 reason: • Action / Limit Level Exceedances of Turbidity and SS were recorded at Stations DS1 and DS2 which are located in the vicinity of the works area during one tidal period only, and exceedances were not recorded at stations WSR45C and WSR46 which are the nearest WSRs. It is thus considered that the exceedances were not indicating any unacceptable impacts from the dredging operations to the nearby WSRs.
22 October 2014	Mid-Flood	Turbidity	DS2	Limit	
22 October 2014	Mid-Flood	SS	DS1	Action	
22 October 2014	Mid-Flood	SS	DS2	Action	
9 October 2014	Mid-Ebb	SS	DS1	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 reason: • Station DS1 is located close to the works area whilst stations DS4 and DS5 are located further away from the works area of CMP 2 when compared to stations DS2-3 at which the levels of Turbidity and SS did not exceed the Action and Limit Levels during the same tidal period. These exceedances were thus not considered as indicating any unacceptable impacts from the dredging operations to WSR outside the works area.
9 October 2014	Mid-Ebb	Turbidity	DS4	Action	
9 October 2014	Mid-Ebb	Turbidity	DS5	Action	
9 October 2014	Mid-Ebb	SS	DS4	Action	
9 October 2014	Mid-Ebb	SS	DS5	Action	

1.5.22 Water Column Profiling of CMP 1 – October 2014

1.5.23 *Water Column Profiling* was undertaken at a total of two sampling stations (Upstream and Downstream stations) on 8 October 2014. The water quality monitoring results have been assessed for compliance with the Water Quality Objectives (WQOs) through a review of the Environmental Protection Department (EPD) routine water quality monitoring data for the wet season period (April to October) of 2003-2012 from stations in the North Western Water Control Zone (WCZ), where CMP is located. The monitoring results were also compared with the Action and Limit Levels set in *Baseline Monitoring Report* (see *Table C2* of *Annex C* for details).

In-situ Measurements

1.5.24 Analyses of results for October 2014 indicated that levels of Salinity, turbidity, DO and pH complied with the WQOs at both Downstream and Upstream stations (*Table C3* of *Annex C*).

Laboratory Measurements for SS

1.5.25 Analyses of results for September 2014 indicated that the SS levels at Upstream station complied with the WQO. The Downstream station exceeded the WQO. SS levels at all stations complied with the Action and Limit Levels *(Table C3* of *Annex C*).

1.5.26 Overall, the monitoring results indicated that the mud disposal operation at CMP 1 did not appear to cause any deterioration in water quality during this reporting period.

1.6 ACTIVITIES SCHEDULED FOR THE NEXT MONTH

1.6.1 The following monitoring activities will be conducted in the next monthly period of November 2014 for SB CMPs:

- *Pit Specific Sediment Chemistry of CMP 1;*
- *Impact Monitoring during Dredging Operations of CMP 2;*
- *Routine Water Quality Monitoring of CMP 1; and*
- *Water Column Profiling of CMP 1.*

1.6.2 No monitoring activity is scheduled to be undertaken in the next monthly period of November 2014 for ESC CMPs.

1.6.3 The sampling schedule is presented in *Annex A*.

1.7 STUDY PROGRAMME

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

Annex A

Sampling Schedule

Annex A1 - Environmental Monitoring and Audit Sampling Schedule for East of Sha Chau (September 2012 - February 2017)

Pit Specific Sediment Chemistry	Code	2012 S	O	N	D	2013 J	F	M	A	M	J	J	A	S	O	N	D	2014 J	F	M	A	M	J	J	A	S	O	N	D	2015 J	F	M	A	M	J	J	A	S	O	N	D	2016 J	F	M	A	M	J	J	A	S	O	N	D	2017 J	F
Active-Pit																																																						
	ESC-NPDA	*	*	*	*	*	*	*	*	*	*	*	*																															*	*	*	*	*	*	*	*	*	*	*	*	*	*
	ESC-NPDB	*	*	*	*	*	*	*	*	*	*	*	*																															*	*	*	*	*	*	*	*	*	*	*	*	*	*
Pit-Edge																																																								
	ESC-NEDA	*	*	*	*	*	*	*	*	*	*	*	*																															*	*	*	*	*	*	*	*	*	*	*	*	*	*
	ESC-NEDB	*	*	*	*	*	*	*	*	*	*	*	*																															*	*	*	*	*	*	*	*	*	*	*	*	*	*
Near-Pit																																																								
	ESC-NNDA	*	*	*	*	*	*	*	*	*	*	*	*																															*	*	*	*	*	*	*	*	*	*	*	*	*	*
	ESC-NNDB	*	*	*	*	*	*	*	*	*	*	*	*																															*	*	*	*	*	*	*	*	*	*	*	*	*	*

Cumulative Impact Sediment Chemistry	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F
Near-field Stations																																																							
ESC-RNA				*		*				*		*																															*					*							*	
ESC-RNB				*		*				*		*																															*					*							*	
Mid-field Stations																																																								
ESC-RMA				*		*				*		*																															*					*							*	
ESC-RMB				*		*				*		*																															*					*							*	
Capped Pit Stations																																																								
ESC-RCA				*		*				*		*																															*					*							*	
ESC-RCB				*		*				*		*																															*					*							*	
Far-Field Stations																																																								
ESC-RFA				*		*				*		*																															*					*							*	
ESC-RFB				*		*				*		*																															*					*							*	
Ma Wan Station																																																								
MW1				*		*				*		*																															*					*							*	

Sediment Toxicity Tests	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F
Near-Field Stations																																																						
ESC-TDA						*						*																															*					*							*	
ESC-TDB						*						*																															*					*							*	
Reference Stations																																																								
ESC-TRA						*						*																															*					*							*	
ESC-TRB						*						*																															*					*							*	
Ma Wan Station																																																								
MW1						*						*																															*					*							*	

Tissue/ Whole Body Sampling	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F
Impact Stations																																																					
ESC-INA						*						*																															*					*							*	
ESC-INB						*						*																															*					*							*	
Reference																																																							
ESC-TNA						*						*																															*					*							*	
ESC-TNB						*						*																															*					*							*	
ESC-TSA						*						*																															*					*							*	
ESC-TSB						*						*																															*					*							*	

Demersal Trawling	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F
Impact Stations																																																					
ESC-INA					*	*					*	*																															*	*					*	*						*	*
ESC-INB					*	*					*	*																															*	*					*	*						*	*
Reference Stations																																																								
ESC-TNA					*	*					*	*																															*	*					*	*						*	*
ESC-TNB					*	*					*	*																															*	*					*	*						*	*
ESC-TSA					*	*					*	*																															*	*					*	*						*	*
ESC-TSB					*	*					*	*																															*	*					*	*						*	*

Water Column Profiling		S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F
Plume Stations	WCP1	*	*	*	*	*	*	*	*	*	*	*	*																															*	*	*	*	*	*	*	*	*	*	*	*	*	*
	WCP2	*	*	*	*	*	*	*	*	*	*	*	*																															*	*	*	*	*	*	*	*	*	*	*	*	*	*

Annex A1 - Environmental Monitoring and Audit Sampling Schedule for East of Sha Chau (September 2012 - February 2017)

	2012				2013												2014												2015												2016												2017	
Benthic Recolonisation Studies	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F
Capped Contaminated Mud Pits IVa-c																																																		
ESC-CPA				*								*				*								*				*								*				*								*				*		
ESC-CPB				*								*				*								*				*								*				*								*				*		
ESC-CPC				*								*				*								*				*								*				*								*				*		
Reference Stations																																																								
ESC-RBA				*								*				*								*				*								*				*								*				*		
ESC-RBB				*								*				*								*				*								*				*								*				*		
ESC-RBC				*								*				*								*				*								*				*								*				*		

Impact Monitoring for Dredging	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F
Upstream/Reference Stations																																																						
US1	*	*	*	*	*	*	*	*	*																																												
US2	*	*	*	*	*	*	*	*	*																																												
Downstream/Impact Stations																																																						
DS1	*	*	*	*	*	*	*	*	*																																											
DS2	*	*	*	*	*	*	*	*	*																																											
DS3	*	*	*	*	*	*	*	*	*																																											
DS4	*	*	*	*	*	*	*	*	*																																											
DS5	*	*	*	*	*	*	*	*	*																																											
Ma Wan Station																																																						
MW1	*	*	*	*	*	*	*	*	*																																											

Capping	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F
Ebb Tide																																																					
Impact Station																																																						
ESC-IPE1																*		*				*		*				*																											
ESC-IPE2																*		*				*		*				*																											
ESC-IPE3																*		*				*		*				*																											
ESC-IPE4																*		*				*		*				*																											
ESC-IPE5																*		*				*		*				*																											
Intermediate Station																																																						
ESC-INE1																*		*				*		*				*																											
ESC-INE2																*		*				*		*				*																											
ESC-INE3																*		*				*		*				*																											
ESC-INE4																*		*				*		*				*																											
ESC-INE5																*		*				*		*				*																											
Reference Station																																																						
ESC-RFE1																*		*				*		*				*																											
ESC-RFE2																*		*				*		*				*																											
ESC-RFE3																*		*				*		*				*																											
ESC-RFE4																*		*				*		*				*																											
ESC-RFE5																*		*				*		*				*																											
Ma Wan Station																																																						
MW1																*		*				*		*				*																											
Flood Tide																																																						
Impact Station																																																						
ESC-IPF1																*		*				*		*				*																											
ESC-IPF2																*		*				*		*				*																											
ESC-IPF3																*		*				*		*				*																											
Intermediate Station																																																						
ESC-INF1																*		*				*		*				*																											
ESC-INF2																*		*				*		*				*																											
ESC-INF3																*		*				*		*				*																											
Reference Station																																																						
ESC-RFF1																*		*				*		*				*																											
ESC-RFF2																*		*				*		*				*																											
ESC-RFF3																*		*				*		*				*																											
Ma Wan Station																																																						
MW1																*		*				*		*				*																											

Annex A1 - Environmental Monitoring and Audit Sampling Schedule for East of Sha Chau (September 2012 - February 2017)

