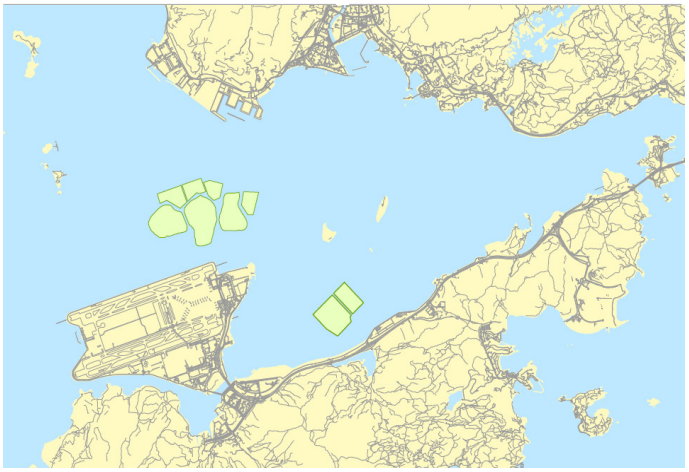


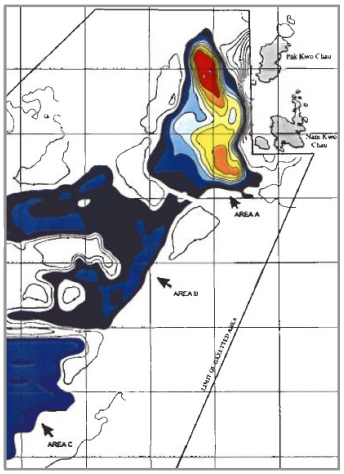



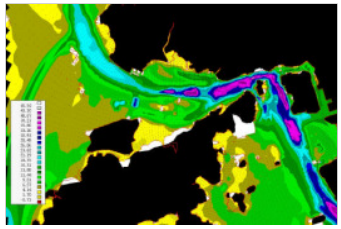


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Civil Engineering and Development Department

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)

21st Monthly Progress Report for Contaminated Mud Pits to the South of The Brothers and at East Sha Chau – May 2014

Revision 0

16 June 2014

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Document Code: 0175086 Monthly May_v0.doc

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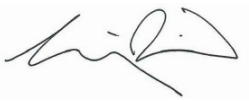
Client:	Project No:
Civil Engineering and Development Department (CEDD)	0175086
Summary: This document presents the 21st monthly progress report for Contaminated Mud Pits at the South of The Brothers and at East Sha Chau.	Date: 16 June 2014 Approved by:  Craig A. Reid *Partner*

Revision	Description	By	Checked	Approved	Date
v0	21st Monthly Progress Report for ESC CMPs and SB CMPs	RC	JT	CAR	16/6/14

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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:	21st Monthly Progress Report for Contaminated Mud Pits to the South of The Brothers and at East Sha Chau – May 2014
Date of Report:	16 June 2014
Date prepared by ET:	16 June 2014
Date received by IA:	16 June 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.

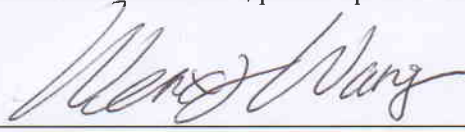
ET Certification

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: 16/6/2014

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: 16/6/2014

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

21ST MONTHLY PROGRESS REPORT FOR MAY 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.

(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))

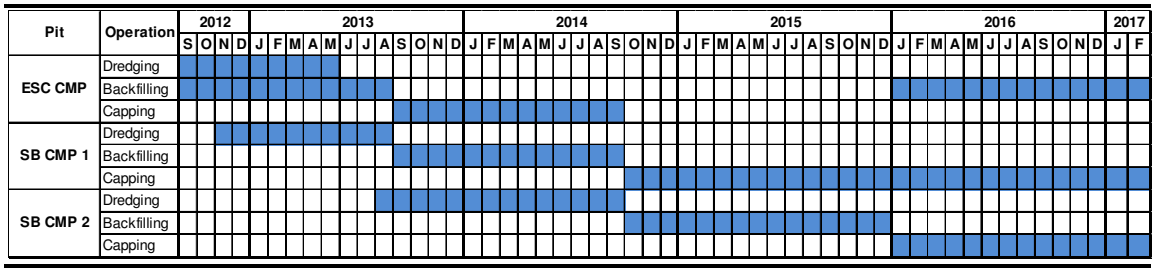
(4) Under the CEDD study *Contaminated Sediment Disposal Facility to the South of The Brothers (Agreement No. FM 2/2009)*

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 undertaken 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 May 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 *21st Monthly Progress Report* covers the EM&A activities for the reporting month of May 2014.

1.3 DETAILS OF SAMPLING AND LABORATORY TESTING ACTIVITIES

1.3.1 The following monitoring activities have been undertaken for SB CMPs in May 2014:

- *Impact Water Quality Monitoring during Dredging Operations* was undertaken for CMP 2 three times per week on 1, 3, 5, 7, 9, 12, 14, 16, 19, 21, 23, 26, 28 and 30 May 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.

- *Pit Specific Sediment Chemistry* was undertaken for CMP 1 on 8 May 2014;
- *Routine Water Quality Monitoring* for CMP 1 was undertaken on 13 May 2014; and
- *Water Column Profiling* for CMP 1 was undertaken on 15 May 2014.

No monitoring activity was undertaken for ESC CMPs in April 2014.

1.4 DETAILS OF OUTSTANDING SAMPLING AND/OR ANALYSIS

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

- Laboratory analyses of sediment samples collected for *Pit Specific Sediment Chemistry of CMP 1* in April and May 2014; and

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 is presented in this *21st Monthly Progress Report*:

- *Pit Specific Sediment Chemistry of CMP 1* conducted in March 2014;
- *Impact Water Quality Monitoring during Dredging Operations of CMP 2* conducted from 26 April to 30 May 2014;
- *Routine Water Quality Monitoring of CMP 1* undertaken on 13 May 2014; and
- *Water Column Profiling of CMP 1* conducted on 16 May 2014.

1.5.2 Pit Specific Sediment Chemistry of CMP 1 – March 2014

1.5.3 Monitoring locations for *Pit Specific Sediment Chemistry for CMP 1* are shown in *Figure 1.2*. A total of six (6) monitoring stations were sampled in March 2014.

1.5.4 The concentrations of most inorganic contaminants were lower than the Lower Chemical Exceedance Level (LCEL) at all stations except Arsenic in March 2014 (*Figures 1-2* of *Annex B*). Concentrations of Arsenic exceeded the LCEL at all stations except Near Pit station SB-NNAB and Active Pit station SB-NPAB.

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.

1.5.6 For organic contaminants, the concentration of Total Organic Carbon (TOC) was similar amongst stations with no consistent spatial trend in March 2014 (*Figure 3* of *Annex B*). Concentrations of Tributyltin (TBTs) were observed to be higher at Active Pit stations SB-NPAA and SB-NPAB in March 2014 (*Figure 4* of *Annex B*). High Molecular Weight Polycyclic Aromatic Hydrocarbons (High MW PAHs) concentrations were recorded below the limit of reporting at all stations except at Active Pit station SB-NPAB (*Figure 5* of *Annex B*). Low MW PAHs, Total Dichloro-Diphenyl-Trichloroethane (DDT), 4,4'-Dichloro-Diphenyl-Dichloroethylene (4,4'-DDE) and Total Polychlorinated Biphenyls (PCBs) were recorded below the limit of reporting at all stations in March 2014.

1.5.7 Active Pit stations SB-NPAA and SB-NPAB are located within CMP 1 which was receiving contaminated mud during the reporting period. Therefore, the higher concentration of contaminants recorded at the Active Pit stations only are not considered as indicating any dispersal of contaminated mud from CMP 1. Nevertheless, detailed analyses will be presented in the *Quarterly Report* to reveal any trend of increasing sediment contaminant concentrations towards CMP 1.

1.5.8 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 March 2014.

(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

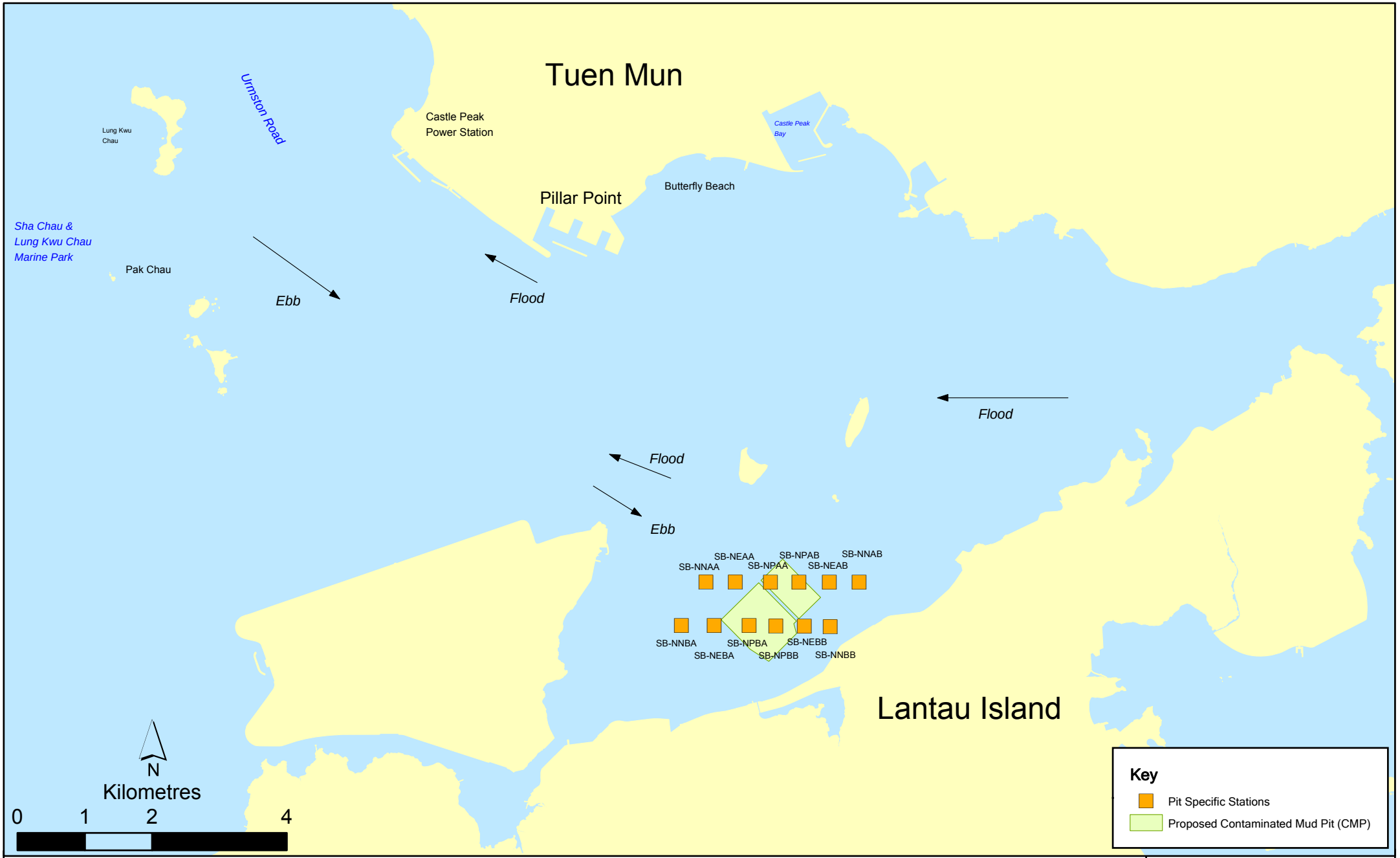


Figure 1.2

Pit Specific Sediment Quality Monitoring Stations for South Brothers Facility

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Date: 12/12/2012

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1.5.9 Impact Water Quality Monitoring during Dredging Operations of CMP 2 – 26 April to 30 May 2014

1.5.10 *Impact Water Quality Monitoring during Dredging Operations of CMP 2* was conducted three times per week from 26 April to 30 May 2014 during the reporting period. On each survey day, sampling 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 stations were monitored and locations of the sampling stations are shown in *Figure 1.3*. Sampling at station THB2 during mid-flood tides of 26 April, 19 and 21 May 2014 as well as during both mid-flood and mid-ebb tides of 9, 12, 16 and 23 May 2014 were cancelled due to adverse weather condition.

1.5.11 Monitoring results are presented in *Table C1* of *Annex C*. Daily dredging volume in May 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 exceedance shown in *Table 1.1* below.

