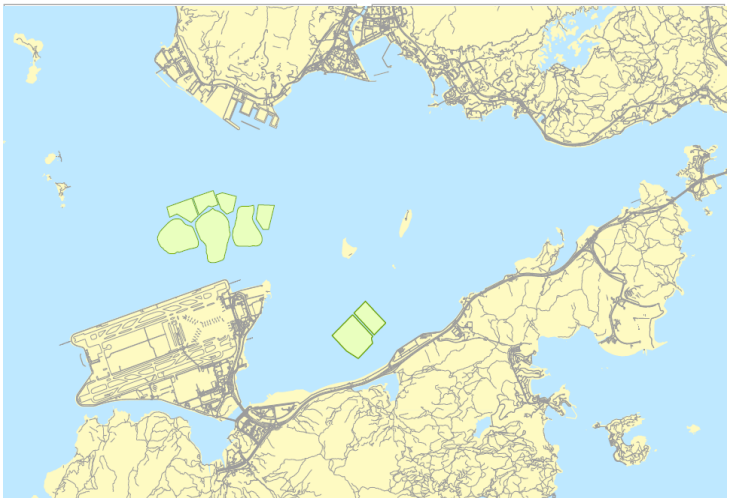
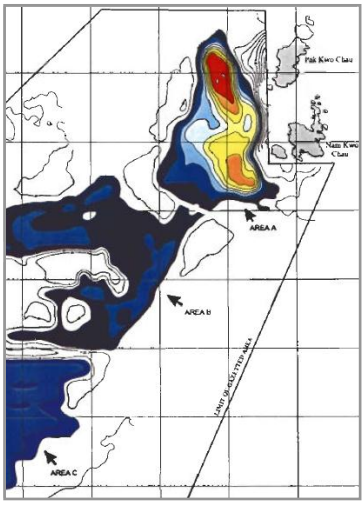
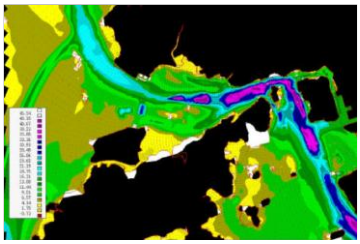






CEDD 土木工程拓展署
Civil Engineering and Development Department

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)

14th Monthly Progress Report for Contaminated Mud Pits to the South of The Brothers and at East Sha Chau – October 2013

Revision 0

22 November 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

The world's leading sustainability consultancy

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

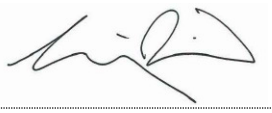
14th Monthly Progress Report for Contaminated Mud Pits to the South of The Brothers and at East Sha Chau – October 2013

Revision 0

Document Code: 0175086 Monthly Oct_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:	Project No:
Civil Engineering and Development Department (CEDD)	0175086
Summary: This document presents the 14th monthly progress report for Contaminated Mud Pits at the South of The Brothers and at East Sha Chau.	Date: 22 November 2013 Approved by:  Craig A. Reid *Partner*

Revision	Description	By	Checked	Approved	Date
v0	14th Monthly Progress Report for CMP V and SB CMPs	YL	JT	CAR	22/11/13

Distribution

☐ Internal

☒ Public

☐ Confidential

土木工程拓展署
CEDD 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:	14th Monthly Progress Report for Contaminated Mud Pits to the South of The Brothers and at East Sha Chau - October 2013
Date of Report:	21 November 2013
Date prepared by ET:	21 November 2013
Date received by IA:	21 November 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.

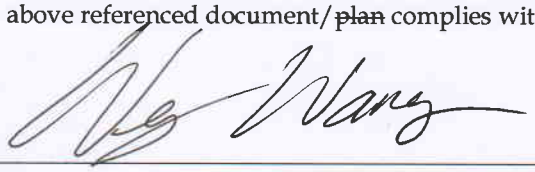
ET Certification

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: 21/11/2013

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: 21/11/2013

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

14TH MONTHLY PROGRESS REPORT FOR OCTOBER 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) 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 East of Sha Chau (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 October 2013, the following works were being undertaken at the CMPs:

- Capping was being undertaken at 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.

1.2 REPORTING PERIOD

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

1.3 DETAILS OF SAMPLING AND LABORATORY TESTING ACTIVITIES

1.3.1 No monitoring activities were undertaken for CMP IV and V in the monitoring month of October 2013.

1.3.2 The following monitoring activities have been undertaken for SB CMPs in September 2013:

- *Pit Specific Sediment Chemistry* was conducted for CMP 1 on 11 October 2013;
- *Routine Water Quality Monitoring* was conducted for CMP 1 on 3, 5, 8, 11, 13, 15, 17, 19, 21, 24, 26, 29 and 31 October 2013;
- *Water Column Profiling* was undertaken on 24 October 2013; and,
- *Impact Water Quality Monitoring during Dredging Operations* was undertaken for SB CMP 2 three times per week (i.e. 2, 4, 7, 10, 12, 14, 16, 18, 21, 23, 25, 28 and 30 October 2013) in this reporting month in accordance with the EM&A Manual.

(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.

1.4 DETAILS OF OUTSTANDING SAMPLING AND/OR ANALYSIS

1.4.1 No outstanding sampling remained for October 2013. Laboratory analyses of *Pit Specific Sediment Chemistry* of SB CMP 1 conducted in September and October 2013 and laboratory analysis of *Cumulative Impact Sediment Chemistry Monitoring* of CMP V undertaken in August 2013 are yet to be completed. Laboratory analyses of Suspended Solids (SS) for *Water Quality Monitoring during Dredging Operations of CMP 2* collected on 30 October 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 Brief discussion of the monitoring results of *Pit Specific Sediment Chemistry Monitoring* conducted in August 2013 is presented in this *14th Monthly Report*. Detailed discussion will be presented in the corresponding *Quarterly Report*.

1.5.2 *Pit Specific Sediment Chemistry of CMP Va – August 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 August 2013. It is observed that the variations of metal concentrations at Active Pit Stations NPDA were much larger (i.e. greater standard deviation) when compared to other stations (*Figures 1 and 2 of Annex B*).

1.5.4 Cadmium, Chromium, Lead, Zinc, Mercury and Nickel complied with the Lower Chemical Exceedance Level (LCEL) at all stations in August 2013 (*Figures 1 and 2* of *Annex B*). Concentrations of Arsenic exceeded the LCEL at Active Pit station NPDB, Pit Edge stations NEDA and NEDB and Near Pit station NNDA (*Figures 1* of *Annex B*). Concentrations of Copper and Silver exceeded LCEL at Active Pit station NPDA (*Figures 1 and 2* of *Annex B*).

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) 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

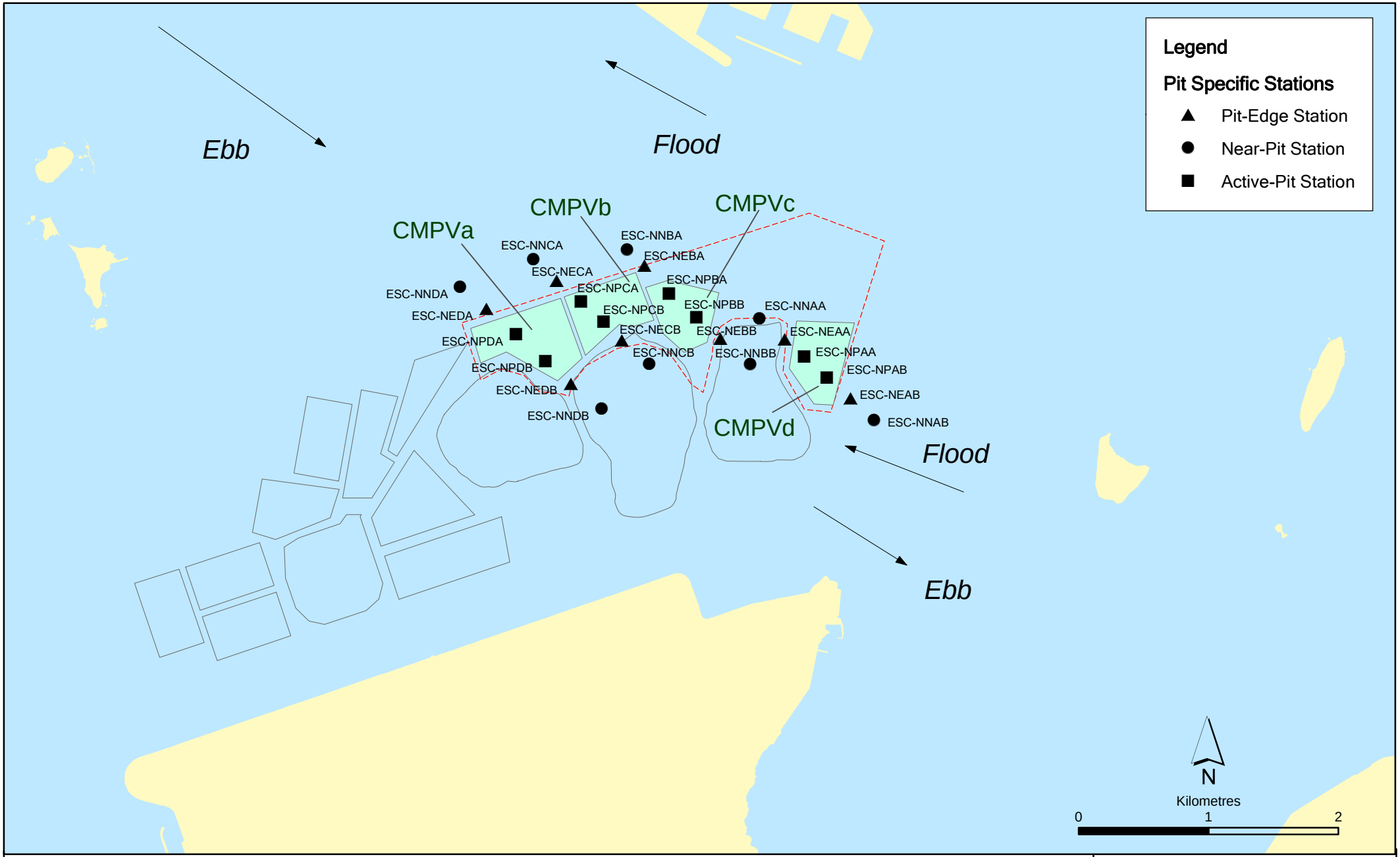


Figure 1.1

Pit Specific Sediment Quality Monitoring Stations for CMPV

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

Environmental Resources Management

ERM

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

1.5.7 Total Organic Carbon (TOC) concentration was similar amongst all stations in August 2013 (*Figure 3* of *Annex B*). Tributyltin (TBT) concentration was found to be higher at Active Pit station NPDA (*Figure 4* of *Annex B*) in August 2013.

1.5.8 Low Molecular Weigh Polycyclic Aromatics Hydrocarbons (Low MW PAHs) concentrations at Active station NPDA were recorded above the limit of reporting in August 2013. High Molecular Weight Polycyclic Aromatics Hydrocarbons (High MW PAHs) concentrations at Active Pit stations NPDA and NPDB and Pit-edge station NEPA were also detected above the limit of reporting in August 2013 (*Figure 5 of Annex B*). However, these detected concentrations of Low and High MW PAHs were below LCELs.

1.5.9 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 the stations in August 2013.

1.5.10 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.

1.5.11 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.

1.6 BRIEF DISCUSSION OF THE MONITORING RESULTS FOR SB CMPS

1.6.1 Impact Water Quality Monitoring during Dredging Operations of CMP 2 – 2 to 28 October 2013

1.6.2 Monitoring data collected for CMP 2 from 2 to 28 October 2013 are presented in this monthly report. Detailed discussion will be presented in the corresponding *Quarterly Report*.

1.6.3 *Impact Water Quality Monitoring during Dredging Operations of CMP 2* (i.e. from 2 October to 28 October 2013) was conducted three times per week for a total of nine (9) sampling days. 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 2. 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 1.2*.

1.6.4 Monitoring results from 2 to 28October are presented in *Table C1* of *Annex C*. Levels of DO, Turbidity and 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 occasions of exceedances shown in *Table 1.1* below.

Table 1.1 Details of exceedances recorded at SB CMP 2 in October 2013

Date	Tide	Parameter	Station	Type
4 October 2013	Mid-Ebb	Turbidity	WSR46	Limit
		SS	WSR46	Action
	Mid-Flood	Turbidity	DS3	Action
		SS	DS2	Action
		SS	DS3	Action
7 October 2013	Mid-Ebb	Turbidity	DS1	Limit
		Turbidity	DS2	Action
		Turbidity	DS3	Limit
		Turbidity	DS4	Limit
		Turbidity	DS5	Limit
		SS	DS1	Limit
		SS	DS3	Action
		SS	DS4	Action
		SS	DS5	Action
	Mid-Flood	Turbidity	DS1	Limit
		SS	DS1	Limit
		SS	WSR46	Action
10 October 2013	Mid-Ebb	Turbidity	DS1	Action
	Mid-Flood	Turbidity	DS1	Limit
		Turbidity	DS2	Action
		SS	DS1	Limit
18 October 2013	Mid-Ebb	SS	DS1	Action
	Mid-Flood	Turbidity	WSR46	Action
		SS	WSR45C	Action
		SS	WSR46	Action
21 October 2013	Mid-Flood	SS	DS1	Action
23 October 2013	Mid-Flood	Turbidity	DS1	Limit
		SS	DS1	Action
		SS	DS4	DS4
25 October 2013	Mid-Flood	Turbidity	DS1	Limit
		SS	DS1	Limit
		SS	DS2	Action
		SS	DS3	Action
28 October 2013	Mid-Flood	Turbidity	DS1	Limit
		SS	DS1	Limit
		SS	DS3	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.

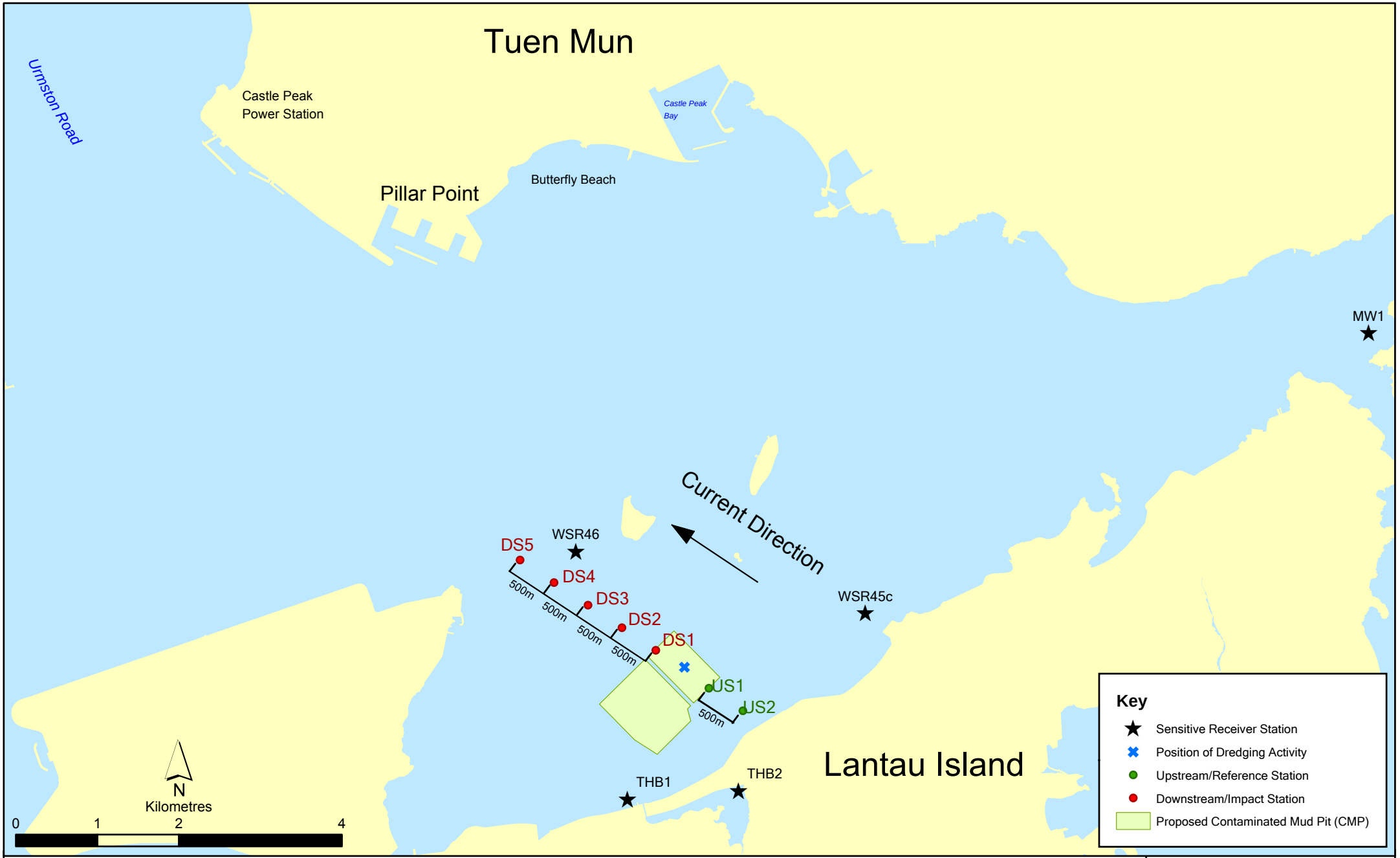


Figure 1.2

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: 13/11/2013

Environmental Resources Management

ERM

1.6.5 It should be noted that the exceedances on 4 (mid-ebb and mid-flood tides) and 18 October 2013 (mid-flood tide) were recorded at stations which are located further away from the works area when compared to station DS1 at which the levels of SS, Turbidity and DO did not exceed the Action and Limit Levels during the same tidal period on the same day. As such, these recorded exceedances are not likely to be caused by the dredging works at CMP 2.

1.6.6 Linear Regression was conducted to determine any significant spatial trend of Turbidity and SS levels recorded at stations DS1 to DS5 on 7 October 2013. Results of the statistical analysis did not indicate any significant spatial trend of increasing Turbidity and SS levels with proximity to the dredging operations (i.e. r^2 value < 0.6). The statistical analysis was also performed for SS levels at stations DS1 to DS5 recorded on 25 October 2013 (mid-flood). Although a significant spatial trend was observed, the exceedances of Action and Limit Levels were only recorded within a limited range at Impact stations DS1, DS2 and DS3 which are within ~1 km distance downstream from the dredging operation and exceedances were not recorded at any WSR stations. In addition, the spatial trend was only recorded on one tide within only one monitoring day. As such, there did not appear to be any evidence of unacceptable water quality impact as a result of the dredging operations at the CMP.

1.6.7 Exceedances at DS1 and other stations were also detected on 10, 18 (mid-ebb), 21 (mid-flood), 23 (mid-flood), 25 (mid-flood) and 28 October 2013 (mid-flood). However, these exceedances did not indicate any trend of increasing SS or Turbidity levels toward the dredging operations. Instead, high levels of Turbidity and SS and low levels of DO 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.

1.6.8 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.

1.6.9 Routine Water Quality Monitoring for SB CMP 1 – October 2013

1.6.10 The results for the Routine Water Quality Monitoring conducted on 3, 5, 8, 11, 13 and 15 October 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 2002-2011 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 C3 and C4 of Annex C*, with graphical presentation provided in *Annex B.* Locations of monitoring stations were presented in *Figure 1.3 and 1.4.*

In-situ Measurements

1.6.11 Analysis of results for 3, 5, 8, 11, 13 and 15 October 2013 indicated that for all the stations (Impact, Intermediate, Reference and Ma Wan), levels of pH, DO and Salinity complied with the WQOs (*Annex B*). All *in-situ* water quality measurements showed relatively minor variations amongst Impact, Intermediate and Reference stations (*Annex B*).

1.6.12 Levels of Turbidity within the reporting month generally complied with the Action and Limit Levels set in the *EM&A Manual* (1) (*Figures 10, 20, 30, 40, 50 and 60 of Annex B*). Variation of Turbidity amongst all the stations was observed throughout the monitoring period.

Laboratory Measurements

1.6.13 Data interpretation on monthly average concentrations of metals and nutrients will be presented when monitoring data are made available upon completion of laboratory analysis. Graphical presentations of monitoring results on individual monitoring days from 3 to 15 October 2013 are presented in *Annex B*.

(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).

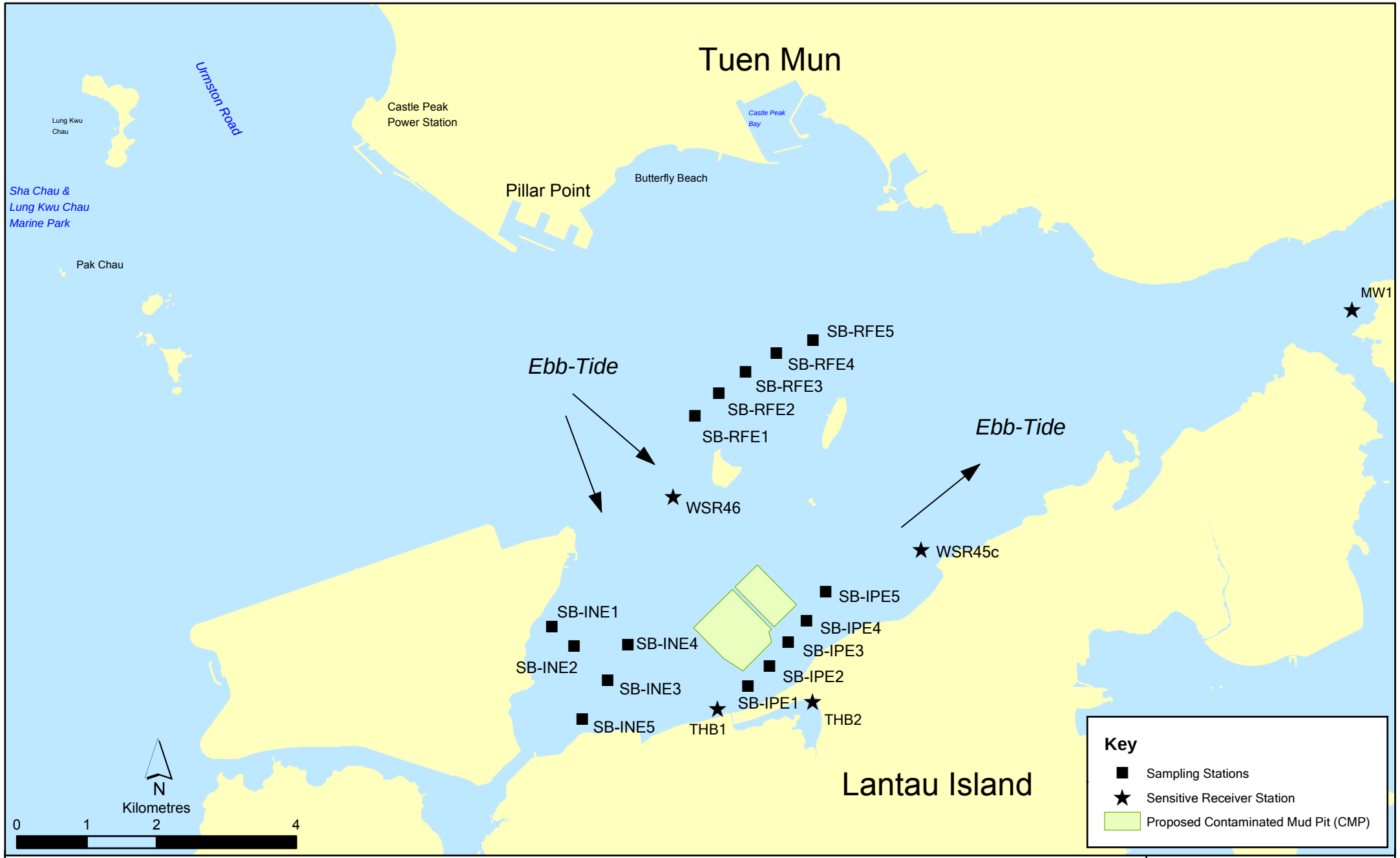


Figure 1.3

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

File: T:\GIS\CONTRACT\0175086\Mxd\0175086_3.3_Routine_Capping_WQMS_ebb.mxd
Date: 13/11/2013

Environmental Resources Management

ERM

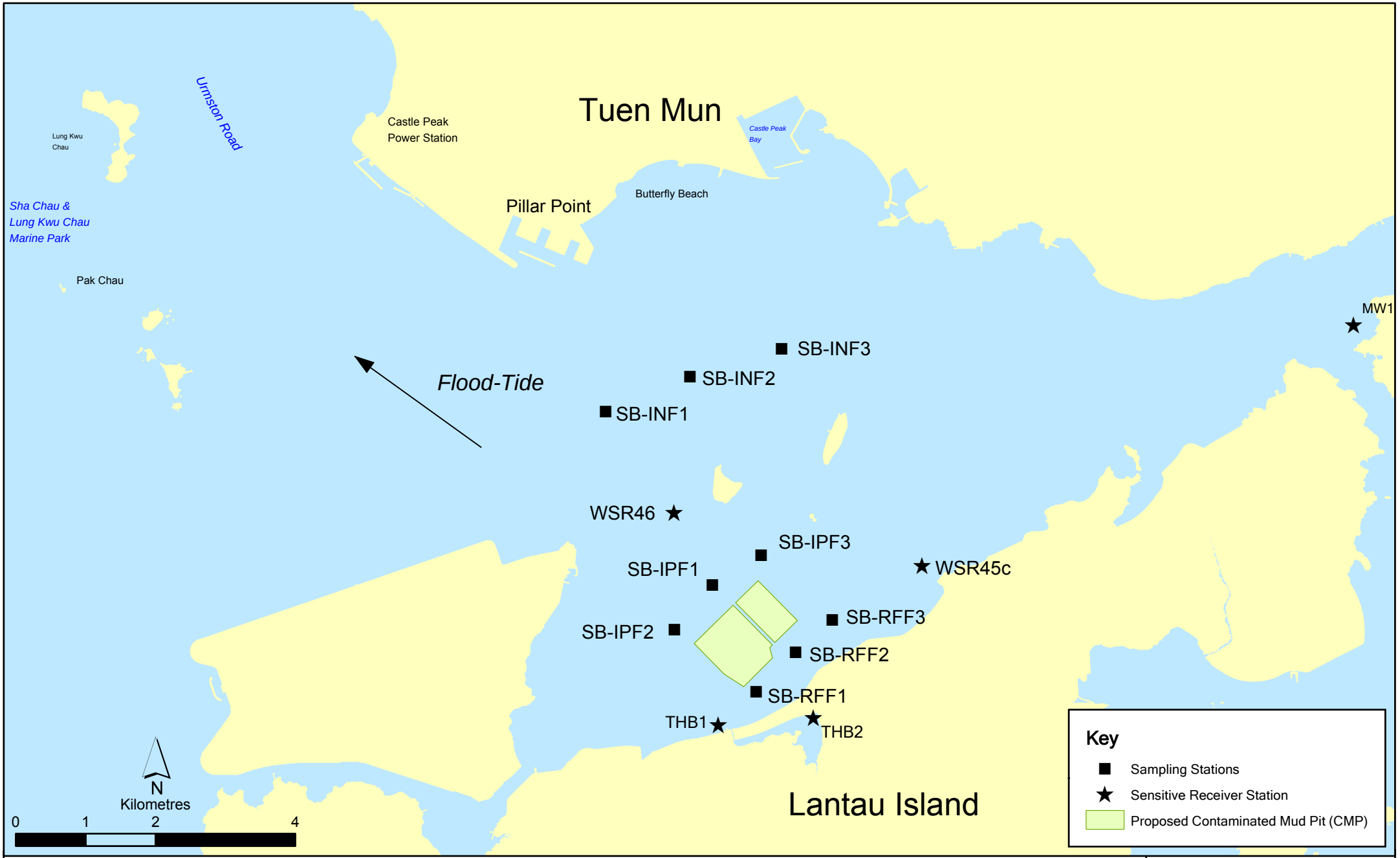


Figure 1.4

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

File: T:\GIS\CONTRACT\0175086\Mxd\0175086_3.4_Routine_Capping_WQMS_flood.mxd
Date: 13/11/2013

Environmental Resources Management

ERM

1.6.14 Exceedances of Suspended Solids (SS) WQO (12.2 mg/L for wet season) were occasionally recorded (*Figure 15, 25, 35, 45, 55 and 65 of Annex B*). The exceedances of WQO were recorded at Reference stations, Impact stations and other Water Sensitive Receiver stations on the same monitoring day (3, 5, 8, and 15 October 2013). The reference stations are located with a sufficient distance from the mud pits and considered unlikely to be affected disposal works. In addition, the SS levels at Impact stations were recorded lower than those at Reference or Intermediate stations. Hence, it is considered that the exceedances of WQO are unlikely to be caused by mud disposal operations. In addition, 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. Concentrations of SS complied with the Action and Limit Levels at all stations during the reporting month.

