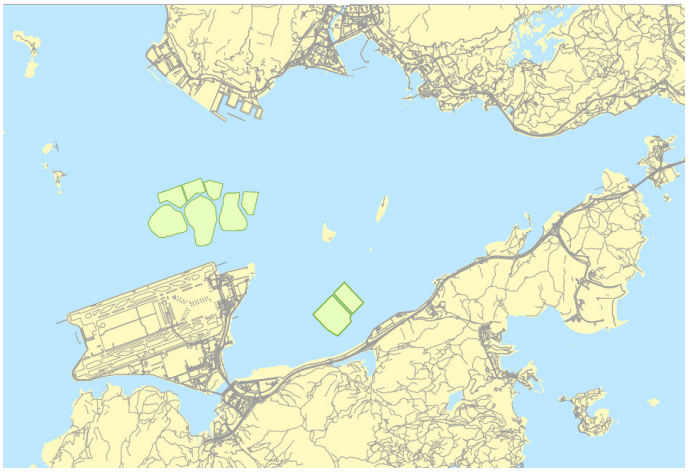
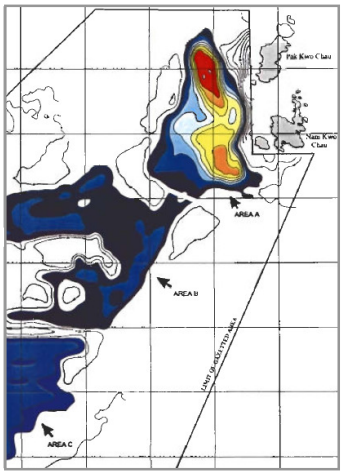
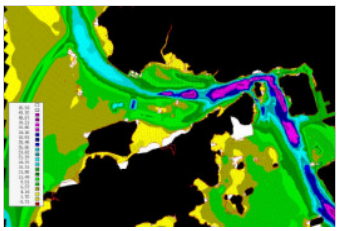






CEDD 土木工程拓展署
Civil Engineering and Development Department

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)

11th Monthly Progress Report for Contaminated Mud Pits to the South of The Brothers and at East Sha Chau – July 2013

Revision 0

16 August 2013

Environmental Resources Management
16/F, DCH Commercial Centre
25 Westlands Road
Quarry Bay, Hong Kong
Telephone (852) 2271 3000
Facsimile (852) 2723 5660
www.erm.com

ERM

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

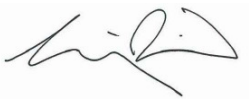
11th Monthly Progress Report for Contaminated Mud Pits to the South of The Brothers and at East Sha Chau – July 2013

Revision 0

Document Code: 0175086 Monthly Jul 13_v0.doc

Environmental Resources Management

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

Client: Civil Engineering and Development Department (CEDD)	Project No: 0175086
Summary: This document presents the eleventh monthly progress report for Contaminated Mud Pits at the South of The Brothers and at East Sha Chau.	Date: 16 August 2013 Approved by:  Craig A. Reid *Partner*

Revision	Description	By	Checked	Approved	Date
v0	11th Monthly Progress Report for CMP V and SB CMPs	RC	JT	CAR	16/8/13

Distribution

☒ Internal

☒ Public

☐ Confidential

OHSAS 18001:2007
Certificate No. OHS 515956

ISO 9001 : 2008
Certificate No. FS 32515

土木工程拓展署
Civil Engineering and Development Department

ERM

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:	11th Monthly Progress Report for Contaminated Mud Pits to the South of The Brothers and at East Sha Chau – July 2013
Date of Report:	16 August 2013
Date prepared by ET:	16 August 2013
Date received by IA:	16 August 2013

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: 16/8/2013

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: 16/8/2013

CONTENTS

ANNEXES

Agreement No. CE 23/2012 (EP)
Environmental Monitoring and Audit
for Contaminated Mud Pits at the South of The Brothers and at East Sha Chau (2012-2017) - Investigation

11TH MONTHLY PROGRESS REPORT FOR JULY 2013

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) (hereafter referred to as "the Project") 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 CMPs at East of Sha Chau (ESC). In July 2013, the following works were being undertaken at the CMPs:

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

1.2 REPORTING PERIOD

1.2.1 This Monthly Progress Report covers the EM&A activities for the reporting month of July 2013.

1.3 DETAILS OF SAMPLING AND LABORATORY TESTING ACTIVITIES

1.3.1 The following monitoring activities have been undertaken for CMP V in July 2013:

- *Pit Specific Sediment Chemistry* was conducted for CMP Va on 3 July 2013;
- *Water Column Profiling* was scheduled to be undertaken on 9 July 2013. However, there was no dumping activity at CMP Va while the monitoring team was on-site. As such, *in-situ* measurements and water sampling were not undertaken for *Water Column Profiling* in July 2013;
- *Routine Water Quality Monitoring* was conducted for CMP Va on 16 July 2013; and
- Demersal Trawling was conducted for CMP V on 30 and 31 July 2013.

(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.

1.3.2 *Impact Water Quality Monitoring during Dredging Operations of CMP 1* was conducted three times per week (ie 4, 6, 8, 10, 12, 15, 17, 19, 22, 24, 26, 29 and 31 July 2013) in this reporting month in accordance with the EM&A Manual. It should be noted that the Impact Water Quality Monitoring during Dredging Operations of CMP 1 was not conducted on 1 July 2013 due to the adverse weather during which Typhoon signal No. 3 was hoisted.

1.4 DETAILS OF OUTSTANDING SAMPLING AND/OR ANALYSIS

1.4.1 No outstanding sampling remained for July 2013. Laboratory analyses of *Pit Specific Sediment Chemistry* of CMP Va conducted in June and July 2013 were yet to be completed and laboratory analyses of Suspended Solids (SS) for *Water Quality Monitoring during Dredging Operations of CMP 1* collected on 31 July 2013 was still in progress during the preparation of this monthly report. A summary of field activities conducted are presented in *Annex A*.

1.5 BRIEF DISCUSSION OF THE MONITORING RESULTS FOR CMP V

1.5.1 *Table 1.1* summarises the monitoring results that are presented in the current monthly report. Brief discussion of the monitoring results is presented in this section. Detailed discussion will be presented in the corresponding *Quarterly Report*.

Table 1.1 Monitoring activities in May to July 2013 for CMP V

Monitoring activities	Date of Monitoring	Monitoring results presented in this report?
Pit Specific Sediment Chemistry Monitoring for CMP Va	14 May 2013	Yes.
	6 June 2013	No. Laboratory analysis yet to be completed during preparation of this monthly report.
	3 July 2013	No. Laboratory analysis yet to be completed during preparation of this monthly report.
Routine Water Quality Monitoring for CMP Va	16 July 2013	Yes.
Water Column Profiling for CMP Va	9 July 2013	No. *In-situ* measurements and water sampling were not undertaken as there was no dumping activity on the monitoring day.

1.5.2 Pit Specific Sediment Chemistry of CMP Va – May 2013

1.5.3 Monitoring locations for Pit Specific Sediment Chemistry for CMP Va are shown in *Figure 1.1*. A total of six monitoring stations were sampled in May 2013. It is observed that the variations of metal concentrations at Active Pit Stations NPDA and NPDB were much larger (ie greater standard deviation) when compared to other stations (*Figures 1-2* of *Annex B*).

1.5.4 Cadmium, Chromium and Nickel complied with the Lower Chemical Exceedance Level (LCEL) at all stations (*Figures 1-2* of *Annex B*). Concentrations of Arsenic exceeded the LCEL at Pit Edge stations NEDA and NEDB and Near Pit stations NNDA and NNDB (*Figures 1-2* of *Annex B*). Concentrations of Lead, Mercury and Zinc exceeded LCEL at Active Pit station NPDA while concentrations of Silver exceeded Upper Chemical Exceedance Level (UCEL) at Active Pit stations NPDA and NPDB. Concentration of Copper exceeded UCEL at Active Pit Station NPDA.

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 exceedances of the LCEL for Arsenic are unlikely to be caused by the disposal operations at CMP Va but rather as a result of naturally occurring deposits.

1.5.6 In addition, the Active Pit stations NPDA and NPDB are located within CMP Va which was receiving contaminated mud during the reporting period. As such, the exceedances of LCEL/UCEL for Copper, Lead, Mercury, Silver and Zinc which were recorded at the two stations only are not considered as indicating any dispersal of contaminated mud from CMP Va.