Table 1.1 Details of Exceedances Recorded at CMP 2 between 26 April and 31 May 2014

Date	Tide	Parameter	Station	Type
16 May 2014	Mid-Ebb	SS	DS2	Action

1.5.12 Action Level exceedance of SS was recorded at stations DS2 during mid-ebb tide on 16 May 2014. Station DS2 is located further away from the works area of CMP 2 when compared to station DS1 at which the levels of SS did not exceed the Action and Limit Levels. As such, the exceedance at station DS2 is not likely to be caused by the dredging works at CMP 2.

1.5.13 It should be noted that high levels of SS were occasionally recorded during baseline monitoring which are considered to be sporadic events and characteristic of water quality in this area of Hong Kong (baseline monitoring data are summarised in *Table C3* of *Annex C*). Therefore, the Action and Limit Level exceedances may be caused by natural background variation in water quality of the area.

1.5.14 Overall, 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.

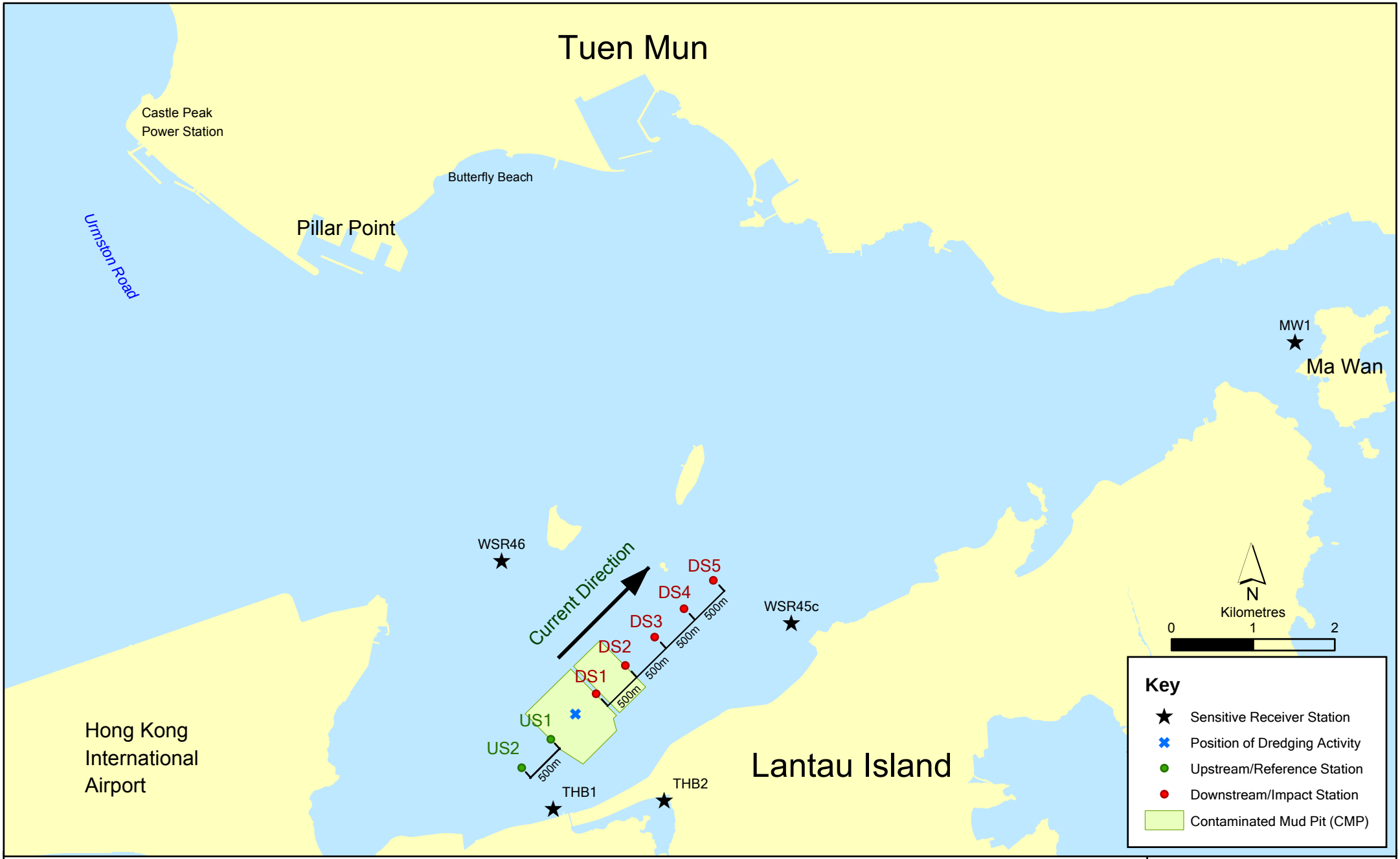

Figure 1.3

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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1.5.15 Routine Water Quality Monitoring of SB CMP 1 – May 2014

1.5.16 The monitoring results for the *Routine Water Quality Monitoring* conducted in May 2014 in the wet season have been assessed for compliance with the Water Quality Objectives (WQOs) set by EPD. This consists of a review of the EPD routine water quality monitoring data for the wet season period (April to October) of 2003-2012 from stations in the Northwestern Water Control Zone, where the CMPs are located. For Salinity, the averaged value obtained from the Reference stations was used for the basis as the WQO. Levels of DO, Turbidity and SS were also assessed for compliance with the Action and Limit Levels (see *Table C2* of *Annex C* for details). The monitoring results are shown in *Figures 6-15* of *Annex B* and *Tables C4-C5* of *Annex C*.

1.5.17 Locations of monitoring stations are presented in *Figure 1.4*. Sampling at station THB2 was cancelled due to adverse weather condition

In-situ Measurements

1.5.18 Analyses of results for May 2014 indicated that the levels of pH and DO complied with the WQOs at all stations (Impact, Intermediate, Reference and Water Sensitive Receiver stations) in May 2014 (*Figures 6-7 of Annex B*). The levels of Salinity exceeded WQO at Impact, Intermediate, Tai Mo To and Tai Ho Bay stations (*Figure 9 of Annex B*). The lower salinities recorded at these stations are likely to be caused by the close proximity to the nearby streams, which release a large amount of freshwater runoff in the area during flooding, when compared to the Reference stations.

1.5.19 The levels of DO and Turbidity complied with the Action and Limit Levels at all stations (*Figures 7* and *10* of *Annex B*; *Table C4* of *Annex C*).

Laboratory Measurements

1.5.20 Analyses of May 2014 results indicated that concentrations of Cadmium, Mercury and Silver were below their limit of reporting at all stations. Arsenic, Chromium, Copper, Lead, Nickel and Zinc were detected in samples from most stations (*Figures 11-12* of *Annex B*). Concentrations of Arsenic, Chromium, Lead and Nickel appeared to be similar amongst all stations with no apparent spatial trend observed (*Figure 11* of *Annex B*). Concentrations of Copper and Zinc were slightly higher at Ma Wan station when compared to other stations (*Figure 12* of *Annex B*).

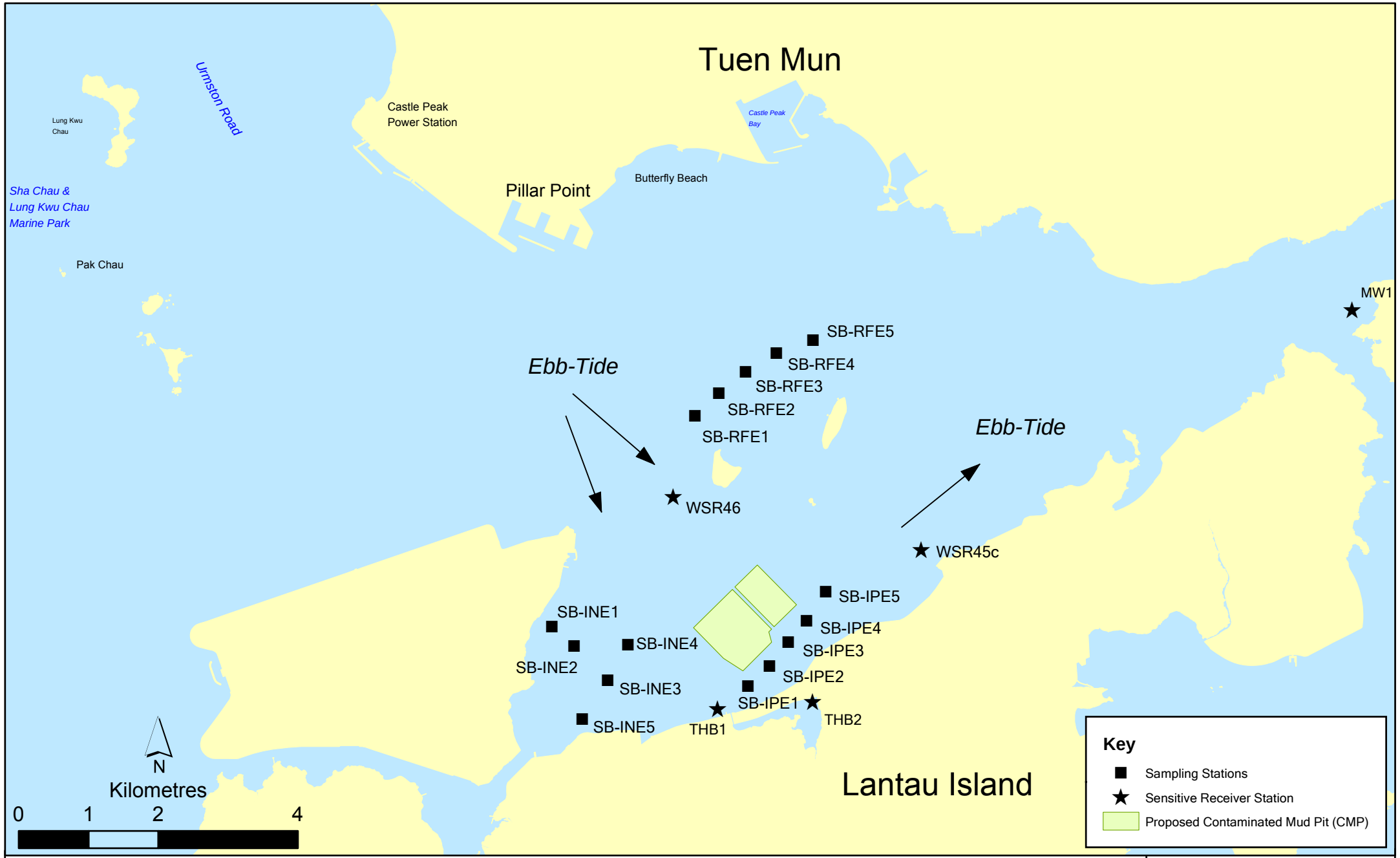

Figure 1.4

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

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Date: 11/12/2012

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1.5.21 For nutrients, concentrations of Total Inorganic Nitrogen (TIN) at most stations exceeded the WQO (0.5mg/L) except at Ma Wan station (*Figure 13 of Annex B*). It is important to note that due to the effect of the Pearl River, the North Western WCZ has historically experienced higher levels of TIN [(1)] . Therefore, the exceedances of TIN WQO at all stations are unlikely to be caused by the disposal operation at CMP 1. Ammonia Nitrogen (NH3-N) concentration was relatively similar amongst all stations (*Figure 13 of Annex B*). Level of 5-day Biochemical Oxygen Demand (BOD_5) was higher at Ma Wan stations (*Figure 14 of Annex B*).

1.5.22 Concentrations of SS exceeded the WQO (12.00 mg/L for wet season) at Reference and Intermediate stations. However, SS at all stations complied with the Action and Limit Levels during the reporting period (*Figure 15* of *Annex B*; *Table C5* of *Annex C*). As discussed in *Section 1.5.13*, the WQO exceedances of SS are considered to be sporadic and characteristic of water quality in this area of Hong Kong.

1.5.23 Overall, results of the *Routine Water Quality Monitoring* indicated that the disposal operation at CMP 1 did not appear to cause any unacceptable deterioration in water quality in May 2014.

1.5.24 Water Column Profiling of CMP 1 – May 2014

1.5.25 *Water Column Profiling* was undertaken at a total of two sampling stations (Upstream and Downstream stations) on 15 May 2014. The water quality monitoring results have been assessed for compliance with the WQOs. 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

1.5.26 Analyses of results for May 2014 indicated that levels of Salinity, pH and DO complied with the WQOs at both Downstream and Upstream stations (*Table C6* of *Annex C*). DO and Turbidity also complied with the Action and Limit Levels.

Laboratory Measurements for SS

1.5.27 Analyses of results for May 2014 indicated that the SS levels at Downstream and Upstream stations complied with the WQO and the Action and Limit Levels (*Table C6 of Annex C*).