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

1.6.16 Water Column Profiling for CMP 1 – October 2013

In-situ Measurements

1.6.17 Water Column Profiling was undertaken at a total of two sampling stations (Upstream and Downstream stations) in October 2013. The water quality monitoring results for October 2013 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 2002-2011 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. Graphical presentation of the monitoring results is provided in *Annex B*.

1.6.18 Analyses of results for October 2013 indicated that levels of Salinity, pH and DO complied with the WQOs at both Upstream and Downstream stations (*Figures 66-68 of Annex B*). DO and Turbidity complied with the Action and Limit Levels set in the *EM&A Manual* (1).

(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).

Laboratory Measurements for Suspended Solids (SS)

1.6.19 Analyses of data obtained in October 2013 indicated that the SS levels at Downstream and Upstream stations exceeded the WQO (*Figure 69 of Annex B*) but the SS levels at Downstream stations are significantly smaller than those at Upstream stations indicating by statistical analysis. In addition, SS levels at all stations complied with the Action and Limit Levels set in the *EM&A Manual*.

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

1.7 ACTIVITIES SCHEDULED FOR THE NEXT MONTH

1.7.1 *Pit Specific Sediment Chemistry*, *Routine Water Quality Monitoring* and *Water Column Profiling* for CMP 1 as well as *Impact Water Quality Monitoring during Dredging Operations* for CMP 2 will be conducted in the next monthly period of November 2013.

1.7.2 No monitoring activities will be conducted for CMP IV and CMP V in the next monthly period of November 2013.

1.7.3 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																											
	SB-RNB	4 times per year														12				12		12				12		12				12		12				12		12				12																											
Mid-field Stations																																																																					
	SB-RMA	4 times per year														12				12		12				12		12				12		12				12		12				12																											
	SB-RMB	4 times per year														12				12		12				12		12				12		12				12		12				12																											
Far-Field Stations																																																																			
	SB-RFA	4 times per year														12				12		12				12		12				12		12				12		12				12																											
	SB-RFB	4 times per year														12				12		12				12		12				12		12				12		12				12																											
Capped Pit Stations																																																																			
	SB-RCA	4 times per year														12				12		12				12		12				12		12				12		12				12																											
	SB-RCB	4 times per year														12				12		12				12		12				12		12				12		12				12																											
Sensitive Receiver Stations																																																																			
	MW1	4 times per year														12				12		12				12		12				12		12				12		12				12																											
	THB1	4 times per year														12				12		12				12		12				12		12				12		12				12																											
	THB2	4 times per year														12				12		12				12		12				12		12				12		12				12																											

			2012						2013												2014												2015												2016												2017											
Sediment Toxicity Tests			J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	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																				
	SB-INB 1-5	4 times per year														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																				
	TNB 1-5	4 times per year														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																				
	TSB 1-5	4 times per year														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)

		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

Monitoring Results

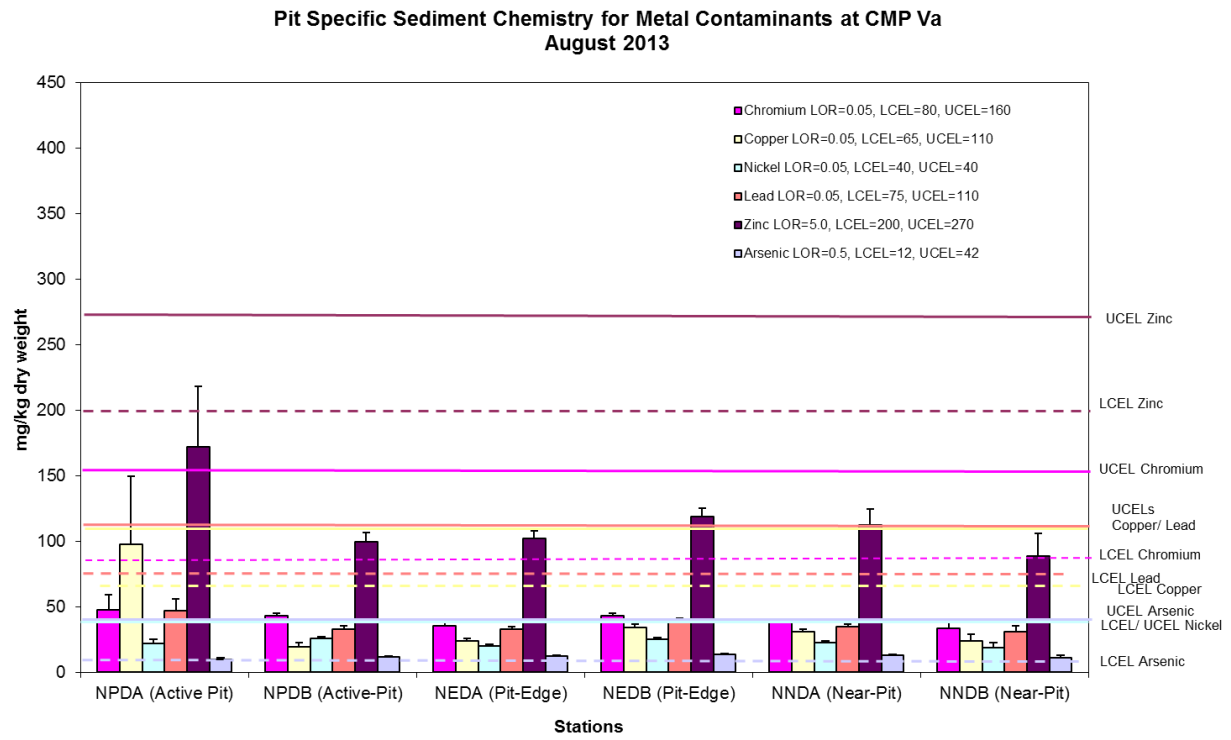


Figure 1: Concentration of Metals (Cr, Cu, Ni, Pb, Zn, As; mean +SD) in sediment samples collected from Pit Specific Sediment Chemistry Monitoring for CMP Va in August 2013.

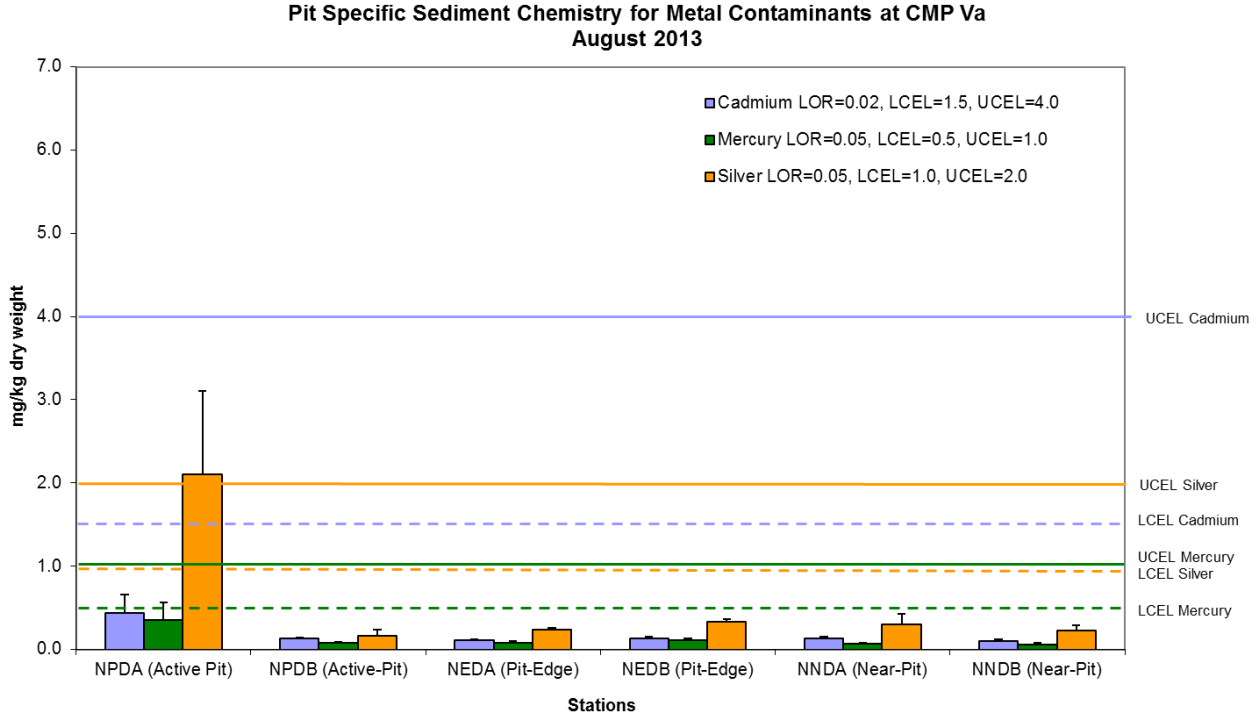


Figure 2: Concentration of Metals (Cd, Hg, Ag; mean +SD) in sediment samples collected from Pit Specific Sediment Chemistry Monitoring for CMP Va in August 2013.

Source: H:\Team\EM\GMS Projects\0175086 CEDD EM&A for South Brothers\02 Deliverable\07 CMP Monthly Report\14th (October 2013)

Date: 14/10/13

Environmental Resources Management

ERM

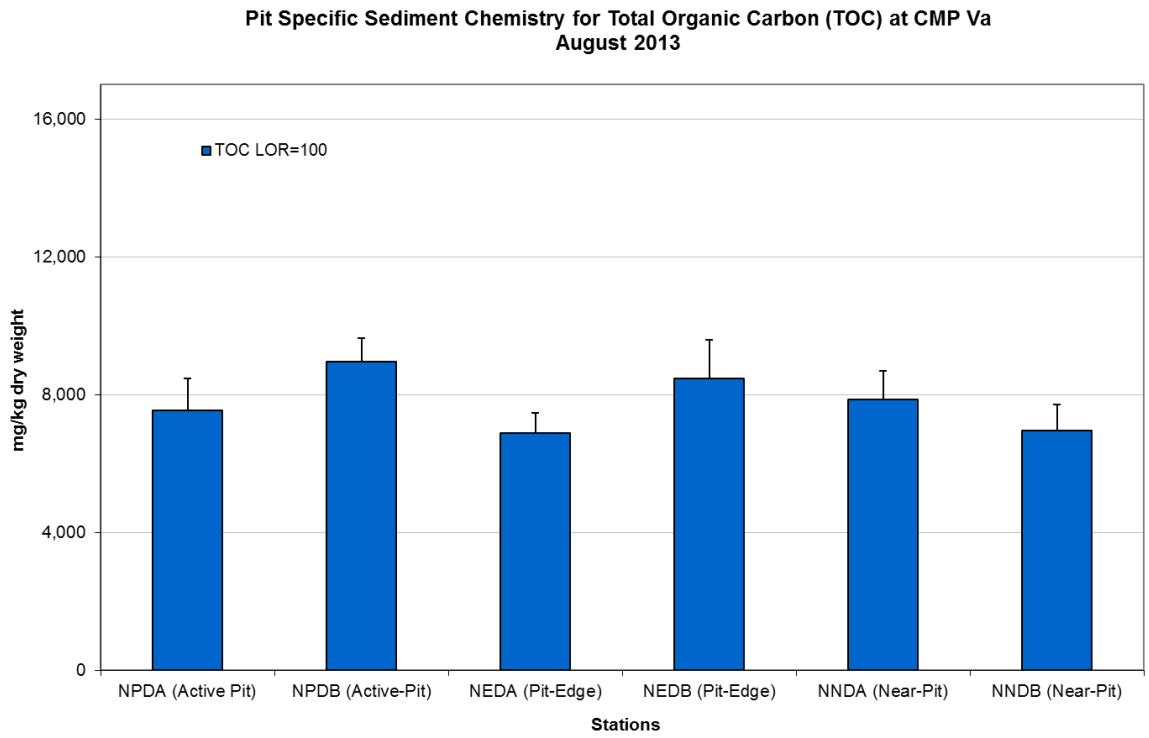


Figure 3: Concentration of Total Organic Carbon (mg/kg dry weight; mean +SD) in sediment samples collected from Pit Specific Sediment Chemistry Monitoring for CMP Va in August 2013.

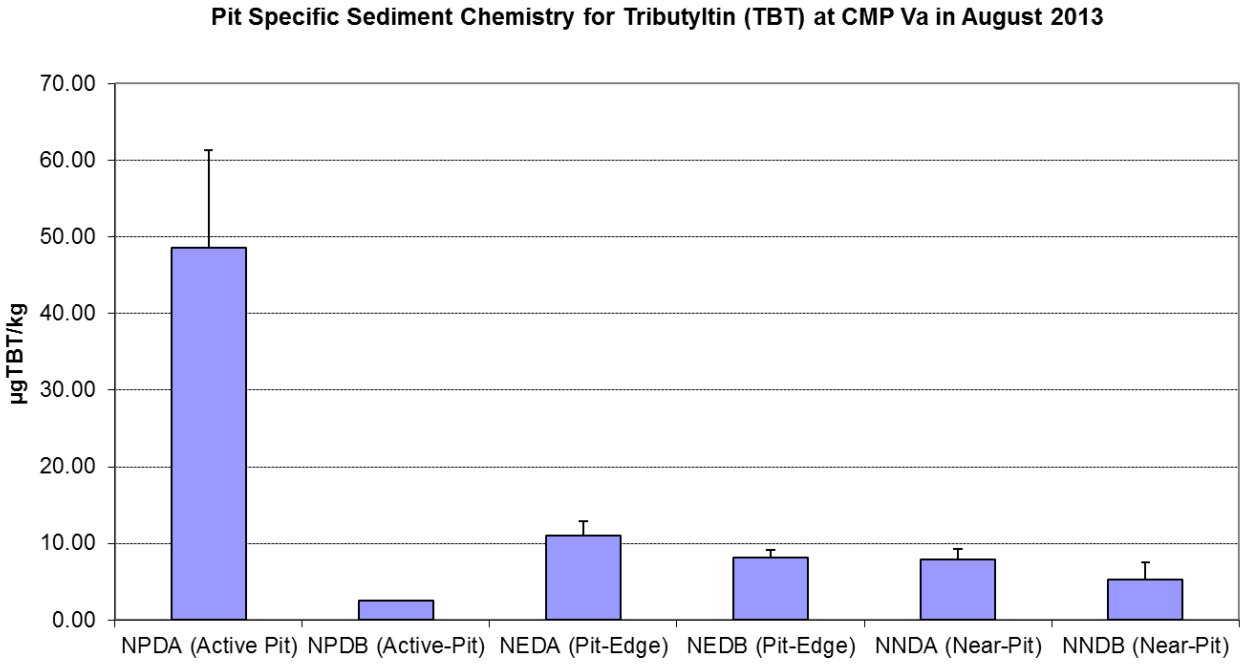


Figure 4: Concentration of Tributyltin (µg TBT/kg; mean +SD) in sediment samples collected from Pit Specific Sediment Chemistry Monitoring of CMP Va in August 2013.

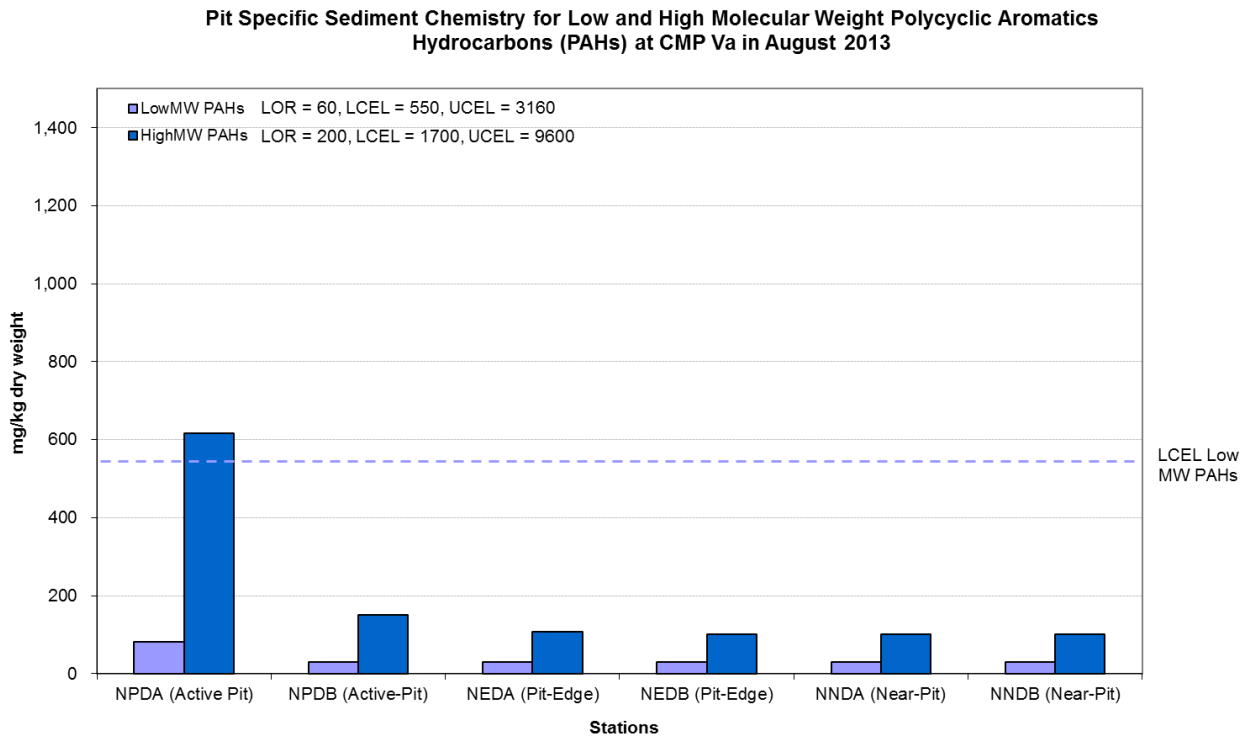


Figure 5: Concentration of Low and High Molecular Weight Polycyclic Aromatics Hydrocarbons (PAHs) (µg/kg; mean +SD) in sediment samples collected from Pit Specific Sediment Chemistry Monitoring for CMP Va in August 2013.

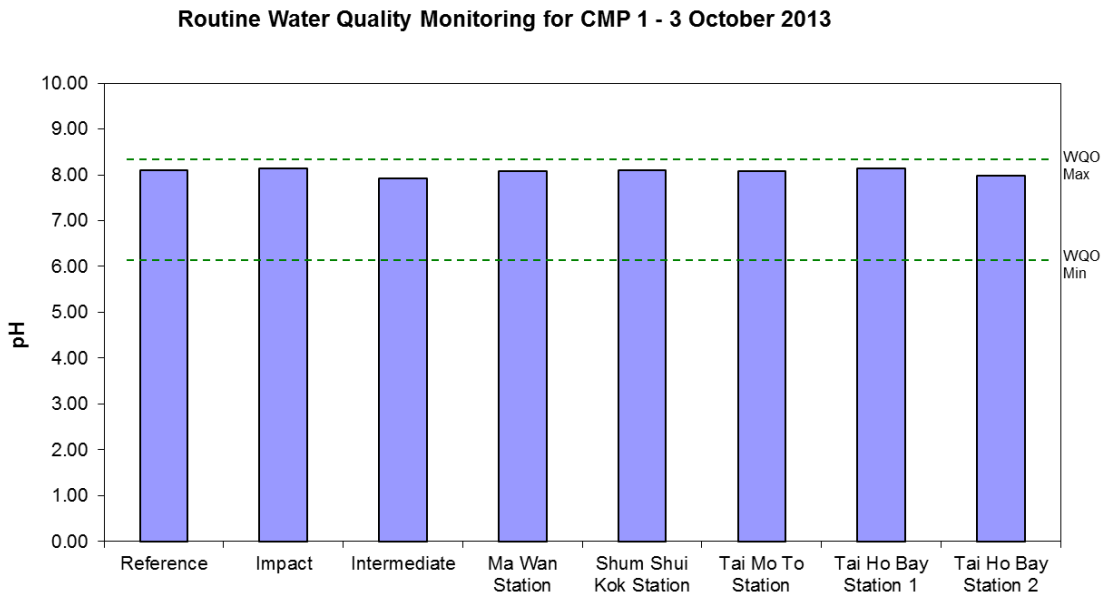


Figure 6: Level of pH (mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP 1 on 3 October 2013.

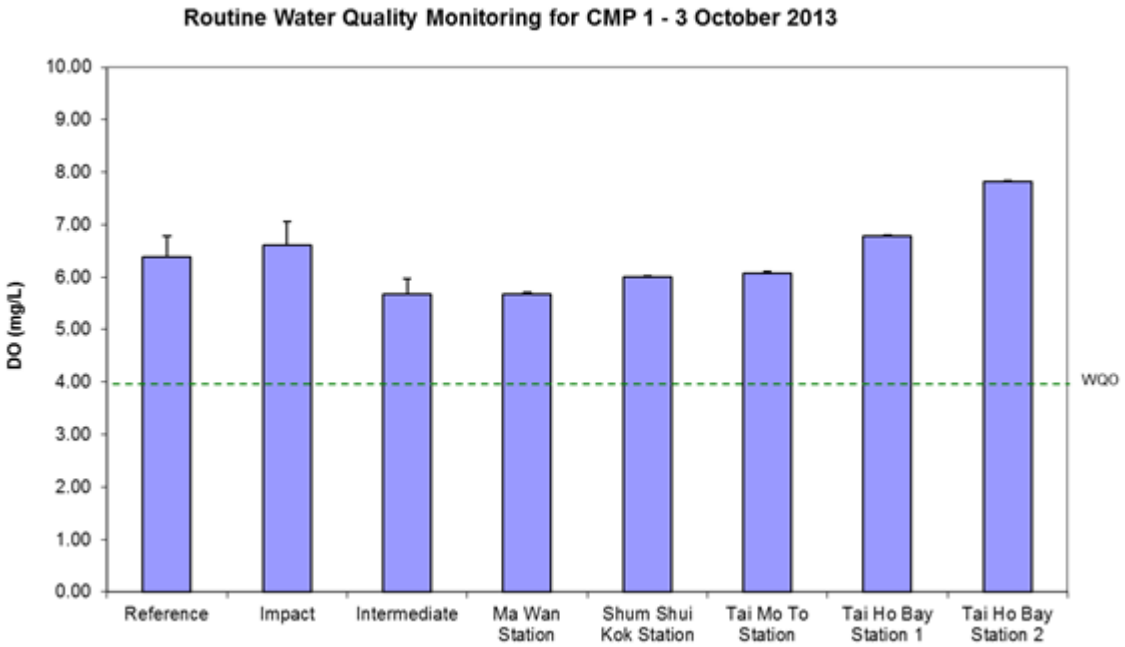


Figure 7: Concentration of Dissolved Oxygen (mg/L; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP 1 on 3 October 2013.

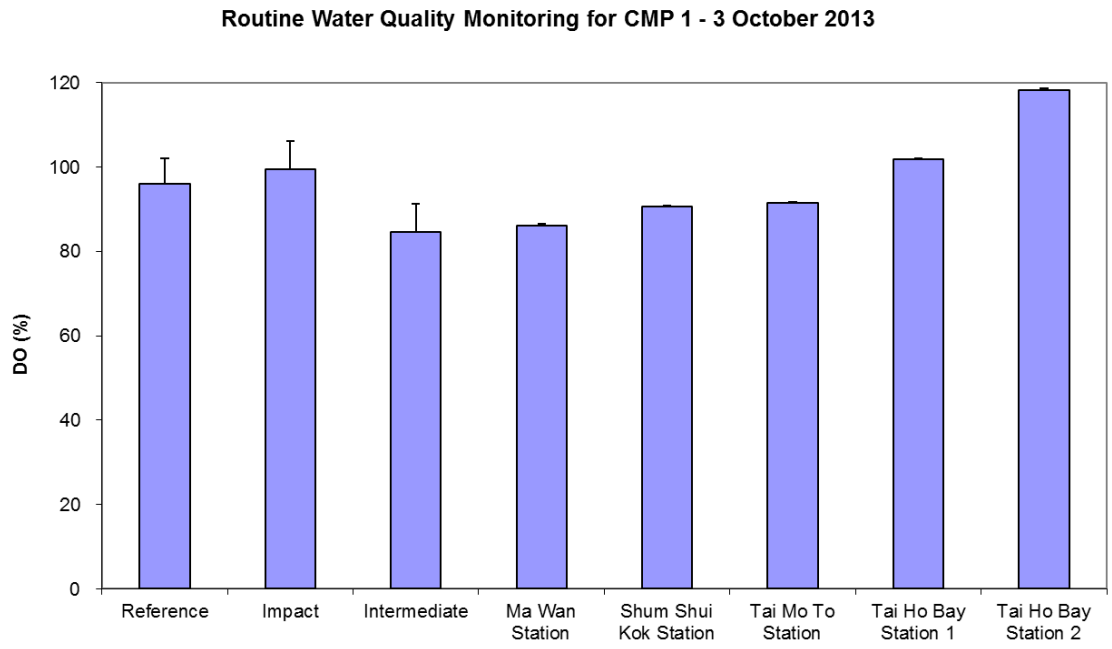


Figure 8: Level of Dissolved Oxygen (% saturation; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP 1 on 3 October 2013.