(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

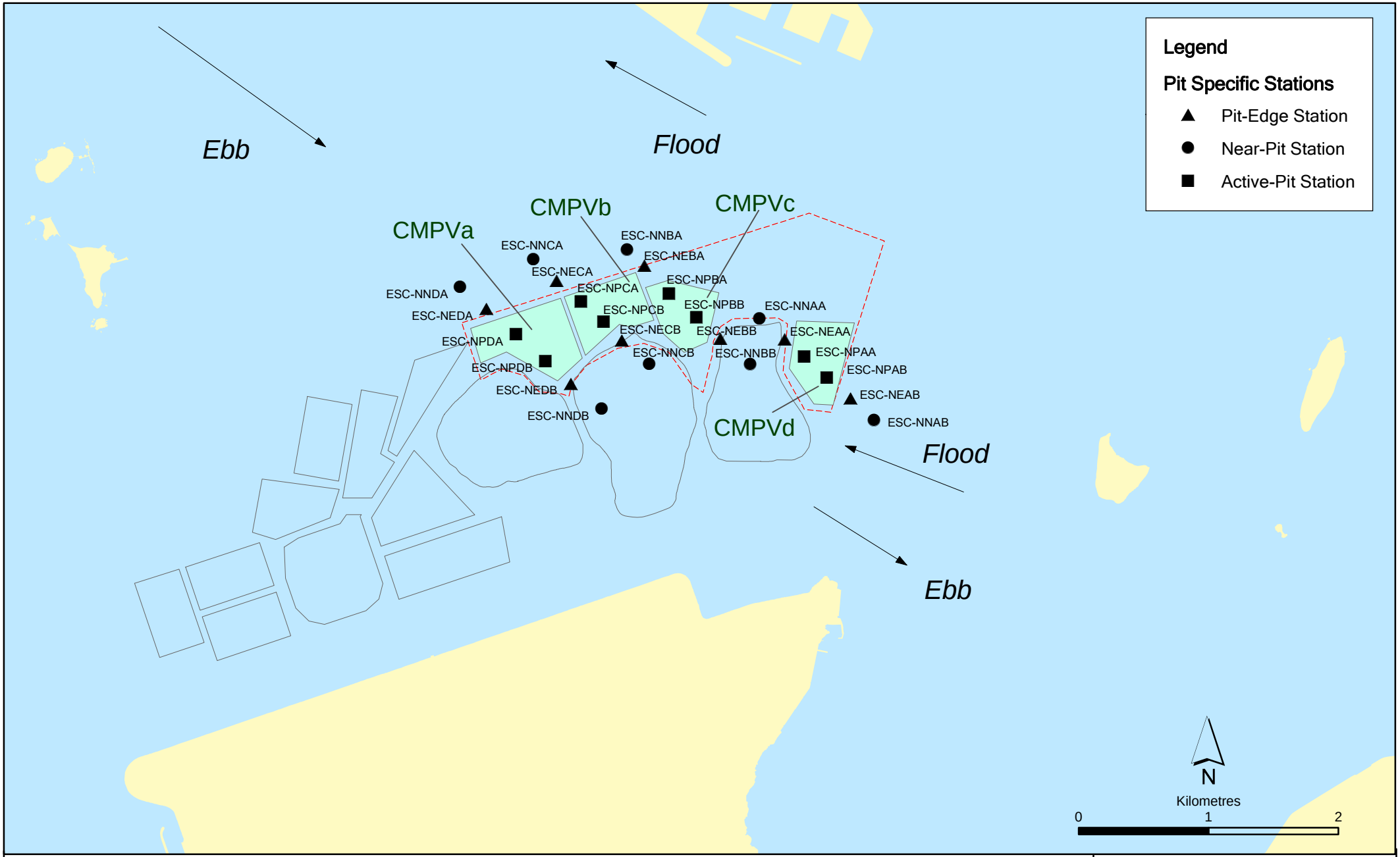


Figure 1.1

Pit Specific Sediment Quality Monitoring Stations for CMPV

File: CMPV\0103262_SQMS_pit specific.mxd
Date: 29/10/2009

Environmental Resources Management

ERM

1.5.7 For organic contaminants, Total Organic Carbon (TOC) concentration was similar amongst all stations (*Figure 3* of *Annex B*). Tributyltin (TBT) concentration was found to be higher at Active Pit stations NPDA and NPDB (*Figure 4* of *Annex B*). Low Molecular Weigh Polycyclic Aromatics Hydrocarbons (Low MW PAHs) and High Molecular Weight Polycyclic Aromatics Hydrocarbons (High MW PAHs) concentrations were recorded above the limit of reporting at Active Pit stations NPDA and NPDB (*Figure 5 of Annex B*). Total Polychlorinated Biphenyls (PCBs), Total Dichloro-diphenyl-trichloroethane (DDT) and 4,4'-Dichloro-diphenyl-dichloroethylene (4,4'-DDE) were below the limit of reporting at all stations. As explained in *Section 1.5.6*, Active Pit stations NPDA and NPDB are located within CMP Va which was receiving contaminated mud during the reporting period. Therefore, the higher concentrations of contaminants (including metals and organic contaminants) recorded at the two stations only are not considered as indicating any dispersal of contaminated mud from CMP Va. Nevertheless, detailed analysis will be presented in the *Quarterly Report* to reveal any trend of increasing sediment contaminant concentrations towards CMP Va.

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 Va during this monthly period.

1.5.9 Routine Water Quality Monitoring for CMP Va – July 2013

1.5.10 The results for the Routine Water Quality Monitoring conducted during July 2013 in the wet season have been assessed for compliance with the Water Quality Objectives (WQOs) set by Environmental Protection Department (EPD). This consists of a review of the EPD routine water quality monitoring data for the wet season period (April to October) of 1999-2010 from stations in the Northwestern Water Control Zone, where the CMPs are located. For Salinity, the average value obtained from the Upstream Station was used for the basis as the WQO. *In-situ* monitoring and laboratory results are shown in *Tables 1.2* and *1.3*, respectively, with graphical presentation provided in *Annex B.* Monitoring was undertaken at a total of 10 stations in the reporting month (see *Figure 1.2*).

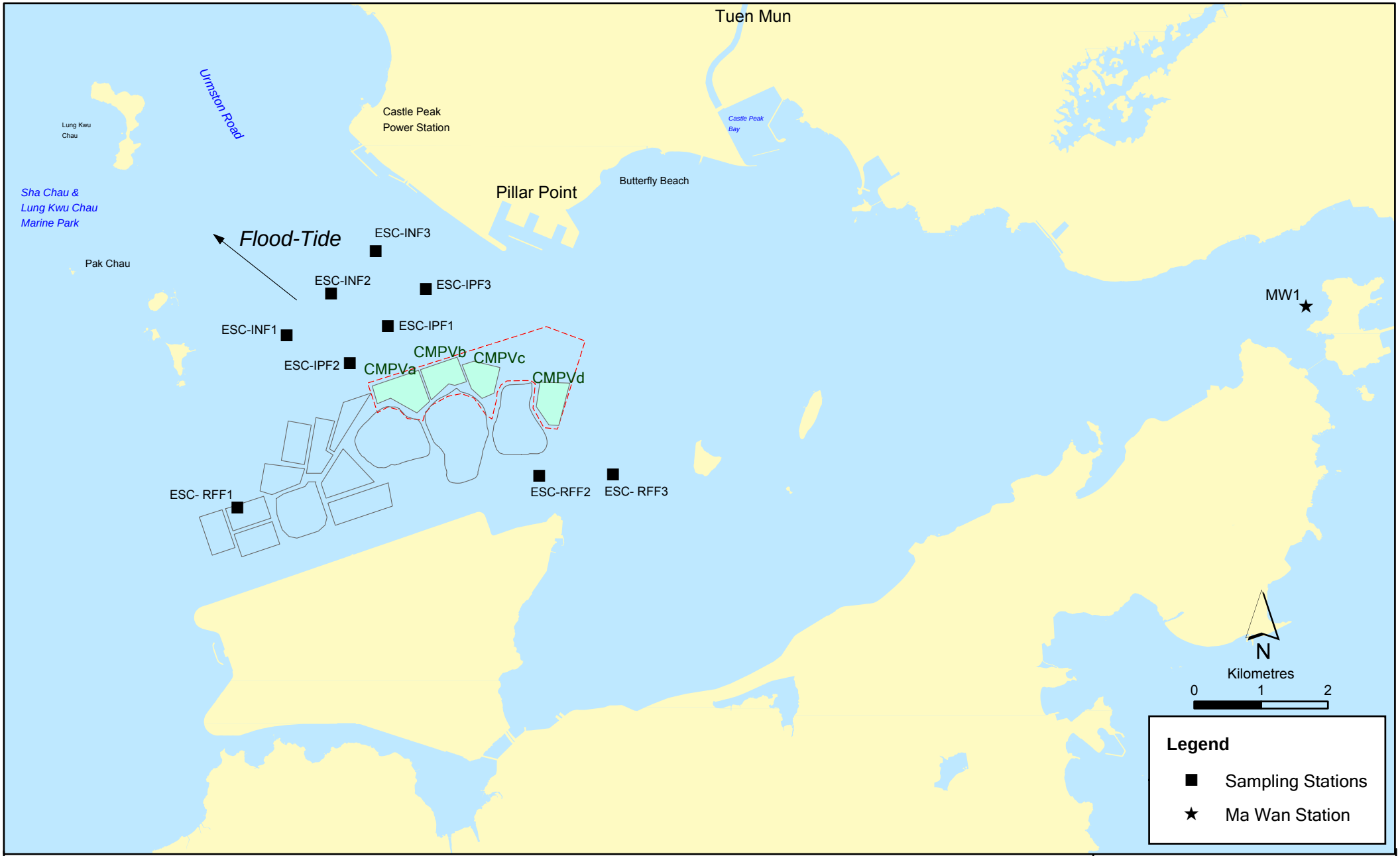


Figure 1.2

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

File: T:\GIS\CONTRACT\0103262\Mxd\CMPV\0103262_R_C_WQMS_flood.mxd
Date: 3/12/2012

Environmental Resources Management

ERM

In-situ Measurements

1.5.11 Analysis of results for July 2013 indicated that for all stations (Impact, Intermediate, Reference and Ma Wan), levels of pH and DO complied with the WQOs (*Figures 6 and 7* of *Annex B*). Levels of Salinity complied with the WQO at all stations, except at Ma Wan Station (*Figure 9* of *Annex B*). The higher salinity recorded at Ma Wan station is likely to be caused by its greater separation distance from the Pearl River mouth, which is a key source of freshwater inputs in the area, when compared to the Reference stations. Levels of DO and Turbidity within the reporting month complied with the Action and Limit Levels set in the *EM&A Manual* (1) (*Figures 7 and 10 of Annex B*). All *in-situ* water quality measurements showed relatively minor variations amongst Impact, Intermediate and Reference stations (*Figures 6-10* of *Annex B*).

Laboratory Measurements

1.5.12 Analyses of July 2013 results indicate that concentrations of Cadmium, Mercury and Silver were below their limit of reporting at all stations while Arsenic, Chromium, Copper, Lead, Nickel and Zinc were detected in samples from all stations. Concentrations of Chromium, Copper, Lead, Nickel and Zinc were slightly higher at Ma Wan station while the concentrations of Arsenic were similar amongst stations (*Figures 11 and 12 of Annex B*). Levels of 5-day Biochemical Oxygen Demand (BOD_5), Total Inorganic Nitrogen (TIN) and Ammoniacal-Nitrogen (NH_3-N) were similar amongst all stations (*Figures 13 and 14 of Annex B*). Concentrations of Suspended Solids (SS) complied with the WQO (12.74 mg/L for wet season) and Action and Limit Levels at all stations during the reporting month (*Figure 15 of Annex B*).

1.5.13 Overall, the results indicated that the disposal operation at CMP Va did not appear to cause any unacceptable deterioration in water quality during this reporting period.

Table 1.2 In-situ Monitoring Results for Routine Water Quality Monitoring of CMP Va in July 2013

Stations	Temp (°C)	Salinity	Turbidity (NTU)	pH	Dissolved Oxygen (%)	Dissolved Oxygen (mg L^{-1})
RFF (Reference)	28.05	22.05	2.05	7.69	59.95	4.18
IPF (Impact)	27.67	23.28	3.90	7.65	65.10	4.50
INF (Intermediate)	27.76	23.23	2.86	7.65	65.39	4.51
Ma Wan Station	26.13	27.90	1.58	7.54	59.51	4.12
WQO	*N/A*	19.85-24.26#	*N/A*	*6.5-8.5*	*N/A*	>4

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

(1) ERM (2009). Draft Second Review of the EM&A Manual. Prepared for CEDD for EM&A for Contaminated Mud Pit at Sha Chau (2009-2013) – Investigation Agreement No. CE 4/2009 (EP).

Table 1.3 ***Laboratory Results for Routine Water Quality Monitoring of CMP Va in July 2013***

Stations	As (µg/L)	Ag (µg/L)	Cd (µg/L)	Cr (µg/L)	Cu (µg/L)	Hg (µg/L)	Pb (µg/L)	Ni (µg/L)	Zn (µg/L)	NH_3-N (mg/L)	TIN (mg/L)	BOD_5 (mg/L)	SS (mg/L)
RFF	1.58	<LOR	<LOR	0.63	8.08	<LOR	0.98	3.29	10.29	0.08	0.95	0.36	4.00
IPF	1.96	<LOR	<LOR	0.90	10.75	<LOR	1.13	2.75	11.25	0.08	0.75	0.29	5.38
INF	1.75	<LOR	<LOR	0.56	8.25	<LOR	0.65	2.13	8.33	0.10	0.89	0.27	4.46
Ma Wan Station	1.50	<LOR	<LOR	1.88	21.25	<LOR	1.88	4.00	20.00	0.06	0.53	0.25	3.75
												WQO of SS: 12.74 mg/L	

Note: LOR = Limit Of Reporting

1.6 BRIEF DISCUSSION OF THE MONITORING RESULTS FOR SB CMPS

1.6.1 Monitoring data collected for SB CMPs in July 2013 are presented in this monthly report. Detailed discussion will be presented in the corresponding *Quarterly Report*.

1.6.2 Impact Water Quality Monitoring during Dredging Operations of CMP 1 – 4 to 29 July 2013

1.6.3 *Impact Water Quality Monitoring during Dredging Operations of CMP 1* was conducted three times per week for a total of twelve (12) sampling days from 4 to 29 July 2013. On each survey day, sampling was conducted during both mid-ebb and mid-flood tides at two Reference (Upstream) stations upstream and five Impact (Downstream) stations downstream of the dredging operations at CMP 1. Monitoring was also conducted at five Sensitive Receiver Stations (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*.