1.5.28 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) http://www.epd.gov.hk/epd/misc/marine_quality/1986-2005/textonly/eng/index.htm

1.6 ACTIVITIES SCHEDULED FOR THE NEXT MONTH

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

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

1.6.2 *Water Quality Monitoring for Capping* will be undertaken in the next monthly period of June 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 - December 2014)

		2012				2013												2014											
Pit Specific Sediment Chemistry	**Code**	**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**
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**
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**
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**
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**
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**
Plume Stations WCP1	*	*	*	*	*	*	*	*	*	*	*	*																
WCP2	*	*	*	*	*	*	*	*	*	*	*	*																

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**
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**
Upstream/Reference Stations																												
US1	*	*	*	*	*	*	*	*	*																			
US2	*	*	*	*	*	*	*	*	*																			
Downstream/Impact Stations																												
DS1	*	*	*	*	*	*	*	*	*																			
DS2	*	*	*	*	*	*	*	*	*																			
DS3	*	*	*	*	*	*	*	*	*																			
DS4	*	*	*	*	*	*	*	*	*																			
DS5	*	*	*	*	*	*	*	*	*																			
Ma Wan Station																												
MW1	*	*	*	*	*	*	*	*	*																			

Annex A1 - Environmental Monitoring and Audit Sampling Schedule for East of Sha Chau (September 2012 - December 2014)

Capping		2012				2013												2014											
		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
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																*		*				*		*				*

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
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 - December 2017)

Baseline Monitoring Prior to Dredging	Code	Frequency
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	Code	Frequency
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	Code	Frequency
SB CMP 1 Active		
Near-Pit		
	SB-NNAA	Monthly
	SB-NNAB	Monthly
Pit-Edge		
	SB-NEAA	Monthly
	SB-NEAB	Monthly
Active-Pit		
	SB-NPAA	Monthly
	SB-NPAB	Monthly
SB CMP 2 Active		
Near-Pit		
	SB-NNBA	Monthly
	SB-NNBB	Monthly
Pit-Edge		
	SB-NEBA	Monthly
	SB-NEBB	Monthly
Active-Pit		
	SB-NPBA	Monthly
	SB-NPBB	Monthly

Annex A2 - Environmental Monitoring and Audit Sampling Schedule for South of The Brothers (July 2012 - December 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	M	A	M	J	J	A	S	O	N	D
Near-field Stations																																																																									
	SB-RNA	4 times per year														12				12		12				12		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		12				12		12				12																	
Mid-field Stations																																																																						
	SB-RMA	4 times per year														12				12		12				12		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		12				12		12				12																	
Far-Field Stations																																																																					
	SB-RFA	4 times per year														12				12		12				12		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		12				12		12				12																	
Capped Pit Stations																																																																					
	SB-RCA	4 times per year														12				12		12				12		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		12				12		12				12																	
Sensitive Receiver Stations																																																																					
	MW1	4 times per year														12				12		12				12		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		12				12		12				12																	
	THB2	4 times per year														12				12		12				12		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	M	A	M	J	J	A	S	O	N	D
SB CMP 1 Active																																																																									
Reference																																																																					
	SB-TRA	2 times per year														5						5																																																		
	SB-TRB	2 times per year														5						5																																																
Near-Field																																																																					
	SB-TAA	2 times per year														5						5																																																	
	SB-TAB	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																																															
SB CMP 2 Active																																																																			
Reference																																																																					
	SB-TRA	2 times per year																										5												5						5																				
	SB-TRB	2 times per year																										5												5						5																				
Near-Field																																																																		
	SB-TBA	2 times per year																										5												5						5																				
	SB-TBB	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																				

			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	M	A	M	J	J	A	S	O	N	D
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	M	A	M	J	J	A	S	O	N	D
Impact																																																																							
	SB-INA 1-5	4 times per year														5					5	5					5	5					5	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					5	5					5	5					5	5																	
Reference North																																																																									
	TNA 1-5	4 times per year														5					5	5					5	5					5	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					5	5					5	5					5	5																	
Reference South																																																																								
	TSA 1-5	4 times per year														5					5	5					5	5					5	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					5	5					5	5					5	5																	

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

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

Routine Water Quality Monitoring			2014												2015											
			J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Ebb Tide																										
Impact Stations Downcurrent																										
	SB-IPE1	8 times per year	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	
	SB-IPE3	8 times per year	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	
	SB-IPE5	8 times per year	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	
	SB-INE2	8 times per year	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	
	SB-INE4	8 times per year	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	
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	
	SB-RFE2	8 times per year	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	
	SB-RFE4	8 times per year	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	
Sensitive Receiver Stations																										
	MW1	8 times per year	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	
	THB2	8 times per year	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	
	WSR46	8 times per year	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	
	SB-IPF2	8 times per year	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	
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	
	SB-INF2	8 times per year	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	
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	
	SB-RFF2	8 times per year	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	
Sensitive Receiver Stations																										
	MW1	8 times per year	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	
	THB2	8 times per year	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	
	WSR46	8 times per year	8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8	

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

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	M	A	M	J	J	A	S	O	N	D
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 - December 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	M	A	M	J	J	A	S	O	N	D
Ebb Tide																																																																	
Impact Stations Downcurrent																																																																	
SB-IPE1	8 times per year																																											3	3		3	3		3	3		3	3													
SB-IPE2	8 times per year																																											3	3		3	3		3	3		3	3													
SB-IPE3	8 times per year																																											3	3		3	3		3	3		3	3													
SB-IPE4	8 times per year																																											3	3		3	3		3	3		3	3													
SB-IPE5	8 times per year																																											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													
SB-INE2	8 times per year																																											3	3		3	3		3	3		3	3													
SB-INE3	8 times per year																																											3	3		3	3		3	3		3	3													
SB-INE4	8 times per year																																											3	3		3	3		3	3		3	3													
SB-INE5	8 times per year																																											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													
SB-RFE2	8 times per year																																											3	3		3	3		3	3		3	3													
SB-RFE3	8 times per year																																											3	3		3	3		3	3		3	3													
SB-RFE4	8 times per year																																											3	3		3	3		3	3		3	3													
SB-RFE5	8 times per year																																											3	3		3	3		3	3		3	3													
Sensitive Receiver Stations																																																																	
MW1	8 times per year																																											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													
WSR46	8 times per year																																											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													
SB-IPF2	8 times per year																																											3	3		3	3		3	3		3	3													
SB-IPF3	8 times per year																																											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													
SB-INF2	8 times per year																																											3	3		3	3		3	3		3	3													
SB-INF3	8 times per year																																											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													
SB-RFF2	8 times per year																																											3	3		3	3		3	3		3	3													
SB-RFF3	8 times per year																																											3	3		3	3		3	3		3	3													
Sensitive Receiver Stations																																																																	
MW1	8 times per year																																											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													
WSR46	8 times per year																																											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	M	A	M	J	J	A	S	O	N	D
Capped Contaminated Mud Pits																																																																	
SB-CPA	2 times per year																																																		12				12								12				12
SB-CPB	2 times per year																																																		12				12								12				12
																																																			12				12								12				12
Reference Stations																																																																	
RBA	2 times per year																																																		12				12								12				12
RBB	2 times per year																																																		12				12								12				12
RBC	2 times per year																																																		12				12								12				12

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

Annex B

Graphs of Monitoring Results

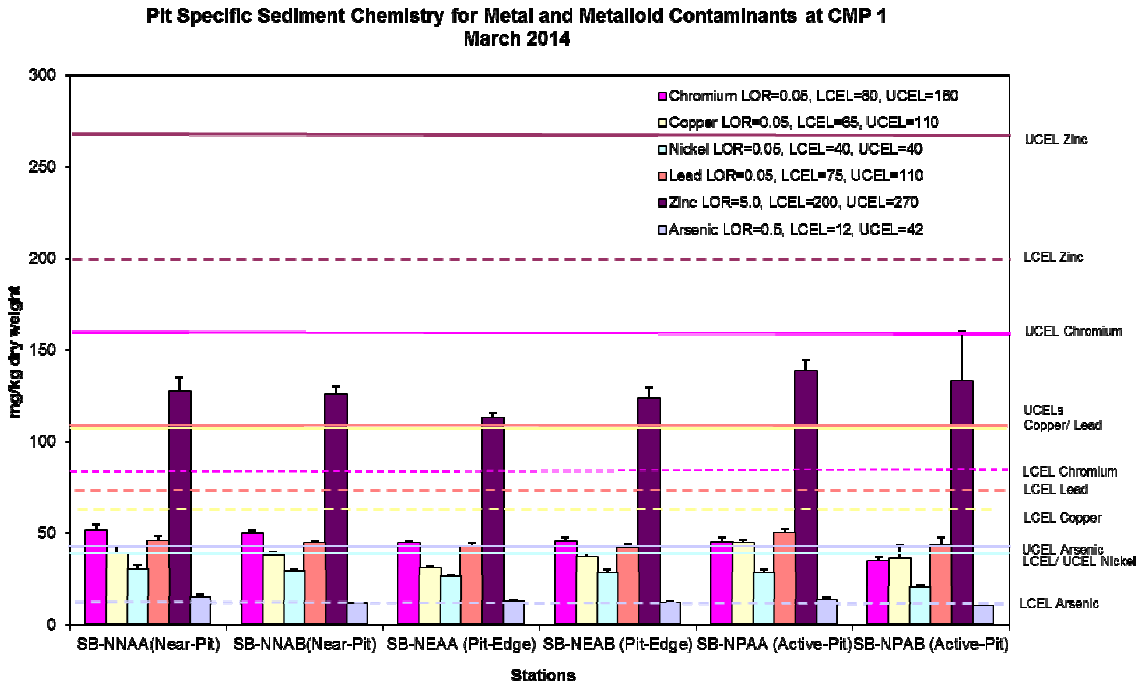


Figure 1: Concentration of Metals and Metalloid (Cr, Cu, Ni, Pb, Zn, As; mean +SD) in sediment samples collected from *Pit Specific Sediment Chemistry Monitoring* for CMP 1 in March 2014.

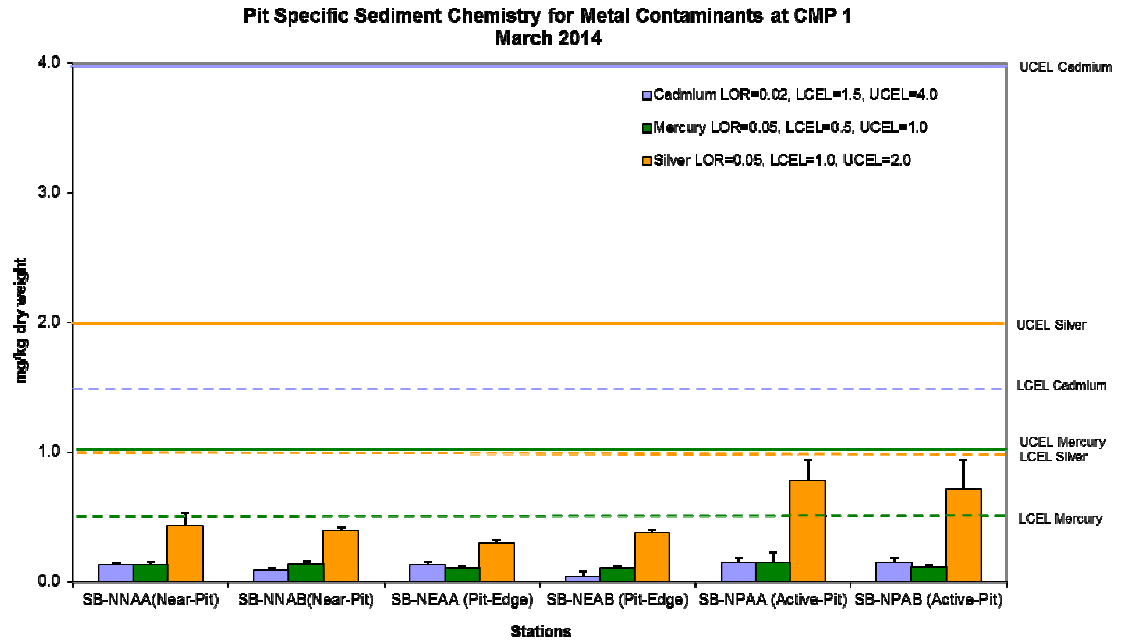


Figure 2: Concentration of Metals (Cd, Hg, Ag; mean +SD) in sediment samples collected from *Pit Specific Sediment Chemistry Monitoring* for CMP 1 in March 2014.