		2012				2013												2014												2015												2016												2017	
Routine Water Quality Monitoring		S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F
Ebb Tide																																																				
Impact Station																																																					
	ESC-IPE1		*	*		*	*		*	*		*	*																														*	*		*	*		*	*		*	*		*	*
	ESC-IPE2		*	*		*	*		*	*		*	*																														*	*		*	*		*	*		*	*		*	*
	ESC-IPE3		*	*		*	*		*	*		*	*																														*	*		*	*		*	*		*	*		*	*
	ESC-IPE4		*	*		*	*		*	*		*	*																														*	*		*	*		*	*		*	*		*	*
	ESC-IPE5		*	*		*	*		*	*		*	*																														*	*		*	*		*	*		*	*		*	*
Intermediate Station																																																					
	ESC-INE1		*	*		*	*		*	*		*	*																														*	*		*	*		*	*		*	*		*	*
	ESC-INE2		*	*		*	*		*	*		*	*																														*	*		*	*		*	*		*	*		*	*
	ESC-INE3		*	*		*	*		*	*		*	*																														*	*		*	*		*	*		*	*		*	*
	ESC-INE4		*	*		*	*		*	*		*	*																														*	*		*	*		*	*		*	*		*	*
	ESC-INE5		*	*		*	*		*	*		*	*																														*	*		*	*		*	*		*	*		*	*
Reference Station																																																					
	ESC-RFE1		*	*		*	*		*	*		*	*																														*	*		*	*		*	*		*	*		*	*
	ESC-RFE2		*	*		*	*		*	*		*	*																														*	*		*	*		*	*		*	*		*	*
	ESC-RFE3		*	*		*	*		*	*		*	*																														*	*		*	*		*	*		*	*		*	*
	ESC-RFE4		*	*		*	*		*	*		*	*																														*	*		*	*		*	*		*	*		*	*
	ESC-RFE5		*	*		*	*		*	*		*	*																														*	*		*	*		*	*		*	*		*	*
Ma Wan Station																																																					
	MW1		*	*		*	*		*	*		*	*																														*	*		*	*		*	*		*	*		*	*
Flood Tide																																																				
Impact Station																																																					
	ESC-IPF1		*	*		*	*		*	*		*	*																														*	*		*	*		*	*		*	*		*	*
	ESC-IPF2		*	*		*	*		*	*		*	*																														*	*		*	*		*	*		*	*		*	*
	ESC-IPF3		*	*		*	*		*	*		*	*																														*	*		*	*		*	*		*	*		*	*
Intermediate Station																																																					
	ESC-INF1		*	*		*	*		*	*		*	*																														*	*		*	*		*	*		*	*		*	*
	ESC-INF2		*	*		*	*		*	*		*	*																														*	*		*	*		*	*		*	*		*	*
	ESC-INF3		*	*		*	*		*	*		*	*																														*	*		*	*		*	*		*	*		*	*
Reference Station																																																					
	ESC-RFF1		*	*		*	*		*	*		*	*																														*	*		*	*		*	*		*	*		*	*
	ESC-RFF2		*	*		*	*		*	*		*	*																														*	*		*	*		*	*		*	*		*	*
	ESC-RFF3		*	*		*	*		*	*		*	*																														*	*		*	*		*	*		*	*		*	*
Ma Wan Station																																																					
	MW1		*	*		*	*		*	*		*	*																														*	*		*	*		*	*		*	*		*	*

Annex A2 - Environmental Monitoring and Audit Sampling Schedule for South of The Brothers (July 2012 - February 2017)

			2012						2013												2014												2015												2016												2017	
Baseline Monitoring Prior to Dredging	**Code**	**Frequency**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**
Far Field Stations																																																						
	SB-WFA	3 days per week for 4 weeks	*	*																																																	
	SB-WFB	3 days per week for 4 weeks	*	*																																																
Mid Field Stations																																																					
	SB-WMA	3 days per week for 4 weeks	*	*																																																
	SB-WMB	3 days per week for 4 weeks	*	*																																																
Near Field Stations																																																					
	SB-WNAA	3 days per week for 4 weeks	*	*																																																
	SB-WNAB	3 days per week for 4 weeks	*	*																																																
	SB-WNBA	3 days per week for 4 weeks	*	*																																																
	SB-WNBB	3 days per week for 4 weeks	*	*																																																
Reference Stations																																																					
	NM1	3 days per week for 4 weeks	*	*																																																
	NM2	3 days per week for 4 weeks	*	*																																																
	NM3	3 days per week for 4 weeks	*	*																																																
	NM5	3 days per week for 4 weeks	*	*																																																
	NM6	3 days per week for 4 weeks	*	*																																																
Sensitive Receiver Stations																																																				
	MW1	3 days per week for 4 weeks	*	*																																																
	THB1	3 days per week for 4 weeks	*	*																																																
	THB2	3 days per week for 4 weeks	*	*																																																
	WSR45C	3 days per week for 4 weeks	*	*																																																
	WSR46	3 days per week for 4 weeks	*	*																																																

Impact Monitoring for Dredging			**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**
Upstream Stations																																																								
	US1	3 days per week					*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*																								
	US2	3 days per week					*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*																								
Downstream Stations																																																						
	DS1	3 days per week					*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*																								
	DS2	3 days per week					*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*																								
	DS3	3 days per week					*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*																								
	DS4	3 days per week					*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*																								
	DS5	3 days per week					*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*																								
Sensitive Receiver Stations																																																						
	MW1	3 days per week					*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*																								
	THB1	3 days per week					*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*																								
	THB2	3 days per week					*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*																								
	WSR45C	3 days per week					*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*																								
	WSR46	3 days per week					*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*																								

Pit Specific Sediment Chemistry			**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**
SB CMP 1 Active																																																						
Near-Pit																																																						
	SB-NNAA	Monthly														12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12																								
	SB-NNAB	Monthly														12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12																								
Pit-Edge																																																					
	SB-NEAA	Monthly														12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12																								
	SB-NEAB	Monthly														12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12																								
Active-Pit																																																					
	SB-NPAA	Monthly														12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12																								
	SB-NPAB	Monthly														12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12																								
SB CMP 2 Active																																																						
Near-Pit																																																					
	SB-NNBA	Monthly																															12	12	12	12	12	12	12	12	12	12	12	12												
	SB-NNBB	Monthly																															12	12	12	12	12	12	12	12	12	12	12	12												
Pit-Edge																																																					
	SB-NEBA	Monthly																															12	12	12	12	12	12	12	12	12	12	12	12												
	SB-NEBB	Monthly																															12	12	12	12	12	12	12	12	12	12	12	12												
Active-Pit																																																					
	SB-NPBA	Monthly																															12	12	12	12	12	12	12	12	12	12	12	12												
	SB-NPBB	Monthly																															12	12	12	12	12	12	12	12	12	12	12	12												

Annex A2 - Environmental Monitoring and Audit Sampling Schedule for South of The Brothers (July 2012 - February 2017)

			2012						2013												2014												2015												2016												2017	
Cumulative Impact Sediment Chemistry			J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F
Near-field Stations																																																							
	SB-RNA	4 times per year														12				12		12				12		12				12		12				12		12				12														
	SB-RNB	4 times per year														12				12		12				12		12				12		12				12		12				12														
Mid-field Stations																																																								
	SB-RMA	4 times per year														12				12		12				12		12				12		12				12		12				12														
	SB-RMB	4 times per year														12				12		12				12		12				12		12				12		12				12														
Far-Field Stations																																																							
	SB-RFA	4 times per year														12				12		12				12		12				12		12				12		12				12														
	SB-RFB	4 times per year														12				12		12				12		12				12		12				12		12				12														
Capped Pit Stations																																																						
	SB-RCA	4 times per year														12				12		12				12		12				12		12				12		12				12														
	SB-RCB	4 times per year														12				12		12				12		12				12		12				12		12				12														
Sensitive Receiver Stations																																																						
	MW1	4 times per year														12				12		12				12		12				12		12				12		12				12														
	THB1	4 times per year														12				12		12				12		12				12		12				12		12				12														
	THB2	4 times per year														12				12		12				12		12				12		12				12		12				12														

			2012						2013												2014												2015												2016												2017	
Sediment Toxicity Tests			J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F
SB CMP 1 Active																																																					
Reference																																																							
	SB-TRA	2 times per year														5						5				5																														
	SB-TRB	2 times per year														5						5				5																														
Near-Field																																																						
	SB-TAA	2 times per year														5						5				5																														
	SB-TAB	2 times per year														5						5				5																														
Sensitive Receiver Stations																																																					
	MW1	2 times per year														5						5				5																														
	THB1	2 times per year														5						5				5																														
	THB2	2 times per year														5						5				5																														
SB CMP 2 Active																																																					
Reference																																																						
	SB-TRA	2 times per year																																5						5																
	SB-TRB	2 times per year																																5						5																
Near-Field																																																					
	SB-TBA	2 times per year																																5						5																
	SB-TBB	2 times per year																																5						5																
Sensitive Receiver Stations																																																					
	MW1	2 times per year																																5						5																
	THB1	2 times per year																																5						5																
	THB2	2 times per year																																5						5																

			2012						2013												2014												2015												2016												2017	
Tissue/ Whole Body Sampling			J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F
Near-Pit Stations																																																						
	SB-INA	2 times per year																				*						*						*						*																
	SB-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																				*						*						*						*																

			2012						2013												2014												2015												2016												2017	
Demersal Trawling			J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F
Impact																																																						
	SB-INA 1-5	4 times per year														5					5	5				5	5					5	5					5	5																
	SB-INB 1-5	4 times per year														5					5	5				5	5					5	5					5	5																
Reference North																																																					
	TNA 1-5	4 times per year														5					5	5				5	5					5	5					5	5																
	TNB 1-5	4 times per year														5					5	5				5	5					5	5					5	5																
Reference South																																																					
	TSA 1-5	4 times per year														5					5	5				5	5					5	5					5	5																
	TSB 1-5	4 times per year														5					5	5				5	5					5	5					5	5																

Annex A2 - Environmental Monitoring and Audit Sampling Schedule for South of The Brothers (July 2012 - February 2017)