1.6.4 Monitoring results from 4 to 29 July 2013 are presented in *Table C1* of *Annex C*. It should be noted that sampling at station THB2 during mid-ebb tide on 24 July 2013 and during both mid-ebb and mid-flood tides on 26 July 2013 were not carried out due to adverse weather. Levels of DO, Turbidity and SS generally complied with the Action and Limit Levels (see *Table C2* for details) set in the Baseline Monitoring Report [(1)], except for the following occasions of exceedances shown in *Table 1.4* below.

Table 1.4 ***Details of exceedances recorded at CMP 1 in July 2013***

Date	Tide	Parameter	Station	Type
22 July 2013	Mid-Ebb	Turbidity	WSR46	Action
22 July 2013	Mid-Ebb	SS	WSR46	Action
26 July 2013	Mid-Ebb	Turbidity	WSR46	Action
26 July 2013	Mid-Ebb	SS	WSR46	Limit
26 July 2013	Mid-Flood	SS	WSR46	Action

(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.

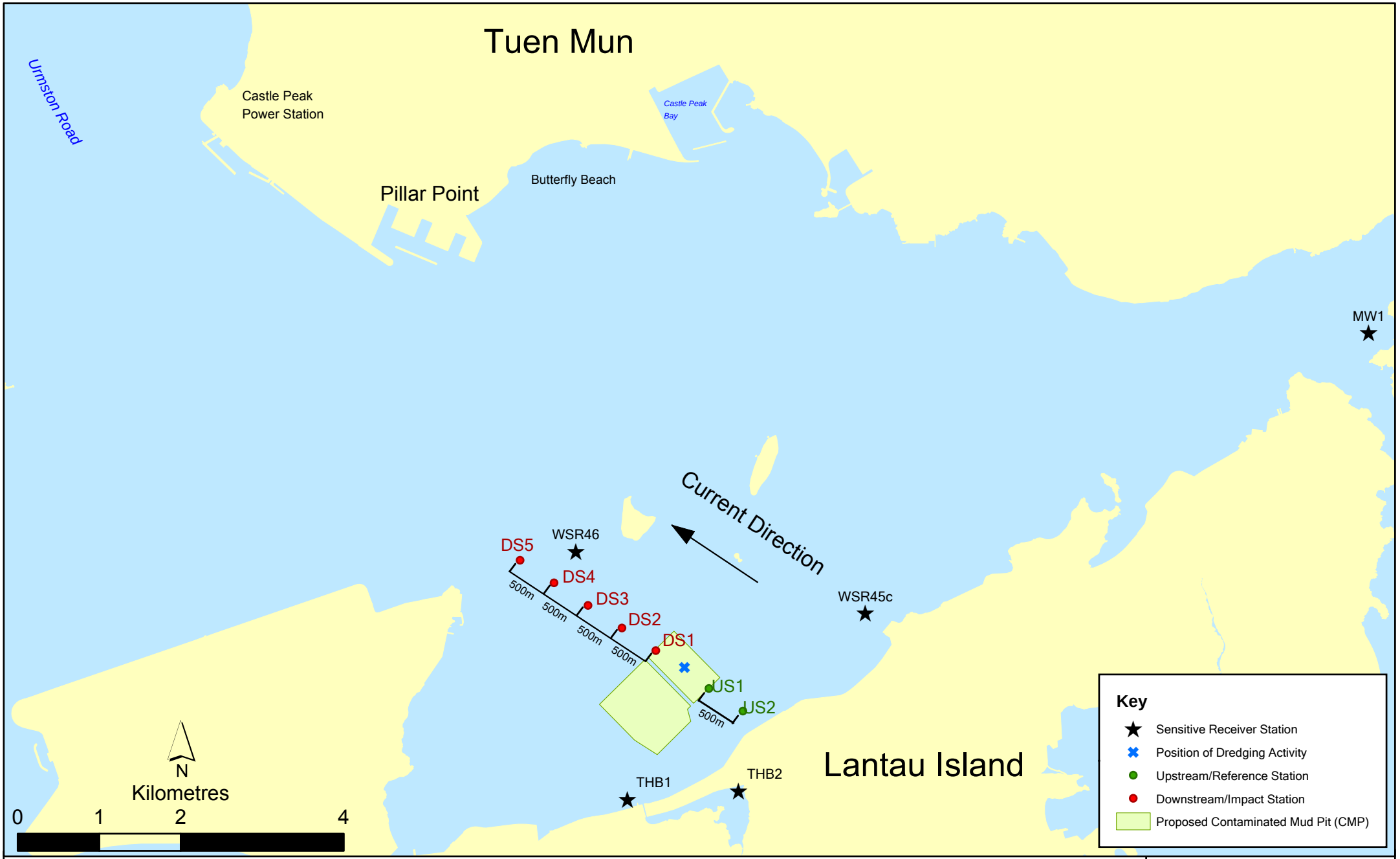


Figure 1.3

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

File: T:\GIS\CONTRACT\0175086\Mxd\0175086_3.2a_Indicative Dredging Impact_Flood.mxd
Date: 11-Dec-2012

Environmental Resources Management

ERM

1.6.5 Action/Limit Level exceedances of Turbidity and SS were recorded at Sensitive Receiver station WSR46 during mid-ebb tide on 22 July and during both mid-ebb and mid-flood tides on 26 July 2013. Station WSR46 is located further away from the works area of CMP 1 when compared to station DS1 at which the levels of SS and Turbidity did not exceed the Action and Limit Levels during the same tidal period. As such, the exceedances at WSR46 are not likely to be caused by the dredging works at CMP 1. It should be noted that high levels of Turbidity and 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. Therefore, the Action and Limit Level exceedances may be caused by natural background variation in water quality of the area.

1.6.6 Overall, the results indicated that the dredging operations at CMP 1 of SB 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.

1.7 ACTIVITIES SCHEDULED FOR THE NEXT MONTH

1.7.1 The following monitoring activities will be conducted in the next monthly period of August 2013 for CMP V:

- *Pit Specific Sediment Chemistry* for CMP Va;
- *Cumulative Impact Sediment Chemistry* for CMP Va;
- *Sediment Toxicity Test* for CMP Va;
- *Routine Water Quality Monitoring* for CMP Va;
- *Water Column Profiling* for CMP Va; and
- *Demersal Trawling* for CMP V.

1.7.2 *Water Quality Monitoring during Capping* for CMP IVc and *Benthic Recolonisation Studies* for CMP IV will be conducted in the next monthly period of August 2013.

1.7.3 *Impact Water Quality Monitoring during Dredging Operations for CMP 1* will be conducted three times per week in the next monthly period of August 2013.

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

1.8 STUDY PROGRAMME

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

Annex A

Sampling Schedule

Annex A1 - East of Sha Chau Environmental Monitoring and Audit Sampling Schedule for CMP IV (January 2012 - December 2013)

		2012												2013											
Tissue/ Whole Body Sampling		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																									
	INA		*																						
	INB		*																						
Reference North																									
	TNA		*																						
	TNB		*																						
Reference South																									
	TSA		*																						
	TSB		*																						
Demersal Trawling		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																									
	INA 1-5	*	*																						
	INB 1-5	*	*																						
Reference North																									
	TNA 1-5	*	*																						
	TNB 1-5	*	*																						
Reference South																									
	TSA 1-5	*	*																						
	TSB 1-5	*	*																						
Capping		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 Downcurrent																									
	IPE1		*				*		*				*		*				*		*				*
	IPE2		*				*		*				*		*				*		*				*
	IPE3		*				*		*				*		*				*		*				*
	IPE4		*				*		*				*		*				*		*				*
	PFC1		*				*		*				*		*				*		*				*
Intermediate Station Downcurrent																									
	INE1		*				*		*				*		*				*		*				*
	INE2		*				*		*				*		*				*		*				*
	INE3		*				*		*				*		*				*		*				*
	INE4		*				*		*				*		*				*		*				*
	INE5		*				*		*				*		*				*		*				*
Reference Station Upcurrent																									
	RFE1		*				*		*				*		*				*		*				*
	RFE2		*				*		*				*		*				*		*				*
	RFE3		*				*		*				*		*				*		*				*
	RFE4		*				*		*				*		*				*		*				*
	RFE5		*				*		*				*		*				*		*				*
Flood Tide																									
Impact Station Downcurrent																									
	INF1		*				*		*				*		*				*		*				*
	PFC2		*				*		*				*		*				*		*				*
	INF3		*				*		*				*		*				*		*				*
Intermediate Station Downcurrent																									
	IPF1		*				*		*				*		*				*		*				*
	IPF2		*				*		*				*		*				*		*				*
	IPF3		*				*		*				*		*				*		*				*
Reference Station Upcurrent																									
	RFF1		*				*		*				*		*				*		*				*
	RFF2		*				*		*				*		*				*		*				*
	RFF3		*				*		*				*		*				*		*				*
Water Column Profiling		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		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 III																									
CPA	1 grab per station								*																
CPB	1 grab per station								*																
CPC	1 grab per station								*																
Reference Stations																									
RBA	1 grab per station								*																
RBB	1 grab per station								*																
RBC	1 grab per station								*																

"*" = Number of replicates depends on field catch or parameters

Sampling completed

Sampling to be completed

Annex A2 - East of Sha Chau Environmental Monitoring and Audit Sampling Schedule for CMP V (January 2012 - February 2014)

		2012												2013												2014	
Pit Specific Sediment Chemistry	**Code**	**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**
Active-Pit																											
	ESC-NPDA		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*						
	ESC-NPDB		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*						
Pit-Edge																											
	ESC-NEDA		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*						
	ESC-NEDB		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*						
Near-Pit																											
	ESC-NNDA		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*						
	ESC-NNDB		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*						

Cumulative Impact Sediment Chemistry		**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		**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		**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		**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							*	*					*	*					*	*						

Capping		**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																								*		*

		2012												2013												2014	
Routine Water Quality Monitoring		**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		*		*	*		*	*		*	*		*	*		*	*		*	*						

Water Column Profiling		**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		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*						

Benthic Recolonisation Studies		**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		**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	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*									

Sampling completed

Sampling to be completed

Annex A3 - Environmental Monitoring and Audit Sampling Schedule for South of The Brothers (July 2012 - December 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	M	A	M	J	J	A	S	O	N	D
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	M	A	M	J	J	A	S	O	N	D
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	M	A	M	J	J	A	S	O	N	D
SB CMP 1 Active																																																																			
Near-Pit																																																																			
	SB-NNAA	Monthly														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																																						
Pit-Edge																																																																			
	SB-NEAA	Monthly														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																																						
Active-Pit																																																																			
	SB-NPAA	Monthly														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																																						
SB CMP 2 Active																																																																			
Near-Pit																																																																			
	SB-NNBA	Monthly																												12	12	12	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	12	12	12																								
Pit-Edge																																																																			
	SB-NEBA	Monthly																												12	12	12	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	12	12	12																								
Active-Pit																																																																			
	SB-NPBA	Monthly																												12	12	12	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	12	12	12																								

Annex A3 - 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 A3 - Environmental Monitoring and Audit Sampling Schedule for South of The Brothers (July 2012 - December 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	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	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	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 A3 - Environmental Monitoring and Audit Sampling Schedule for South of The Brothers (July 2012 - December 2017)

Capping Water Quality Monitoring			2012						2013												2014												2015												2016												2017											
			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																																																																								
	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																																																																								