Source: H:\Team\EM\GMS Projects\0175086 CEDD EM&A for South Brothers\02 Deliverable\07 CMP Monthly Report\21st (May 2014)\Annex

Date: 16/6/2014

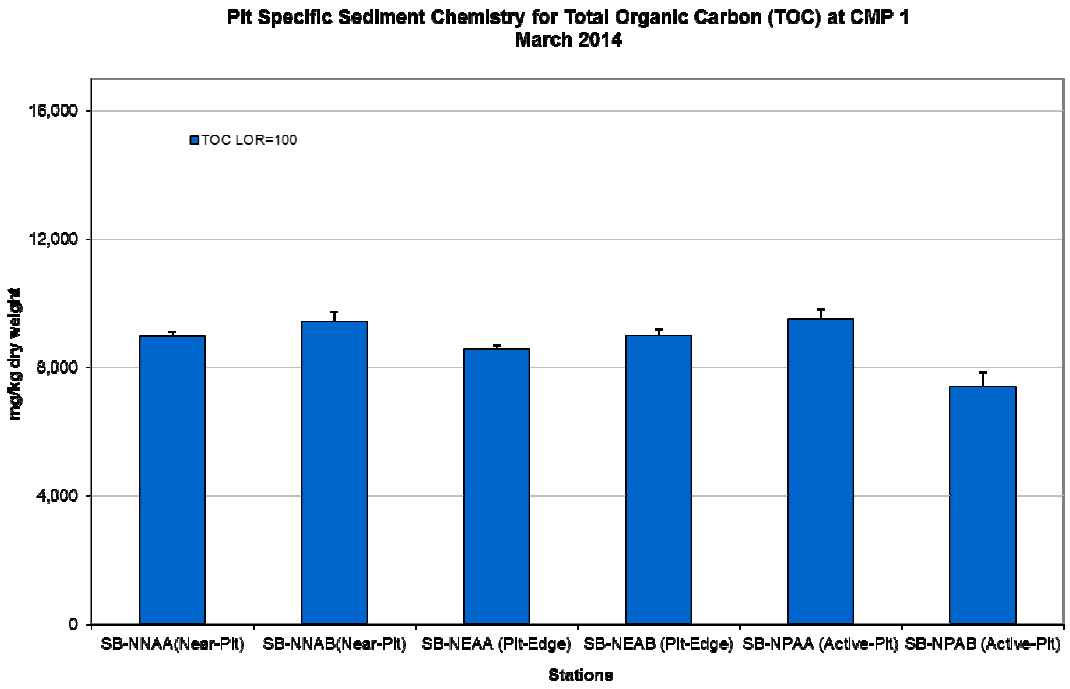


Figure 3: Concentration of Total Organic Carbon (mg/kg dry weight; mean +SD) in sediment samples collected from *Pit Specific Sediment Chemistry Monitoring* for CMP 1 in March 2014.

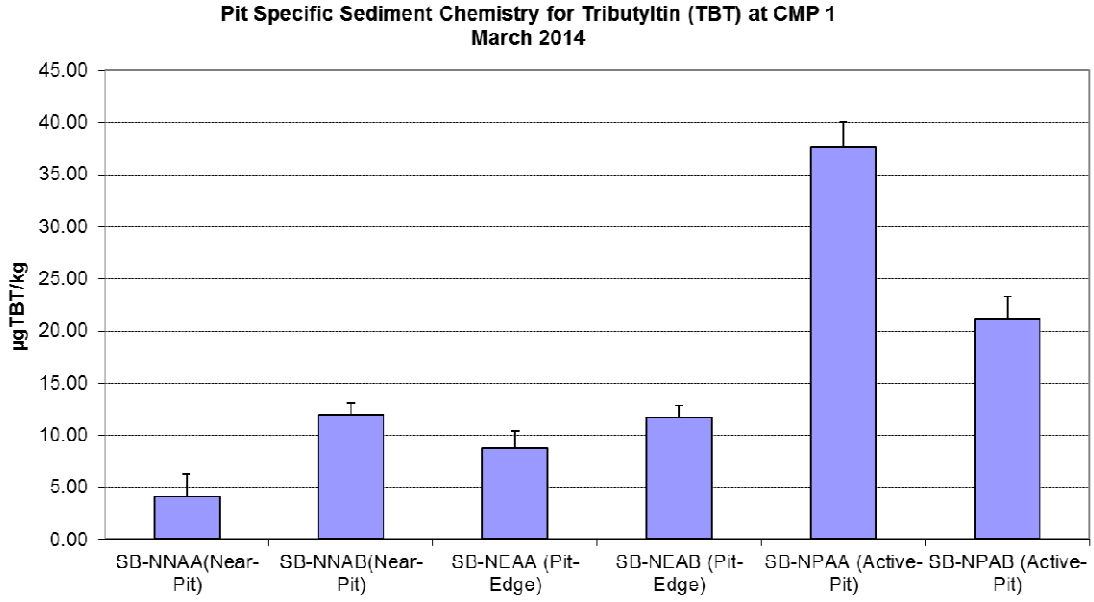


Figure 4: Concentration of Tributyltin (µg TBT/kg; mean +SD) in sediment samples collected from *Pit Specific Sediment Chemistry Monitoring* of CMP 1 in March 2014.

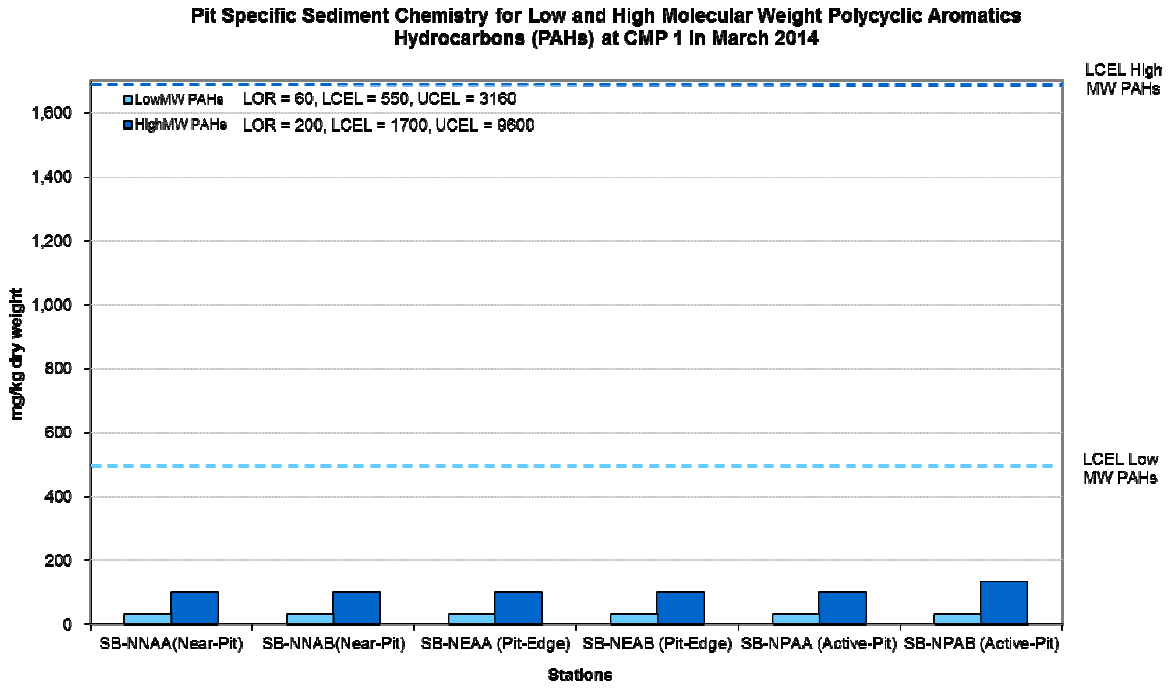


Figure 5: Concentration of Low and High Molecular Weight Polycyclic Aromatics Hydrocarbons (mg/kg dry weight; mean +SD) in sediment samples collected from *Pit Specific Sediment Chemistry Monitoring* for CMP 1 in January 2014.

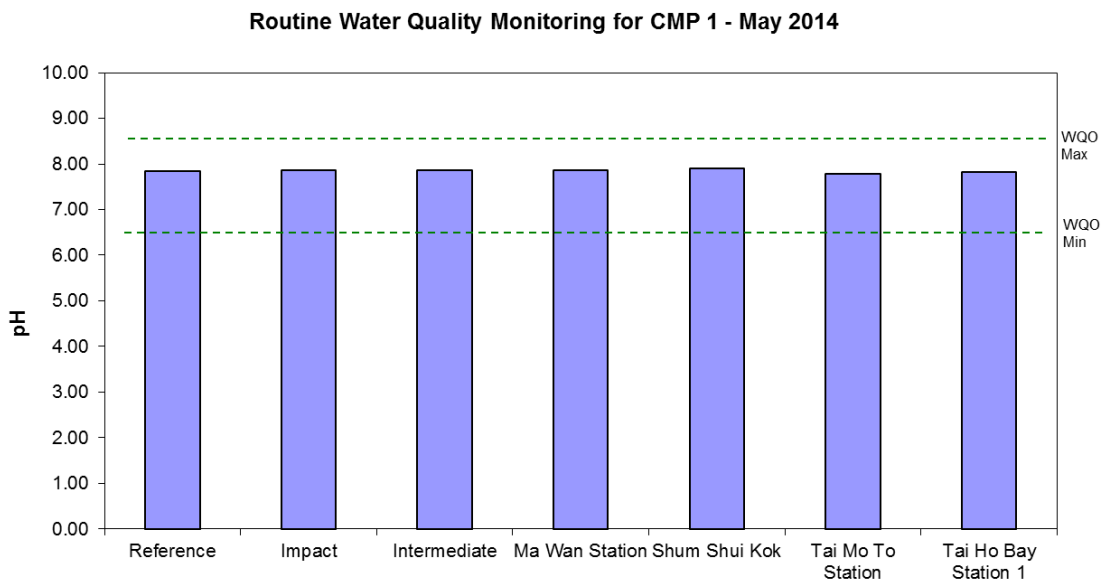


Figure 6: Level of pH recorded during Routine Water Quality Monitoring for disposal operations at CMP 1 in May 2014.

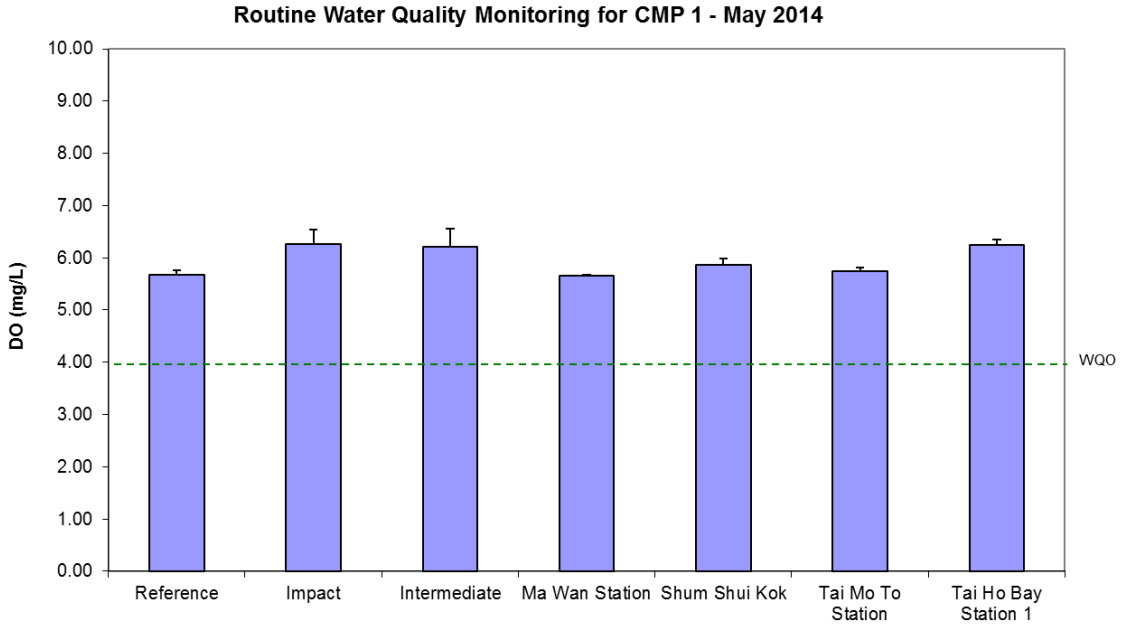


Figure 7: Concentration of Dissolved Oxygen (mg/L; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP 1 in May 2014.