			2012						2013												2014												2015												2016												2017	
Routine Water Quality Monitoring			J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F
Ebb Tide																																																										
Impact Stations Downcurrent																																																										
	SB-IPE1	8 times per year														8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8														
	SB-IPE2	8 times per year														8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8														
	SB-IPE3	8 times per year														8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8														
	SB-IPE4	8 times per year														8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8														
	SB-IPE5	8 times per year														8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8														
Intermediate Stations Downcurrent																																																											
	SB-INE1	8 times per year														8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8														
	SB-INE2	8 times per year														8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8														
	SB-INE3	8 times per year														8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8														
	SB-INE4	8 times per year														8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8														
	SB-INE5	8 times per year														8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8														
Reference Stations Upcurrent																																																										
	SB-RFE1	8 times per year														8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8														
	SB-RFE2	8 times per year														8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8														
	SB-RFE3	8 times per year														8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8														
	SB-RFE4	8 times per year														8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8														
	SB-RFE5	8 times per year														8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8														
Sensitive Receiver Stations																																																											
	MW1	8 times per year														8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8														
	THB1	8 times per year														8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8														
	THB2	8 times per year														8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8														
	WSR45C	8 times per year														8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8														
	WSR46	8 times per year														8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8														
Flood Tide																																																											
Impact Stations Downcurrent																																																										
	SB-IPF1	8 times per year														8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8														
	SB-IPF2	8 times per year														8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8														
	SB-IPF3	8 times per year														8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8														
Intermediate Stations Downcurrent																																																											
	SB-INF1	8 times per year														8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8														
	SB-INF2	8 times per year														8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8														
	SB-INF3	8 times per year														8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8														
Reference Stations Upcurrent																																																											
	SB-RFF1	8 times per year														8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8														
	SB-RFF2	8 times per year														8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8														
	SB-RFF3	8 times per year														8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8														
Sensitive Receiver Stations																																																											
	MW1	8 times per year														8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8														
	THB1	8 times per year														8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8														
	THB2	8 times per year														8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8														
	WSR45C	8 times per year														8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8														
	WSR46	8 times per year														8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8														

Water Column Profiling			J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F
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														
	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														

Annex A2 - Environmental Monitoring and Audit Sampling Schedule for South of The Brothers (July 2012 - February 2017)

			2012						2013												2014												2015												2016												2017	
Capping Water Quality Monitoring			J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F
Ebb Tide																																																					
Impact Stations Downcurrent																																																						
	SB-IPE1	8 times per year																															3	3		3	3		3	3		3	3		3	3		3	3		3	3			
	SB-IPE2	8 times per year																															3	3		3	3		3	3		3	3		3	3		3	3			
	SB-IPE3	8 times per year																															3	3		3	3		3	3		3	3		3	3		3	3			
	SB-IPE4	8 times per year																															3	3		3	3		3	3		3	3		3	3		3	3			
	SB-IPE5	8 times per year																															3	3		3	3		3	3		3	3		3	3		3	3			
Intermediate Stations Downcurrent																																																					
	SB-INE1	8 times per year																															3	3		3	3		3	3		3	3		3	3		3	3			
	SB-INE2	8 times per year																															3	3		3	3		3	3		3	3		3	3		3	3			
	SB-INE3	8 times per year																															3	3		3	3		3	3		3	3		3	3		3	3			
	SB-INE4	8 times per year																															3	3		3	3		3	3		3	3		3	3		3	3			
	SB-INE5	8 times per year																															3	3		3	3		3	3		3	3		3	3		3	3			
Reference Stations Upcurrent																																																					
	SB-RFE1	8 times per year																															3	3		3	3		3	3		3	3		3	3		3	3			
	SB-RFE2	8 times per year																															3	3		3	3		3	3		3	3		3	3		3	3			
	SB-RFE3	8 times per year																															3	3		3	3		3	3		3	3		3	3		3	3			
	SB-RFE4	8 times per year																															3	3		3	3		3	3		3	3		3	3		3	3			
	SB-RFE5	8 times per year																															3	3		3	3		3	3		3	3		3	3		3	3			
Sensitive Receiver Stations																																																					
	MW1	8 times per year																															3	3		3	3		3	3		3	3		3	3		3	3			
	THB1	8 times per year																																																			
	THB2	8 times per year																																																		
	WSR45C	8 times per year																															3	3		3	3		3	3		3	3		3	3		3	3			
	WSR46	8 times per year																															3	3		3	3		3	3		3	3		3	3		3	3			
Flood Tide																																																					
Impact Stations Downcurrent																																																					
	SB-IPF1	8 times per year																															3	3		3	3		3	3		3	3		3	3		3	3			
	SB-IPF2	8 times per year																															3	3		3	3		3	3		3	3		3	3		3	3			
	SB-IPF3	8 times per year																															3	3		3	3		3	3		3	3		3	3		3	3			
Intermediate Stations Downcurrent																																																					
	SB-INF1	8 times per year																															3	3		3	3		3	3		3	3		3	3		3	3			
	SB-INF2	8 times per year																															3	3		3	3		3	3		3	3		3	3		3	3			
	SB-INF3	8 times per year																															3	3		3	3		3	3		3	3		3	3		3	3			
Reference Stations Upcurrent																																																					
	SB-RFF1	8 times per year																															3	3		3	3		3	3		3	3		3	3		3	3			
	SB-RFF2	8 times per year																															3	3		3	3		3	3		3	3		3	3		3	3			
	SB-RFF3	8 times per year																															3	3		3	3		3	3		3	3		3	3		3	3			
Sensitive Receiver Stations																																																					
	MW1	8 times per year																															3	3		3	3		3	3		3	3		3	3		3	3			
	THB1	8 times per year																																																			
	THB2	8 times per year																																																		
	WSR45C	8 times per year																															3	3		3	3		3	3		3	3		3	3		3	3			
	WSR46	8 times per year																															3	3		3	3		3	3		3	3		3	3		3	3			

Benthic Recolonisation Studies			J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F
Capped Contaminated Mud Pits																																																									
	SB-CPA	2 times per year																																																									
	SB-CPB	2 times per year																																																								
Reference Stations																																																										
	RBA	2 times per year																																																									
	RBB	2 times per year																																																								
	RBC	2 times per year																																																								

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

Annex B

Graphical Presentations

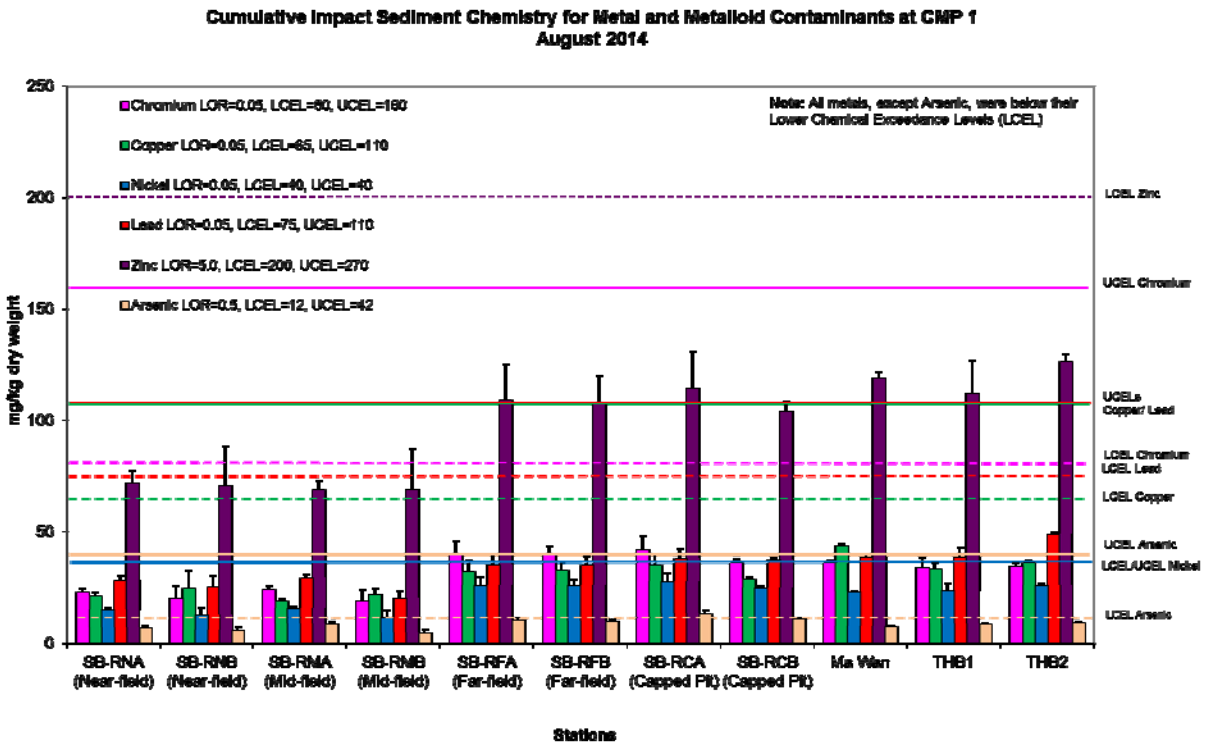


Figure 1: Concentration of Metals (Cr, Cu, Ni, Pb, Zn, As; mean +SD) in sediment samples collected from *Cumulative Impact Sediment Chemistry* for CMP 1 in August 2014.