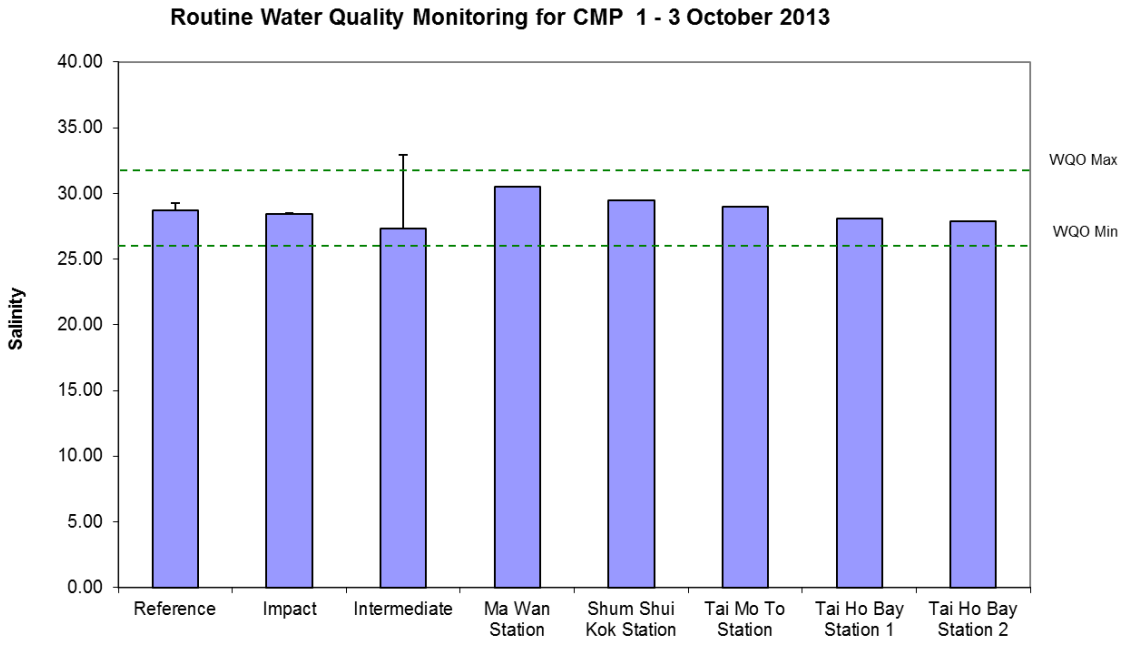


Figure 9: Level of Salinity (mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP 1 on 3 October 2013.

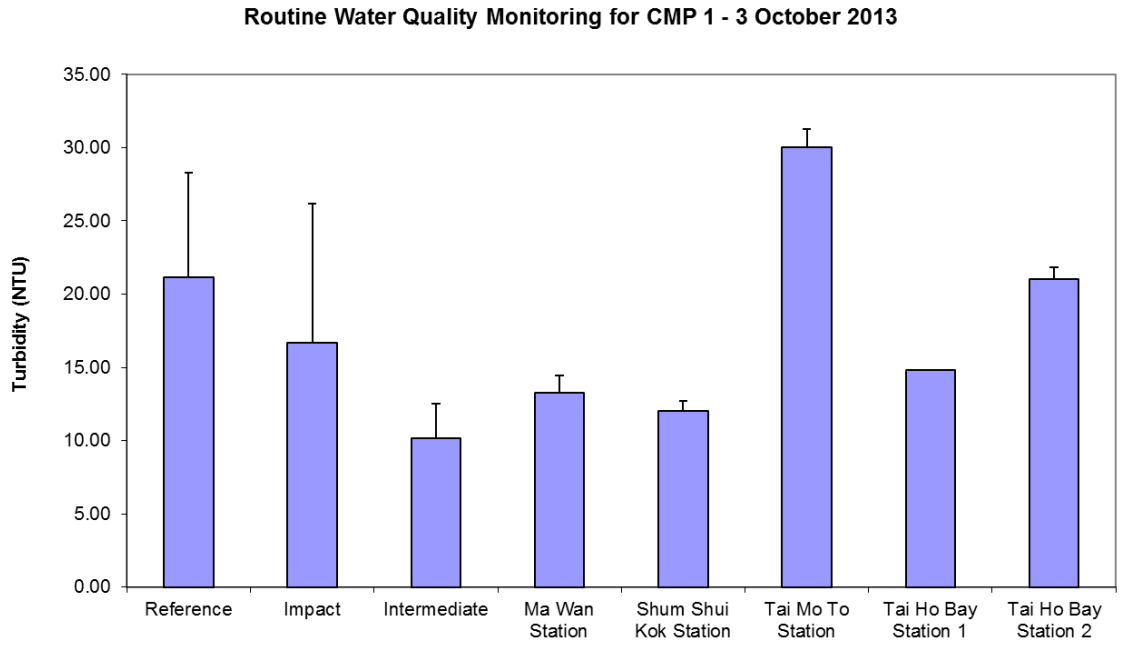


Figure 10: Level of Turbidity (NTU; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP 1 on 3 October 2013.

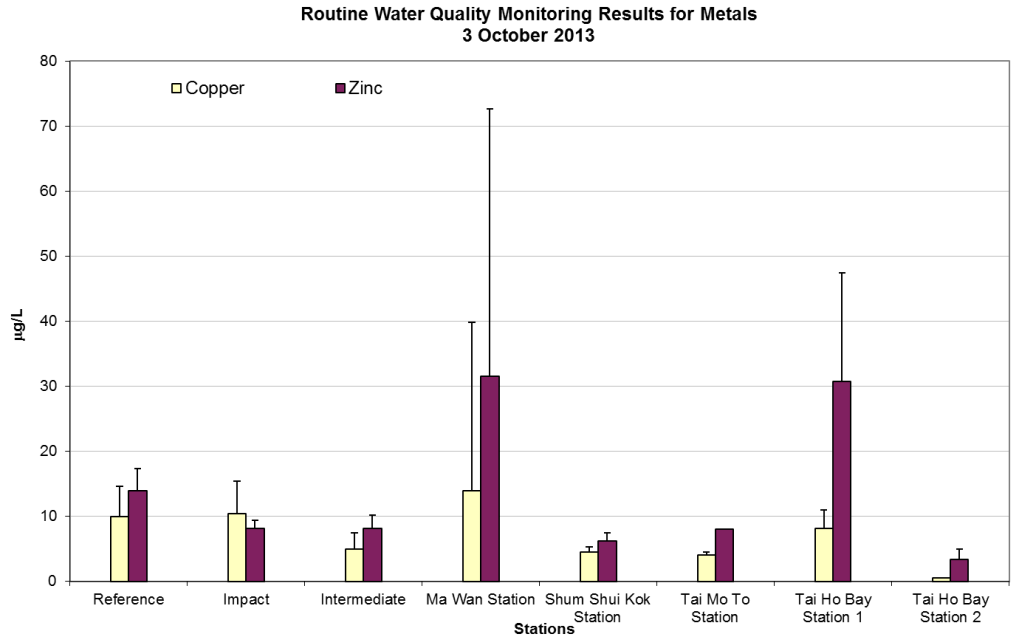


Figure 11: Concentration of Copper and Zinc (mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP 1 on 3 October 2013.

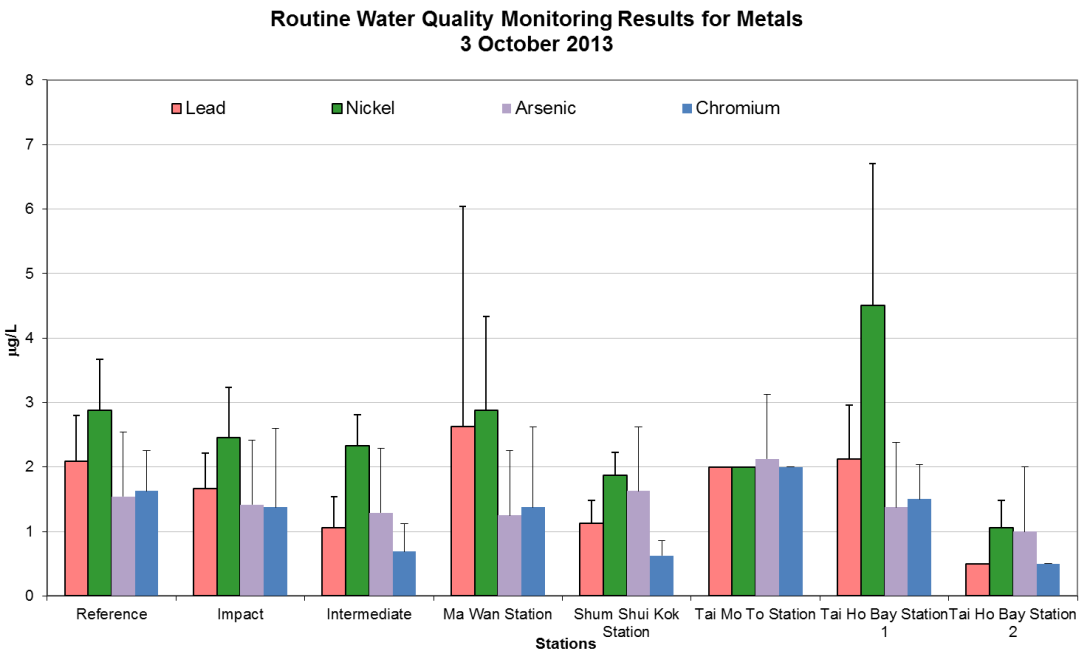


Figure 12: Concentration of Lead, Nickel, Arsenic and Chromium (mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP 1 on 3 October 2013.

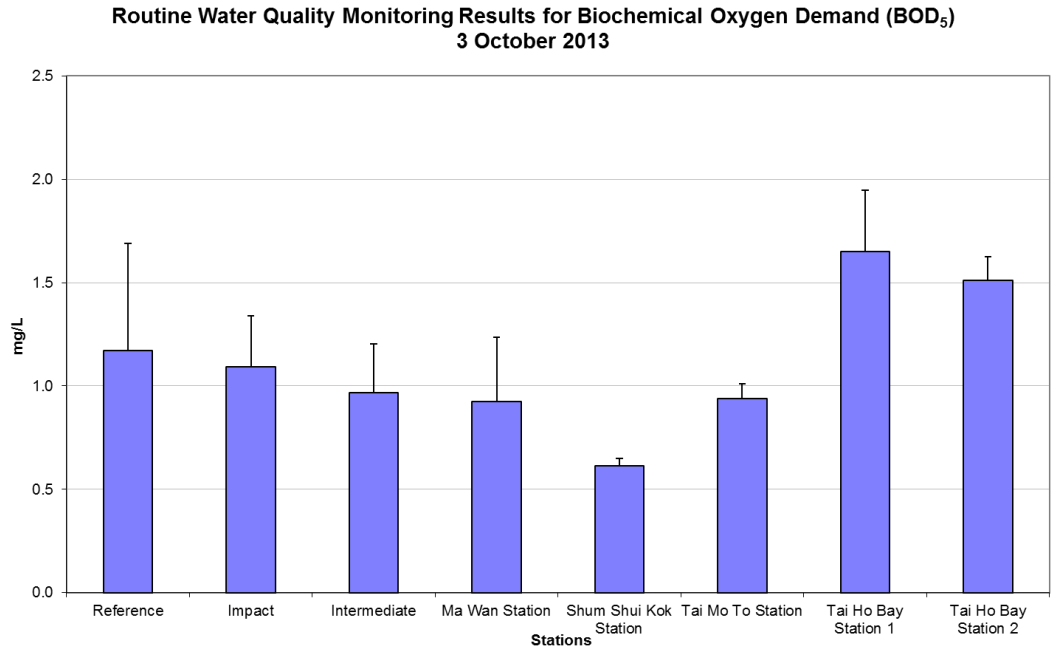


Figure 13: Level of Biochemical Oxygen Demand (BOD_5; mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP 1 on 3 October 2013.

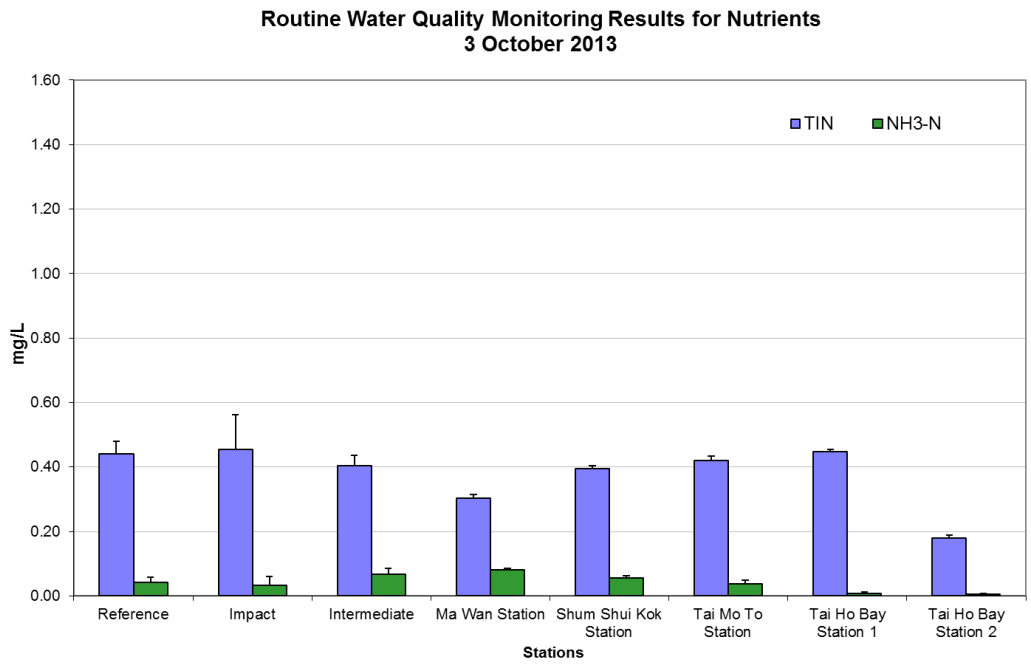


Figure 14: Concentration of Total Inorganic Nitrogen and NH_3-N (mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP 1 on 3 October 2013.

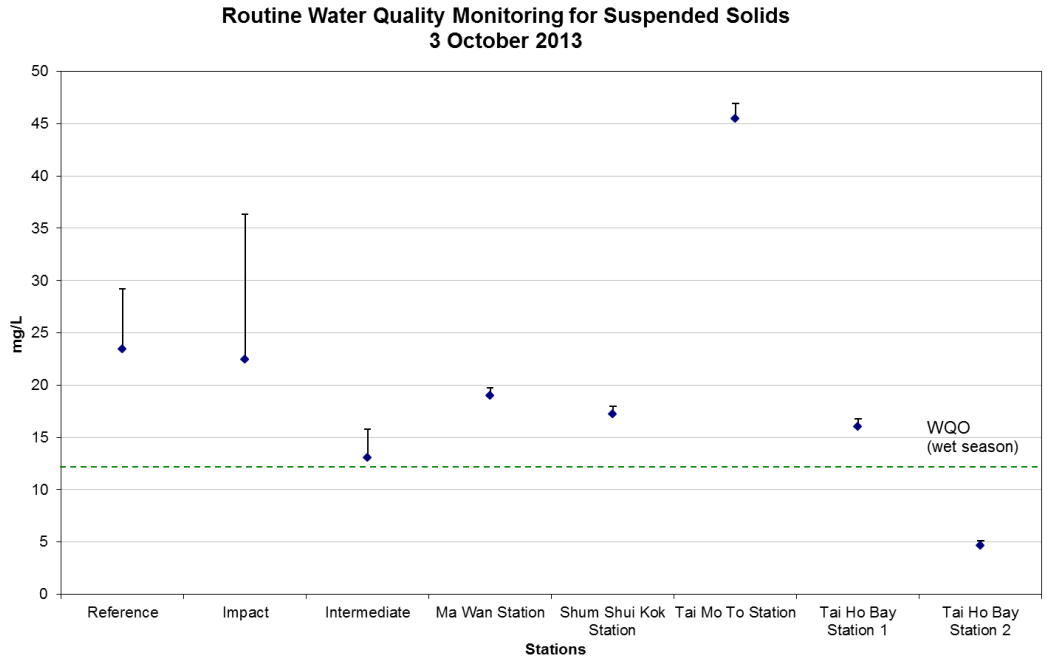


Figure 15: Concentration of Suspended Solids (mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP 1 on 3 October 2013.

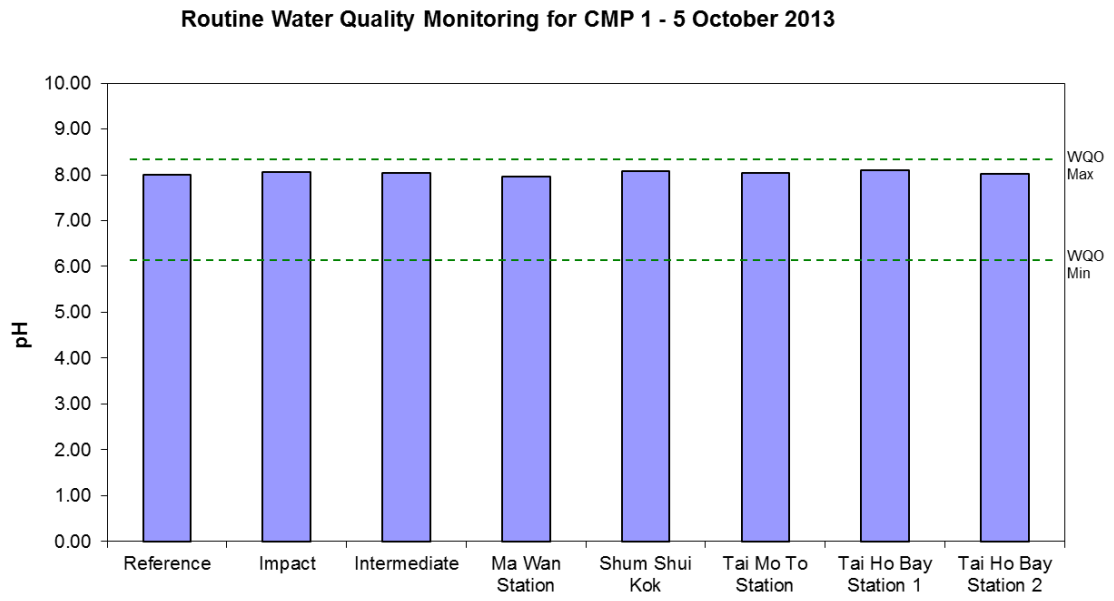


Figure 16: Level of pH (mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP 1 on 5 October 2013.

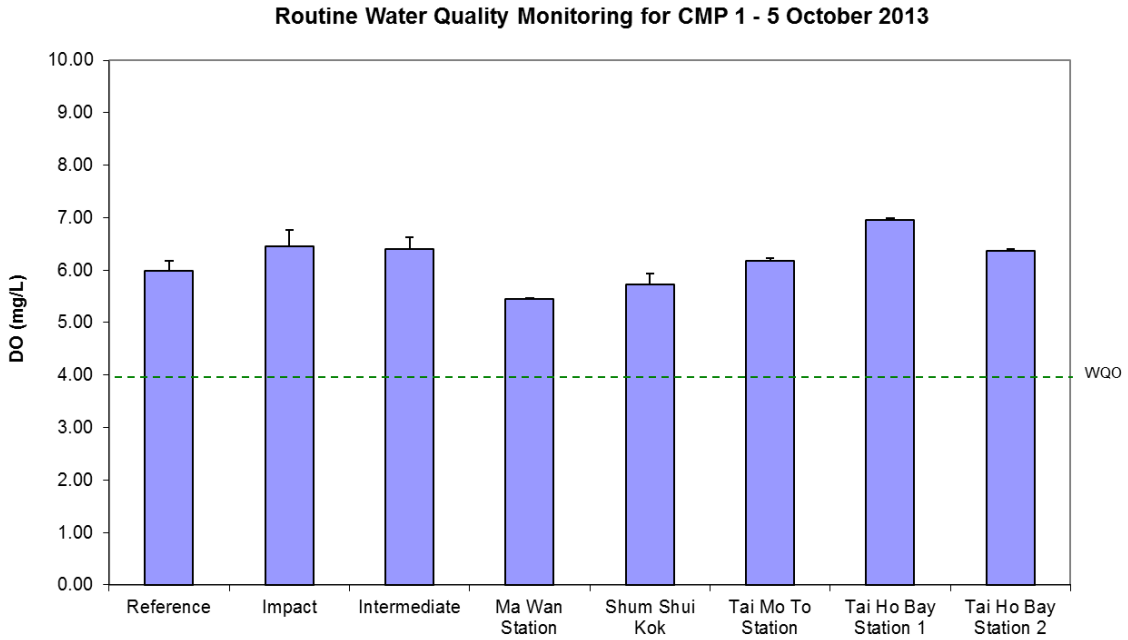


Figure 17: Concentration of Dissolved Oxygen (mg/L; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP 1 on 5 October 2013.

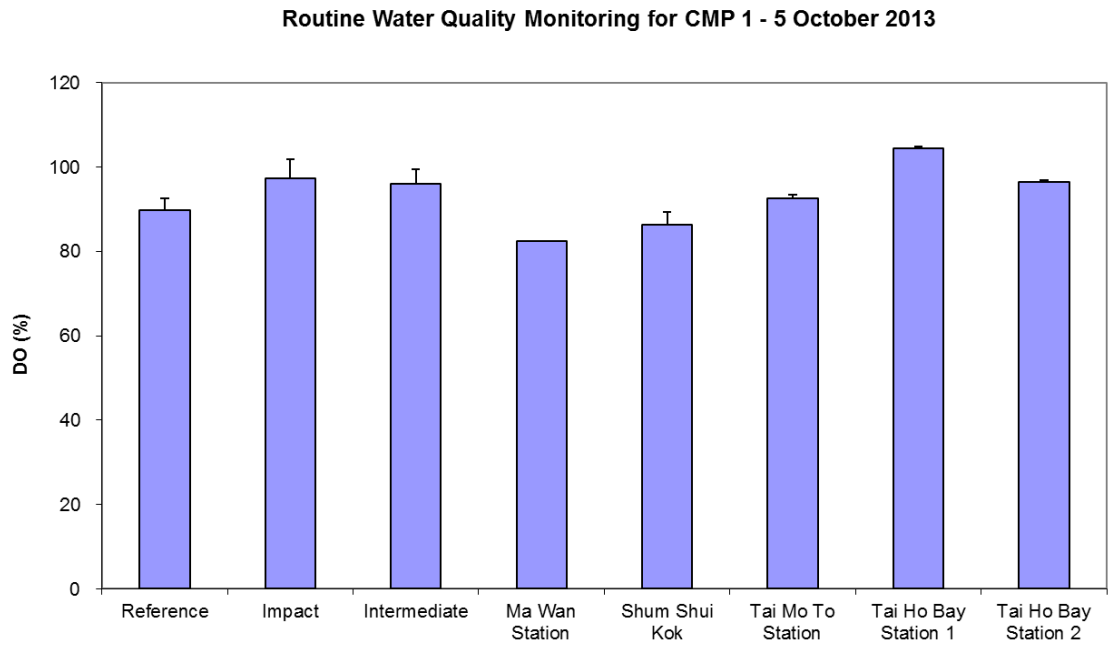


Figure 18: Level of Dissolved Oxygen (% saturation; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP 1 on 5 October 2013.

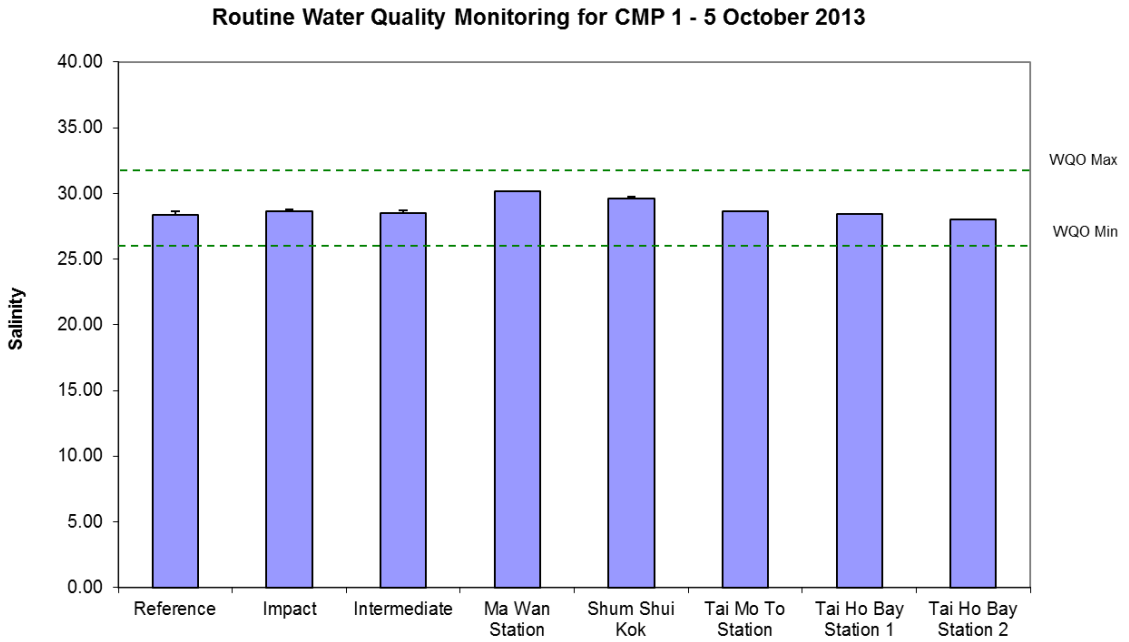


Figure 19: Level of Salinity (mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP 1 on 5 October 2013.