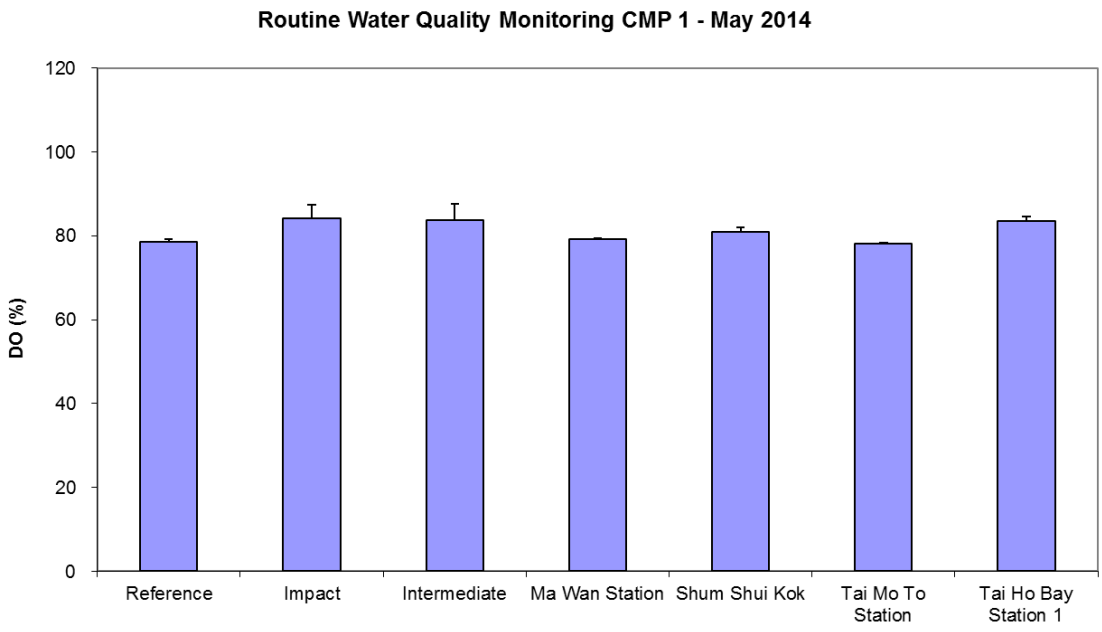


Figure 8: Level of Dissolved Oxygen (% saturation; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP 1 in May 2014.

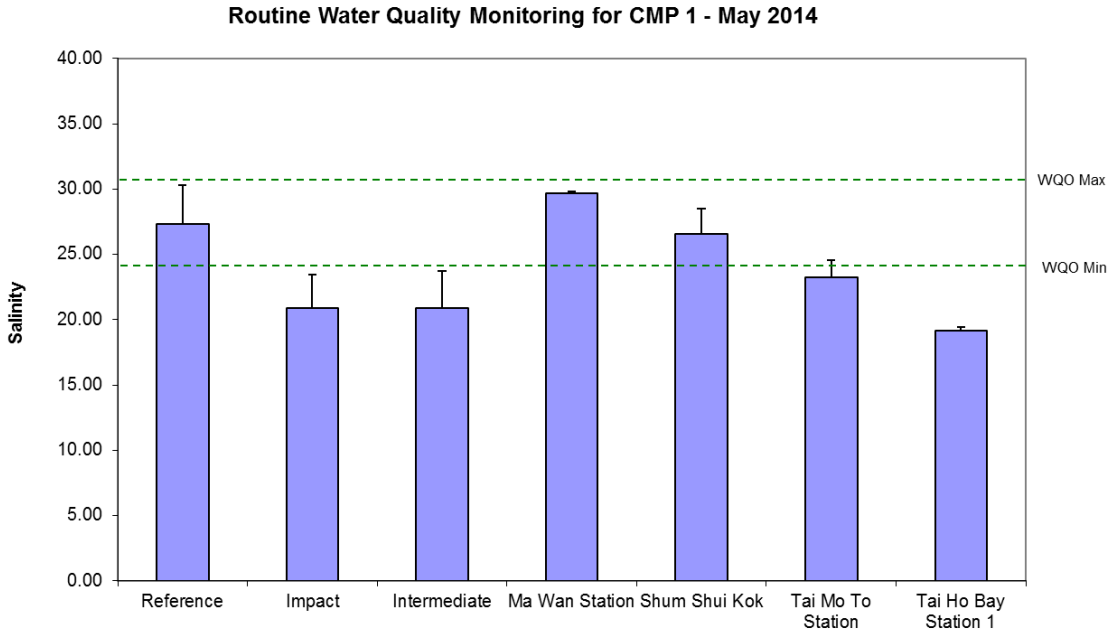


Figure 9: Level of Salinity (mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP 1 in May 2014.

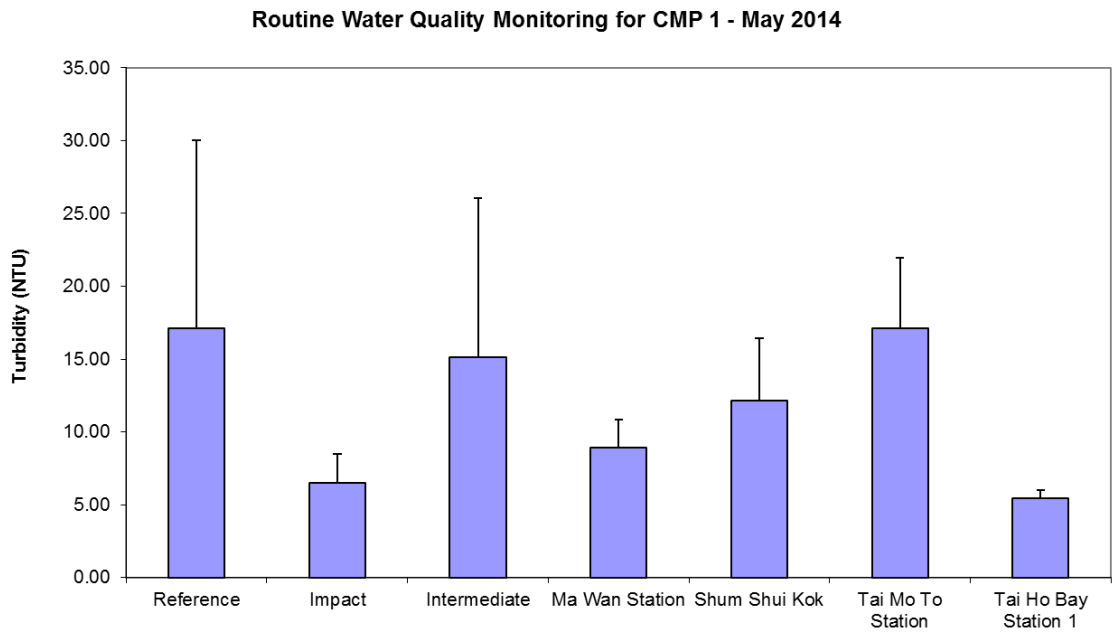


Figure 10: Level of Turbidity (NTU; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP 1 in May 2014.

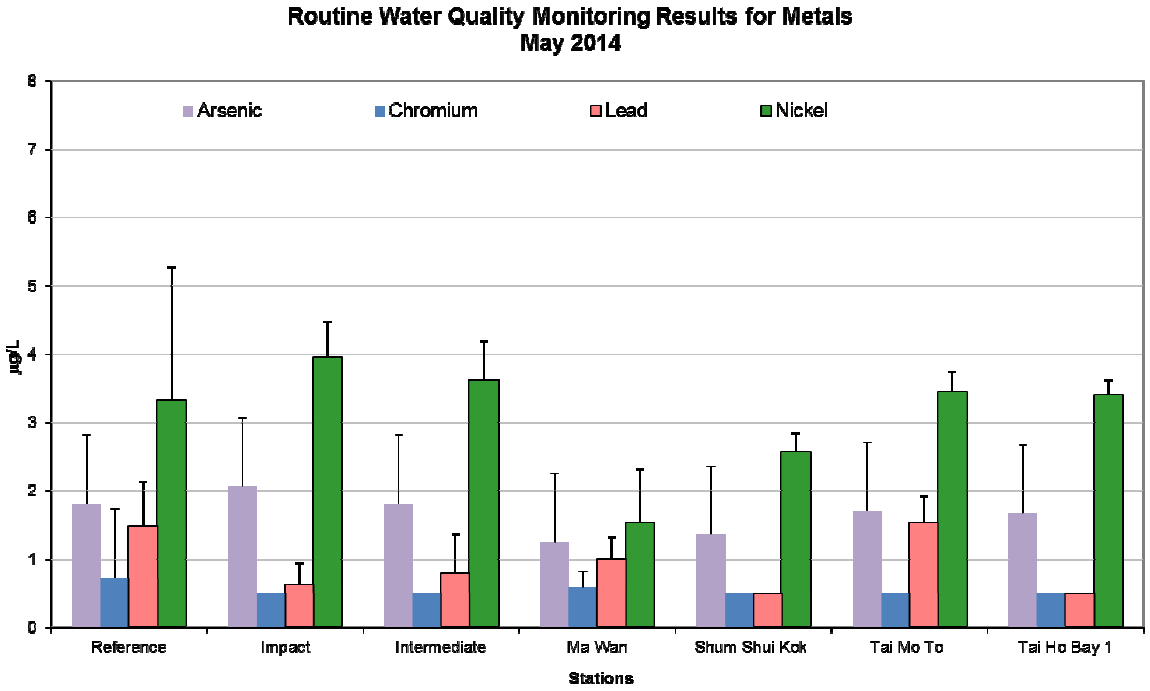


Figure 11: Concentration of Arsenic, Chromium, Lead, Nickel (mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP 1 in May 2014.

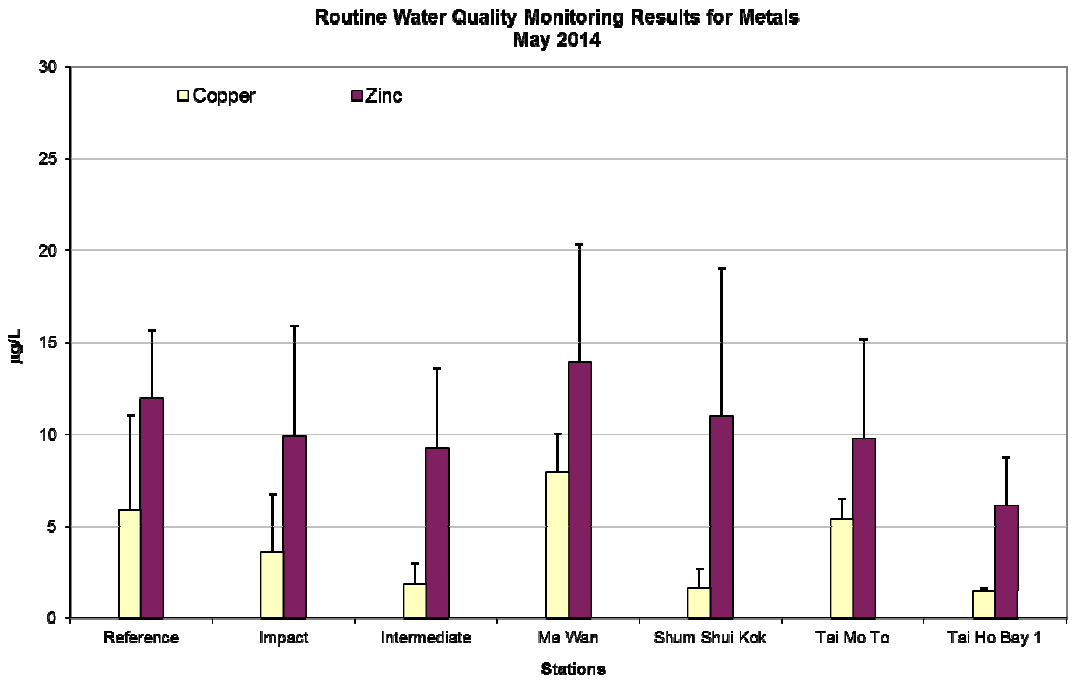


Figure 12: Concentration of Copper and Zinc (mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP 1 in May 2014.