Benthic Recolonisation Studies			2012						2013												2014												2015												2016												2017											
			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																																																																								
	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

Monitoring Results

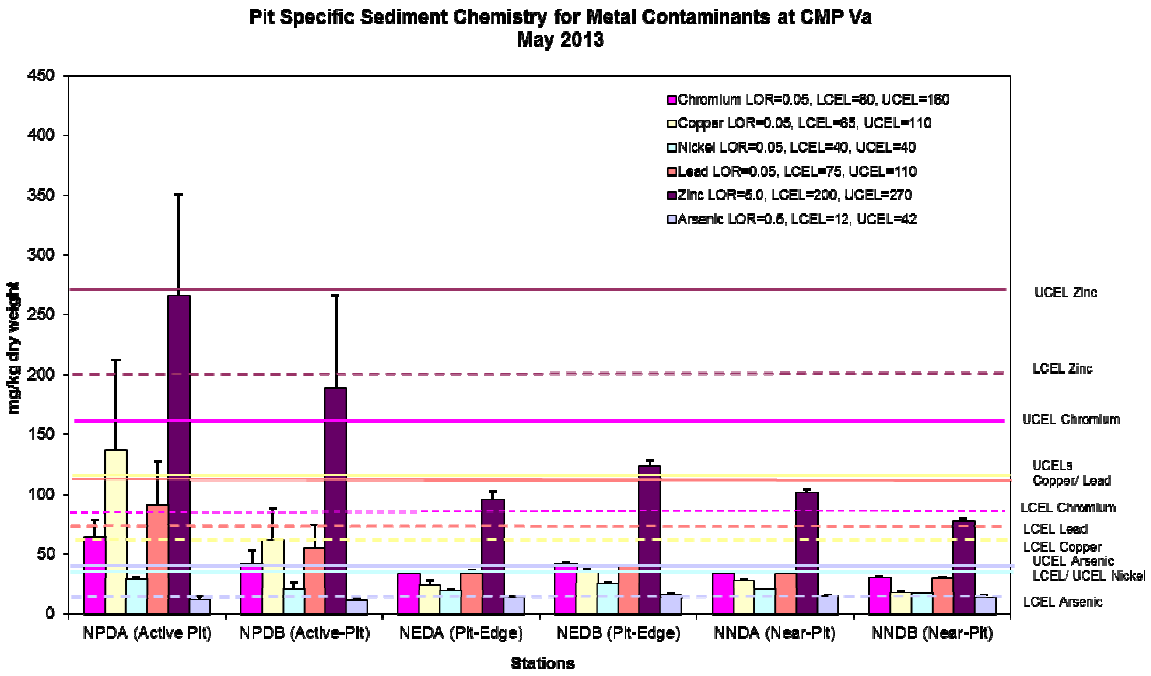


Figure 1: Concentration of Metals (Cr, Cu, Ni, Pb, Zn, As; mean +SD) in sediment samples collected from Pit Specific Sediment Chemistry Monitoring for CMP Va in May 2013.

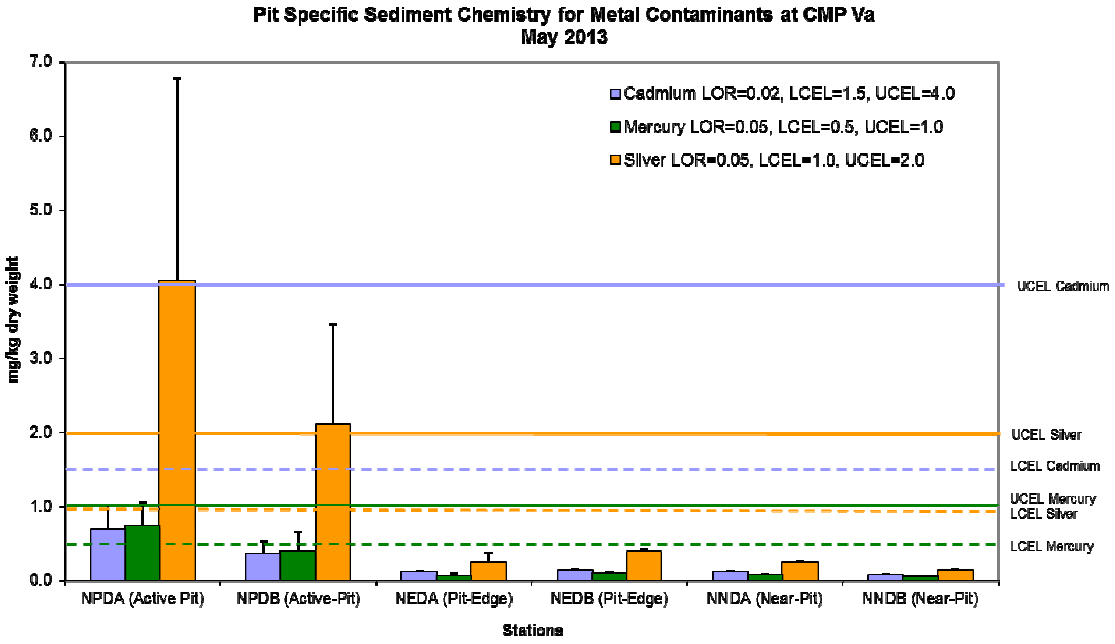


Figure 2: Concentration of Metals (Cd, Hg, Ag; mean +SD) in sediment samples collected from Pit Specific Sediment Chemistry Monitoring for CMP Va in May 2013.

Source: H:\Team\EM\GMS Projects\0175086 CEDD EM&A for South Brothers\02 Deliverable\07 CMP Monthly Report\11th (July 2013)

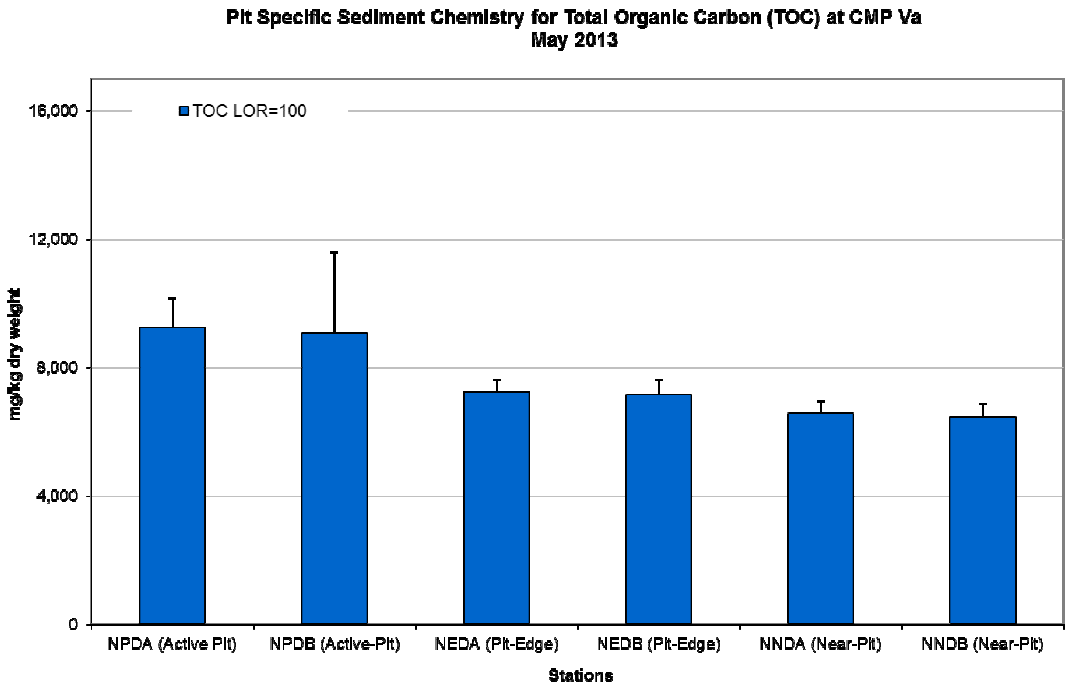


Figure 3: Concentration of Total Organic Carbon (mg/kg dry weight; mean +SD) in sediment samples collected from Pit Specific Sediment Chemistry Monitoring for CMP Va in May 2013.

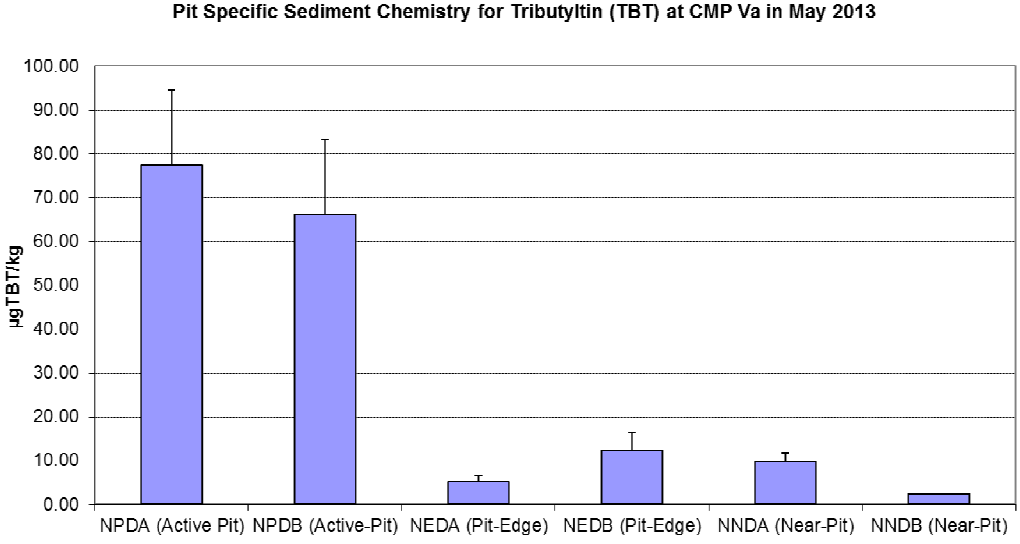


Figure 4: Concentration of Tributyltin (µg TBT/kg; mean +SD) in sediment samples collected from Pit Specific Sediment Chemistry Monitoring of CMP Va in May 2013.