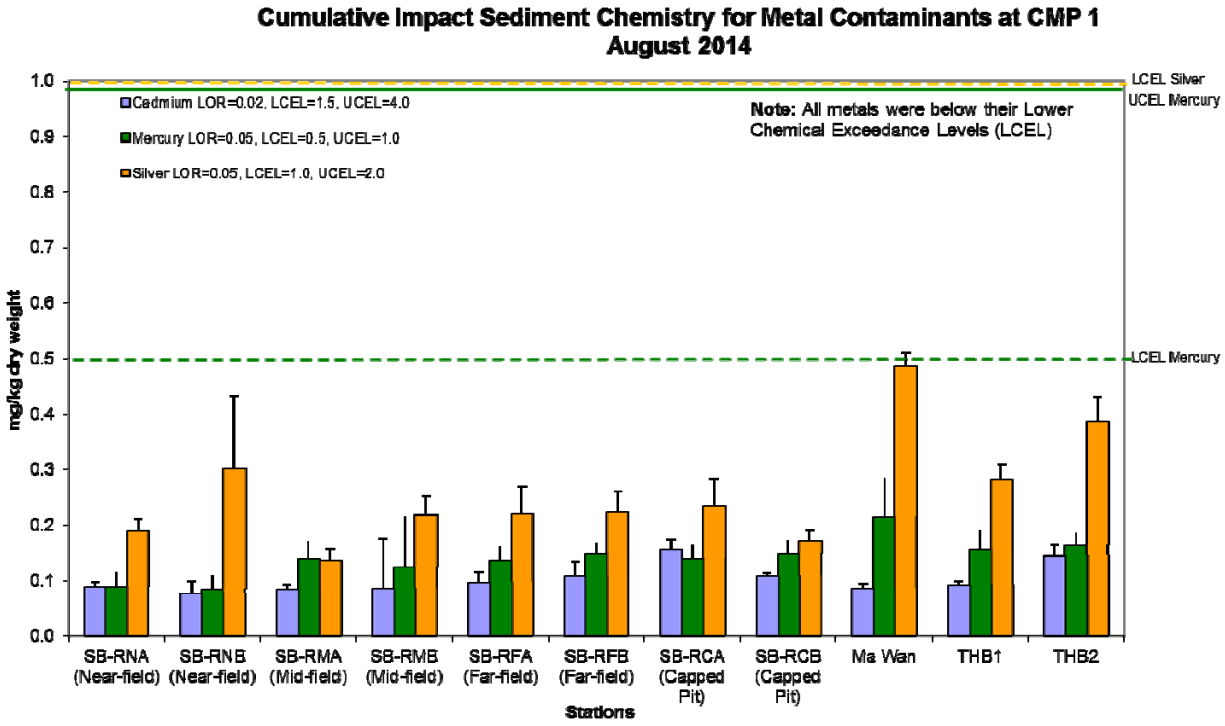


Figure 2: Concentration of Metals (Cd, Hg, Ag; mean +SD) in sediment samples collected from *Cumulative Impact Sediment Chemistry* for CMP 1 in August 2014.

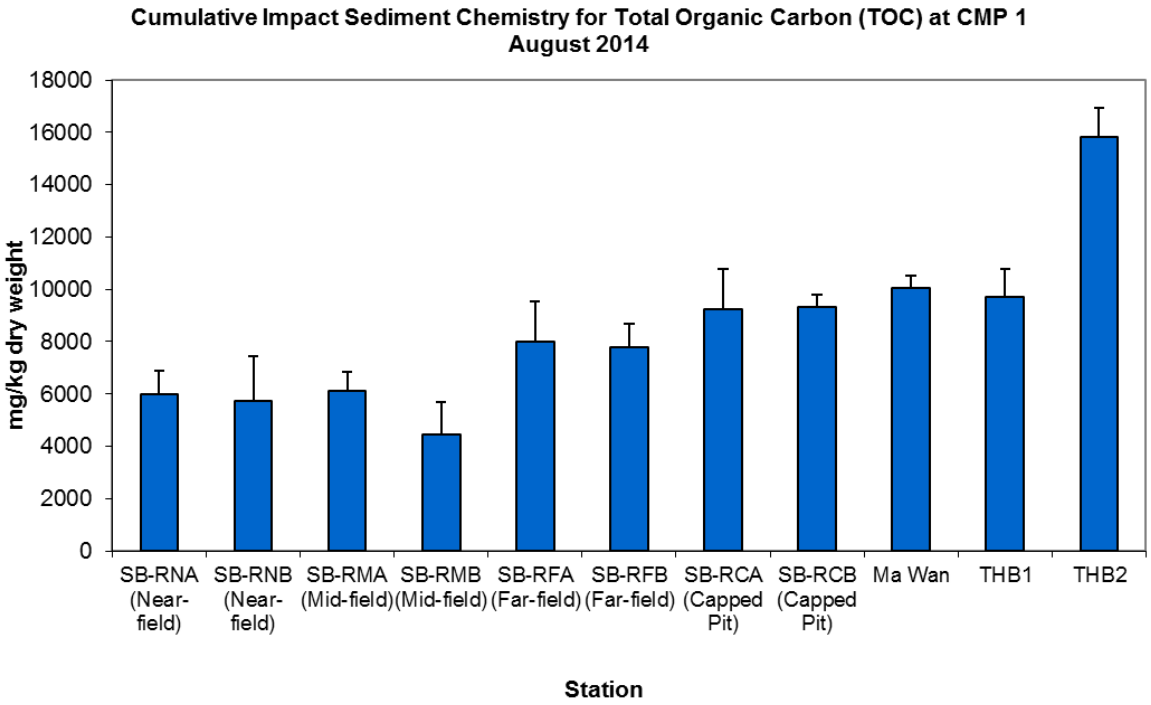


Figure 3: Concentration of Total Organic Carbon (mg/kg dry weight; mean +SD) in sediment samples collected from *Cumulative Impact Sediment Chemistry* for CMP 1 in August 2014.

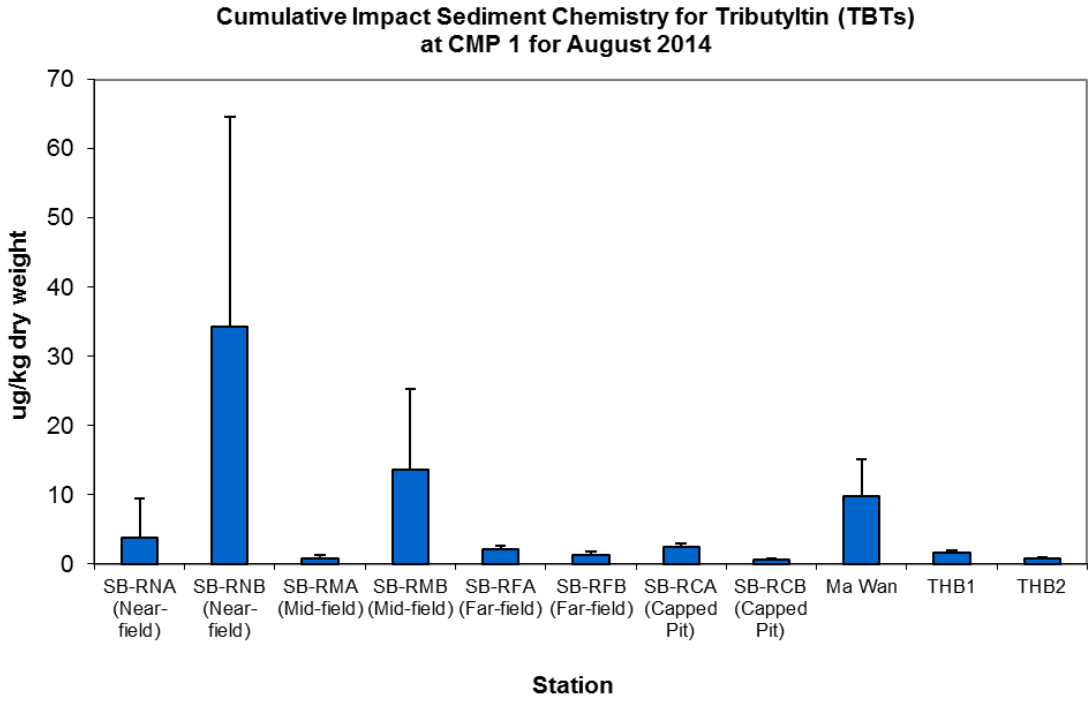


Figure 4: Concentration of Tributyltin (μg TBT/kg; mean +SD) in sediment samples collected from *Cumulative Impact Sediment Chemistry* for CMP 1 in August 2014.

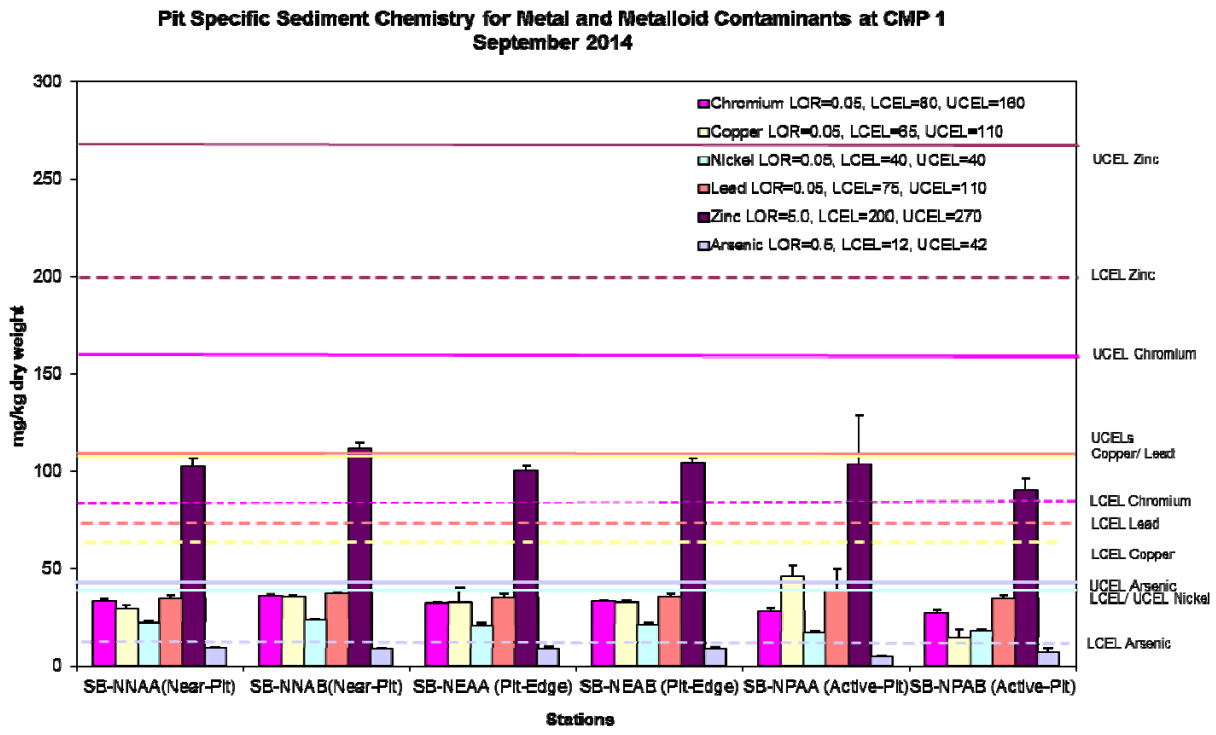


Figure 5: Concentration of Metals (Cr, Cu, Ni, Pb, Zn, As; mean +SD) in sediment samples collected from *Pit Specific Sediment Chemistry Monitoring* for CMP 1 in September 2014.