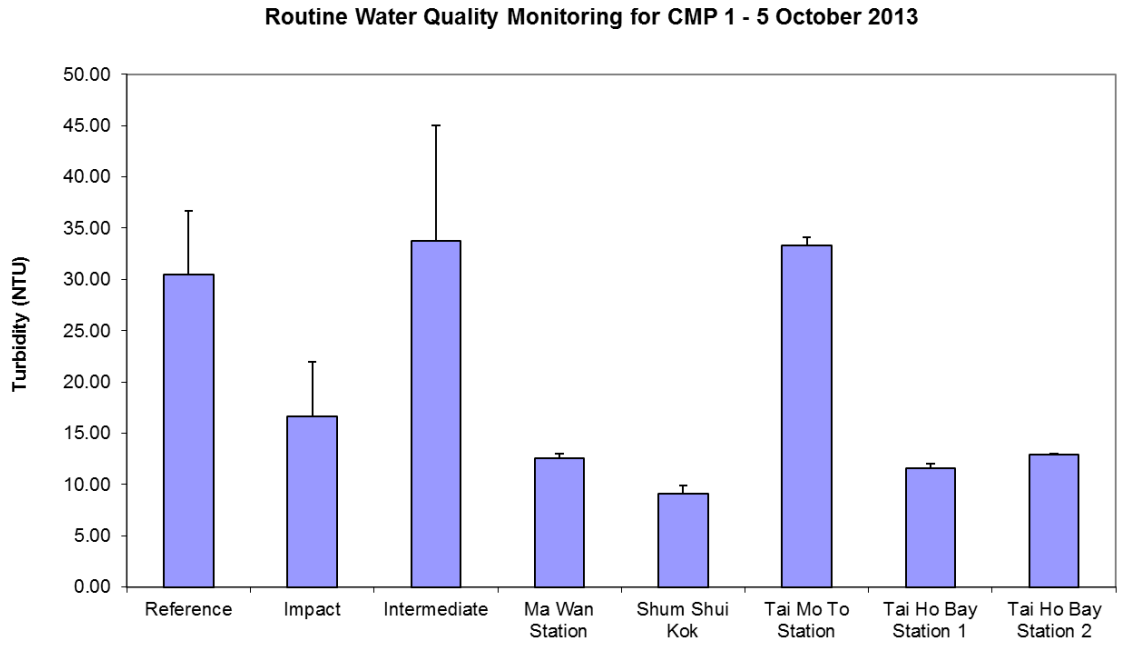


Figure 20: Level of Turbidity (NTU; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP 1 on 5 October 2013.

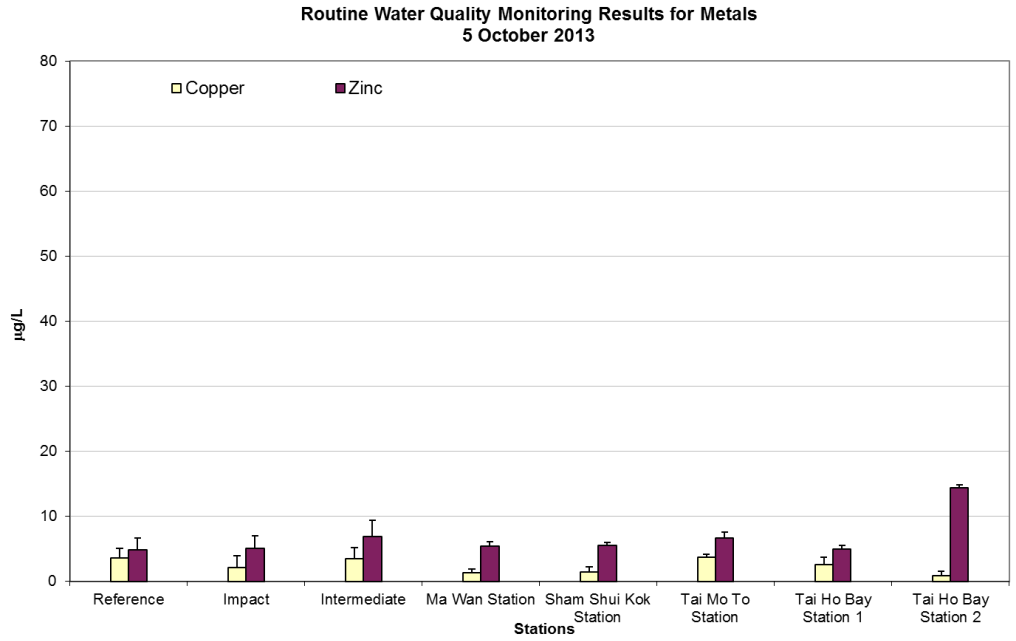


Figure 21: Concentration of Copper and Zinc (mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP 1 on 5 October 2013.

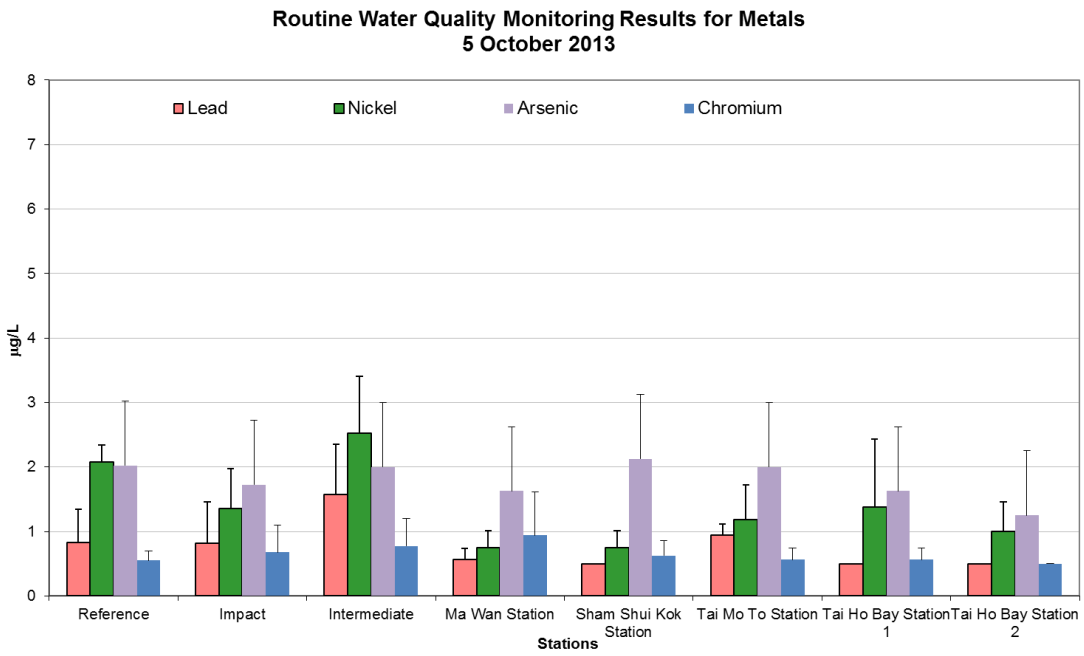


Figure 22: Concentration of Lead, Nickel, Arsenic and Chromium (mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP 1 on 5 October 2013.

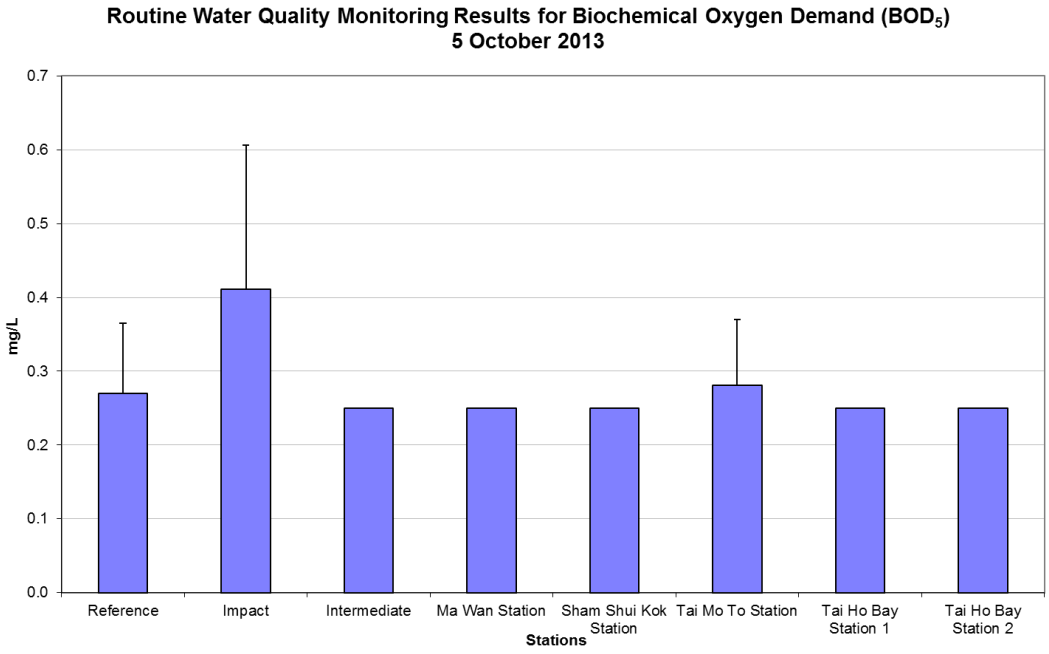


Figure 23: Level of Biochemical Oxygen Demand (BOD_5; mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP 1 on 5 October 2013.

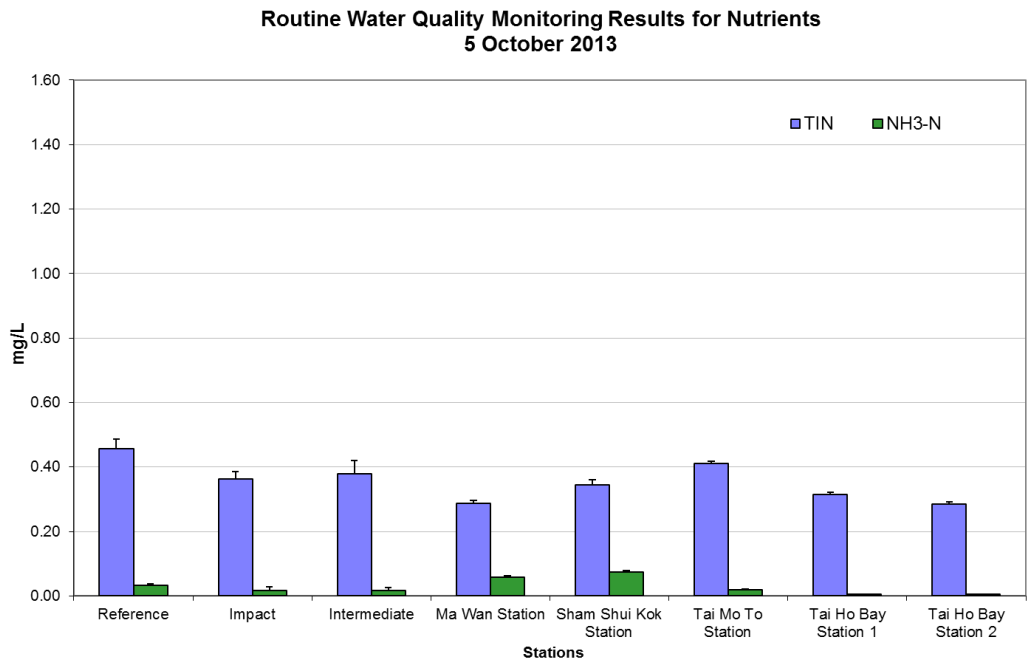


Figure 24: Concentration of Total Inorganic Nitrogen and NH_3-N (mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP 1 on 5 October 2013.

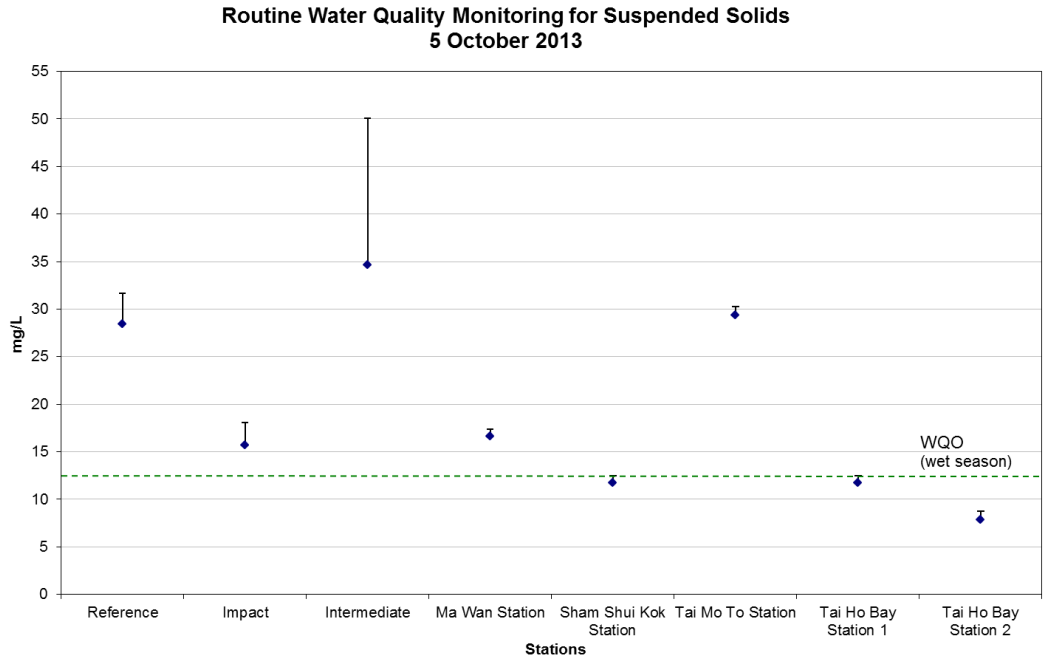


Figure 25: Concentration of Suspended Solids (mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP 1 on 5 October 2013.

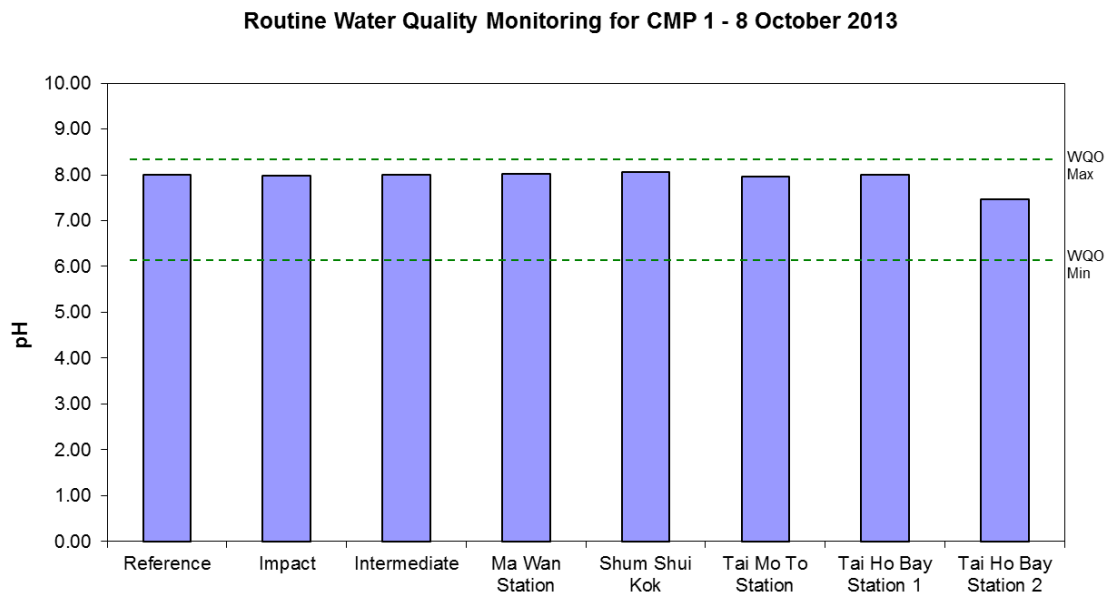


Figure 26: Level of pH (mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP 1 on 8 October 2013.

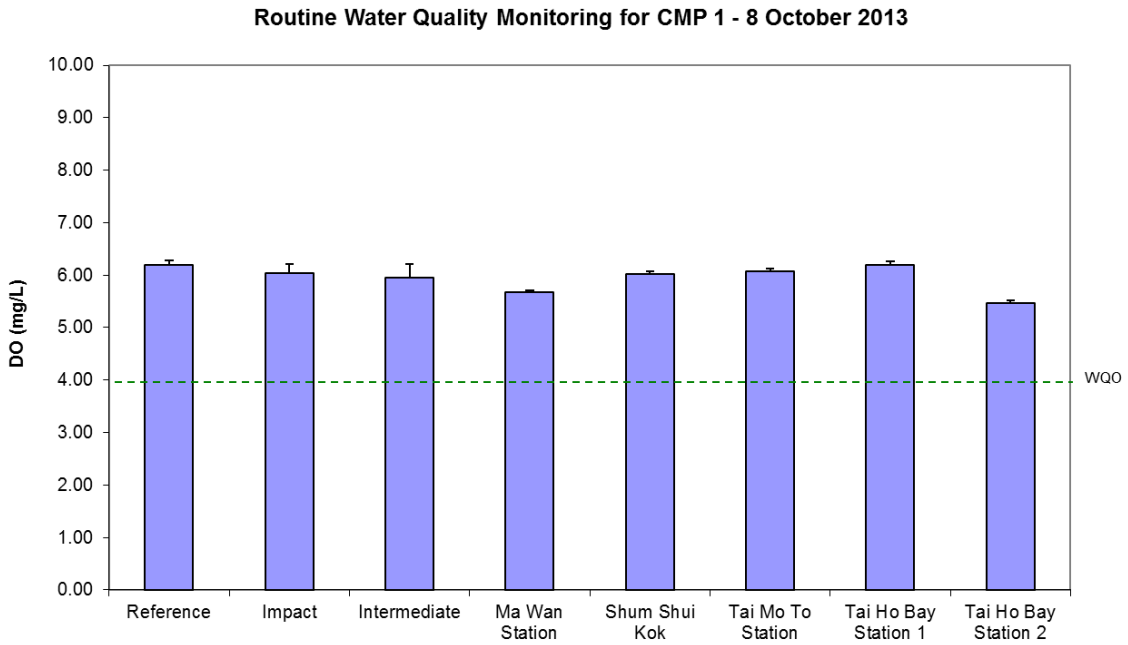


Figure 27: Concentration of Dissolved Oxygen (mg/L; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP 1 on 8 October 2013.

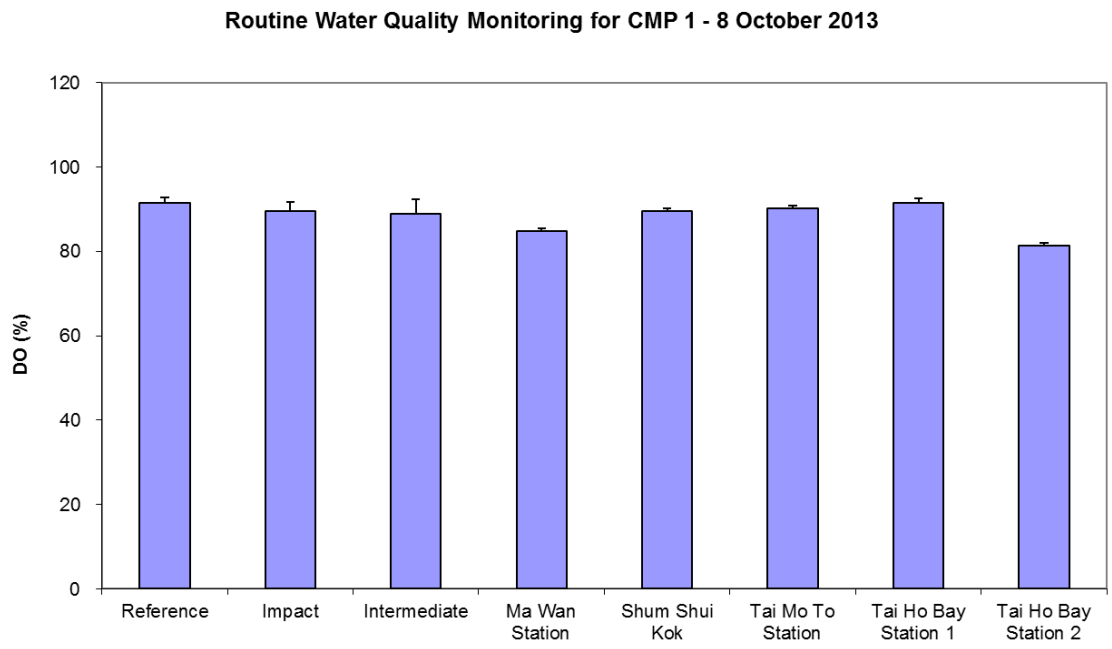


Figure 28: Level of Dissolved Oxygen (% saturation; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP 1 on 8 October 2013.

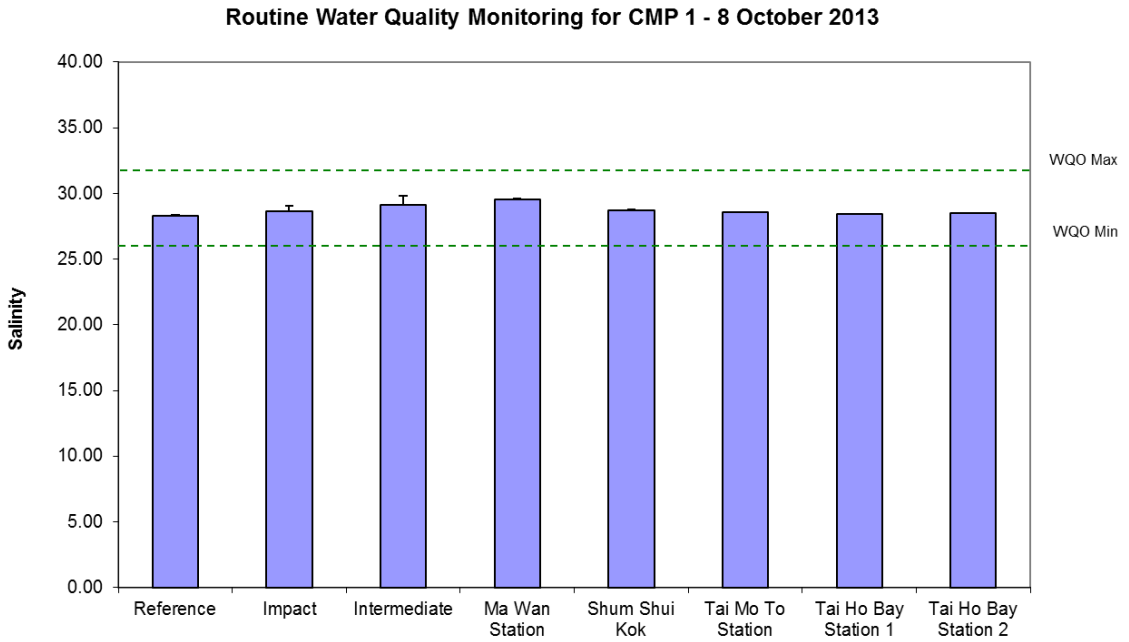


Figure 29: Level of Salinity (mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP 1 on 8 October 2013.

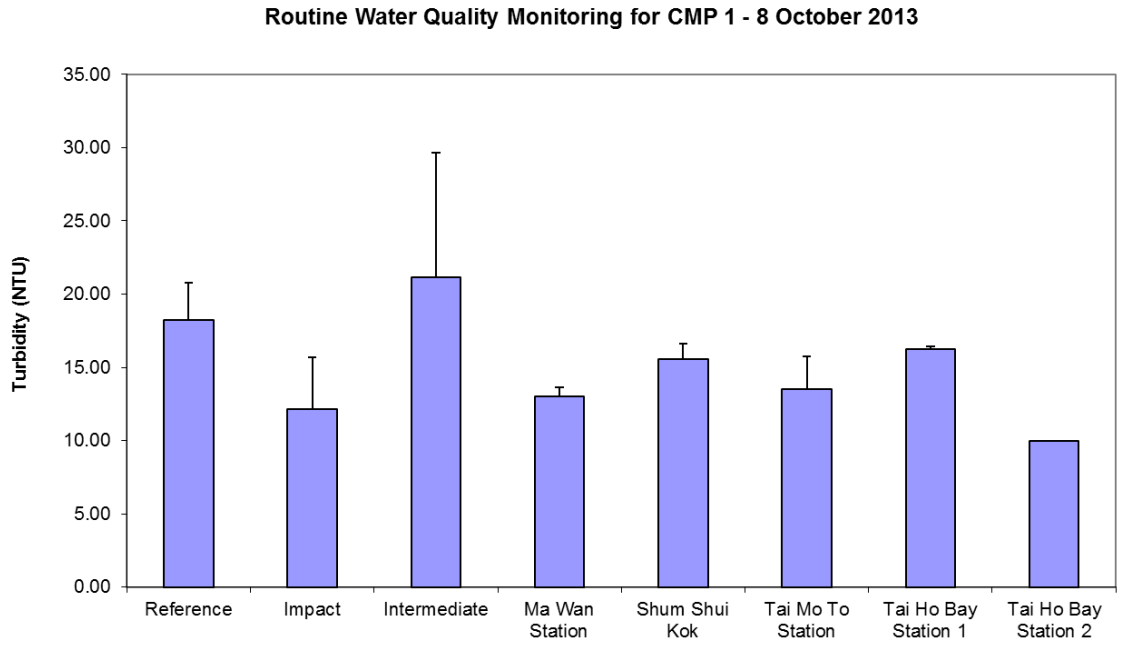


Figure 30: Level of Turbidity (NTU; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP 1 on 8 October 2013.