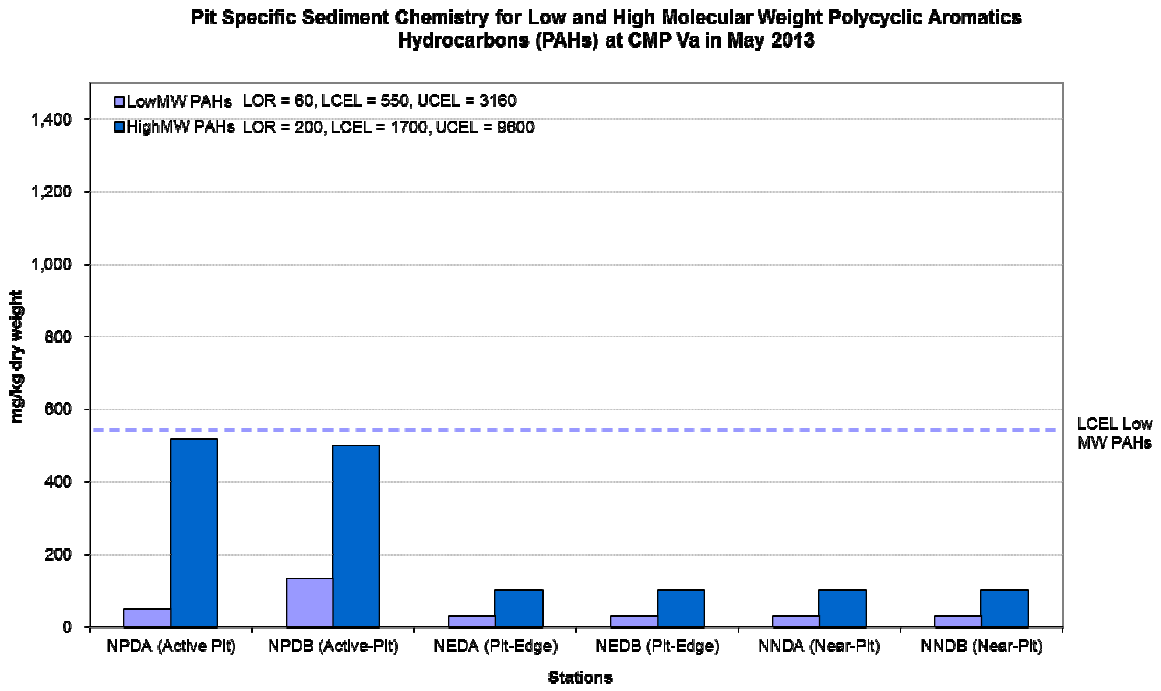


Figure 5: Concentration of Low and High Molecular Weight Polycyclic Aromatics Hydrocarbons (PAHs) (µg/kg; mean +SD) in sediment samples collected from Pit Specific Sediment Chemistry Monitoring for CMP Va in May 2013.

Source: H:\Team\EM\GMS Projects\0175086 CEDD EM&A for South Brothers\02 Deliverable\07 CMP Monthly Report\11th (July 2013)

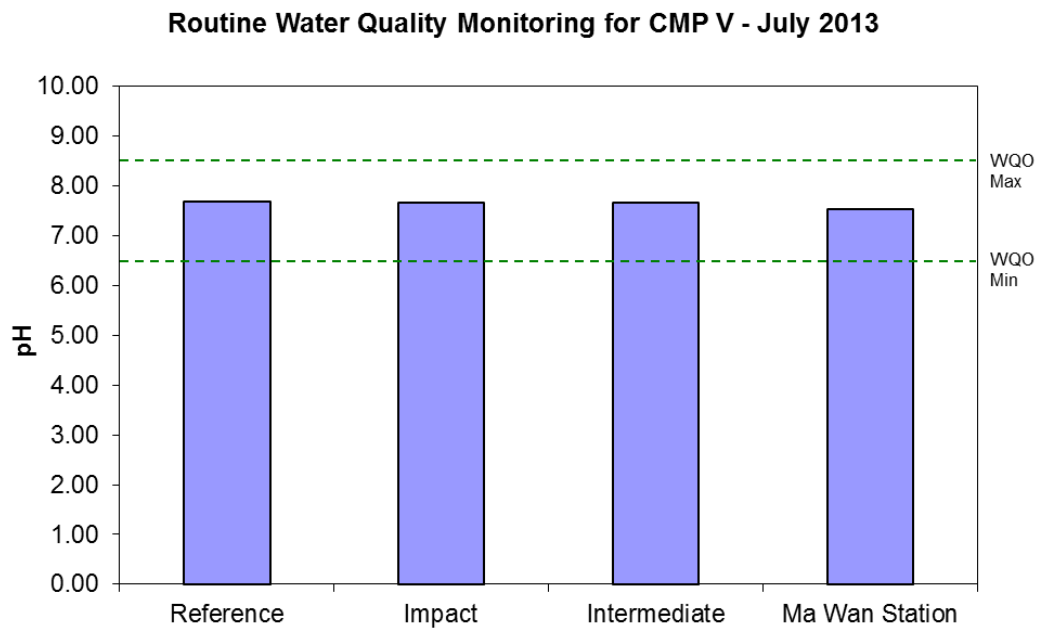


Figure 6: Level of pH (mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP Va in July 2013.

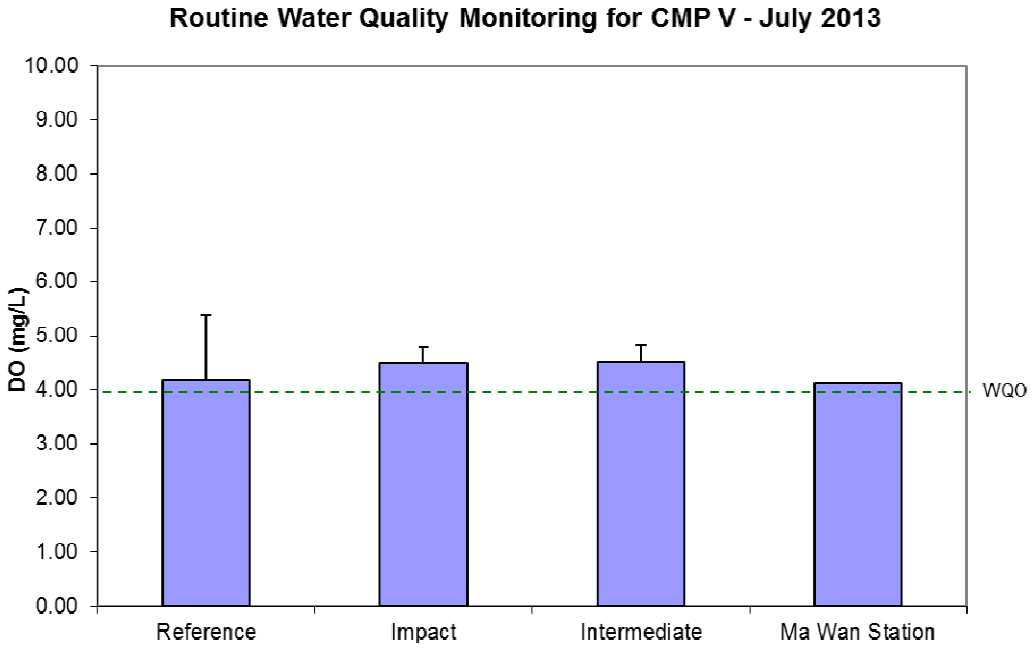


Figure 7: Concentration of Dissolved Oxygen (mg/L; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP Va in July 2013.

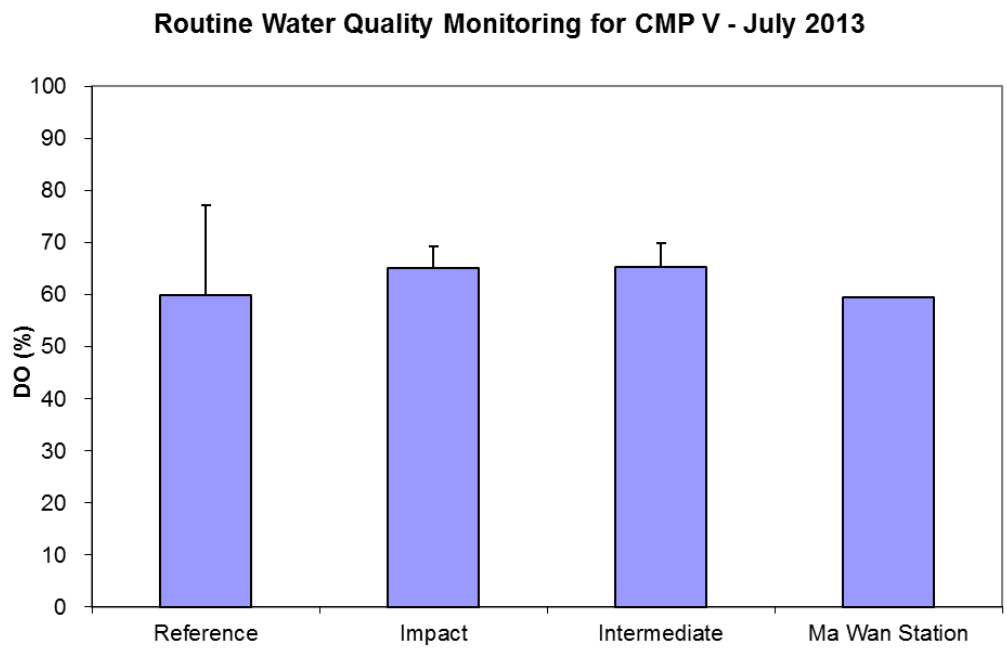


Figure 8: Level of Dissolved Oxygen (% saturation; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP Va in July 2013.

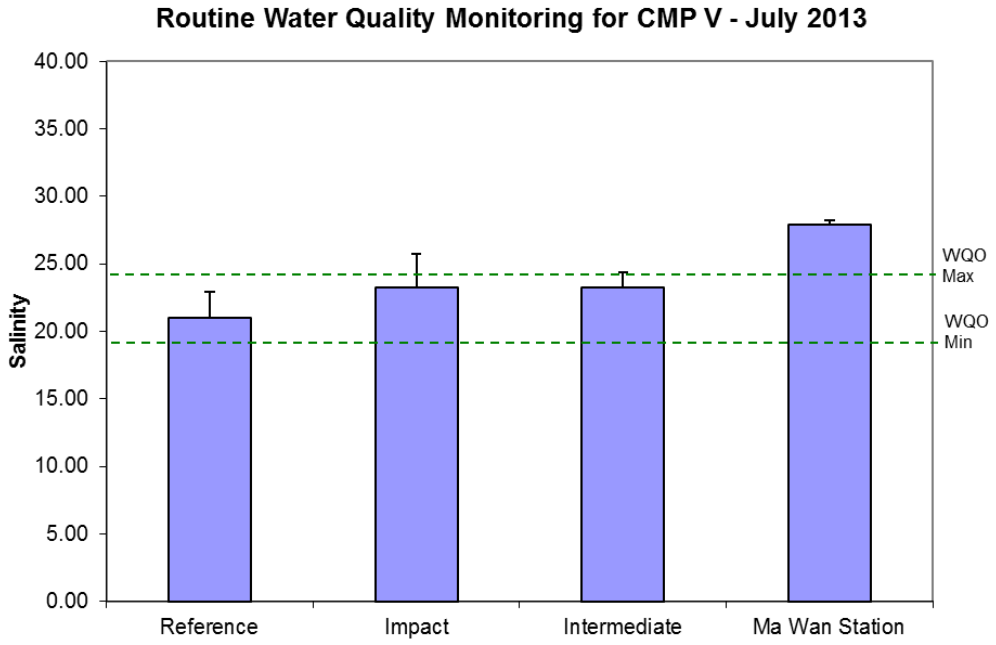


Figure 9: Level of Salinity (mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP Va in July 2013.