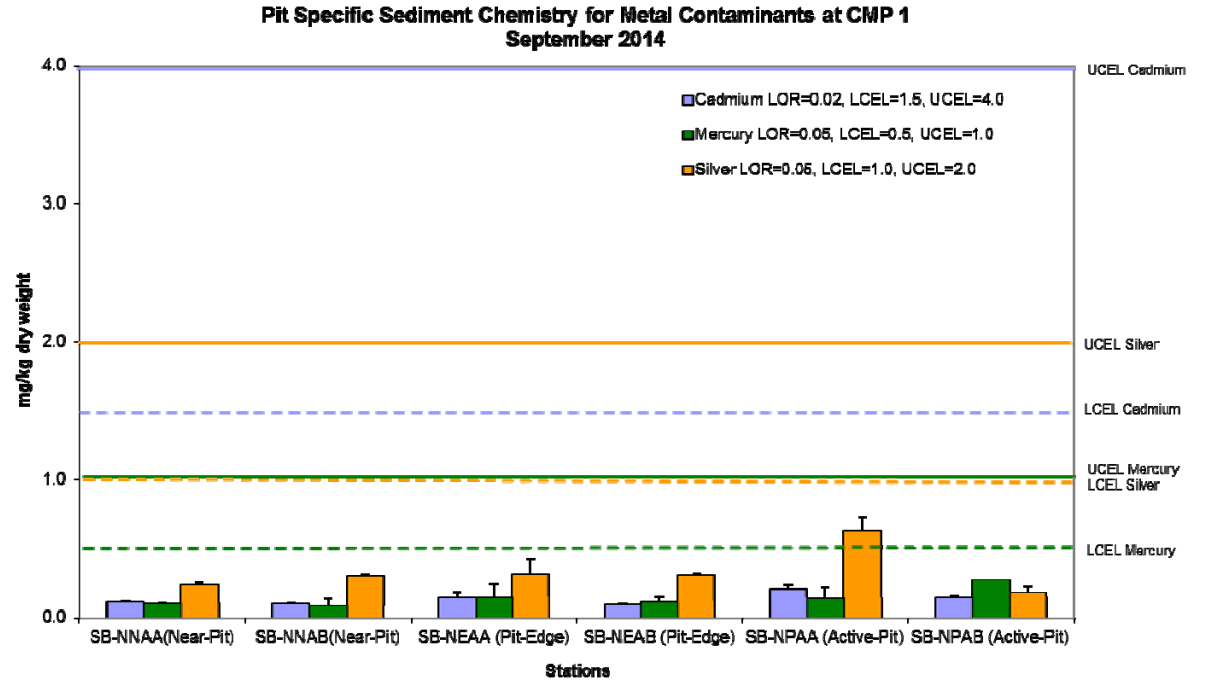


Figure 6: Concentration of Metals (Cd, Hg, Ag; mean +SD) in sediment samples collected from *Pit Specific Sediment Chemistry Monitoring* for CMP 1 in September 2014.

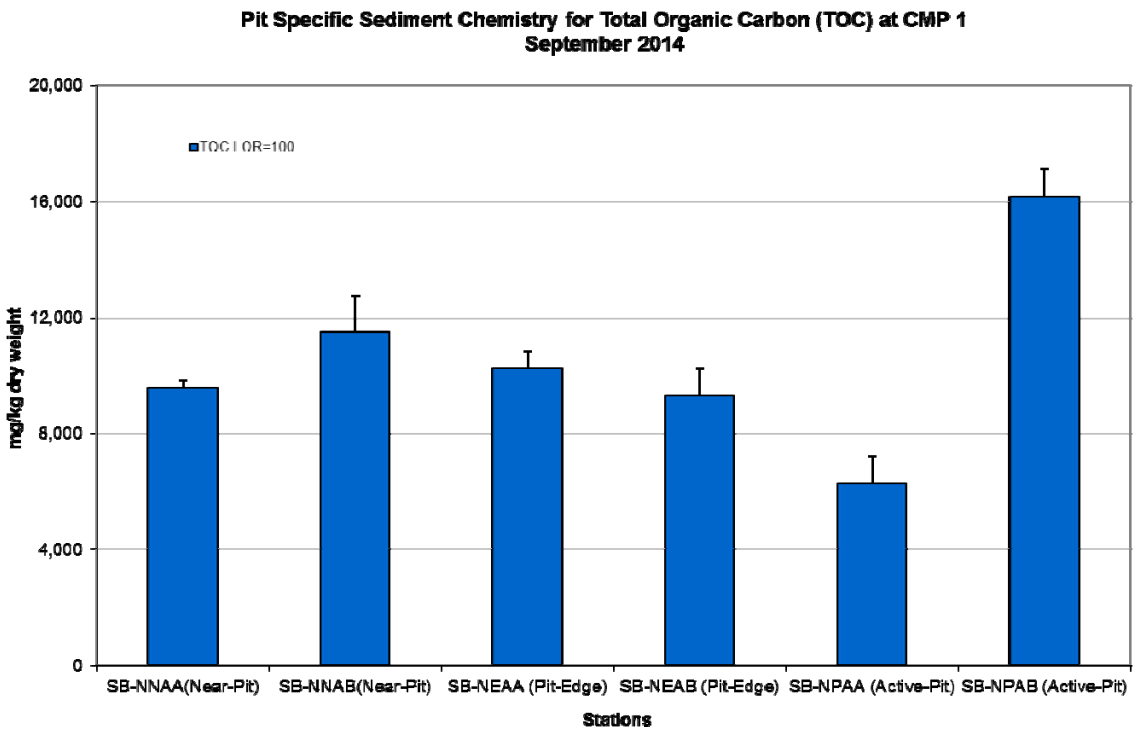


Figure 7: Concentration of Total Organic Carbon (mg/kg dry weight; mean +SD) in sediment samples collected from *Pit Specific Sediment Chemistry Monitoring* for CMP 1 in September 2014.

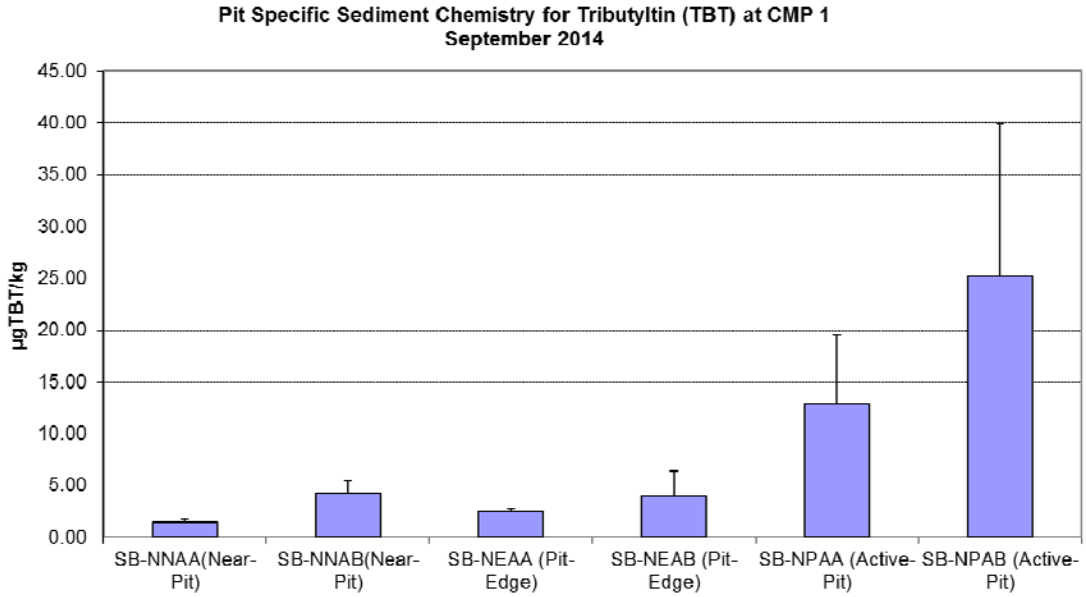


Figure 8: Concentration of Tributyltin (µg TBT/kg; mean +SD) in sediment samples collected from *Pit Specific Sediment Chemistry Monitoring* of CMP 1 in September 2014.

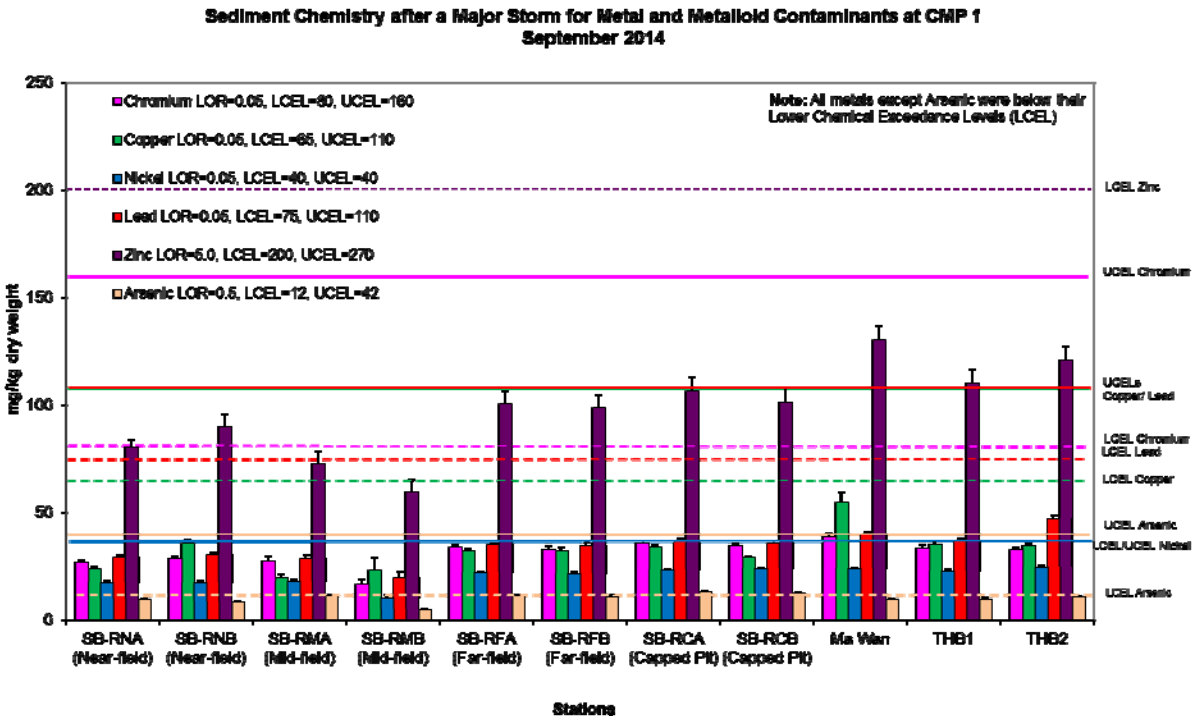


Figure 9: Concentration of Metals (Cr, Cu, Ni, Pb, Zn, As; mean +SD) in sediment samples collected from *Sediment Chemistry after a Major Storm* for CMP 1 in September 2014.