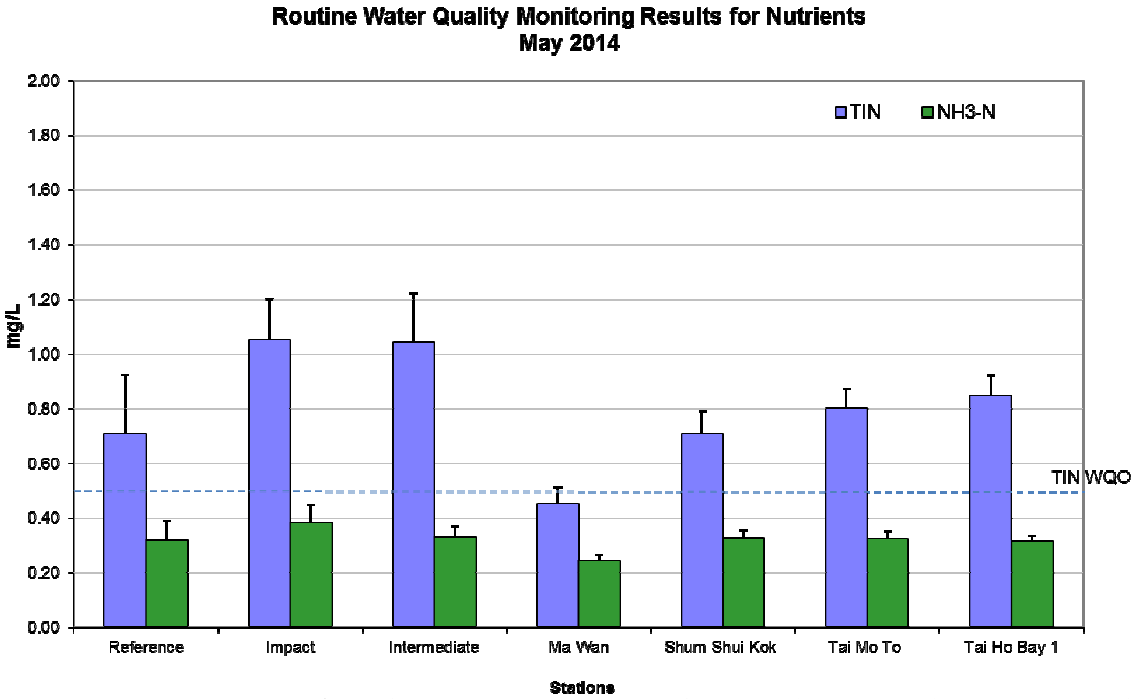


Figure 13: Concentration of Total Inorganic Nitrogen and NH_3-N (mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP 1 in May 2014.

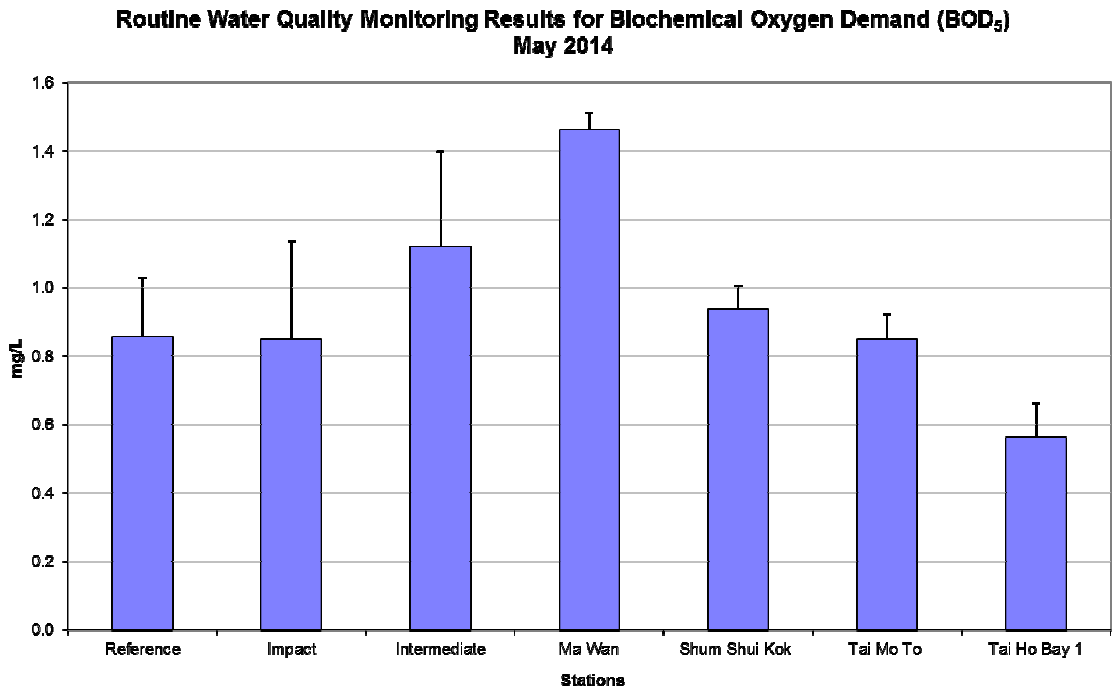


Figure 14: Level of Biochemical Oxygen Demand (BOD_5; mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP 1 in May 2014.

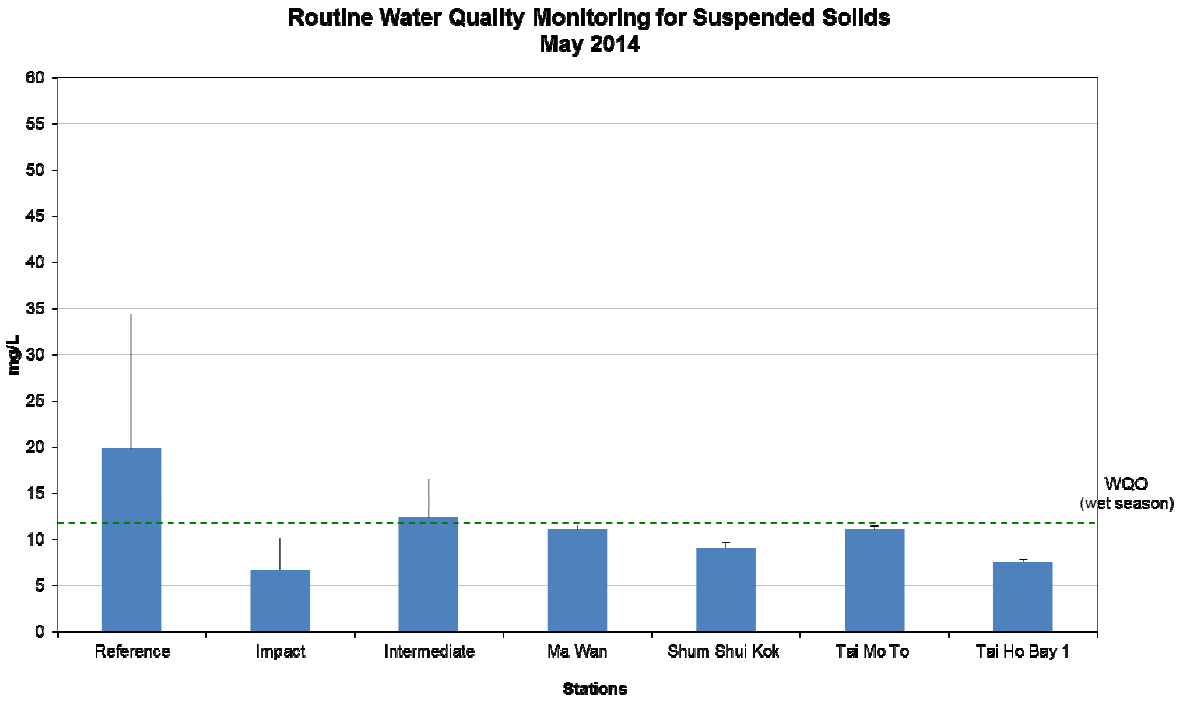


Figure 15: Concentration of Suspended Solids (mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP 1 in May 2014.

Annex C

Water Quality Monitoring Results

Table C1 ***Summary Table of DO, Turbidity and SS Levels Recorded between 26 April and 30 May 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		
2014/04/26	Mid-Ebb	DS1	6.60	6.64	8.43	8.00
		DS2	6.48	6.63	4.97	4.11
		DS3	6.32	6.58	5.37	6.11
		DS4	6.27	6.54	5.06	5.56
		DS5	6.28	6.52	4.97	4.56
		US1	6.66	6.77	7.54	7.17
		US2	6.49	6.52	8.72	8.50
		MW1	6.26	6.33	1.41	2.67
		THB1	6.33	6.54	7.37	4.67
		THB2	-	6.08	3.30	3.33
		WSR45C	6.18	6.42	2.86	3.56
		WSR46	6.29	6.54	8.48	8.67
	Mid-Flood	DS1	6.34	6.80	10.65	10.67
		DS2	6.65	6.79	9.37	9.00
		DS3	6.70	6.69	12.58	12.67
		DS4	6.72	6.75	8.98	8.78
		DS5	6.53	6.59	8.04	7.11
		US1	6.65	6.65	4.36	4.67
		US2	6.38	6.63	6.97	6.89
		MW1	6.29	6.38	3.20	2.44
		THB1	6.51	6.57	7.29	6.33
		THB2	-	-	-	-
		WSR45C	6.31	6.54	5.99	6.00
		WSR46	6.39	6.68	6.55	5.00
2014/04/29	Mid-Ebb	DS1	6.28	6.44	4.97	6.67
		DS2	6.27	6.39	4.85	6.22
		DS3	6.13	6.29	6.62	8.44
		DS4	6.12	6.34	6.66	6.78
		DS5	6.10	6.36	7.58	8.44
		US1	6.53	6.93	5.20	4.67
		US2	6.74	6.81	3.74	3.83
		MW1	6.20	6.38	1.68	3.89
		THB1	6.28	6.73	5.93	8.00
		THB2	-	6.22	3.27	3.67
		WSR45C	6.20	6.41	5.23	6.11
		WSR46	6.26	6.48	11.45	9.33
	Mid-Flood	DS1	6.34	6.51	6.85	7.00
		DS2	6.60	6.64	5.78	4.83
		DS3	6.48	6.64	10.03	10.67
		DS4	6.45	6.45	8.99	10.33
		DS5	6.42	6.42	9.46	9.44
		US1	6.42	6.48	4.72	5.83
		US2	6.21	6.49	5.72	6.44
		MW1	6.18	6.31	3.80	5.11
		THB1	6.20	6.19	14.49	19.00
		THB2	-	6.64	9.96	10.33
		WSR45C	6.22	6.49	12.66	13.67

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average SS Level (mg/L)
			Bottom	Surface and Mid Depth		
		WSR46	6.19	6.58	7.23	14.11
2014/05/01	Mid-Ebb	DS1	6.14	6.08	4.41	4.11
		DS2	5.94	6.08	4.15	4.00
		DS3	6.11	6.14	4.00	4.56
		DS4	6.07	6.16	4.45	4.00
		DS5	6.01	6.11	6.06	5.67
		US1	6.14	6.26	4.60	5.33
		US2	6.08	6.19	4.65	4.00
		MW1	6.10	6.22	3.26	4.44
		THB1	6.11	6.20	4.21	8.67
		THB2	-	5.53	3.64	5.33
		WSR45C	5.97	6.08	7.19	6.89
		WSR46	5.98	6.02	5.96	6.78
	Mid-Flood	DS1	6.05	6.08	4.49	5.67
		DS2	6.16	6.13	4.34	5.67
		DS3	6.06	6.07	4.84	5.67
		DS4	6.12	6.11	3.52	5.11
		DS5	5.98	6.09	5.48	5.22
		US1	6.02	6.06	9.81	8.78
		US2	6.01	6.07	7.51	6.67
		MW1	5.99	6.11	2.66	4.89
		THB1	6.22	6.10	4.72	7.00
		THB2	-	5.07	4.40	6.33
		WSR45C	6.01	6.10	4.45	6.11
		WSR46	6.02	6.07	5.57	7.22
2014/05/03	Mid-Ebb	DS1	6.58	6.70	5.58	9.50
		DS2	6.18	6.36	4.33	4.56
		DS3	6.22	6.47	4.87	5.00
		DS4	6.16	6.37	5.58	5.00
		DS5	6.19	6.41	5.41	5.00
		US1	6.99	7.06	3.23	5.50
		US2	6.95	6.95	3.03	5.83
		MW1	6.50	6.63	2.57	4.44
		THB1	6.66	6.70	3.43	4.33
		THB2	-	6.44	2.44	6.67
		WSR45C	6.20	6.40	5.48	8.44
		WSR46	6.20	6.24	9.31	7.33
	Mid-Flood	DS1	6.23	6.22	4.30	6.00
		DS2	6.22	6.25	3.25	2.17
		DS3	6.29	6.26	3.28	5.00
		DS4	6.31	6.28	3.35	3.89
		DS5	6.39	6.37	3.38	2.88
		US1	5.92	6.02	4.52	5.44
		US2	6.01	6.20	4.53	4.89
		MW1	6.02	6.15	2.17	2.67
		THB1	6.18	6.19	3.78	4.33
		THB2	-	6.07	2.97	4.67
		WSR45C	6.04	6.12	4.74	5.00
		WSR46	6.10	6.19	5.47	7.56
2014/05/05	Mid-Ebb	DS1	6.18	6.54	6.64	7.00
		DS2	6.18	6.35	4.94	4.78