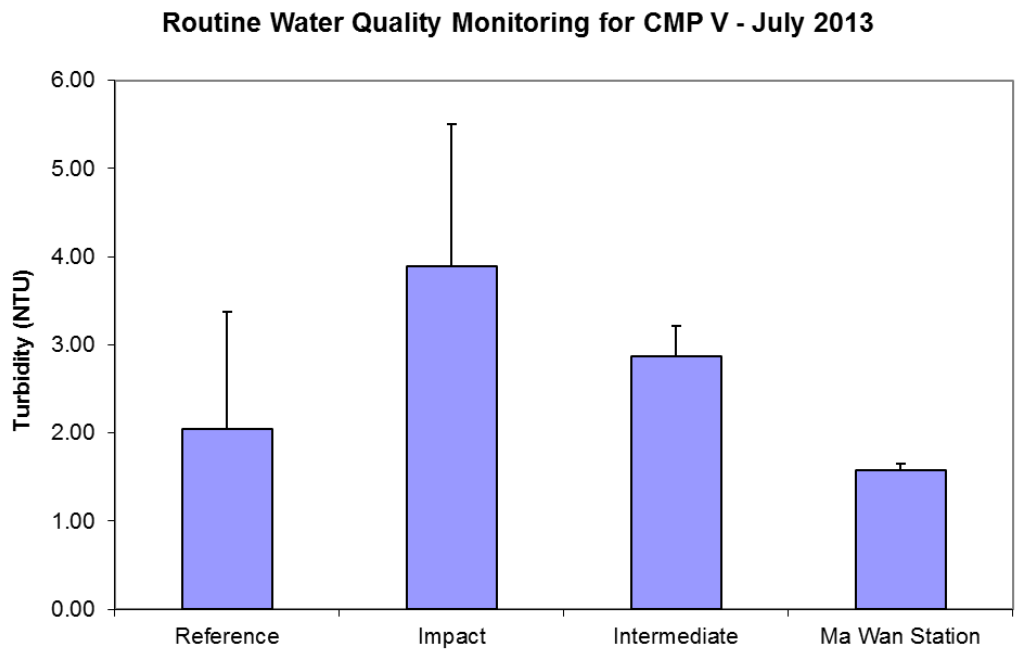


Figure 10: Level of Turbidity (NTU; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP Va in July 2013.

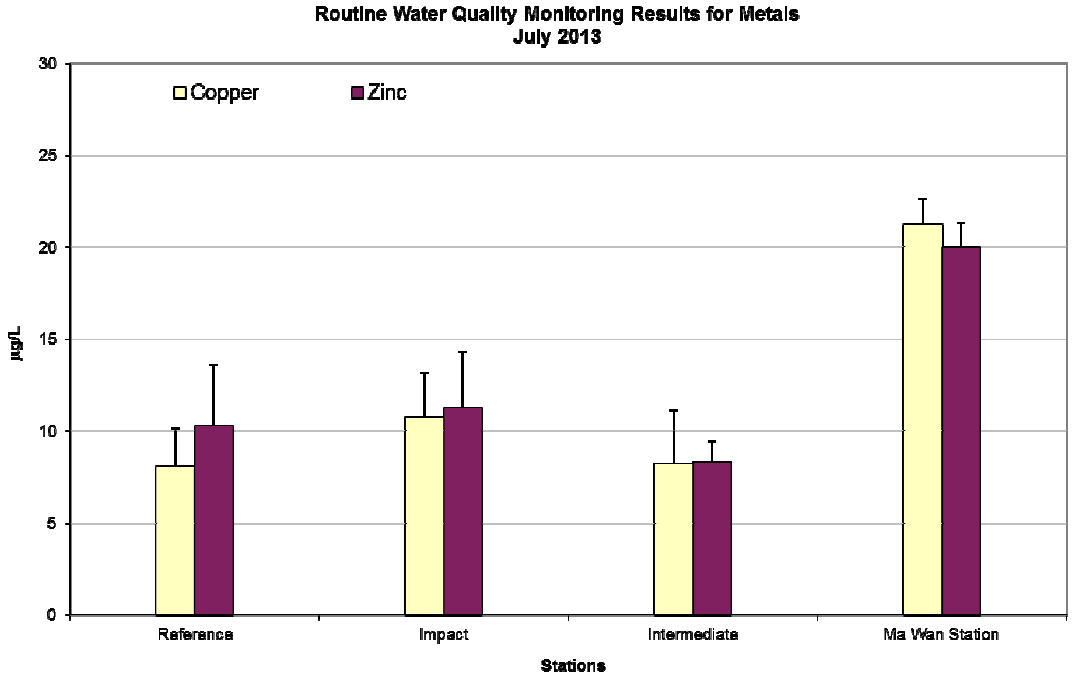


Figure 11: Concentration of Copper and Zinc (mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP Va in July 2013.

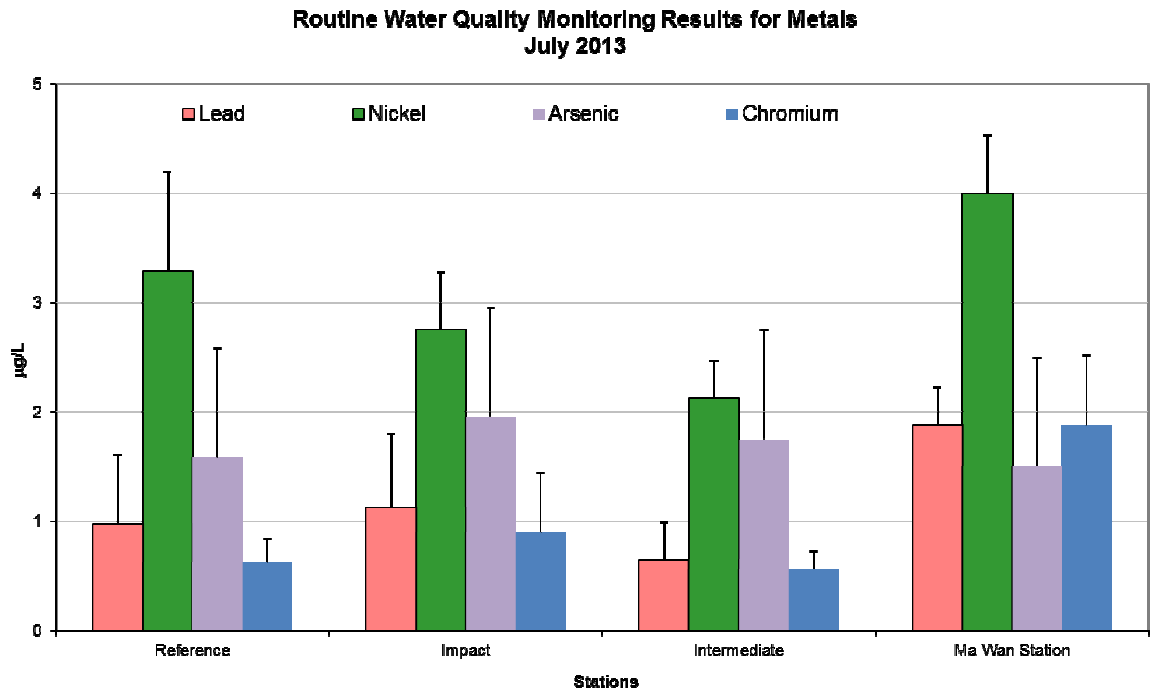


Figure 12: Concentration of Lead, Nickel, Arsenic and Chromium (mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP Va in July 2013.

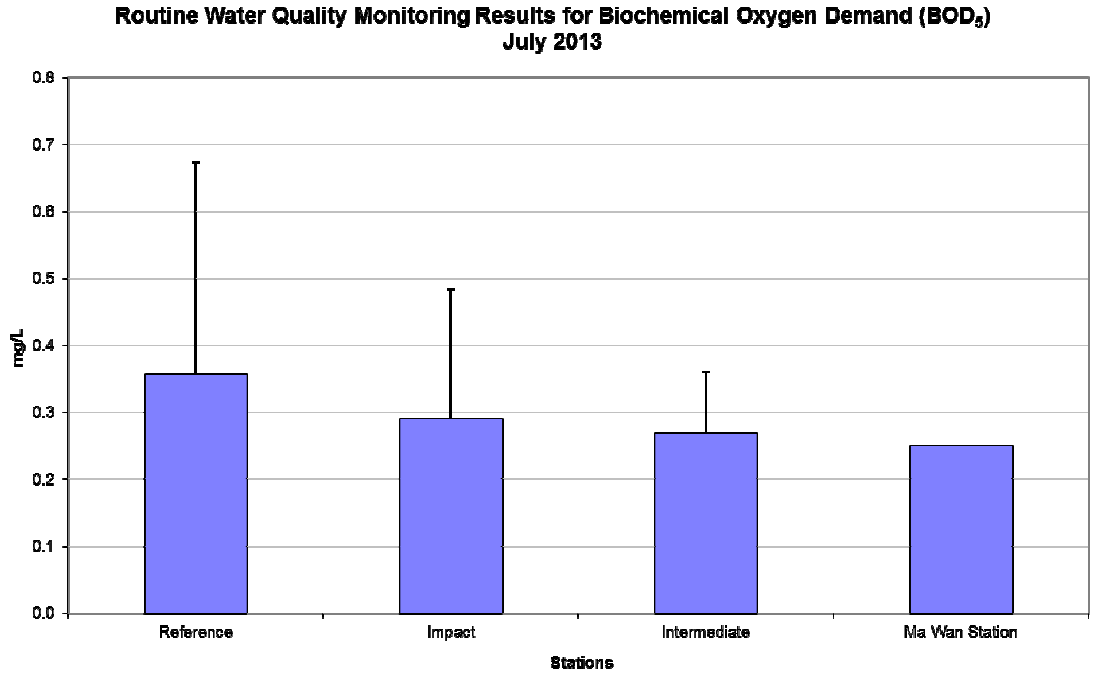


Figure 13: Level of Biochemical Oxygen Demand (BOD_5; mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP Va in July 2013.

Source: H:\Team\EM\GMS Projects\0175086 CEDD EM&A for South Brothers\02 Deliverable\07 CMP Monthly Report\11th (July 2013)

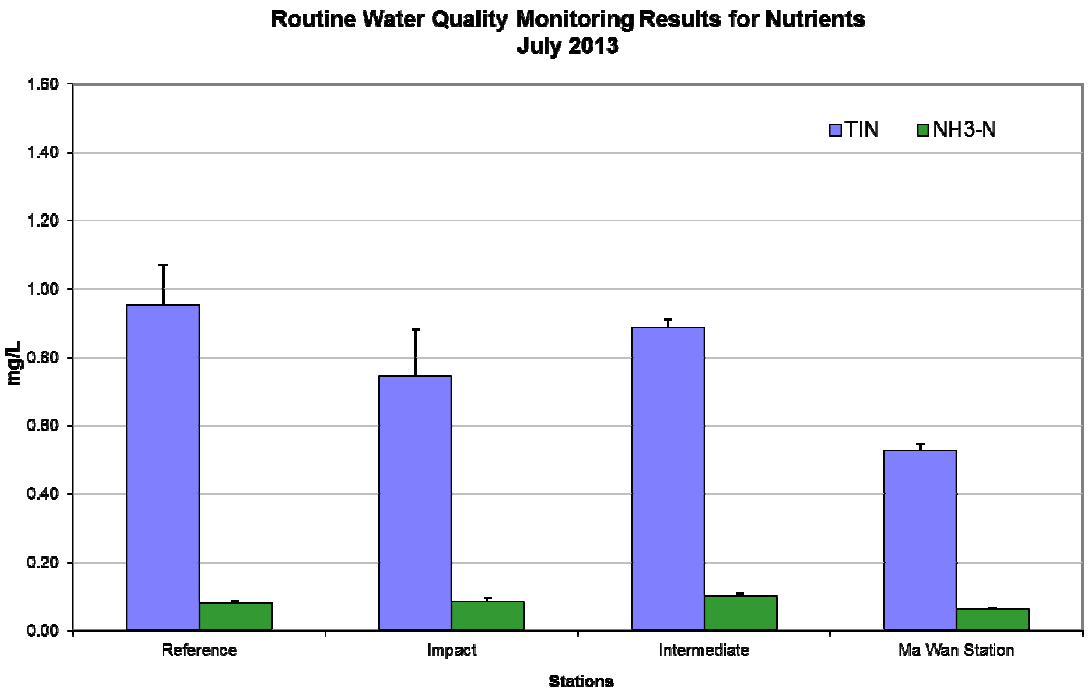


Figure 14: Concentration of Total Inorganic Nitrogen and NH_3-N (mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP Va in July 2013.