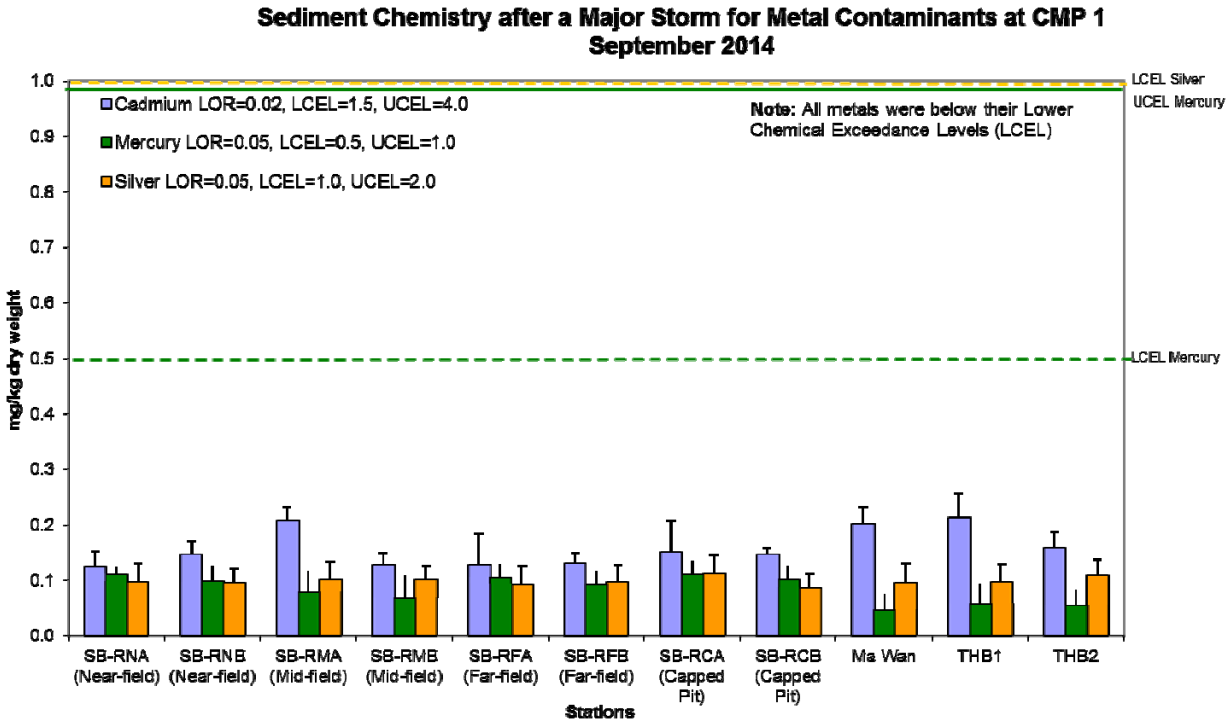


Figure 10: Concentration of Metals (Cd, Hg, Ag; mean +SD) in sediment samples collected from *Sediment Chemistry after a Major Storm* for CMP 1 in September 2014.

Annex C

Water Quality Monitoring Results

Table C1 *Summary Table of DO, Turbidity and SS Levels Recorded between 3 and 31 October 2014*

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average SS Level (mg/L)
			Bottom	Surface and Mid Depth		
2014/10/03	Mid-Ebb	DS1	4.97	5.29	20.42	16.13
		DS2	5.27	5.50	4.90	4.43
		DS3	5.15	5.45	5.19	7.26
		DS4	4.90	5.33	6.49	8.37
		DS5	5.29	5.37	4.12	5.20
		US1	4.89	5.33	17.43	14.33
		US2	5.62	5.91	6.05	5.10
		MW1	4.34	5.35	3.12	4.98
		THB1	5.55	5.79	4.00	6.63
		THB2	-	4.96	14.60	6.97
		WSR45C	4.88	5.31	6.96	4.46
		WSR46	4.92	5.90	4.84	5.91
	Mid-Flood	DS1	6.06	6.01	12.78	15.13
		DS2	6.16	6.29	10.10	12.95
		DS3	6.39	6.44	10.92	12.02
		DS4	5.55	6.18	10.01	11.10
		DS5	6.65	6.66	7.50	8.30
		US1	5.36	5.94	4.05	3.77
		US2	5.20	6.07	4.38	4.55
		MW1	4.37	4.53	7.18	11.58
		THB1	5.50	6.06	11.88	11.43
		THB2	-	4.98	16.43	5.87
		WSR45C	4.49	5.10	7.96	9.97
		WSR46	4.83	5.65	20.78	11.99
2014/10/05	Mid-Ebb	DS1	4.45	4.89	14.19	13.60
		DS2	4.39	4.92	7.56	10.02
		DS3	4.53	4.78	6.57	7.13
		DS4	4.73	4.74	5.76	8.42
		DS5	4.84	5.17	7.36	8.54
		US1	4.29	4.63	10.20	12.60
		US2	4.42	4.76	12.50	11.29
		MW1	4.57	4.74	5.24	6.11
		THB1	5.89	5.96	4.72	7.15
		THB2	-	4.73	8.33	7.73
		WSR45C	4.47	5.14	4.99	4.91
		WSR46	4.61	5.16	9.54	9.66
	Mid-Flood	DS1	5.50	5.61	5.89	6.37
		DS2	5.35	5.80	11.41	11.07
		DS3	5.18	5.77	10.46	14.47
		DS4	5.49	5.93	9.57	9.68
		DS5	5.72	6.37	9.80	14.12
		US1	4.73	4.99	14.69	16.16
		US2	4.71	5.38	6.87	8.07
		MW1	4.49	4.55	11.02	12.97
		THB1	5.71	5.67	5.07	7.53
		THB2	-	5.04	13.30	7.77
		WSR45C	4.51	4.88	8.26	11.72
		WSR46	4.70	5.24	19.22	14.24

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average SS Level (mg/L)
			Bottom	Surface and Mid Depth		
2014/10/07	Mid-Ebb	DS1	5.86	6.03	8.57	11.85
		DS2	5.14	6.03	6.16	10.54
		DS3	5.01	5.66	6.37	8.80
		DS4	4.78	4.99	12.50	14.67
		DS5	4.70	4.85	14.16	16.34
		US1	5.53	6.18	6.77	15.55
		US2	5.25	5.94	10.00	10.45
		MW1	4.71	4.75	5.73	8.06
		THB1	5.95	6.12	4.10	5.00
		THB2	-	5.12	9.17	5.10
		WSR45C	4.58	5.11	10.89	9.96
		WSR46	5.11	5.26	18.80	18.07
	Mid-Flood	DS1	5.19	5.62	12.17	17.58
		DS2	5.78	6.17	25.50	21.47
		DS3	5.61	6.07	16.72	20.32
		DS4	5.40	5.68	15.02	14.67
		DS5	-	6.01	11.57	14.07
		US1	5.51	5.52	12.72	24.85
		US2	5.12	5.11	14.19	18.61
		MW1	4.85	4.88	14.17	15.94
		THB1	5.80	6.23	13.35	17.32
		THB2	-	5.93	14.20	7.43
		WSR45C	4.85	4.98	17.59	15.97
		WSR46	4.98	6.10	13.92	16.36
2014/10/09	Mid-Ebb	DS1	5.27	5.51	11.40	27.10
		DS2	5.24	5.36	8.26	10.40
		DS3	5.03	5.21	10.89	15.13
		DS4	4.98	5.08	29.97	31.53
		DS5	5.03	5.07	27.66	26.86
		US1	5.73	5.78	22.17	21.82
		US2	5.60	5.66	10.60	15.27
		MW1	4.85	4.91	7.63	9.78
		THB1	6.09	6.24	4.70	6.37
		THB2	-	5.92	7.23	8.60
		WSR45C	4.87	5.20	16.47	13.54
		WSR46	5.11	5.28	15.21	14.38
	Mid-Flood	DS1	5.61	5.71	11.00	15.02
		DS2	5.80	5.89	15.12	18.80
		DS3	5.78	5.77	20.20	27.80
		DS4	5.77	5.80	12.49	14.00
		DS5	5.76	5.77	16.59	19.38
		US1	5.42	5.47	12.88	13.75
		US2	5.36	5.38	25.03	22.07
		MW1	5.01	5.00	15.37	19.37
		THB1	6.00	6.01	13.92	16.52
		THB2	-	5.40	11.43	11.47
		WSR45C	5.10	5.20	33.99	20.21
		WSR46	5.27	5.39	31.89	16.96
2014/10/11	Mid-Ebb	DS1	5.28	5.39	7.64	9.33
		DS2	5.02	5.10	7.15	8.68
		DS3	5.01	5.20	7.51	7.10
		DS4	4.97	5.41	8.96	7.66