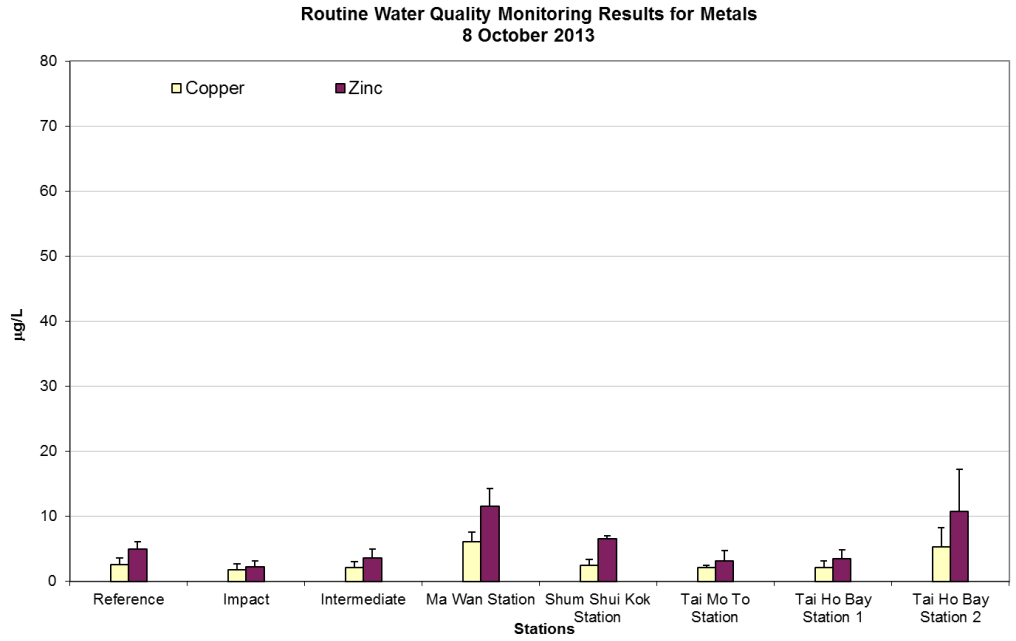


Figure 31: Concentration of Copper and Zinc (mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP 1 on 8 October 2013.

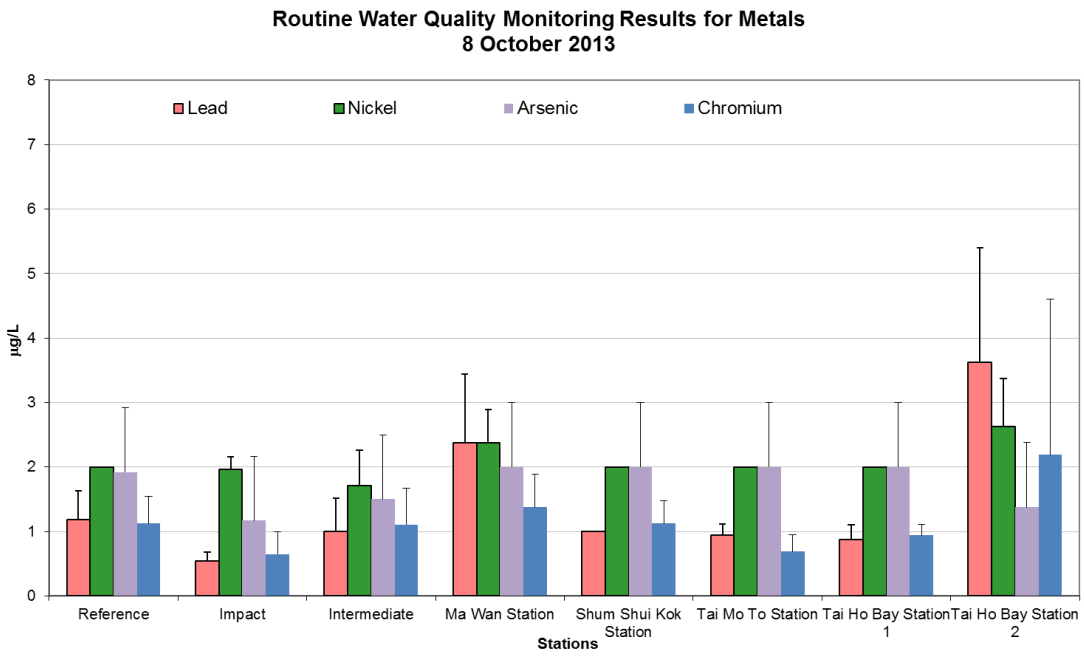


Figure 32: Concentration of Lead, Nickel, Arsenic and Chromium (mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP 1 on 8 October 2013.

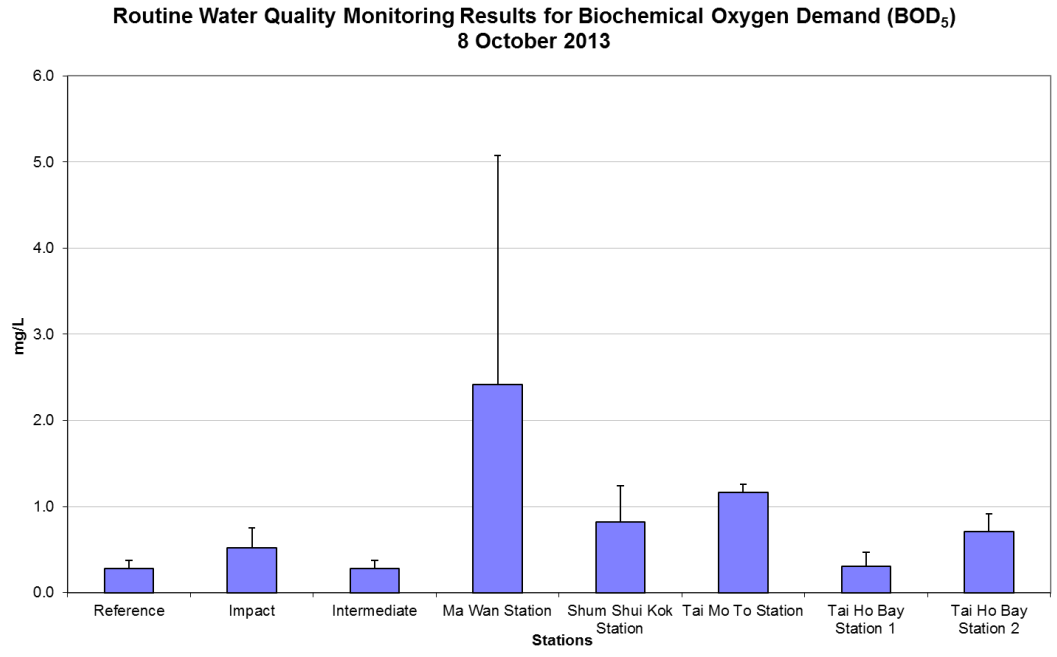


Figure 33: Level of Biochemical Oxygen Demand (BOD_5; mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP 1 on 8 October 2013.

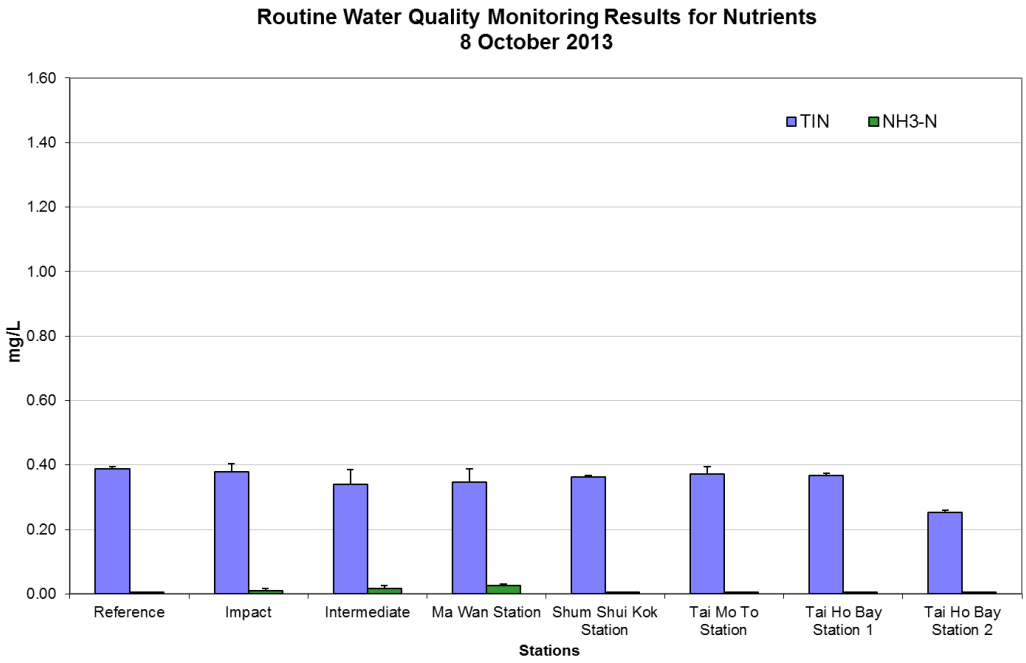


Figure 34: Concentration of Total Inorganic Nitrogen and NH_3-N (mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP 1 on 8 October 2013.

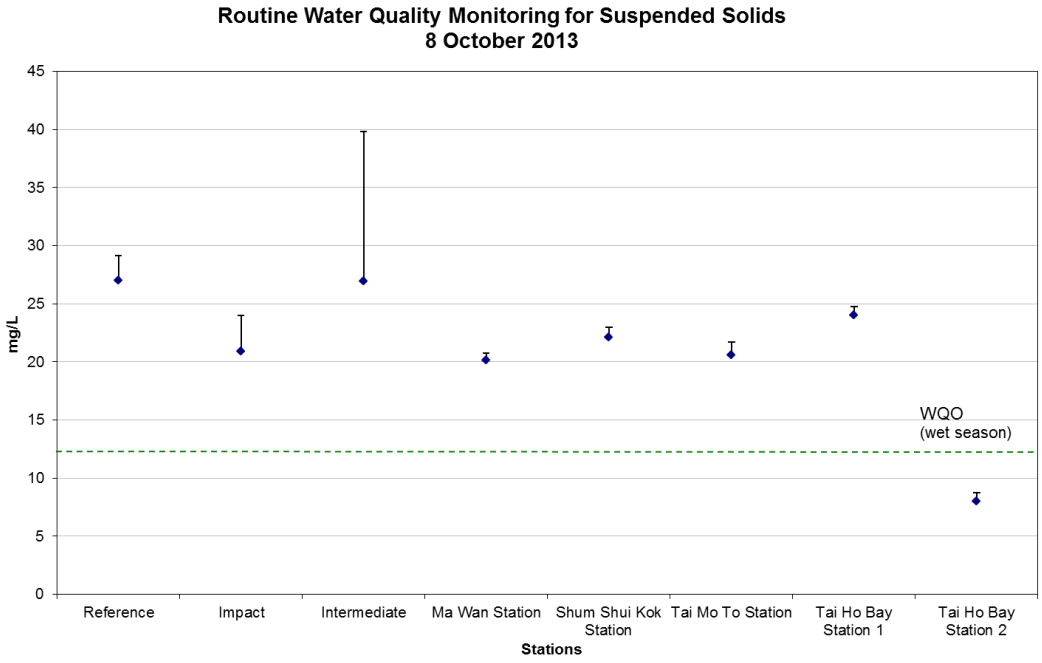


Figure 35: Concentration of Suspended Solids (mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP 1 on 8 October 2013.

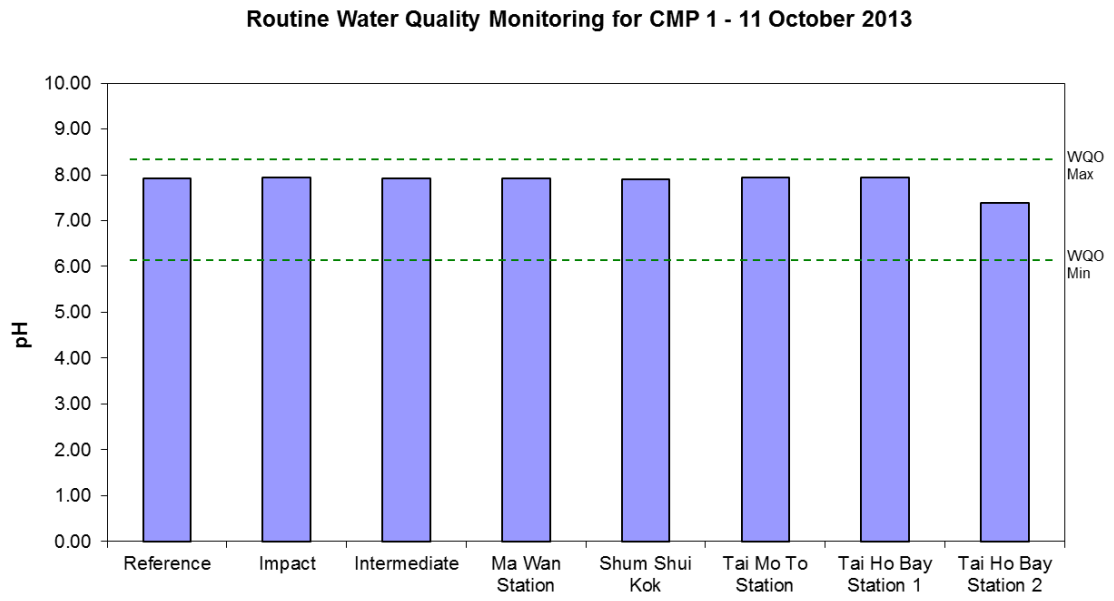


Figure 36: Level of pH (mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP 1 on 11 October 2013.

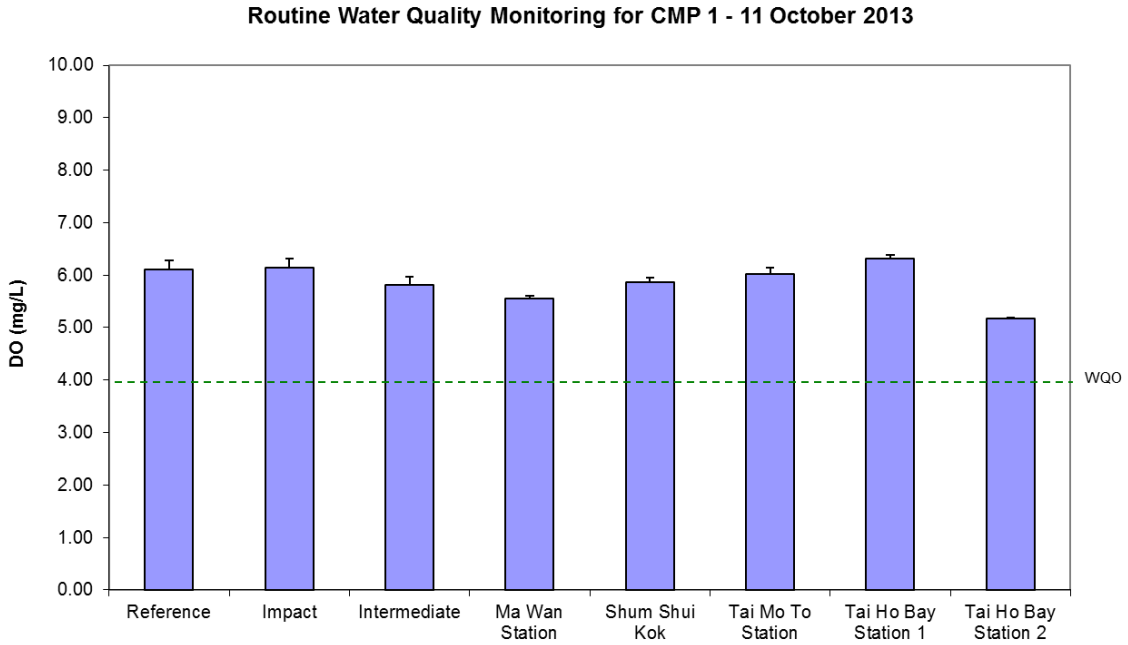


Figure 37: Concentration of Dissolved Oxygen (mg/L; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP 1 on 11 October 2013.

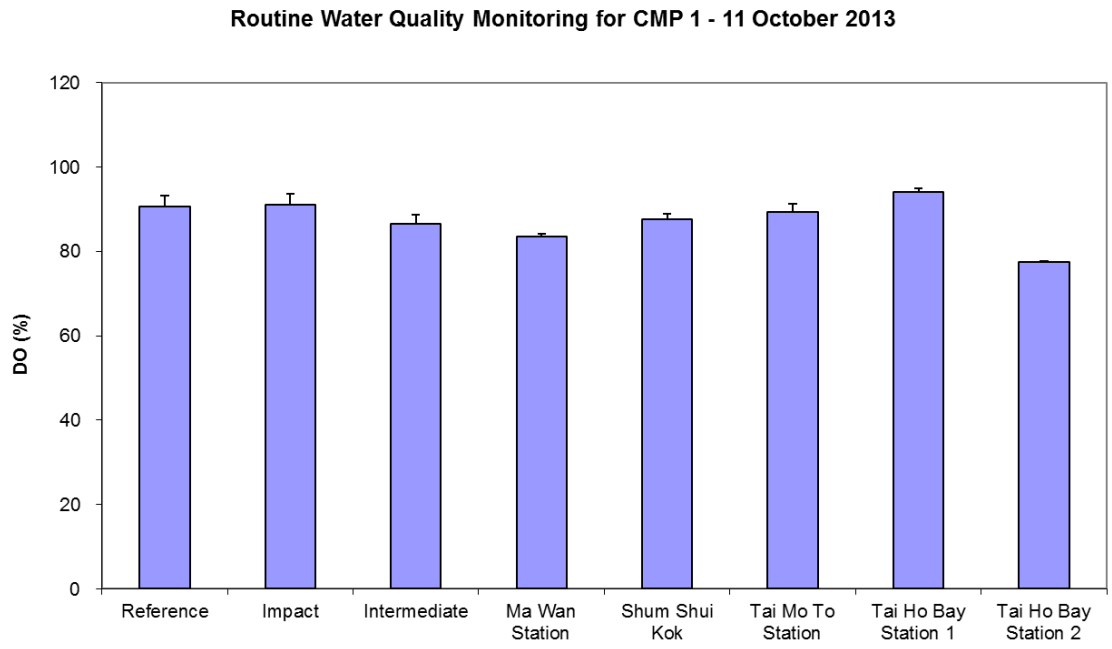


Figure 38: Level of Dissolved Oxygen (% saturation; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP 1 on 11 October 2013.

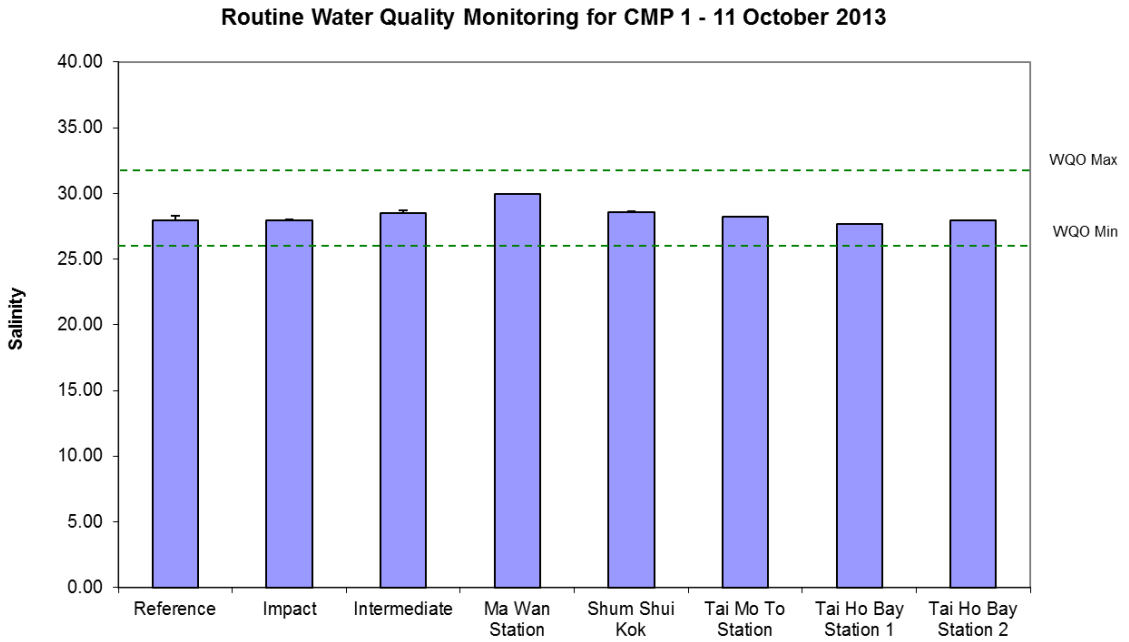


Figure 39: Level of Salinity (mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP 1 on 11 October 2013.

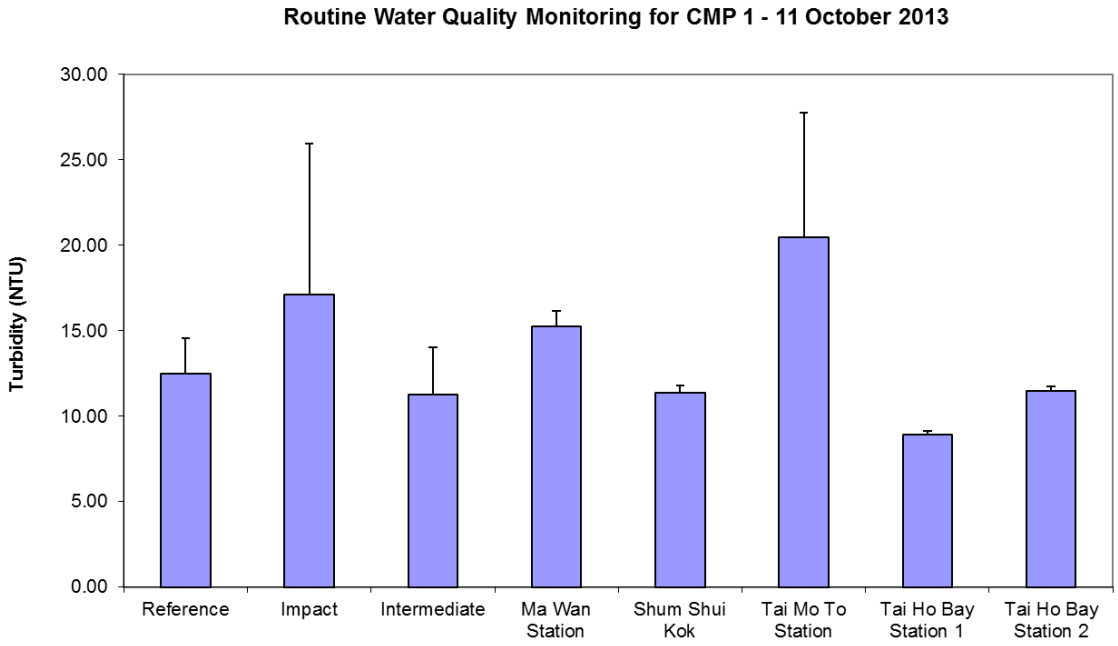


Figure 40: Level of Turbidity (NTU; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP 1 on 11 October 2013.

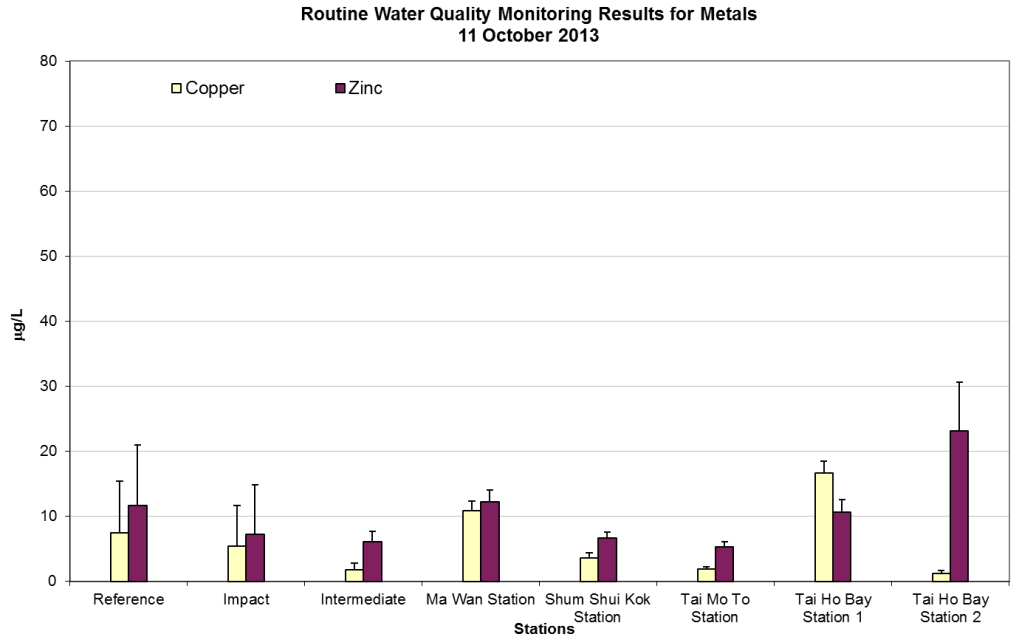


Figure 41: Concentration of Copper and Zinc (mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP 1 on 11 October 2013.

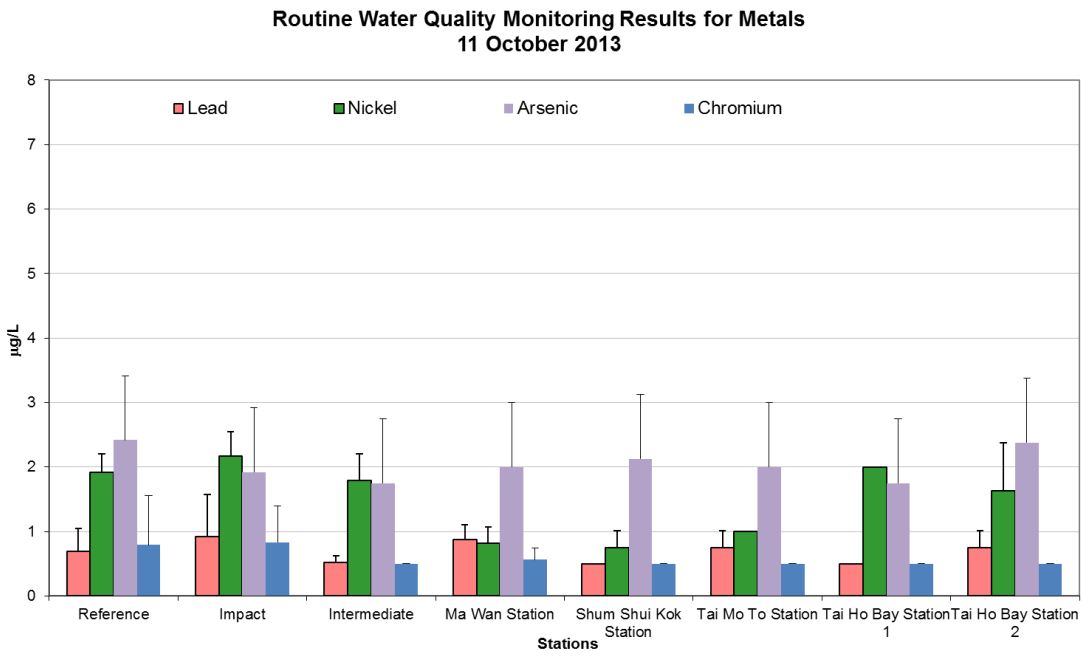


Figure 42: Concentration of Lead, Nickel, Arsenic and Chromium (mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP 1 on 11 October 2013.