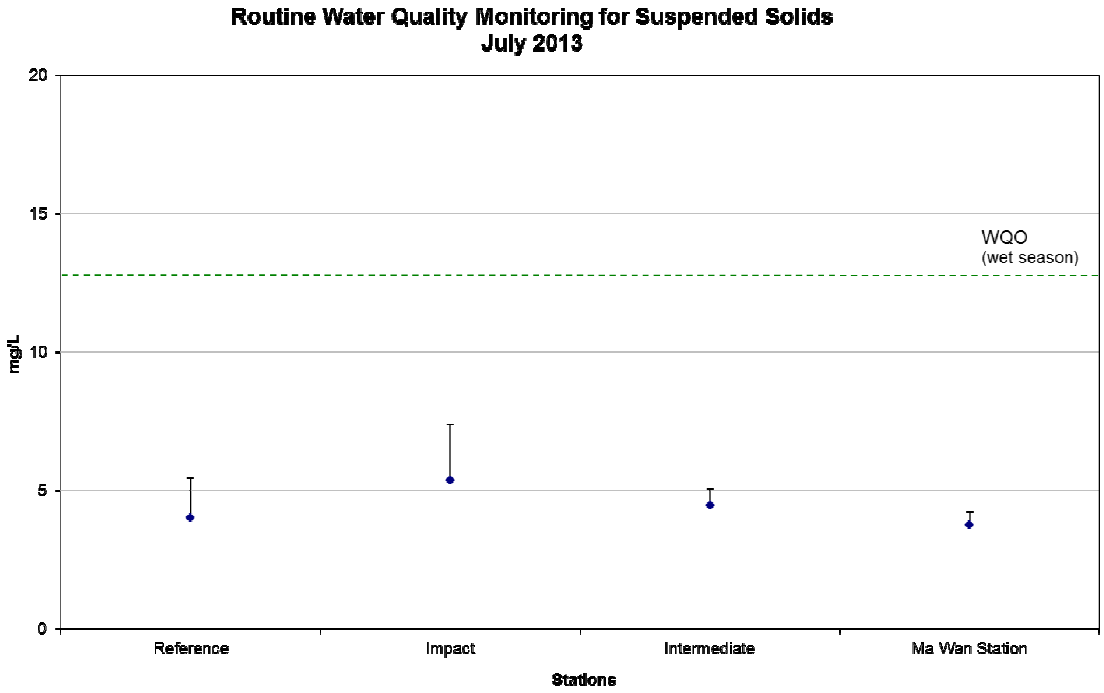


Figure 15: Concentration of Suspended Solids (mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP Va in July 2013.

Source: H:\Team\EM\GMS Projects\0175086 CEDD EM&A for South Brothers\02 Deliverable\07 CMP Monthly Report\11th (July 2013)

Annex C

Results of Impact Monitoring during Dredging Operations of CMP 1 in July 2013

Table C1 Summary Table of DO, Turbidity and SS Levels Recorded in July 2013

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average SS Level (mg/L)
			Bottom	Surface and Mid Depth		
2013/7/4	Mid-Ebb	DS1	4.07	5.88	6.74	6.67
		DS2	5.00	6.46	4.98	3.89
		DS3	4.91	6.75	5.08	3.67
		DS4	4.72	5.98	5.38	4.22
		DS5	4.79	5.97	5.61	5.11
		US1	4.42	6.11	11.21	13.78
		US2	5.75	6.78	8.92	7.78
		MW1	3.71	6.20	3.71	4.00
		THB1	7.96	8.02	6.77	7.33
		THB2	-	9.11	4.58	10.67
		WSR45C	4.63	5.94	5.41	5.56
		WSR46	4.24	5.63	7.33	6.11
	Mid-Flood	DS1	5.10	6.77	6.99	4.78
		DS2	5.96	7.90	12.38	12.33
		DS3	6.75	8.29	10.94	14.00
		DS4	8.83	8.74	11.86	9.83
		DS5	9.49	9.02	8.90	10.17
		US1	4.51	6.07	8.55	8.89
		US2	4.03	6.23	6.91	5.78
		MW1	3.89	5.16	4.48	4.22
		THB1	7.64	8.53	9.06	8.17
		THB2	-	9.66	9.84	10.00
		WSR45C	3.59	6.22	10.47	9.11
		WSR46	3.86	6.32	13.16	11.78
2013/7/6	Mid-Ebb	DS1	4.27	6.16	9.69	11.89
		DS2	3.84	6.43	9.39	10.22
		DS3	4.41	6.83	8.02	7.22
		DS4	4.12	6.63	8.89	7.56
		DS5	4.35	6.85	7.95	7.56
		US1	3.63	5.75	13.34	13.11
		US2	4.67	7.11	12.14	11.33
		MW1	3.67	6.41	3.66	4.56
		THB1	4.60	8.05	10.91	12.83
		THB2	-	8.01	6.01	8.00
		WSR45C	3.11	6.81	10.07	12.22
		WSR46	4.10	6.49	7.66	10.33
	Mid-Flood	DS1	5.98	7.73	11.02	9.33
		DS2	5.81	7.81	9.83	7.22
		DS3	6.02	8.40	12.60	12.89
		DS4	6.36	10.12	12.43	13.33
		DS5	8.72	10.00	9.06	11.00
		US1	4.23	6.68	12.05	12.11
		US2	3.86	6.63	10.51	10.11
		MW1	3.66	4.74	6.76	8.22
		THB1	5.79	9.51	17.17	13.33
		THB2	-	8.26	12.74	15.67
		WSR45C	3.57	6.37	10.68	8.22
		WSR46	4.08	8.11	17.46	7.44

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average SS Level (mg/L)
			Bottom	Surface and Mid Depth		
2013/7/8	Mid-Ebb	DS1	4.76	6.23	14.70	12.11
		DS2	5.28	6.41	7.13	6.78
		DS3	5.28	6.28	9.27	12.44
		DS4	5.85	6.34	6.82	6.67
		DS5	6.89	7.01	6.70	6.22
		US1	6.43	7.31	7.01	5.56
		US2	6.68	7.19	8.10	6.67
		MW1	5.23	6.97	5.10	4.89
		THB1	6.26	7.08	8.39	12.33
		THB2	-	7.24	6.44	8.00
		WSR45C	3.58	6.84	12.08	14.56
		WSR46	4.73	6.40	7.45	8.00
	Mid-Flood	DS1	5.46	5.63	8.96	8.78
		DS2	5.05	5.81	11.50	13.11
		DS3	5.41	6.08	10.62	8.89
		DS4	6.66	6.55	7.10	5.67
		DS5	6.68	6.70	7.75	7.17
		US1	4.86	5.57	8.83	8.67
		US2	3.53	5.69	20.95	21.33
		MW1	3.86	5.52	4.16	7.22
		THB1	5.91	6.10	9.37	11.17
		THB2	-	5.90	9.64	7.67
		WSR45C	3.87	5.83	8.10	12.00
		WSR46	4.71	6.08	6.37	7.22
2013/7/10	Mid-Ebb	DS1	4.35	5.84	4.87	5.22
		DS2	4.64	5.79	4.86	5.00
		DS3	4.78	5.99	5.61	5.89
		DS4	4.96	6.10	5.21	3.89
		DS5	6.48	6.80	3.74	3.89
		US1	5.93	6.35	9.42	8.44
		US2	4.87	6.25	7.70	6.56
		MW1	5.35	6.54	3.19	3.33
		THB1	6.35	7.31	4.87	4.17
		THB2	-	6.43	4.78	4.33
		WSR45C	5.42	6.64	5.85	8.33
		WSR46	4.56	5.89	5.40	7.56
	Mid-Flood	DS1	4.96	5.41	10.53	13.44
		DS2	5.44	5.72	9.33	10.00
		DS3	5.68	5.67	8.44	8.33
		DS4	5.61	6.05	6.97	5.22
		DS5	6.13	6.18	6.28	6.17
		US1	4.28	5.47	8.07	10.56
		US2	3.74	5.12	14.37	21.78
		MW1	3.83	5.28	3.10	6.11
		THB1	5.51	5.95	9.86	8.33
		THB2	-	5.79	8.77	6.67
		WSR45C	3.97	4.90	12.22	5.67
		WSR46	4.29	5.45	9.12	8.44
2013/7/12	Mid-Ebb	DS1	4.61	6.14	4.62	4.78
		DS2	3.85	6.10	6.67	7.67
		DS3	4.14	6.27	7.03	8.44

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average SS Level (mg/L)
			Bottom	Surface and Mid Depth		
		DS4	5.83	6.65	3.22	4.11
		DS5	6.99	7.07	3.25	2.89
		US1	5.64	6.32	5.59	5.56
		US2	6.30	6.66	4.90	5.33
		MW1	4.67	6.48	2.10	8.56
		THB1	5.71	7.30	4.57	4.17
		THB2	-	6.91	5.34	4.00
		WSR45C	3.80	6.57	8.78	9.33
		WSR46	4.17	5.32	4.32	5.00
	Mid-Flood	DS1	4.61	5.22	5.09	6.44
		DS2	4.81	5.22	5.03	5.78
		DS3	5.10	5.44	4.61	4.56
		DS4	4.55	5.61	6.29	5.67
		DS5	5.87	5.79	3.66	3.83
		US1	4.56	5.53	3.15	3.56
		US2	3.85	4.97	11.02	13.00
		MW1	3.79	4.84	1.57	2.44
		THB1	5.50	5.76	5.96	4.50
		THB2	-	4.60	6.51	7.67
		WSR45C	4.07	4.98	3.33	5.00
		WSR46	4.09	5.12	6.51	7.56
2013/7/15	Mid-Ebb	DS1	4.06	5.92	7.59	12.67
		DS2	4.08	5.87	8.85	12.00
		DS3	4.14	6.27	7.81	9.78
		DS4	5.10	6.39	3.51	4.11
		DS5	5.47	6.23	2.94	3.11
		US1	4.95	5.90	14.09	13.78
		US2	6.02	6.37	6.30	6.50
		MW1	4.33	6.24	1.03	2.00
		THB1	5.82	7.79	3.97	9.83
		THB2	-	5.54	5.87	6.33
		WSR45C	3.79	6.01	5.56	8.44
		WSR46	4.73	5.79	5.45	6.33
	Mid-Flood	DS1	5.77	6.27	3.10	3.50
		DS2	6.46	6.48	1.95	3.83
		DS3	5.51	6.34	5.87	5.67
		DS4	6.48	6.70	2.56	4.67
		DS5	6.73	7.12	2.35	5.83
		US1	4.75	5.62	3.23	3.89
		US2	4.39	5.66	5.35	7.67
		MW1	4.18	5.47	0.99	11.33
		THB1	5.66	5.97	5.74	3.83
		THB2	-	5.99	3.72	3.67
		WSR45C	4.22	5.51	2.53	5.67
		WSR46	4.65	6.04	3.76	3.11
2013/7/17	Mid-Ebb	DS1	3.98	5.22	7.74	14.56
		DS2	3.74	5.29	4.92	7.00
		DS3	4.18	5.25	3.46	4.78
		DS4	4.73	5.52	1.78	3.67
		DS5	4.77	5.41	1.60	3.44
		US1	4.98	5.29	7.22	8.78