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average SS Level (mg/L)
			Bottom	Surface and Mid Depth		
		DS5	4.95	5.36	8.87	8.16
		US1	5.60	5.60	5.95	8.23
		US2	5.50	5.70	6.33	10.05
		MW1	5.15	5.32	5.14	7.66
		THB1	5.67	5.79	5.04	7.23
		THB2	-	5.25	7.00	7.33
		WSR45C	4.91	5.35	11.72	12.76
		WSR46	5.07	5.23	12.50	14.04
	Mid-Flood	DS1	5.29	5.33	8.26	9.05
		DS2	5.23	5.25	20.04	22.35
		DS3	5.31	5.28	9.57	10.99
		DS4	5.42	5.45	8.90	11.54
		DS5	5.60	5.60	7.78	13.10
		US1	5.42	5.39	7.65	8.43
		US2	5.19	5.32	5.60	6.67
		MW1	4.85	4.95	13.50	14.60
		THB1	5.12	5.14	11.81	13.80
		THB2	-	5.02	12.18	7.53
		WSR45C	4.96	5.07	23.38	18.08
		WSR46	5.16	5.32	9.57	9.24
2014/10/13	Mid-Ebb	DS1	5.75	5.83	12.41	17.07
		DS2	5.64	5.79	7.70	9.70
		DS3	5.40	5.69	5.65	8.21
		DS4	5.11	5.54	7.10	10.10
		DS5	5.08	5.54	6.26	8.56
		US1	5.82	5.96	5.85	12.72
		US2	5.78	5.94	7.77	9.48
		MW1	5.16	5.19	4.46	8.08
		THB1	5.93	6.02	9.00	13.90
		THB2	-	6.07	7.36	11.23
		WSR45C	5.06	5.47	6.00	10.49
		WSR46	5.28	5.59	8.39	9.68
	Mid-Flood	DS1	5.61	5.65	13.48	19.07
		DS2	5.60	5.57	20.62	19.62
		DS3	5.73	5.73	11.92	21.15
		DS4	5.99	6.01	8.50	11.11
		DS5	5.85	5.92	8.90	12.71
		US1	5.73	5.70	7.82	11.30
		US2	5.63	5.66	7.00	11.47
		MW1	5.09	5.21	8.84	10.30
		THB1	5.62	5.60	12.57	15.10
		THB2	-	5.34	14.88	10.60
		WSR45C	5.18	5.48	8.22	13.98
		WSR46	5.36	5.63	10.98	11.12
2014/10/15	Mid-Ebb	DS1	5.52	5.76	17.02	17.02
		DS2	5.35	5.58	8.79	10.91
		DS3	5.37	5.56	7.42	9.43
		DS4	5.29	5.43	6.46	10.36
		DS5	5.30	5.48	6.02	8.23
		US1	5.92	5.93	9.09	10.85
		US2	5.80	5.85	5.70	5.87
		MW1	5.11	5.15	3.11	4.51

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average SS Level (mg/L)
			Bottom	Surface and Mid Depth		
		THB1	5.87	5.83	5.67	8.95
		THB2	-	5.94	4.26	5.20
		WSR45C	5.26	5.49	5.75	6.97
		WSR46	5.84	6.05	7.28	9.69
	Mid-Flood	DS1	6.14	6.21	16.19	17.10
		DS2	6.08	6.14	13.24	13.80
		DS3	6.22	6.24	8.65	14.25
		DS4	5.56	6.06	9.26	10.86
		DS5	5.91	6.25	6.65	10.56
		US1	5.72	6.03	7.97	9.57
		US2	5.22	6.09	6.26	7.57
		MW1	5.77	5.30	4.40	7.33
		THB1	6.32	6.30	7.58	8.55
		THB2	-	5.54	8.69	7.73
		WSR45C	5.14	5.83	5.14	9.91
		WSR46	5.42	5.67	9.24	14.47
2014/10/18	Mid-Ebb	DS1	6.12	6.12	9.96	13.13
		DS2	6.03	6.10	5.05	7.82
		DS3	5.88	5.89	6.11	10.10
		DS4	5.83	5.90	5.26	7.72
		DS5	6.01	6.06	3.77	6.68
		US1	6.30	6.27	13.08	15.10
		US2	6.34	6.38	9.20	14.73
		MW1	5.25	5.36	2.06	6.42
		THB1	6.28	6.24	4.82	8.05
		THB2	-	5.61	8.66	5.83
		WSR45C	5.48	5.92	4.43	8.20
		WSR46	5.97	6.59	6.11	10.07
	Mid-Flood	DS1	6.95	7.54	9.76	18.80
		DS2	7.27	7.32	8.98	13.98
		DS3	6.62	6.66	10.69	14.98
		DS4	6.77	6.82	8.92	12.11
		DS5	6.79	7.10	5.33	7.83
		US1	7.12	7.65	15.08	15.40
		US2	6.57	7.49	6.61	9.63
		MW1	5.30	5.45	5.50	8.26
		THB1	6.65	7.05	12.25	13.52
		THB2	-	6.65	9.02	10.70
		WSR45C	5.33	6.47	5.59	7.81
		WSR46	6.19	6.99	19.57	13.79
2014/10/20	Mid-Ebb	DS1	6.71	6.82	9.71	14.10
		DS2	6.81	7.05	6.43	12.06
		DS3	6.55	7.12	6.21	10.36
		DS4	6.14	7.20	5.79	8.38
		DS5	6.13	7.20	6.14	8.77
		US1	7.39	7.58	7.24	14.05
		US2	7.66	7.83	5.64	10.45
		MW1	5.58	5.68	4.18	6.33
		THB1	7.61	7.87	6.50	11.13
		THB2	-	6.90	12.15	6.53
		WSR45C	6.03	7.07	3.83	6.18
		WSR46	6.93	8.17	6.26	8.93

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average SS Level (mg/L)
			Bottom	Surface and Mid Depth		
	Mid-Flood	DS1	8.23	8.73	7.76	16.58
		DS2	8.58	8.62	23.52	26.83
		DS3	8.36	8.28	18.80	23.38
		DS4	8.61	8.71	9.38	14.14
		DS5	9.24	9.37	5.29	9.56
		US1	7.22	8.01	13.17	19.26
		US2	7.20	7.98	7.18	8.54
		MW1	5.78	5.93	8.97	12.92
		THB1	7.64	7.68	19.25	21.20
		THB2	-	7.83	10.29	8.30
		WSR45C	6.38	7.33	9.72	12.32
		WSR46	6.71	7.52	11.91	14.59
2014/10/22	Mid-Ebb	DS1	8.56	8.64	8.10	11.60
		DS2	8.25	8.49	7.21	10.89
		DS3	7.74	7.93	12.92	15.30
		DS4	7.07	7.96	10.48	13.10
		DS5	7.32	8.06	9.81	12.99
		US1	8.76	8.76	5.47	6.73
		US2	8.62	8.76	6.47	8.65
		MW1	6.29	6.57	7.32	11.84
		THB1	8.54	8.78	6.29	7.63
		THB2	-	7.26	7.23	7.13
		WSR45C	7.58	8.30	7.01	7.52
		WSR46	7.02	8.20	7.67	10.81
	Mid-Flood	DS1	7.87	7.86	48.20	28.87
		DS2	7.94	7.95	33.92	23.62
		DS3	8.35	8.26	20.58	19.69
		DS4	8.17	8.25	10.14	12.72
		DS5	-	8.79	5.41	7.40
		US1	8.08	8.19	11.27	15.85
		US2	6.80	8.03	12.99	15.09
		MW1	5.67	5.77	15.19	18.88
		THB1	7.99	8.01	84.99	23.27
		THB2	-	7.38	20.97	8.23
		WSR45C	6.29	7.07	10.34	13.58
		WSR46	7.13	8.18	15.51	15.66
2014/10/24	Mid-Ebb	DS1	6.01	6.06	8.85	11.94
		DS2	5.82	5.87	11.19	15.21
		DS3	5.74	5.99	10.78	14.24
		DS4	5.78	6.03	12.25	15.40
		DS5	5.65	5.91	11.29	15.83
		US1	6.04	6.11	12.03	12.88
		US2	6.37	6.39	6.64	9.10
		MW1	5.70	5.76	6.59	27.40
		THB1	5.79	5.92	13.11	13.97
		THB2	-	6.04	9.05	11.77
		WSR45C	5.59	5.88	13.23	25.24
		WSR46	5.94	6.01	14.58	22.64
	Mid-Flood	DS1	6.01	5.98	17.00	21.23
		DS2	6.10	6.20	12.17	13.13
		DS3	6.15	6.37	10.11	12.13
		DS4	6.10	6.32	10.30	12.20

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average SS Level (mg/L)
			Bottom	Surface and Mid Depth		
		DS5	6.21	6.25	9.97	9.19
		US1	6.08	6.09	15.10	23.41
		US2	6.03	6.04	14.27	17.93
		MW1	5.70	5.81	12.00	14.09
		THB1	5.89	6.19	12.69	16.20
		THB2	-	5.49	8.69	12.83
		WSR45C	6.05	6.09	22.18	22.70
		WSR46	6.00	6.02	13.49	15.69
2014/10/27	Mid-Ebb	DS1	5.88	5.89	9.07	11.90
		DS2	5.71	5.87	11.05	23.61
		DS3	5.59	5.95	10.71	13.87
		DS4	5.56	5.99	9.84	12.96
		DS5	5.52	5.90	10.34	12.29
		US1	6.05	6.14	11.78	14.53
		US2	6.13	6.21	10.51	13.02
		MW1	5.54	5.66	5.18	9.97
		THB1	5.99	6.05	9.08	13.63
		THB2	-	5.44	11.52	10.23
		WSR45C	5.49	5.81	9.53	11.83
		WSR46	5.85	5.93	18.66	19.87
	Mid-Flood	DS1	5.74	5.79	13.92	14.78
		DS2	5.71	5.71	22.84	24.67
		DS3	5.78	5.80	14.98	19.85
		DS4	5.80	5.89	13.48	14.53
		DS5	5.82	5.84	10.88	14.42
		US1	5.85	5.86	10.09	12.88
		US2	5.72	5.76	11.24	12.50
		MW1	5.46	5.58	11.95	14.76
		THB1	5.60	5.60	13.72	15.53
		THB2	-	5.47	8.95	8.87
		WSR45C	5.68	5.72	24.87	19.52
		WSR46	5.75	5.80	13.00	19.10
2014/10/29	Mid-Ebb	DS1	6.02	6.02	10.12	12.69
		DS2	6.11	6.12	8.38	12.00
		DS3	5.82	5.97	7.95	10.89
		DS4	5.66	5.88	10.31	12.19
		DS5	5.67	5.82	8.50	11.37
		US1	6.36	6.30	14.22	14.27
		US2	6.43	6.40	10.04	11.13
		MW1	5.64	5.67	4.48	9.14
		THB1	6.21	6.20	11.71	11.53
		THB2	-	6.57	10.22	10.57
		WSR45C	5.59	5.74	7.83	11.07
		WSR46	6.17	6.18	11.01	14.59
	Mid-Flood	DS1	6.28	6.28	14.67	16.47
		DS2	6.25	6.20	17.58	22.43
		DS3	6.24	6.21	21.15	21.05
		DS4	6.42	6.39	11.02	13.61
		DS5	6.38	6.39	9.65	12.30
		US1	6.20	6.18	8.81	12.43
		US2	6.10	6.06	8.86	11.67
		MW1	5.70	5.74	8.47	13.53