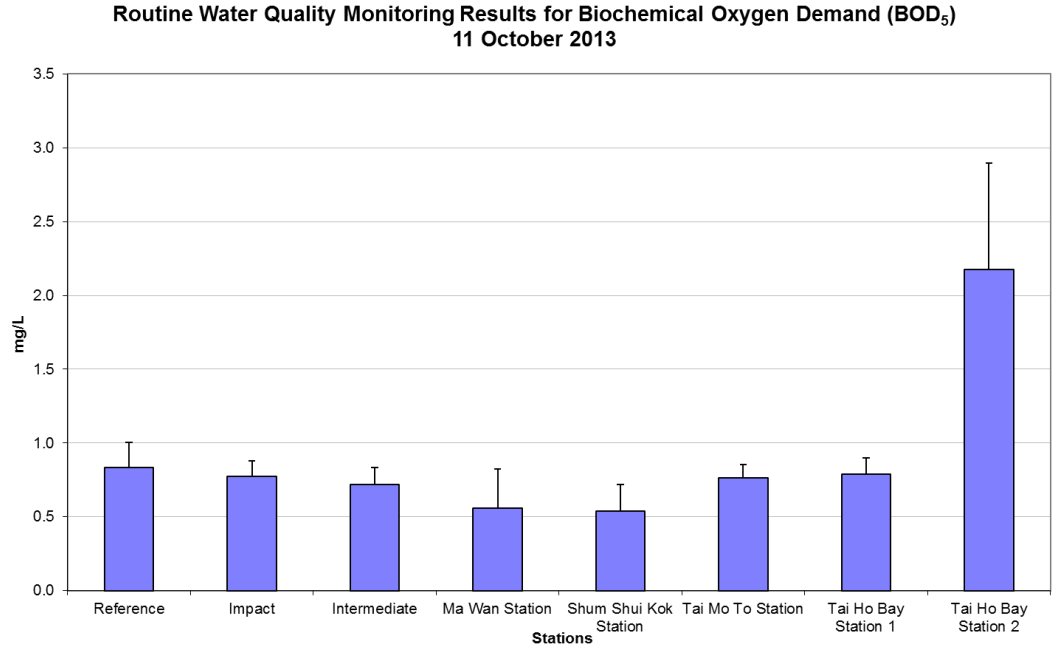


Figure 43: Level of Biochemical Oxygen Demand (BOD_5; mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP 1 on 11 October 2013.

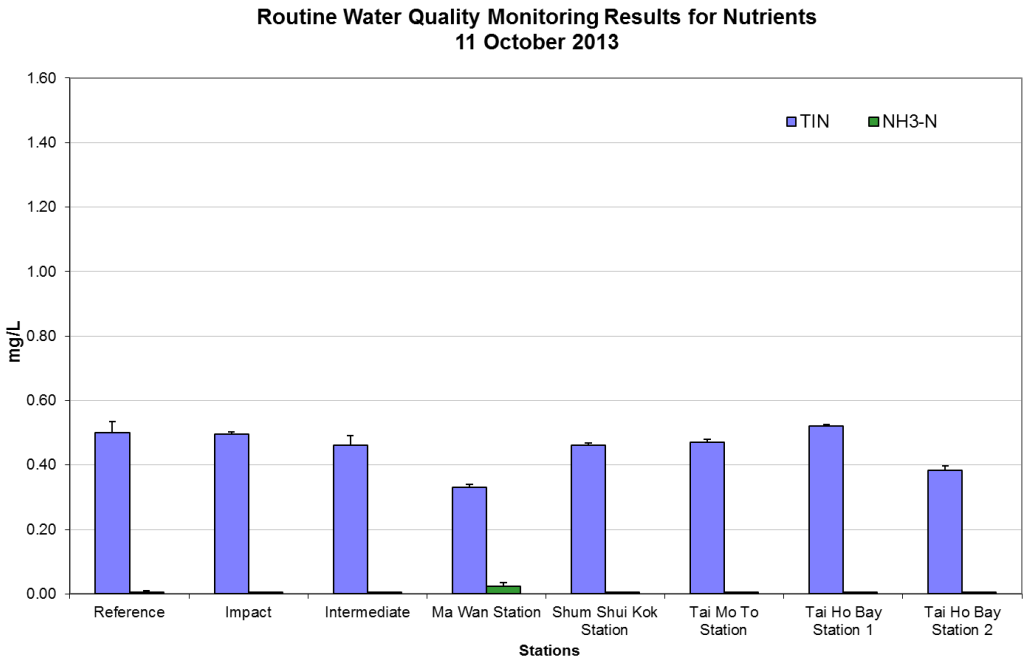


Figure 44: Concentration of Total Inorganic Nitrogen and NH_3-N (mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP 1 on 11 October 2013.

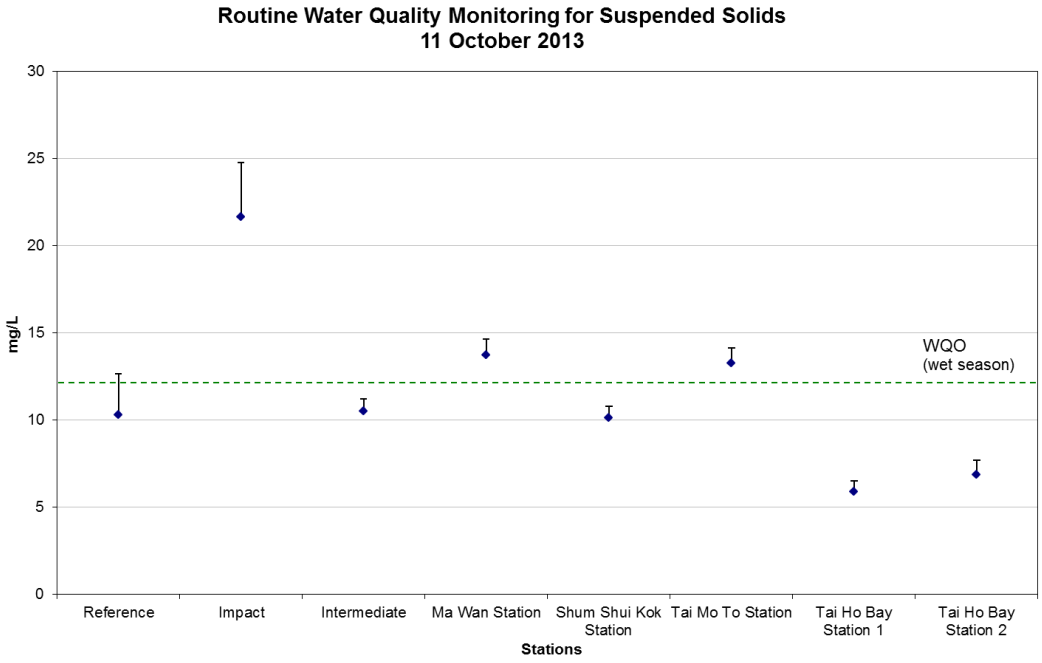


Figure 45: Concentration of Suspended Solids (mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP 1 on 11 October 2013.

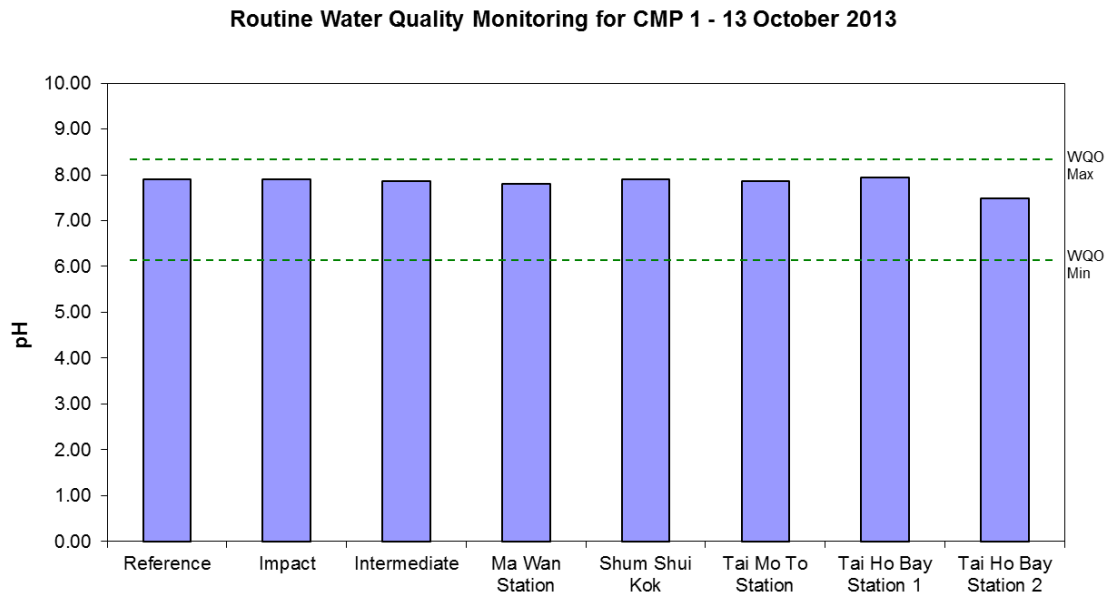


Figure 46: Level of pH (mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP 1 on 13 October 2013.

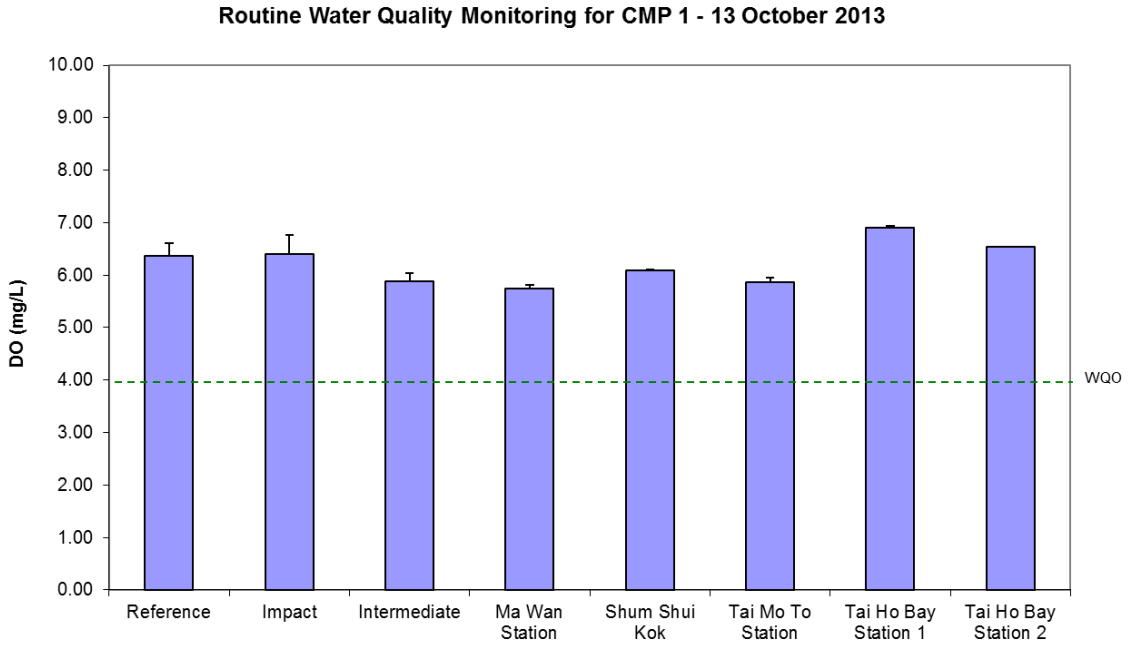


Figure 47: Concentration of Dissolved Oxygen (mg/L; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP 1 on 13 October 2013.

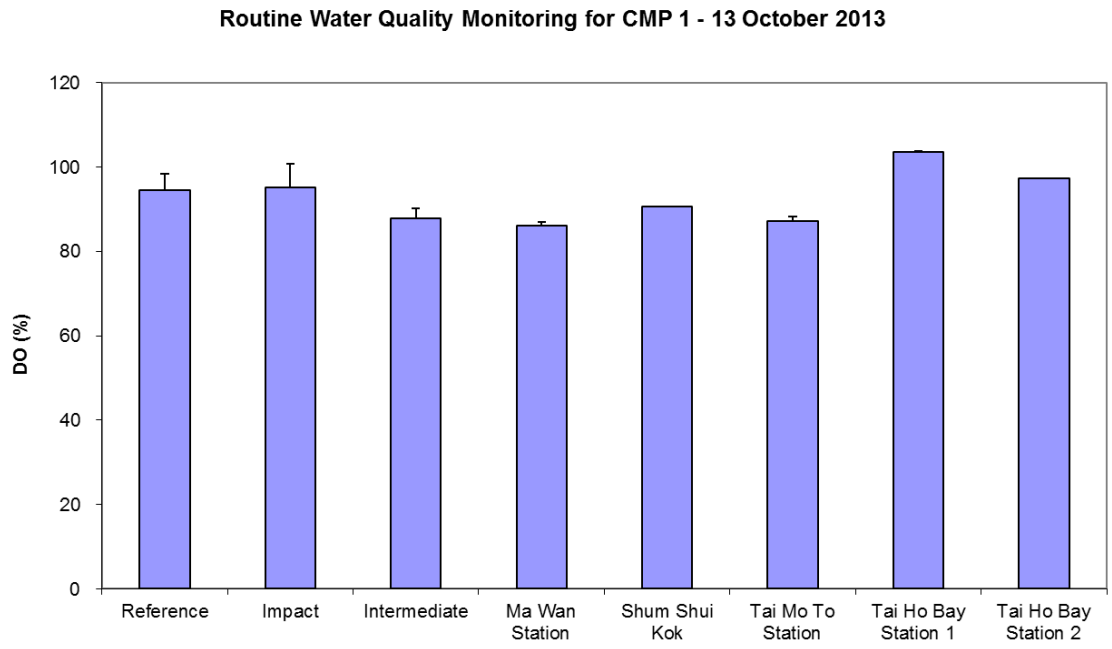


Figure 48: Level of Dissolved Oxygen (% saturation; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP 1 on 13 October 2013.

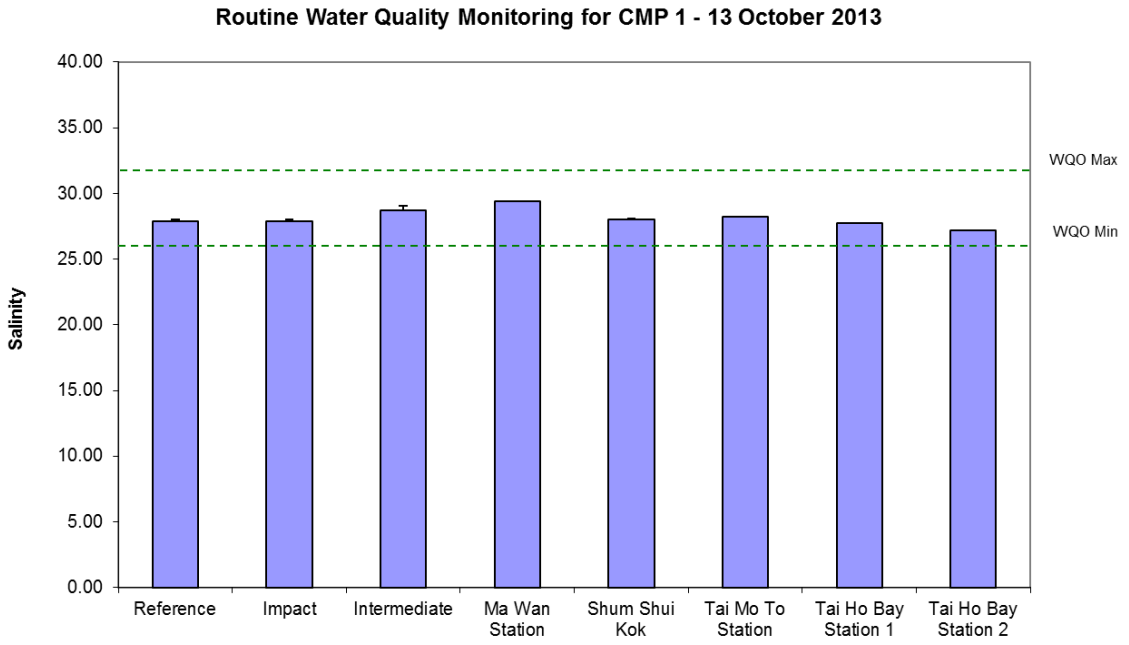


Figure 49: Level of Salinity (mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP 1 on 13 October 2013.

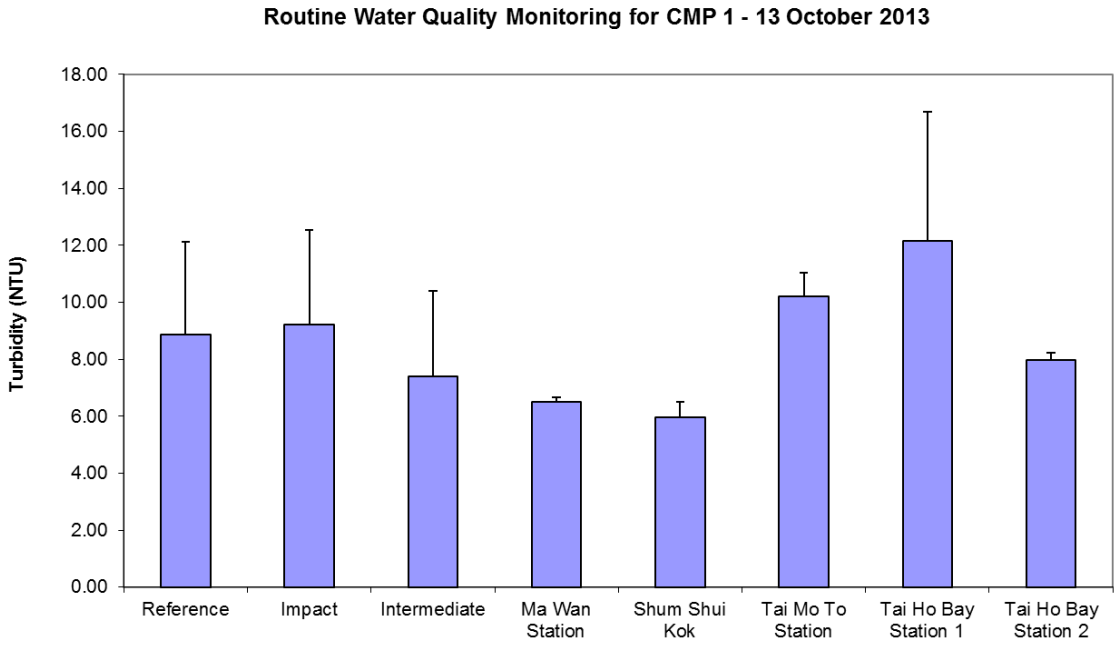


Figure 50: Level of Turbidity (NTU; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP 1 on 13 October 2013.

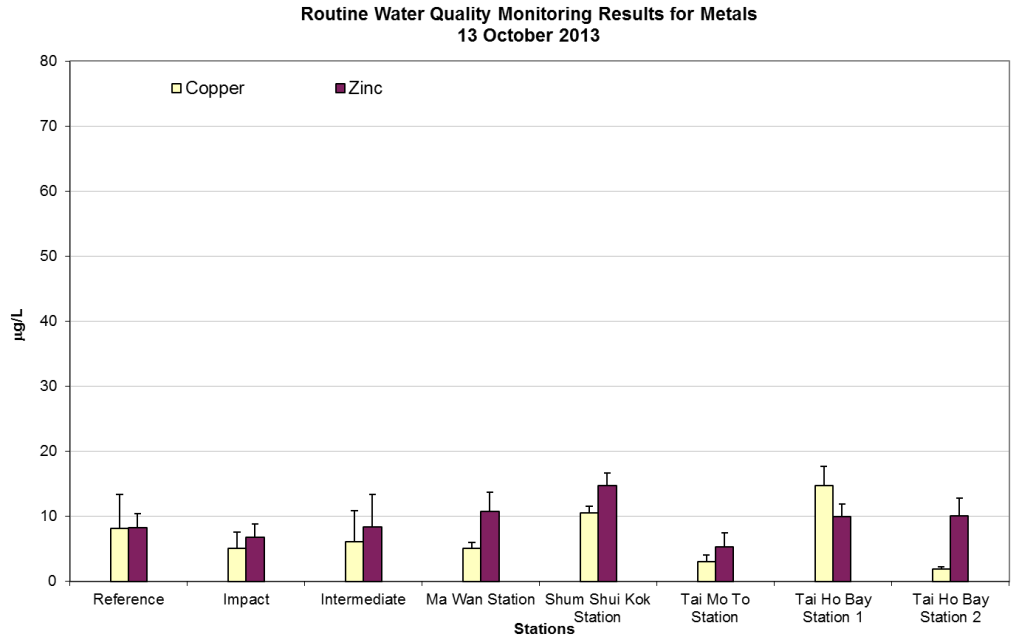


Figure 51: Concentration of Copper and Zinc (mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP 1 on 13 October 2013.

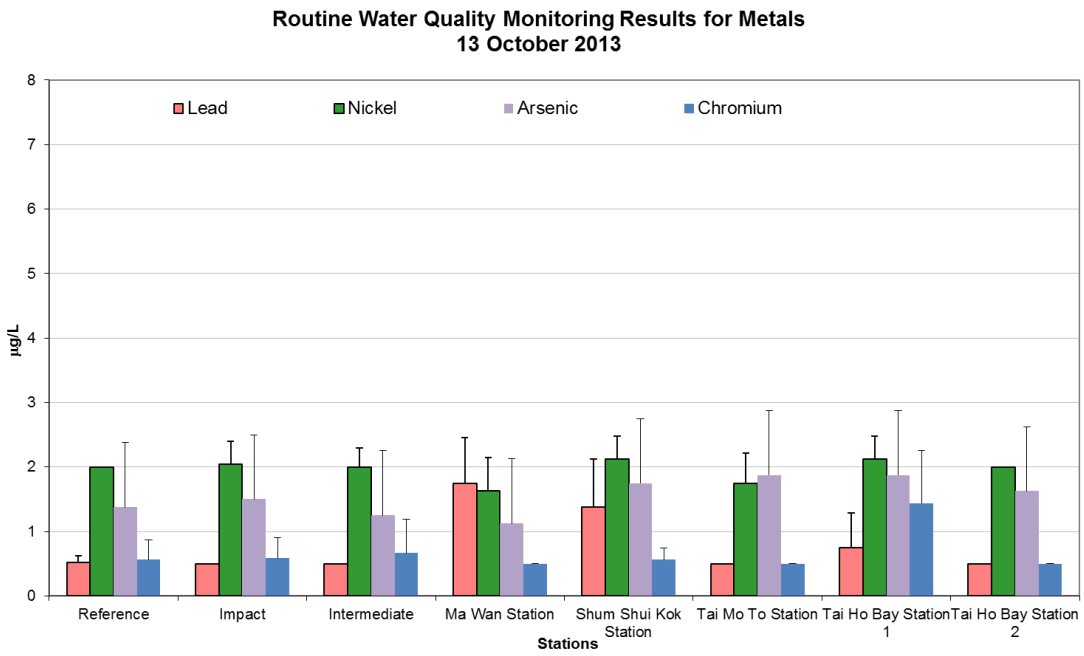


Figure 52: Concentration of Lead, Nickel, Arsenic and Chromium (mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP 1 on 13 October 2013.

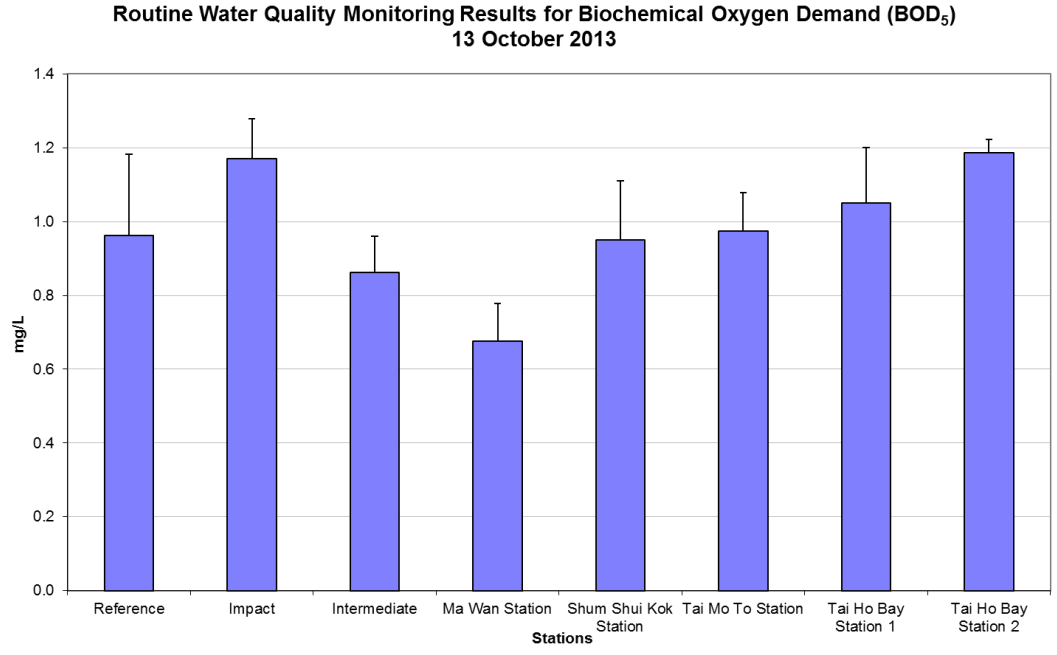


Figure 53: Level of Biochemical Oxygen Demand (BOD_5; mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP 1 on 13 October 2013.