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average SS Level (mg/L)
			Bottom	Surface and Mid Depth		
		US2	5.70	5.69	3.80	6.00
		MW1	3.62	4.34	1.30	3.33
		THB1	5.08	5.54	3.42	9.67
		THB2	-	4.73	6.97	4.67
		WSR45C	3.85	5.16	3.18	5.89
		WSR46	3.98	4.50	4.15	7.44
	Mid-Flood	DS1	4.66	5.88	2.80	4.00
		DS2	5.28	5.84	3.04	5.44
		DS3	4.93	6.34	3.24	4.89
		DS4	6.82	6.72	2.15	3.33
		DS5	7.10	7.06	2.37	4.50
		US1	4.19	5.15	2.94	6.33
		US2	4.04	5.04	3.14	6.44
		MW1	3.71	4.79	1.92	5.56
		THB1	5.78	7.14	5.16	7.83
		THB2	-	6.62	5.08	4.33
		WSR45C	3.92	5.16	5.83	8.44
		WSR46	4.08	5.62	3.70	7.44
2013/7/19	Mid-Ebb	DS1	4.27	5.47	4.84	14.11
		DS2	4.32	5.46	4.89	6.33
		DS3	4.84	5.61	3.93	5.11
		DS4	4.97	5.89	3.52	4.89
		DS5	5.29	6.38	2.93	4.22
		US1	4.55	5.76	4.81	6.00
		US2	4.81	5.86	3.15	4.78
		MW1	4.33	4.99	1.27	5.22
		THB1	5.90	6.93	3.37	4.67
		THB2	-	5.40	4.98	4.33
		WSR45C	5.14	5.95	3.31	5.56
		WSR46	4.16	5.47	6.09	10.56
	Mid-Flood	DS1	4.50	5.45	6.50	9.33
		DS2	5.67	6.18	5.04	9.56
		DS3	6.16	6.60	12.14	19.22
		DS4	5.33	6.33	11.30	12.33
		DS5	7.06	7.24	7.74	9.17
		US1	4.57	6.25	3.13	6.56
		US2	3.96	5.16	13.97	16.67
		MW1	4.45	4.66	3.40	5.44
		THB1	7.51	7.76	4.91	13.50
		THB2	-	7.16	9.77	13.67
		WSR45C	4.08	5.27	5.69	10.00
		WSR46	5.07	5.98	13.67	16.00
2013/7/22	Mid-Ebb	DS1	4.54	5.01	6.36	7.67
		DS2	4.78	5.29	4.59	5.56
		DS3	4.71	5.19	5.60	7.89
		DS4	4.58	5.12	8.21	11.78
		DS5	4.52	4.80	8.75	14.67
		US1	5.10	5.84	8.73	6.67
		US2	5.02	5.52	6.74	7.33
		MW1	4.53	4.77	3.95	6.89
		THB1	5.57	6.11	3.57	6.17

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average SS Level (mg/L)
			Bottom	Surface and Mid Depth		
		THB2	-	5.24	4.98	5.33
		WSR45C	4.44	5.05	11.40	14.67
		WSR46	4.92	5.10	37.29	21.89
	Mid-Flood	DS1	5.39	5.53	5.11	7.50
		DS2	5.42	5.46	6.38	10.33
		DS3	5.43	5.48	6.01	9.33
		DS4	5.44	5.53	7.46	9.00
		DS5	5.67	5.64	7.83	10.50
		US1	5.34	5.61	4.90	8.33
		US2	4.77	4.88	6.80	9.44
		MW1	4.24	4.34	8.92	11.33
		THB1	5.45	5.68	8.62	12.50
		THB2	-	6.38	9.37	9.33
		WSR45C	4.64	5.06	9.69	14.33
		WSR46	4.84	5.28	13.99	19.78
2013/7/24	Mid-Ebb	DS1	4.55	4.89	5.76	8.33
		DS2	4.67	5.23	4.88	6.78
		DS3	4.86	5.08	6.26	10.33
		DS4	4.80	4.91	7.71	8.33
		DS5	4.88	4.94	7.98	8.50
		US1	5.11	5.59	7.77	9.00
		US2	5.09	5.34	9.00	10.33
		MW1	4.91	5.05	4.32	5.56
		THB1	5.46	5.66	3.92	4.83
		THB2	-	-	-	-
		WSR45C	4.68	4.99	11.33	13.33
		WSR46	5.22	5.33	19.31	21.22
	Mid-Flood	DS1	5.12	5.18	5.12	9.00
		DS2	5.11	5.15	6.72	12.00
		DS3	5.07	5.26	6.77	13.00
		DS4	5.02	5.35	6.63	13.33
		DS5	5.35	5.32	5.30	7.89
		US1	4.48	4.87	16.67	23.33
		US2	4.32	4.74	15.43	24.56
		MW1	4.42	4.73	4.87	6.67
		THB1	5.36	5.36	4.43	7.83
		THB2	-	4.67	6.80	6.67
		WSR45C	4.65	5.18	6.47	8.33
		WSR46	4.59	5.02	23.99	27.67
2013/7/26	Mid-Ebb	DS1	4.97	5.35	12.22	15.44
		DS2	5.08	5.51	9.97	17.11
		DS3	5.09	5.46	9.14	12.22
		DS4	5.05	5.29	9.58	12.11
		DS5	5.35	5.36	8.73	10.83
		US1	5.37	5.88	10.73	14.50
		US2	5.35	5.79	9.58	10.00
		MW1	4.98	5.09	5.43	6.78
		THB1	5.44	5.49	7.12	9.17
		THB2	-	-	-	-
		WSR45C	4.72	4.95	13.71	15.33
		WSR46	4.70	5.11	35.61	49.33

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	5.49	5.47	6.98	8.83
		DS2	5.55	5.61	5.37	6.00
		DS3	5.64	5.71	6.07	9.17
		DS4	5.74	5.83	5.63	7.33
		DS5	5.47	5.71	8.34	10.67
		US1	5.17	5.40	8.19	8.44
		US2	4.77	5.09	13.27	16.89
		MW1	4.90	5.28	4.49	5.44
		THB1	5.24	5.34	9.97	11.33
		THB2	-	-	-	-
		WSR45C	5.16	5.40	11.27	14.89
		WSR46	5.03	5.36	20.00	29.56
2013/7/29	Mid-Ebb	DS1	5.02	5.91	6.60	7.56
		DS2	5.14	5.79	7.32	10.78
		DS3	5.18	5.84	5.11	8.00
		DS4	5.03	5.76	5.27	6.11
		DS5	5.48	5.73	4.29	6.17
		US1	6.28	6.45	6.40	5.33
		US2	6.35	6.48	13.93	16.67
		MW1	4.44	6.32	2.36	3.56
		THB1	5.48	6.21	8.14	10.17
		THB2	-	6.17	7.54	5.00
		WSR45C	4.30	5.75	4.90	6.22
		WSR46	4.76	5.80	6.83	10.67
	Mid-Flood	DS1	5.74	5.81	5.47	4.50
		DS2	5.78	5.83	5.05	5.17
		DS3	5.90	5.92	4.68	7.83
		DS4	6.19	6.08	4.25	3.50
		DS5	5.65	6.12	9.22	7.22
		US1	5.27	5.90	4.07	6.00
		US2	4.77	5.38	8.12	8.67
		MW1	4.66	5.72	3.53	4.89
		THB1	6.16	6.28	3.99	5.50
		THB2	-	5.41	10.11	5.00
		WSR45C	4.78	5.61	5.27	6.33
		WSR46	4.65	5.59	10.53	12.44

Notes:

1. Please refer to Table B2 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-ebb tide of 24 July 2013 and both mid-ebb and mid-flood tides of 26 July 2013 were not carried out due to adverse weather.

Table B2 ***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 = **56.30 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.

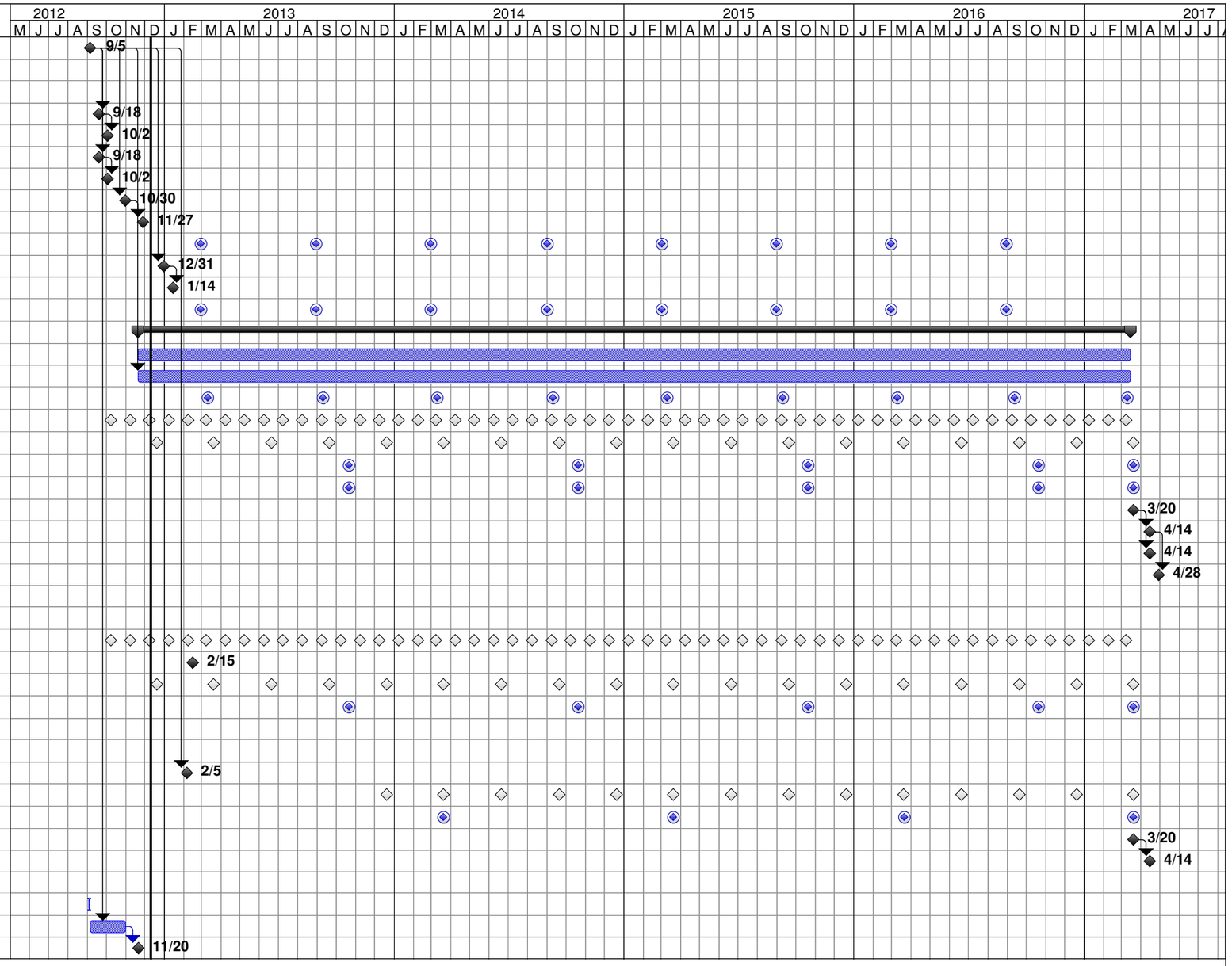
(3) "Depth-averaged" is calculated by taking the arithmetic means of reading of all three depths.

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

Annex D

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