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average SS Level (mg/L)
			Bottom	Surface and Mid Depth		
		DS3	6.22	6.47	4.06	4.33
		DS4	6.27	6.51	3.66	3.44
		DS5	6.17	6.39	4.00	2.67
		US1	6.73	6.93	3.42	2.20
		US2	6.91	6.96	2.88	2.83
		MW1	6.42	6.57	1.48	3.22
		THB1	6.87	6.87	2.33	3.00
		THB2	-	6.47	4.34	4.78
		WSR45C	6.15	6.41	4.80	5.00
		WSR46	6.19	6.68	2.95	2.83
	Mid-Flood	DS1	6.64	6.70	4.08	4.17
		DS2	6.66	6.72	2.88	3.33
		DS3	6.69	6.79	2.39	2.43
		DS4	6.83	6.78	2.32	3.11
		DS5	6.70	6.48	2.97	3.33
		US1	6.33	6.37	8.38	8.67
		US2	6.15	6.34	1.76	6.56
		MW1	6.25	6.46	3.08	3.33
		THB1	6.43	5.34	3.47	5.00
		THB2	-	6.41	3.87	3.33
		WSR45C	6.16	6.53	7.72	9.00
		WSR46	6.17	6.54	6.64	7.00
2014/05/07	Mid-Ebb	DS1	6.09	6.48	6.15	8.10
		DS2	5.76	6.00	9.65	12.27
		DS3	6.04	6.22	5.09	7.70
		DS4	6.00	6.18	4.11	4.93
		DS5	5.81	6.22	4.57	5.10
		US1	6.09	6.41	6.68	11.10
		US2	6.02	6.27	10.15	18.02
		MW1	6.10	6.16	1.91	2.59
		THB1	6.43	6.73	3.23	3.08
		THB2	-	5.42	5.63	3.00
		WSR45C	5.88	6.17	5.06	6.17
		WSR46	5.97	6.33	6.39	7.47
	Mid-Flood	DS1	6.29	6.40	3.52	5.88
		DS2	6.33	6.61	5.99	7.80
		DS3	6.59	6.64	2.51	6.43
		DS4	6.01	6.47	3.51	3.56
		DS5	6.11	6.37	3.10	4.46
		US1	6.28	6.41	3.34	3.57
		US2	5.93	6.21	4.67	4.84
		MW1	5.97	6.08	2.42	3.19
		THB1	6.20	6.26	5.50	6.22
		THB2	-	5.50	3.60	3.07
		WSR45C	5.90	6.07	3.43	3.94
		WSR46	5.92	6.16	8.62	9.99
2014/05/09	Mid-Ebb	DS1	6.46	6.49	5.00	5.07
		DS2	6.19	6.41	5.36	5.77
		DS3	6.15	6.31	5.70	6.40
		DS4	6.04	6.23	6.40	7.14
		DS5	5.90	6.19	6.37	6.81

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average SS Level (mg/L)
			Bottom	Surface and Mid Depth		
		US1	6.31	6.47	12.83	15.17
		US2	6.59	6.65	4.82	5.53
		MW1	5.97	6.01	3.42	5.83
		THB1	6.29	6.47	6.82	7.82
		THB2	-	-	-	-
		WSR45C	5.91	6.01	5.08	7.41
		WSR46	5.95	6.16	8.91	9.81
	Mid-Flood	DS1	6.26	6.39	7.55	10.23
		DS2	6.51	6.52	7.35	9.30
		DS3	6.53	6.52	7.25	10.98
		DS4	6.09	6.40	7.80	9.93
		DS5	6.21	6.35	10.54	12.24
		US1	6.36	6.33	8.62	10.38
		US2	5.88	6.11	8.63	11.07
		MW1	5.97	6.09	3.43	5.47
		THB1	6.33	6.33	9.43	11.98
		THB2	-	-	-	-
		WSR45C	5.93	6.13	8.38	11.24
		WSR46	6.10	6.28	8.04	10.73
2014/05/12	Mid-Ebb	DS1	6.80	6.96	4.59	10.47
		DS2	6.77	6.91	3.82	4.67
		DS3	6.71	6.81	3.47	4.91
		DS4	6.13	6.62	6.95	7.44
		DS5	5.87	6.46	12.16	7.54
		US1	6.66	6.83	7.52	7.48
		US2	6.61	6.76	6.75	6.28
		MW1	5.72	6.19	3.37	5.64
		THB1	6.72	6.90	5.15	8.12
		THB2	-	-	-	-
		WSR45C	5.72	6.75	8.37	9.34
		WSR46	6.11	6.38	7.04	7.73
	Mid-Flood	DS1	6.81	6.89	4.39	6.42
		DS2	6.92	6.93	6.62	5.58
		DS3	6.91	6.94	6.10	11.30
		DS4	6.44	6.86	7.48	6.41
		DS5	6.35	6.83	7.18	8.01
		US1	6.57	6.60	5.38	7.40
		US2	5.96	6.32	9.58	8.70
		MW1	5.75	5.86	5.90	9.61
		THB1	6.88	6.92	6.98	7.68
		THB2	-	-	-	-
		WSR45C	5.71	6.26	11.10	10.22
		WSR46	5.86	6.32	19.95	12.48
2014/05/14	Mid-Ebb	DS1	6.13	6.18	5.33	6.36
		DS2	5.72	6.12	7.52	10.42
		DS3	5.82	6.17	7.07	7.53
		DS4	5.83	6.24	7.03	8.92
		DS5	5.80	6.06	8.03	8.98
		US1	6.12	6.33	8.27	7.95
		US2	6.28	6.36	8.52	9.43
		MW1	5.86	6.02	3.67	7.02

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	5.66	6.00	6.93	8.18
		THB2	-	5.44	4.45	4.60
		WSR45C	5.74	6.02	7.76	8.88
		WSR46	5.66	6.01	10.33	12.32
	Mid-Flood	DS1	6.36	6.36	19.20	17.93
		DS2	6.48	6.51	8.95	11.70
		DS3	6.33	6.51	11.82	18.57
		DS4	5.93	6.68	12.95	11.90
		DS5	6.29	6.26	9.23	11.56
		US1	6.37	6.48	13.75	16.32
		US2	5.58	6.47	6.43	10.58
		MW1	5.82	5.71	10.00	13.33
		THB1	6.36	6.04	25.97	21.00
		THB2		6.06	13.83	11.90
		WSR45C	5.70	6.11	11.17	13.61
		WSR46	5.80	6.17	9.76	10.51
2014/05/16	Mid-Ebb	DS1	5.82	5.95	5.96	9.16
		DS2	5.49	5.82	11.88	25.88
		DS3	5.53	5.94	6.94	10.30
		DS4	5.55	5.78	7.65	10.33
		DS5	5.53	5.75	8.46	10.66
		US1	6.05	6.29	4.88	7.65
		US2	5.96	6.20	5.43	6.50
		MW1	5.70	5.83	6.21	9.33
		THB1	6.00	5.99	6.35	10.30
		THB2	-	-	-	-
		WSR45C	5.54	5.83	7.63	11.30
		WSR46	5.52	5.67	7.14	9.90
	Mid-Flood	DS1	5.79	5.80	8.64	13.22
		DS2	5.87	5.84	7.39	11.18
		DS3	5.92	5.86	5.73	8.14
		DS4	5.96	5.92	6.59	8.60
		DS5	5.97	5.95	4.98	7.43
		US1	5.64	5.74	7.59	12.01
		US2	5.53	5.79	10.84	14.52
		MW1	5.47	5.80	6.44	9.66
		THB1	5.74	5.79	5.53	7.02
		THB2	-	-	-	-
		WSR45C	5.50	5.70	18.24	10.21
		WSR46	5.52	5.71	14.28	15.04
2014/05/19	Mid-Ebb	DS1	5.53	6.27	5.84	6.36
		DS2	5.31	6.07	11.06	9.13
		DS3	5.62	6.10	5.66	6.89
		DS4	5.59	6.20	5.40	6.89
		DS5	5.49	6.00	7.93	9.02
		US1	5.64	6.75	5.57	8.48
		US2	5.60	6.36	5.76	7.61
		MW1	5.66	5.96	3.60	5.64
		THB1	5.78	5.56	6.43	6.62
		THB2	-	5.96	5.57	3.57
		WSR45C	5.33	5.88	7.83	7.97

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average SS Level (mg/L)
			Bottom	Surface and Mid Depth		
		WSR46	5.24	6.03	5.79	7.47
	Mid-Flood	DS1	5.50	5.52	4.75	5.55
		DS2	5.75	5.62	4.38	5.72
		DS3	6.01	5.85	4.03	4.73
		DS4	5.71	5.87	4.67	5.48
		DS5	5.88	5.98	4.42	5.29
		US1	5.39	5.41	5.57	6.81
		US2	5.37	5.44	7.27	9.22
		MW1	5.31	5.42	3.22	4.82
		THB1	5.21	5.13	29.83	12.47
		THB2	-	-	-	-
		WSR45C	5.19	5.26	9.76	12.21
		WSR46	5.27	5.36	8.38	10.83
2014/05/21	Mid-Ebb	DS1	5.60	6.00	6.35	7.50
		DS2	5.12	5.75	7.28	10.06
		DS3	5.39	5.76	5.53	8.32
		DS4	5.32	5.69	5.87	6.74
		DS5	5.37	5.73	4.49	6.37
		US1	5.92	6.79	4.55	5.08
		US2	5.32	6.30	6.61	7.20
		MW1	5.28	5.94	2.82	4.66
		THB1	5.35	6.17	5.45	5.02
		THB2	-	5.12	5.49	10.30
		WSR45C	4.91	5.71	7.20	8.88
		WSR46	5.14	5.74	3.65	5.38
	Mid-Flood	DS1	6.09	5.92	4.28	6.47
		DS2	6.10	6.03	4.48	4.62
		DS3	6.12	6.21	4.71	5.51
		DS4	5.56	6.07	5.96	6.44
		DS5	5.65	6.19	4.34	5.80
		US1	5.43	5.54	4.18	5.41
		US2	5.43	5.64	4.34	5.81
		MW1	5.07	5.57	3.07	4.98
		THB1	5.84	5.82	12.19	10.52
		THB2	-	-	-	-
		WSR45C	5.06	5.43	4.46	5.00
		WSR46	5.05	5.71	10.50	10.16
2014/05/23	Mid-Ebb	DS1	6.20	6.26	3.23	3.58
		DS2	5.04	5.96	3.82	4.22
		DS3	5.12	5.79	3.83	4.67
		DS4	4.94	5.52	4.06	4.17
		DS5	4.76	5.48	6.95	7.41
		US1	5.76	5.88	32.45	24.15
		US2	6.18	6.34	2.27	3.17
		MW1	4.65	5.62	3.48	5.23
		THB1	5.90	6.31	3.58	3.52
		THB2	-	-	-	-
		WSR45C	4.76	5.29	6.99	8.22
		WSR46	4.86	5.11	6.34	5.68
	Mid-Flood	DS1	6.25	6.37	6.98	9.93
		DS2	6.76	6.79	2.83	3.55

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average SS Level (mg/L)
			Bottom	Surface and Mid Depth		
		DS3	5.56	6.20	3.48	4.34
		DS4	5.48	6.11	4.08	3.94
		DS5	5.79	6.21	3.28	3.14
		US1	5.94	6.10	3.29	3.70
		US2	4.76	5.71	6.79	6.67
		MW1	4.62	5.15	4.35	7.53
		THB1	5.63	6.09	5.35	3.07
		THB2	-	-	-	-
		WSR45C	4.75	5.36	8.13	7.80
		WSR46	5.01	5.80	5.46	5.26
2014/05/26	Mid-Ebb	DS1	6.61	6.75	3.32	3.72
		DS2	4.42	5.37	4.85	5.56
		DS3	5.11	5.45	3.42	4.31
		DS4	4.63	5.39	5.37	4.94
		DS5	4.57	4.93	5.85	5.69
		US1	6.10	6.64	2.80	4.25
		US2	5.16	6.42	3.87	4.15
		MW1	4.51	5.21	2.05	3.50
		THB1	5.71	6.74	3.00	3.00
		THB2	-	6.09	6.13	2.97
		WSR45C	4.44	5.15	6.42	5.42
		WSR46	4.54	5.36	6.65	5.98
	Mid-Flood	DS1	6.44	6.69	10.25	6.75
		DS2	6.74	6.67	15.03	10.98
		DS3	6.95	6.73	6.47	6.20
		DS4	5.93	7.23	7.42	7.21
		DS5	6.21	8.23	5.66	6.97
		US1	5.62	6.90	3.45	4.17
		US2	4.68	5.35	5.49	6.11
		MW1	4.57	4.95	2.83	3.79
		THB1	7.17	7.18	4.57	6.87
		THB2	-	8.36	4.07	5.80
		WSR45C	4.46	5.65	9.22	10.51
		WSR46	4.50	5.71	8.27	7.71
2014/05/28	Mid-Ebb	DS1	8.68	10.04	3.83	5.72
		DS2	5.51	8.46	2.61	4.56
		DS3	5.42	8.08	2.08	5.04
		DS4	4.78	8.32	3.22	5.33
		DS5	4.67	7.21	3.86	6.42
		US1	7.81	9.39	7.00	9.58
		US2	5.90	9.22	7.43	8.50
		MW1	4.57	6.46	1.44	3.79
		THB1	8.94	9.57	5.43	6.68
		THB2	-	7.95	4.20	6.60
		WSR45C	4.52	6.14	3.63	4.67
		WSR46	4.64	6.04	3.31	3.47
	Mid-Flood	DS1	10.05	10.12	2.38	5.03
		DS2	12.00	12.07	4.47	7.03
		DS3	5.97	10.69	9.57	14.48
		DS4	7.93	10.26	7.42	9.29
		DS5	10.63	10.99	6.20	9.43