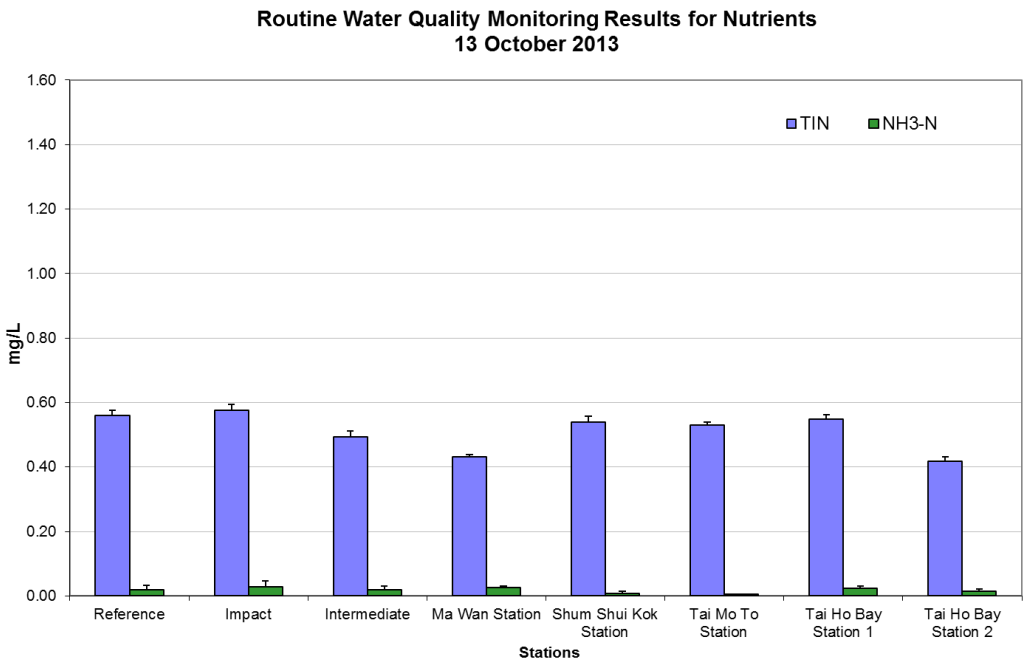


Figure 54: Concentration of Total Inorganic Nitrogen and NH_3-N (mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP 1 on 13 October 2013.

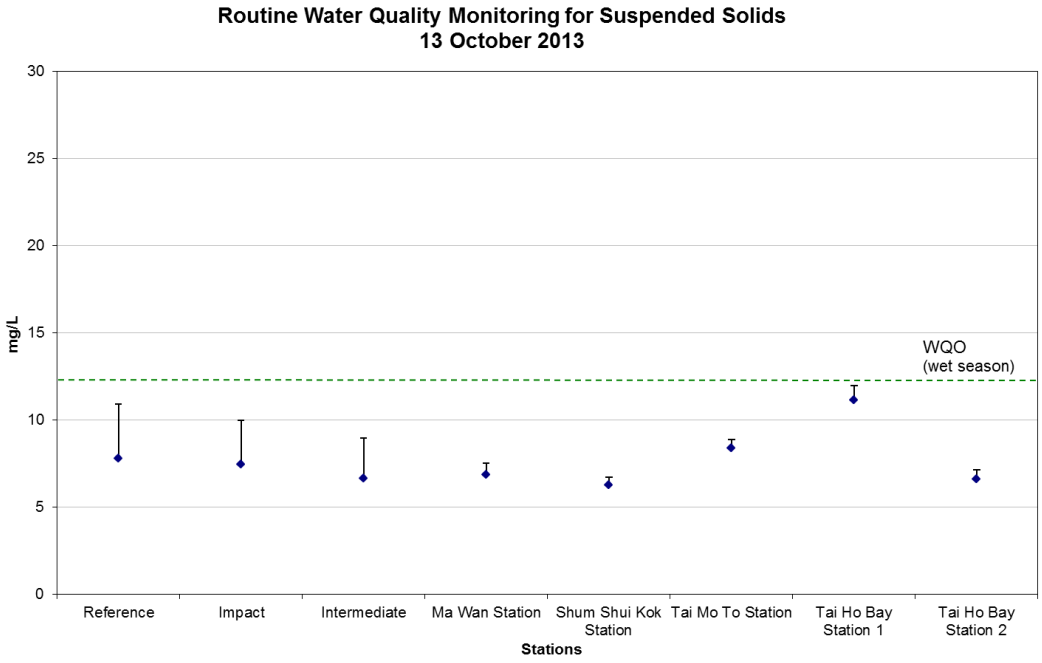


Figure 55: Concentration of Suspended Solids (mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP 1 on 13 October 2013.

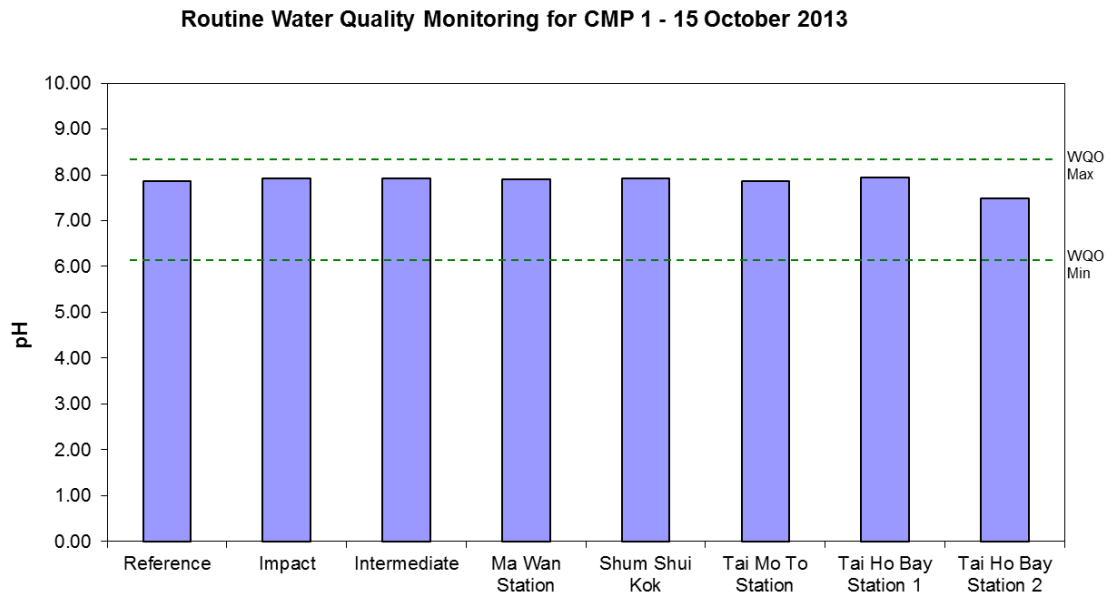


Figure 56: Level of pH (mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP 1 on 15 October 2013.

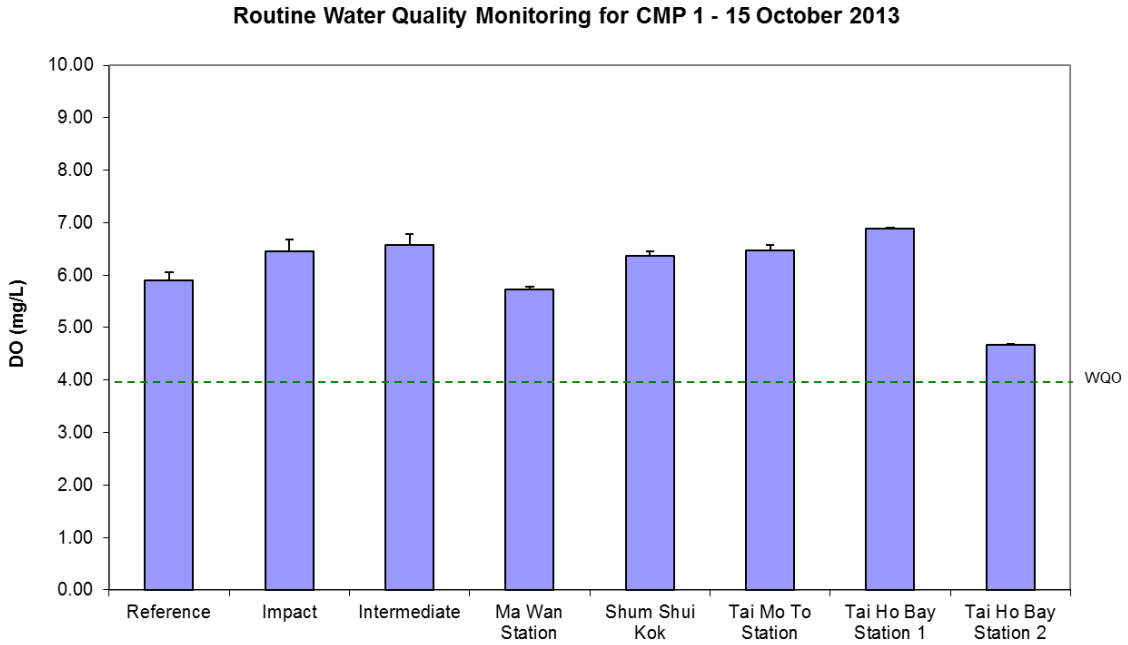


Figure 57: Concentration of Dissolved Oxygen (mg/L; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP 1 on 15 October 2013.

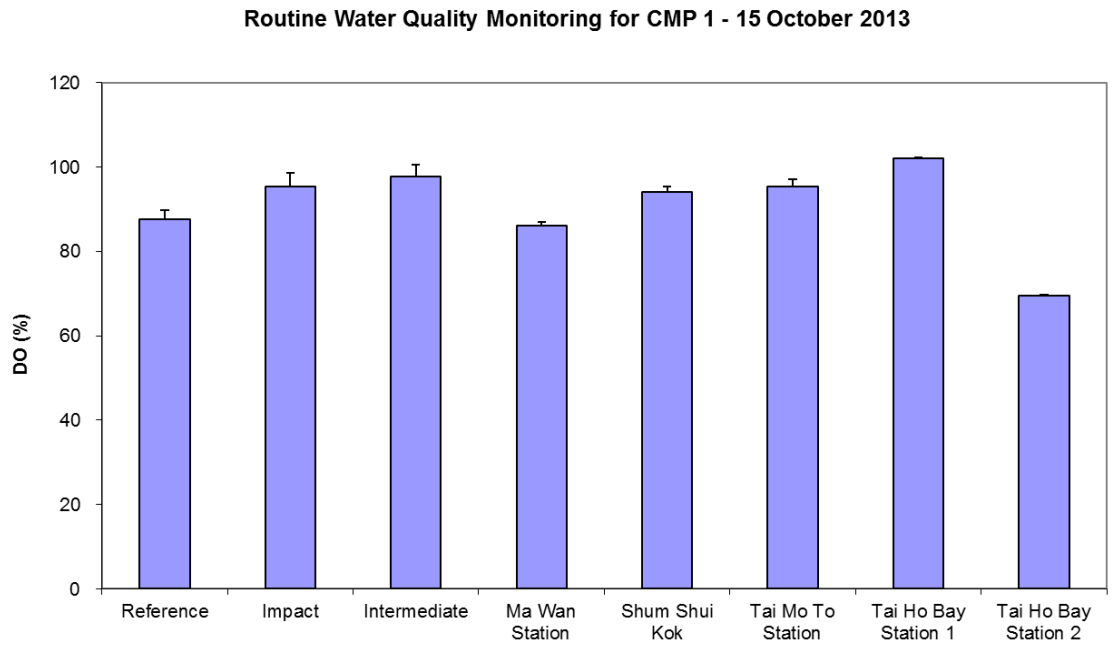


Figure 58: Level of Dissolved Oxygen (% saturation; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP 1 on 15 October 2013.

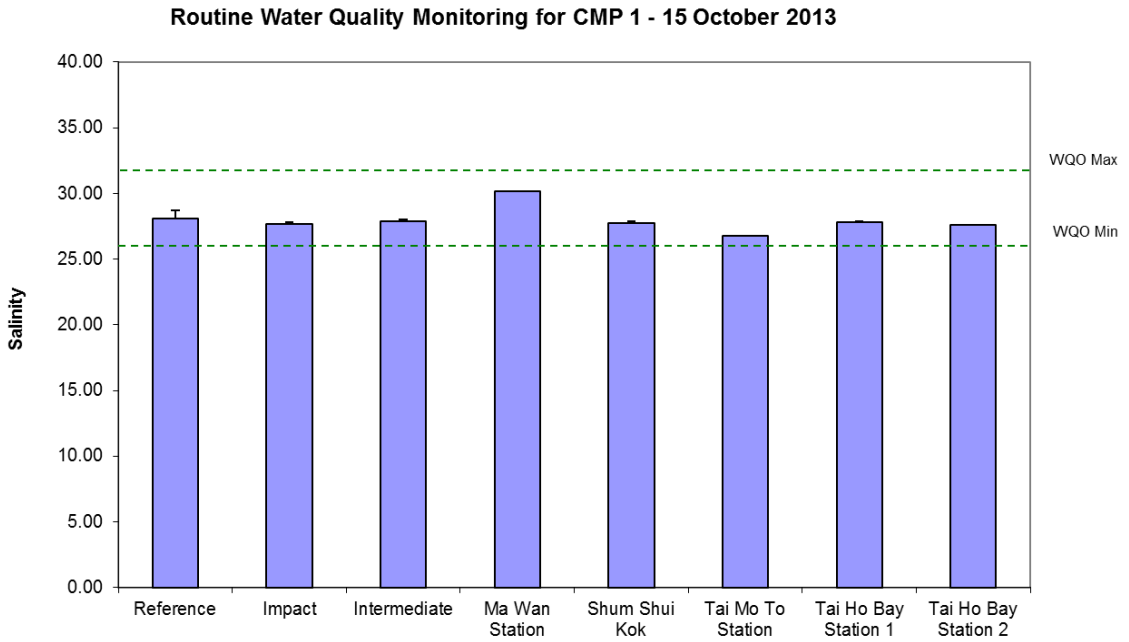


Figure 59: Level of Salinity (mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP 1 on 15 October 2013.

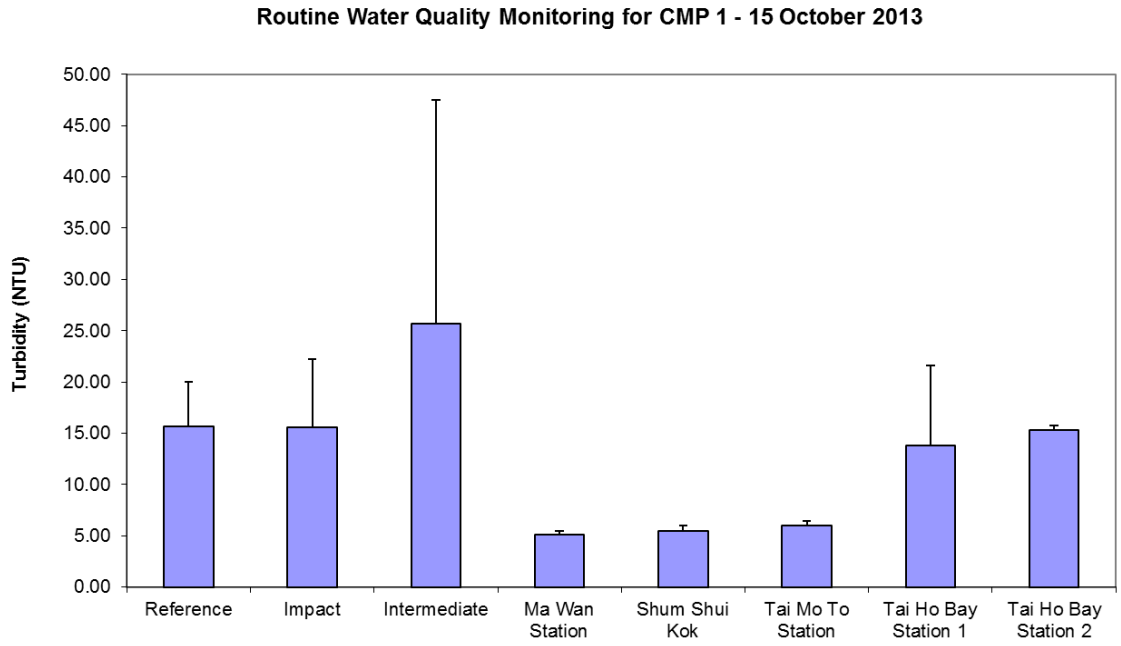


Figure 60: Level of Turbidity (NTU; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP 1 on 15 October 2013.

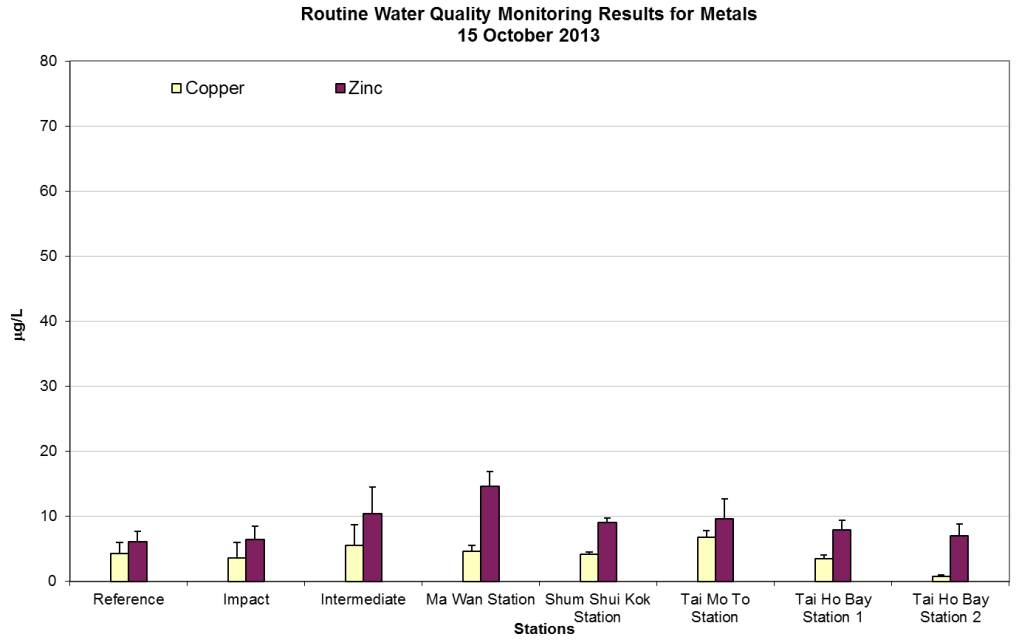


Figure 61: Concentration of Copper and Zinc (mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP 1 on 15 October 2013.

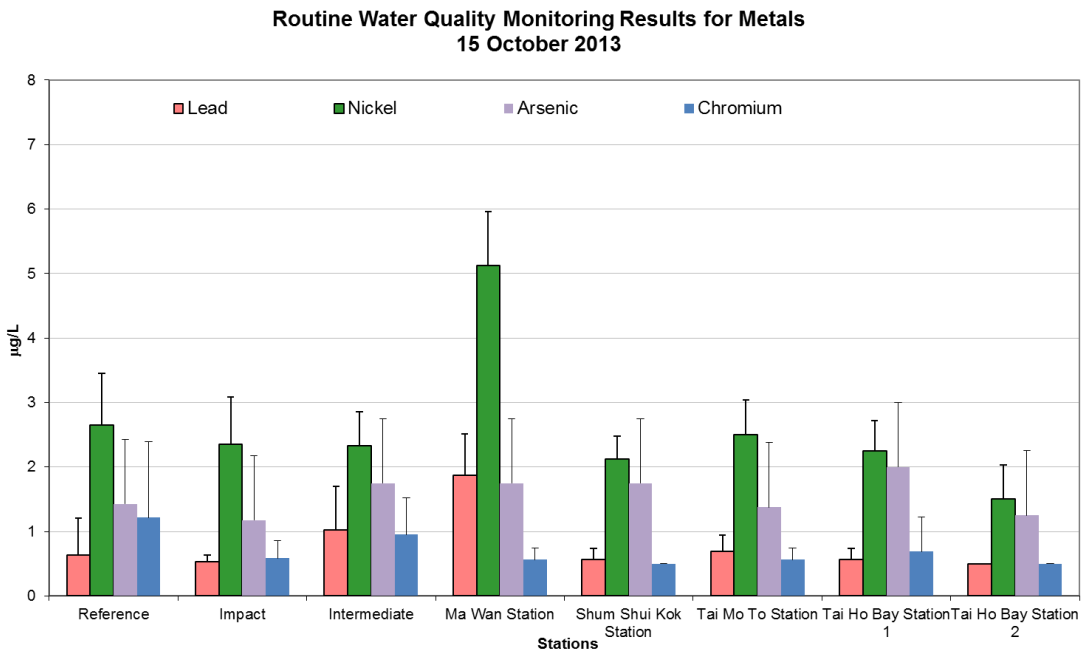


Figure 62: Concentration of Lead, Nickel, Arsenic and Chromium (mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP 1 on 15 October 2013.

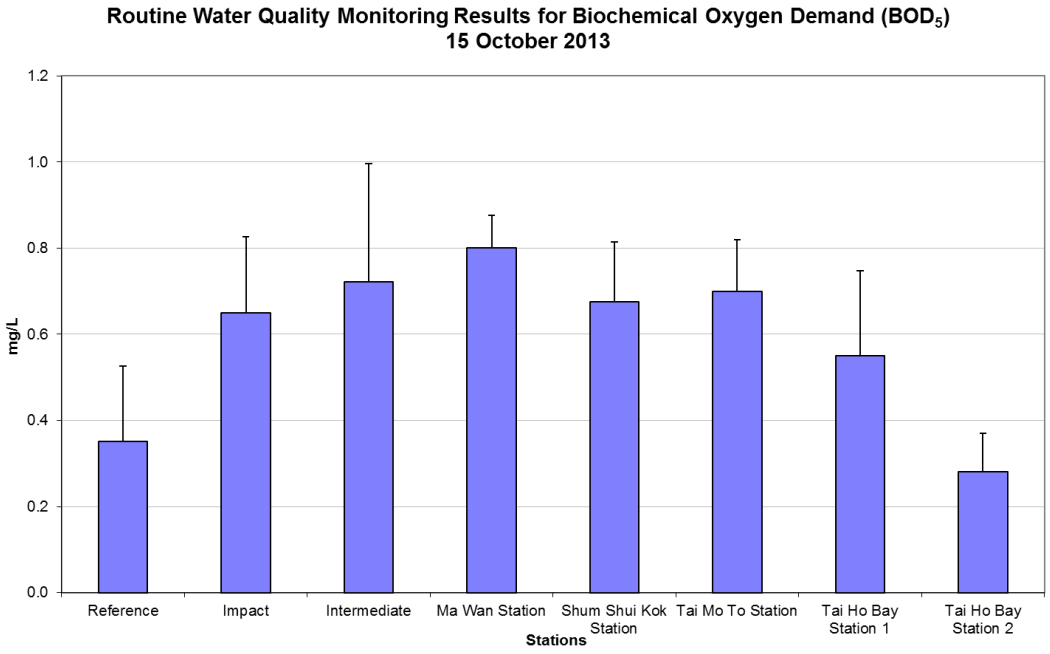


Figure 63: Level of Biochemical Oxygen Demand (BOD_5; mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP 1 on 15 October 2013.

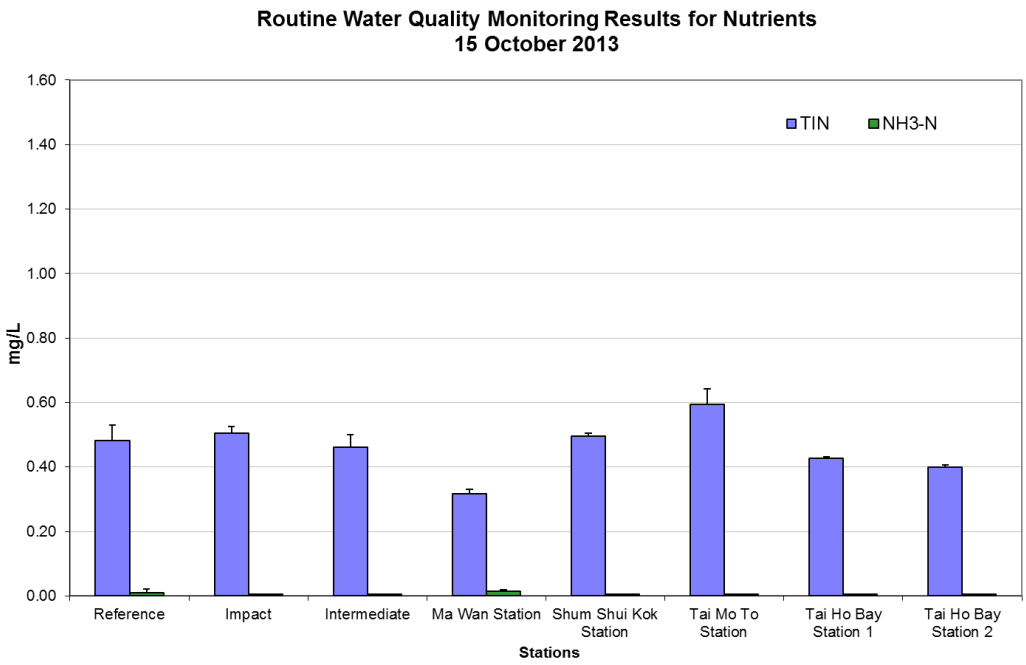


Figure 64: Concentration of Total Inorganic Nitrogen and NH_3-N (mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP 1 on 15 October 2013.