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average SS Level (mg/L)
			Bottom	Surface and Mid Depth		
		THB1	5.94	5.97	19.35	18.70
		THB2	-	6.17	16.57	12.63
		WSR45C	6.01	6.01	11.48	16.09
		WSR46	6.08	6.10	7.05	10.58
2014/10/31	Mid-Ebb	DS1	5.90	5.95	7.87	-
		DS2	5.81	5.94	9.90	-
		DS3	5.78	5.80	6.71	-
		DS4	5.71	5.85	5.39	-
		DS5	5.68	5.81	6.24	-
		US1	6.12	6.08	9.71	-
		US2	6.28	6.21	17.35	-
		MW1	5.68	5.69	3.86	-
		THB1	6.06	6.09	12.52	-
		THB2	-	6.04	8.85	-
		WSR45C	5.61	5.90	5.05	-
		WSR46	5.82	6.09	9.11	-
	Mid-Flood	DS1	6.12	6.16	9.44	-
		DS2	6.12	6.23	12.97	-
		DS3	6.07	6.19	15.11	-
		DS4	6.30	6.29	11.89	-
		DS5	6.47	6.44	9.32	-
		US1	5.93	5.94	14.28	-
		US2	5.84	6.14	8.44	-
		MW1	5.71	5.77	5.79	-
		THB1	6.03	6.10	20.41	-
		THB2	-	6.20	11.29	-
		WSR45C	5.74	5.90	9.87	-
		WSR46	5.82	5.97	19.21	-

Notes:

1. Please refer to Table C2 below 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.
4. Only mid-depth water was sampled at Station THB2 because water depth was less than 3m.
5. SS laboratory analysis on 31/10/2014 is still in progress and will be discussed in the next monthly report.

Table C2 Action and Limit Levels of Water Quality for Dredging, Backfilling and Capping Activities

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 C3 Water Column Profiling Results for CMP 1 on 8 October 2014

Stations	Temp (°C)	Salinity (ppt)	Turbidity (NTU)	Dissolved Oxygen (%)	Dissolved Oxygen (mg L^{-1})	pH (mg L^{-1})	Suspended Solids (mg L^{-1})
WCP 1 (Downstream)	28.81	28.92	17.28	76.58	5.04	7.80	15.10
WCP 2 (Upstream)	28.74	28.39	5.95	88.87	5.87	7.80	8.43
WQO (wet season)	N/A	25.79-31.23#	N/A	N/A	>4	6.5-8.5	12.00

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

Annex D

Dredging Record for CMP 2 in October 2014

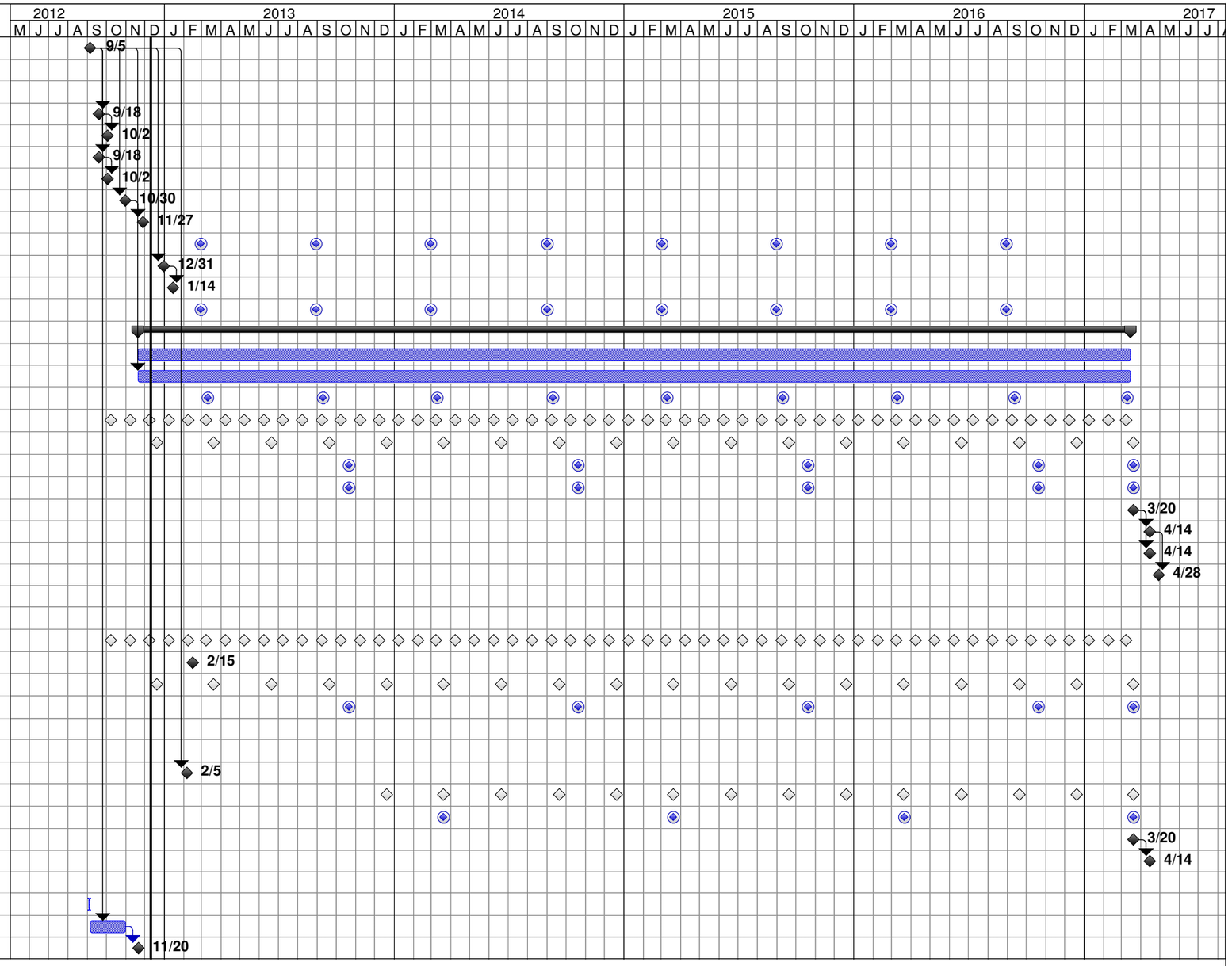
Table D1 Dredging Record at SB CMP 2

Date	Daily Dredging Volume (m^3)	Weekly Dredging Volume (m^3) (From Sunday to Saturday)
28-Sep-2014	6,500	54,600
29-Sep-2014	7,150	
30-Sep-2014	6,500	
01-Oct-2014	7,150	
02-Oct-2014	9,100	
03-Oct-2014	9,750	
04-Oct-2014	8,450	
05-Oct-2014	9,750	79,300
06-Oct-2014	11,700	
07-Oct-2014	11,700	
08-Oct-2014	11,050	
09-Oct-2014	11,050	
10-Oct-2014	13,000	
11-Oct-2014	11,050	
12-Oct-2014	11,050	72,800
13-Oct-2014	10,400	
14-Oct-2014	10,400	
15-Oct-2014	10,400	
16-Oct-2014	10,400	
17-Oct-2014	10,400	
18-Oct-2014	9,750	
19-Oct-2014	9,750	78,000
20-Oct-2014	10,400	
21-Oct-2014	13,000	
22-Oct-2014	12,350	
23-Oct-2014	10,400	
24-Oct-2014	12,350	
25-Oct-2014	9,750	
26-Oct-2014	9,100	56,550
27-Oct-2014	9,750	
28-Oct-2014	8,450	
29-Oct-2014	9,750	
30-Oct-2014	9,100	
31-Oct-2014	10,400	

Annex E

Study Programme

Task Name
Project Commencement
For South Brothers CMPs and East of Sha Chau CMPs
Submission of Draft Inception Report & Draft Programme
Submission of Final Inception Report & Final Programme
Submission of Draft EM&A Manual (First Review)
Submission of Final EM&A Manual (First Review)
Submission of Draft EM&A Manual (Second Review)
Submission of Final EM&A Manual (Second Review)
Submission of Subsequent EM&A Manual Updates
Submission of Draft Operations Manual
Submission of Final Operations Manual
Submission of Operations Manual Updates
Monitoring Contracts
Regular Site Inspections of CMP Contractors
Participate in Liaison Group Meetings/ Consultations as required by CEDD
Submission of Report on Dredging & Capping Operations
Submission of Monthly Progress Report
Submission of Quarterly EM&A Report
Submission of Annual Review Report
Submission of Annual Risk Assessment Report
Submission of Draft Final Report
Submission of the Final Report
Submission of Draft Executive Summary Report
Submission of Final Executive Summary Report
For East Tung Lung Chau Disposal Facility
Submission of Monitoring Results & Monthly EM&A Progress Report
Submission of Initial Review Report (assume disposal commences in November 2012)
Submission of Quarterly EM&A Report
Submission of Annual Report
Alternative / Modified Capping Design
Submission of Investigation Report
Submission of Quarterly Report
Submission of Annual Report
Submission of Draft Final Report
Submission of the Final Report
Baseline Pelagic and Demersal Fisheries Survey
Baseline Shrimp Trawl & Hang Trawl Surveys, twice before SB CMPs dredging
Submission of Baseline Pelagic and Demersal Fisheries Survey Report



Study Programme	Task	Milestone	Summary	Rolled Up Task	Rolled Up Milestone

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) - Investigation