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average SS Level (mg/L)
			Bottom	Surface and Mid Depth		
		US1	5.77	7.25	3.48	5.97
		US2	5.12	6.29	3.51	6.03
		MW1	4.88	5.25	2.04	5.84
		THB1	9.24	9.76	6.23	8.97
		THB2	-	9.59	9.93	16.30
		WSR45C	4.74	6.03	4.38	5.43
		WSR46	4.89	7.26	4.23	6.33
2014/05/30	Mid-Ebb	DS1	5.68	6.99	2.11	3.93
		DS2	4.43	6.09	3.04	6.23
		DS3	5.15	6.51	2.51	4.24
		DS4	5.07	5.98	2.49	4.29
		DS5	5.20	6.15	2.26	3.74
		US1	7.10	9.40	2.97	7.17
		US2	5.24	7.37	2.86	4.63
		MW1	6.24	7.13	1.48	3.63
		THB1	6.52	8.77	3.73	6.20
		THB2	-	8.99	2.60	4.00
		WSR45C	4.79	6.21	4.42	6.11
		WSR46	4.93	6.20	2.68	4.83
	Mid-Flood	DS1	5.95	5.61	1.90	3.13
		DS2	6.83	5.79	2.12	4.53
		DS3	6.30	6.91	2.35	5.44
		DS4	5.59	6.29	3.32	5.57
		DS5	5.40	6.62	3.02	6.06
		US1	5.14	5.78	1.94	3.54
		US2	4.95	5.60	1.87	2.89
		MW1	4.66	5.65	1.36	3.24
		THB1	6.08	5.79	2.25	3.18
		THB2	-	6.82	2.50	4.53
		WSR45C	4.84	5.47	2.75	4.38
		WSR46	5.02	5.75	5.46	4.68

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. Sampling at Station THB2 during mid-flood tides of 26 April, 19 and 21 May 2014 was cancelled due to adverse weather condition.
6. Sampling at Station THB2 on 9, 12, 16 and 23 May 2014 was cancelled due to adverse weather condition.

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 Results of Baseline Monitoring conducted for SB CMPs in July and August 2012

Parameter	Detection Limit	Stations around SB CMP			EPD Stations (NM1, NM2, NM3, NM5 and NM6)		
		Average	Min	Max	Average	Min	Max
DO (mg/L)	0.1	5.6	2.5	12.2	5.1	2.3	10.7
Turbidity (NTU)	0.1	9.5	1.5	74.9	9.6	1.9	120.1
SS (mg/L)	2	9.9	3.1	130.7	8.8	0.8	49.3
Arsenic (µg/L)	10	<10	<10	<10	<10	<10	<10
Cadmium (µg/L)	0.2	0.2	0.2	0.4	0.2	0.2	0.2
Chromium (µg/L)	1	1.5	1.0	2.0	2.0	1.0	3.0
Copper (µg/L)	1	2.3	1.0	13.0	1.2	1.0	11.0
Lead (µg/L)	1	1.3	1.0	2.0	5.0	1.0	9.0
Mercury (µg/L)	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel (µg/L)	1	2.2	1.0	7.0	2.1	1.0	5.0
Silver (µg/L)	1	<1	<1	<1	<1	<1	<1
Zinc (µg/L)	10	18.9	10.0	173.0	23.7	10.0	224.0
NH_3-N (mg/L)	0.01	0.1	0.0	0.4	0.1	0.0	0.4
TIN (mg/L)	0.1	0.8	0.3	1.7	0.8	0.2	1.8
BOD_5 (mg/L)	2	<2	<2	<2	<2	<2	<2

Table C4 In-situ Monitoring Results for Routine Water Quality Monitoring of CMP 1 in May 2014

Sampling Period	Stations	Temp (°C)	Salinity (ppt)	Turbidity (NTU)	Dissolved Oxygen (%)	Dissolved Oxygen (mg L^{-1})	pH (mg L^{-1})
May 2014	RFE (Reference)	23.77	27.35	17.11	78.51	5.68	7.84
	IPE (Impact)	24.30	20.88	6.47	84.23	6.26	7.86
	INE (Intermediate)	24.43	20.89	15.12	83.70	6.21	7.86
	Ma Wan	23.65	29.69	8.94	79.24	5.66	7.86
	Shum Shui Kok	23.86	26.55	12.14	80.86	5.86	7.91
	Tai Mo To	23.99	23.25	17.10	78.03	5.75	7.78
	Tai Ho Bay 1	24.40	19.17	5.46	83.43	6.25	7.82
	Tai Ho Bay 2	-	-	-	-	-	-
	WQO	N/A	24.61-30.08#	N/A	N/A	>4	6.5-8.5

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

Table C5 Laboratory Results for Routine Water Quality Monitoring of CMP 1 in May 2014

Sampling Period	Stations	As (µg/L)	Cd (µg/L)	Cr (µg/L)	Cu (µg/L)	Pb (µg/L)	Hg (µg/L)	Ni (µg/L)	Ag (µg/L)	Zn (µg/L)	NH_3 (mg/L)	TIN (mg/L)	BOD_5 (mg/L)	SS (mg/L)
May 2014	RFE	1.81	<LOR	0.72	5.91	1.48	<LOR	3.32	<LOR	11.97	0.32	0.71	0.86	19.88
	IPE	2.06	<LOR	<LOR	3.60	0.63	<LOR	3.96	<LOR	9.89	0.39	1.05	0.85	6.76
	INE	1.82	<LOR	<LOR	1.84	0.80	<LOR	3.63	<LOR	9.28	0.33	1.04	1.12	12.38
	Ma Wan	1.25	<LOR	0.59	7.96	1.00	<LOR	1.54	<LOR	13.89	0.25	0.45	1.46	11.05
	Shum Shui Kok	1.36	<LOR	<LOR	1.66	<LOR	<LOR	2.58	<LOR	11.03	0.33	0.71	0.94	9.09
	Tai Mo To	1.71	<LOR	<LOR	5.41	1.54	<LOR	3.45	<LOR	9.76	0.32	0.80	0.85	11.03
	Tai Ho Bay 1	1.68	<LOR	<LOR	1.48	<LOR	<LOR	3.40	<LOR	6.13	0.32	0.85	0.56	7.58

WQO of TIN: 0.5 mg/L
Wet Season WQO of SS: 12.0 mg/L

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

Table C6 Water Column Profiling Results for CMP 1 on 15 May 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)	25.38	20.68	5.63	83.74	6.11	7.76	8.33
WCP 2 (Upstream)	25.75	20.73	15.26	87.14	6.32	7.77	11.03
WQO (wet season)	N/A	18.63-22.81#	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 May 2014

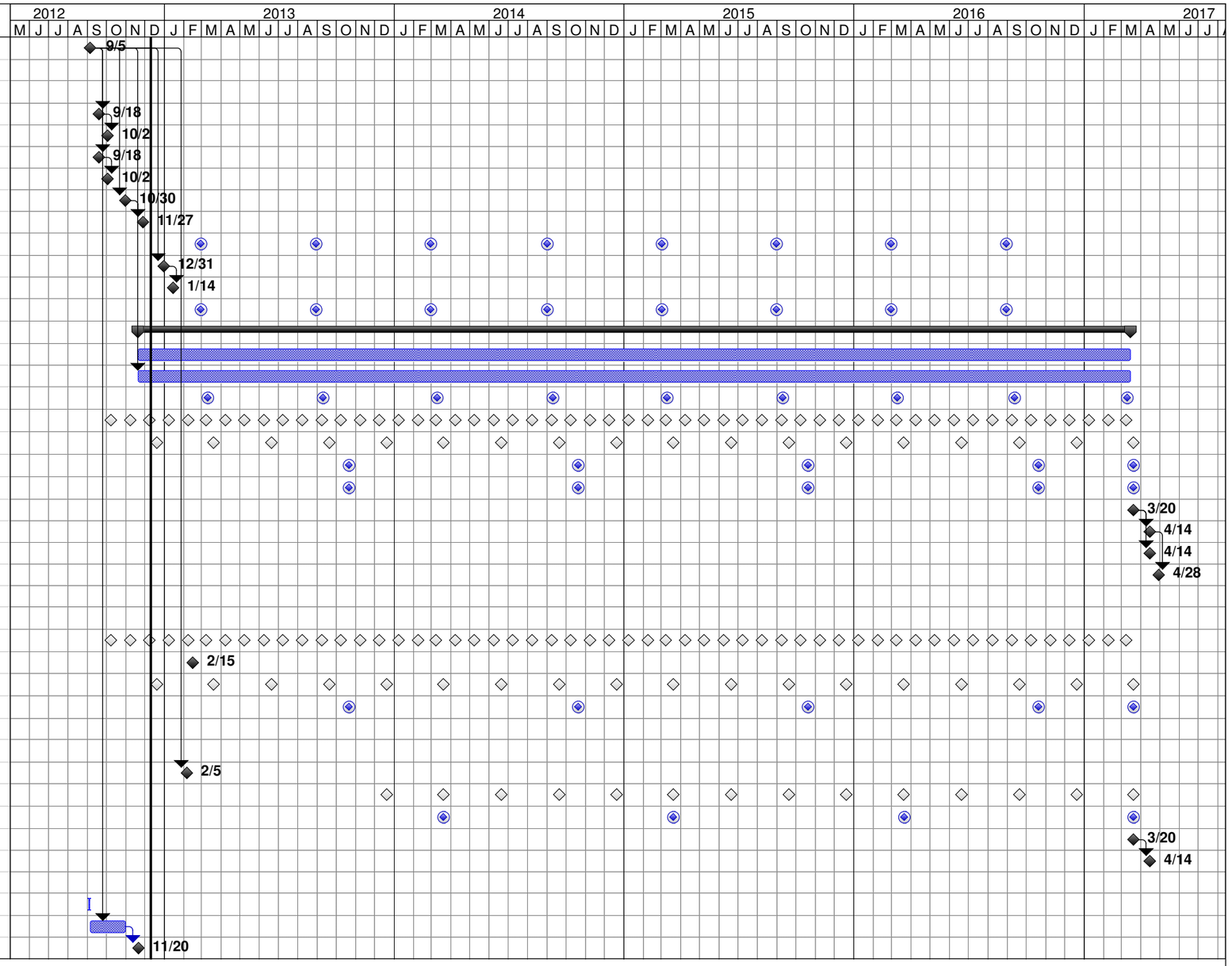
Table D1 Dredging Record at SB CMP 2

Date	Daily Dredging Volume (m^3)	Weekly Dredging Volume (m^3) (From Sunday to Saturday)
27-Apr-2014	7,150	29,900
28-Apr-2014	6,500	
29-Apr-2014	5,850	
30-Apr-2014	1,300	
01-May-2014	0	
02-May-2014	3,250	
03-May-2014	5,850	
04-May-2014	5,850	32,500
05-May-2014	7,150	
06-May-2014	9,100	
07-May-2014	6,500	
08-May-2014	3,900	
09-May-2014	0	
10-May-2014	0	
11-May-2014	0	19,500
12-May-2014	4,550	
13-May-2014	3,900	
14-May-2014	0	
15-May-2014	0	
16-May-2014	5,850	
17-May-2014	5,200	
18-May-2014	6,500	55,250
19-May-2014	6,500	
20-May-2014	8,450	
21-May-2014	9,100	
22-May-2014	9,750	
23-May-2014	7,150	
24-May-2014	7,800	
25-May-2014	7,800	56,550
26-May-2014	8,450	
27-May-2014	8,450	
28-May-2014	6,500	
29-May-2014	8,450	
30-May-2014	8,450	
31-May-2014	8,450	

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