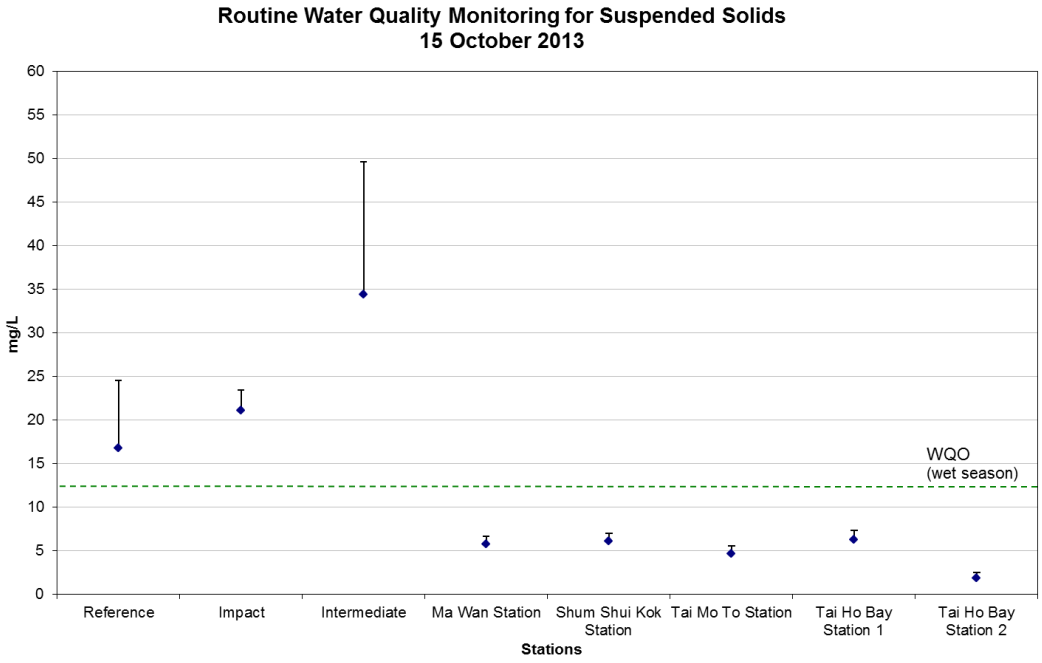


Figure 65: Concentration of Suspended Solids (mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP 1 on 15 October 2013.

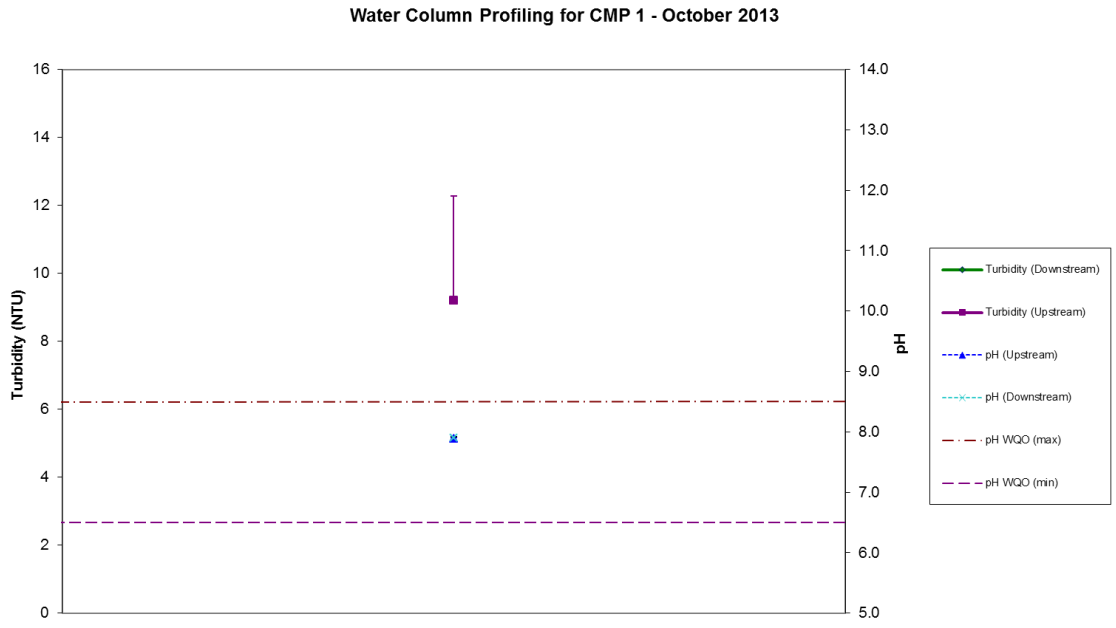


Figure 66: Turbidity and pH (mean + SD) recorded during Water Column Profiling for disposal operations at CMP 1 in October 2013.

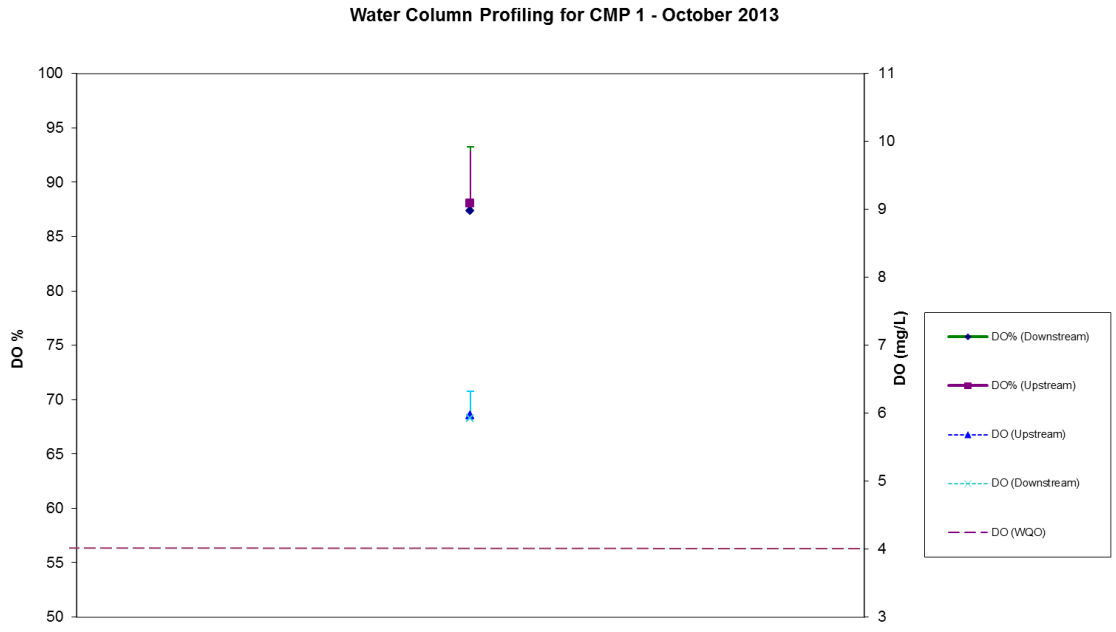


Figure 67: Dissolved Oxygen (mean + SD) recorded during Water Column Profiling for disposal operations at CMP 1 in October 2013.

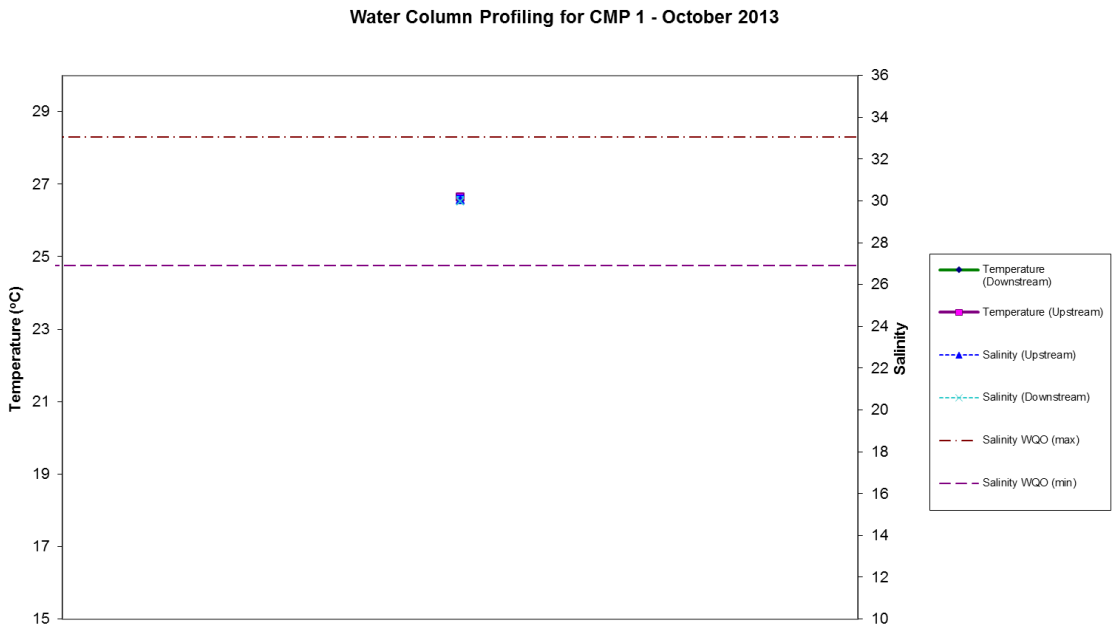


Figure 68: Salinity and Temperature (mean + SD) recorded during Water Column Profiling for disposal operations at CMP 1 in October 2013.

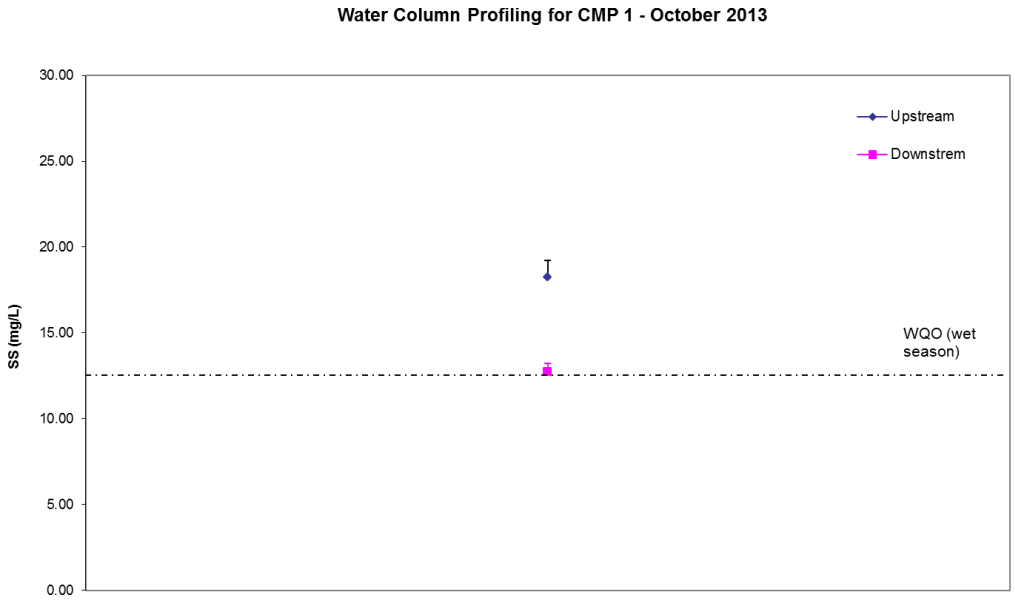


Figure 69: Suspended Solids (mean + SD) recorded during Water Column Profiling for disposal operations at CMP 1 in October 2013.

Annex C

Results of Impact Monitoring during Dredging Operations of CMP 2 and Routine Water Quality Monitoring for CMP 1 in October 2013

Table C1 Summary Table of DO, Turbidity and SS Levels Recorded in October 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		
2013/10/2	Mid-Ebb	DS1	6.02	6.24	12.10	6.83
		DS2	5.37	6.05	12.68	23.78
		DS3	5.64	6.11	11.33	12.11
		DS4	5.65	6.00	13.04	12.89
		DS5	5.73	6.03	11.40	12.33
		US1	5.96	6.19	27.75	33.50
		US2	5.71	6.08	26.57	26.11
		MW1	5.42	5.44	6.83	9.11
		THB1	6.02	6.36	7.66	7.83
		THB2	-	5.59	10.21	8.67
		WSR45C	5.48	6.01	8.45	9.11
		WSR46	6.08	6.36	16.25	19.67
	Mid-Flood	DS1	7.00	7.24	8.87	12.17
		DS2	6.71	7.17	19.55	24.67
		DS3	6.88	7.09	16.03	18.17
		DS4	7.50	7.75	9.67	11.00
		DS5	7.57	7.75	7.82	10.50
		US1	6.02	6.43	21.28	27.78
		US2	5.75	6.48	15.72	17.33
		MW1	5.46	5.58	11.90	11.56
		THB1	8.02	7.98	6.01	7.50
		THB2	-	7.78	14.72	8.67
		WSR45C	5.74	6.48	10.43	12.11
		WSR46	5.92	6.25	13.18	14.11
2013/10/04	Mid-Ebb	DS1	6.07	6.23	14.63	11.83
		DS2	6.00	6.26	15.08	17.00
		DS3	5.58	6.17	12.57	11.11
		DS4	5.59	6.08	11.02	10.89
		DS5	5.65	6.09	9.64	9.22
		US1	6.58	6.99	11.70	11.50
		US2	6.62	7.30	10.90	8.83
		MW1	5.41	5.47	8.21	7.78
		THB1	6.71	7.07	7.61	11.50
		THB2	-	6.62	12.68	6.00
		WSR45C	5.54	5.99	9.04	7.67
		WSR46	5.97	6.05	63.37	27.33
	Mid-Flood	DS1	6.95	7.02	13.55	13.67
		DS2	6.88	6.90	19.62	22.50
		DS3	7.01	6.99	25.70	25.33
		DS4	6.95	6.97	14.02	12.50
		DS5	6.90	6.96	10.70	8.89
		US1	6.06	6.11	22.88	16.50
		US2	5.91	5.91	19.41	18.00
		MW1	6.62	6.69	42.93	9.78
		THB1	7.30	7.34	12.68	11.50
		THB2	-	6.58	25.33	3.67
		WSR45C	5.91	6.28	17.98	13.56
		WSR46	6.16	6.27	16.20	12.22

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average SS Level (mg/L)
			Bottom	Surface and Mid Depth		
2013/10/07	Mid-Ebb	DS1	6.40	6.40	67.72	46.83
		DS2	6.34	6.35	34.32	21.33
		DS3	6.29	6.30	38.51	25.11
		DS4	6.22	6.26	38.79	22.78
		DS5	5.99	6.18	38.96	22.89
		US1	6.66	6.67	19.47	11.50
		US2	6.63	6.62	20.52	10.50
		MW1	5.79	5.85	6.47	5.56
		THB1	6.73	6.75	10.81	13.17
		THB2	-	6.53	9.42	13.67
		WSR45C	5.73	6.11	9.08	13.44
		WSR46	6.00	6.15	10.04	9.89
	Mid-Flood	DS1	6.27	6.26	75.93	59.50
		DS2	6.28	6.26	35.05	24.17
		DS3	6.29	6.28	29.02	23.50
		DS4	6.23	6.21	18.92	11.33
		DS5	6.27	6.30	15.32	10.33
		US1	6.14	6.13	36.79	23.83
		US2	6.17	6.12	36.17	22.17
		MW1	5.45	5.56	11.37	12.00
		THB1	6.19	6.20	13.46	15.67
		THB2	-	5.75	17.86	9.33
		WSR45C	5.66	5.83	12.96	13.89
		WSR46	5.91	5.96	22.62	26.11
2013/10/10	Mid-Ebb	DS1	5.81	5.94	30.90	15.17
		DS2	5.92	6.07	11.82	6.33
		DS3	5.55	5.81	13.81	7.56
		DS4	5.49	5.69	13.84	8.44
		DS5	5.54	5.83	14.57	7.67
		US1	6.08	6.22	17.16	6.83
		US2	6.23	6.36	14.33	7.50
		MW1	5.62	5.69	5.26	5.33
		THB1	6.04	6.28	7.71	6.33
		THB2	-	6.13	7.61	7.33
		WSR45C	5.56	5.82	6.59	7.44
		WSR46	5.72	5.97	7.62	9.67
	Mid-Flood	DS1	5.99	5.99	65.10	48.83
		DS2	6.03	6.03	28.80	17.50
		DS3	6.07	6.07	22.82	16.50
		DS4	6.15	6.14	19.84	12.00
		DS5	6.07	6.12	19.04	12.83
		US1	5.97	5.97	20.09	12.17
		US2	5.94	5.94	18.71	10.33
		MW1	5.55	5.62	10.31	12.00
		THB1	5.90	5.93	11.25	12.67
		THB2	-	5.05	13.61	12.67
		WSR45C	5.73	5.83	11.18	14.44
		WSR46	5.94	5.99	15.14	18.11
2013/10/12	Mid-Ebb	DS1	5.97	6.25	7.96	6.17
		DS2	6.19	6.21	8.23	5.50
		DS3	6.06	6.09	7.94	5.78

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average SS Level (mg/L)
			Bottom	Surface and Mid Depth		
		DS4	5.58	5.90	9.68	8.11
		DS5	5.49	5.78	9.44	7.89
		US1	6.43	6.49	12.78	8.00
		US2	6.48	6.50	18.52	14.00
		MW1	5.45	5.52	3.84	4.78
		THB1	6.45	6.65	5.74	6.67
		THB2	-	7.02	6.48	7.00
		WSR45C	5.37	5.55	4.83	6.56
		WSR46	5.56	6.03	6.91	7.56
	Mid-Flood	DS1	6.44	6.41	7.16	4.50
		DS2	6.61	6.58	8.83	6.50
		DS3	6.66	6.66	9.93	6.33
		DS4	6.66	6.76	10.83	7.67
		DS5	6.39	6.65	12.58	7.33
		US1	6.20	6.52	10.15	5.83
		US2	5.99	6.37	9.66	5.50
		MW1	5.50	5.65	5.09	6.78
		THB1	6.43	6.50	4.10	7.17
		THB2	-	5.46	10.48	7.33
		WSR45C	5.53	5.88	5.51	8.11
		WSR46	5.79	6.10	10.54	9.44
2013/10/14	Mid-Ebb	DS1	6.05	6.05	6.98	4.33
		DS2	6.06	6.05	5.81	4.67
		DS3	5.98	5.99	5.71	2.78
		DS4	5.84	5.97	5.49	3.89
		DS5	5.75	5.96	5.82	3.22
		US1	6.56	6.56	8.00	5.83
		US2	6.62	6.61	12.08	6.00
		MW1	5.49	5.54	3.61	4.00
		THB1	6.43	6.44	6.18	5.33
		THB2	-	6.35	3.61	5.33
		WSR45C	5.32	5.83	4.90	4.89
		WSR46	5.54	5.88	11.64	11.56
	Mid-Flood	DS1	7.14	7.14	11.26	5.67
		DS2	7.40	7.41	9.88	4.67
		DS3	7.36	7.39	10.18	6.33
		DS4	7.30	7.34	13.23	6.67
		DS5	6.90	7.01	13.13	8.33
		US1	6.74	6.78	4.78	3.17
		US2	6.36	6.57	7.46	3.17
		MW1	5.57	5.75	5.82	4.78
		THB1	6.78	6.82	9.96	9.17
		THB2	-	6.66	6.95	3.67
		WSR45C	5.96	6.46	4.23	4.33
		WSR46	6.00	6.24	8.40	8.22
2013/10/16	Mid-Ebb	DS1	6.44	6.44	7.35	6.00
		DS2	6.48	6.50	7.29	4.56
		DS3	6.43	6.48	6.29	5.22
		DS4	6.47	6.51	6.78	4.33
		DS5	6.35	6.55	6.36	5.11
		US1	6.49	6.53	12.52	8.83

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	6.85	6.86	12.06	7.17
		MW1	5.50	5.61	4.77	6.44
		THB1	6.67	6.71	7.63	10.00
		THB2	-	6.56	7.86	9.33
		WSR45C	5.63	6.43	3.86	5.56
		WSR46	5.84	6.36	10.23	13.44
	Mid-Flood	DS1	6.79	6.78	15.17	8.67
		DS2	7.16	7.14	12.50	6.83
		DS3	7.44	7.44	21.02	11.67
		DS4	7.51	7.52	17.56	12.17
		DS5	7.29	7.29	23.52	14.50
		US1	6.76	6.75	16.66	10.50
		US2	6.36	6.54	16.19	9.50
		MW1	5.53	5.72	10.29	11.56
		THB1	6.56	6.55	12.65	12.67
		THB2	-	7.12	15.15	6.67
		WSR45C	5.67	6.07	8.03	8.67
		WSR46	6.42	6.68	7.25	6.89
2013/10/18	Mid-Ebb	DS1	6.23	6.58	18.74	24.00
		DS2	6.35	6.60	9.72	13.11
		DS3	5.98	6.40	9.16	15.56
		DS4	5.99	6.40	9.10	11.44
		DS5	5.90	6.42	8.29	10.89
		US1	6.51	6.96	7.38	12.00
		US2	6.86	7.07	6.03	9.00
		MW1	5.69	5.77	7.73	8.11
		THB1	6.91	7.04	11.40	35.50
		THB2	-	6.26	11.38	8.67
		WSR45C	5.74	6.19	10.01	11.78
		WSR46	6.21	6.54	10.98	12.33
	Mid-Flood	DS1	7.28	7.28	12.08	17.50
		DS2	7.23	7.20	11.93	14.00
		DS3	7.25	7.25	13.38	15.33
		DS4	7.15	7.17	8.25	8.67
		DS5	7.00	7.00	9.71	12.00
		US1	6.99	7.05	10.64	12.50
		US2	6.66	6.65	12.49	16.50
		MW1	5.69	5.75	12.76	13.56
		THB1	7.00	7.03	8.03	11.00
		THB2	-	6.48	9.78	6.00
		WSR45C	6.00	6.52	13.41	16.11
		WSR46	6.31	6.49	14.52	19.56
2013/10/21	Mid-Ebb	DS1	6.58	6.79	8.14	13.00
		DS2	6.43	6.60	10.08	13.22
		DS3	6.24	6.68	7.61	13.89
		DS4	5.91	6.37	10.40	16.11
		DS5	5.91	6.29	9.83	17.11
		US1	7.15	7.39	15.87	25.67
		US2	7.06	7.33	9.40	14.00
		MW1	5.78	5.91	6.46	10.00
		THB1	6.77	6.88	7.13	10.33

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average SS Level (mg/L)
			Bottom	Surface and Mid Depth		
		THB2	-	7.09	9.85	10.33
		WSR45C	5.76	6.12	8.70	11.78
		WSR46	6.01	6.36	9.07	11.11
	Mid-Flood	DS1	6.71	6.71	22.10	30.00
		DS2	6.71	6.71	12.49	17.00
		DS3	6.71	6.71	11.42	14.17
		DS4	6.62	6.63	14.44	20.50
		DS5	6.61	6.63	9.87	12.89
		US1	6.42	6.41	19.02	27.17
		US2	6.34	6.34	15.19	21.00
		MW1	6.00	6.11	8.90	10.00
		THB1	6.63	6.65	17.81	20.33
		THB2	-	5.96	13.65	4.67
		WSR45C	6.32	6.35	18.34	19.33
		WSR46	6.44	6.46	16.97	18.67
2013/10/23	Mid-Ebb	DS1	6.55	6.58	11.36	15.83
		DS2	6.33	6.45	18.01	20.17
		DS3	6.18	6.34	8.81	10.67
		DS4	5.73	6.33	10.00	14.56
		DS5	5.97	6.38	8.34	12.56
		US1	6.86	7.10	10.65	13.83
		US2	7.06	7.09	12.46	12.00
		MW1	5.75	5.80	6.69	12.89
		THB1	6.85	6.89	7.28	18.00
		THB2	-	7.14	10.15	11.00
		WSR45C	5.73	6.10	8.29	11.11
		WSR46	6.15	6.32	10.38	18.33
	Mid-Flood	DS1	6.45	6.45	33.69	43.00
		DS2	6.57	6.58	17.01	24.83
		DS3	6.53	6.53	20.30	24.17
		DS4	6.45	6.48	17.02	27.67
		DS5	6.41	6.51	12.86	20.50
		US1	6.31	6.29	13.54	19.00
		US2	6.19	6.20	14.20	22.67
		MW1	5.71	5.85	8.19	16.00
		THB1	6.37	6.38	14.97	21.50
		THB2	-	5.94	15.66	13.67
		WSR45C	5.96	6.08	12.35	16.78
		WSR46	6.18	6.21	18.90	24.33
2013/10/25	Mid-Ebb	DS1	6.39	6.42	9.02	12.83
		DS2	6.38	6.44	7.37	6.89
		DS3	6.51	6.50	6.05	5.67
		DS4	5.73	6.04	6.79	6.89
		DS5	5.78	6.04	7.35	8.11
		US1	6.72	6.70	7.75	7.33
		US2	6.76	6.75	10.91	11.00
		MW1	5.66	5.71	5.69	5.22
		THB1	6.71	6.72	8.95	8.50
		THB2	-	6.68	14.15	7.00
		WSR45C	5.68	6.15	5.96	6.00
		WSR46	6.01	6.44	7.12	6.11

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	6.33	6.36	50.54	66.17
		DS2	6.52	6.57	24.32	28.50
		DS3	6.75	6.79	18.08	22.83
		DS4	6.77	6.79	14.86	15.00
		DS5	6.54	6.62	13.01	13.56
		US1	6.22	6.23	8.60	9.17
		US2	6.02	6.06	9.40	10.00
		MW1	5.67	5.71	6.04	6.00
		THB1	6.53	6.56	10.36	9.50
		THB2	-	6.34	14.21	6.67
		WSR45C	5.88	6.17	9.27	9.11
		WSR46	6.32	6.33	10.42	8.67
2013/10/28	Mid-Ebb	DS1	6.56	6.64	10.17	17.67
		DS2	6.38	6.59	5.04	7.89
		DS3	6.01	6.55	5.62	7.44
		DS4	5.81	6.28	4.78	4.11
		DS5	5.90	6.24	4.58	5.78
		US1	6.90	6.93	7.55	9.17
		US2	7.19	7.40	6.21	20.00
		MW1	5.59	5.62	2.13	2.78
		THB1	6.50	6.60	7.75	11.83
		THB2	-	6.33	5.21	4.67
		WSR45C	5.86	6.01	4.18	5.33
		WSR46	6.48	6.26	4.82	7.00
	Mid-Flood	DS1	6.89	6.99	49.47	73.83
		DS2	7.26	7.32	16.29	21.00
		DS3	7.76	7.80	12.40	21.67
		DS4	8.16	8.37	11.50	17.83
		DS5	8.12	8.40	7.55	14.89
		US1	6.94	7.00	5.26	9.17
		US2	6.66	6.76	5.40	8.44
		MW1	5.82	5.89	4.17	6.56
		THB1	7.26	7.39	13.87	20.83
		THB2	-	6.77	11.55	15.67
		WSR45C	6.16	6.57	7.30	15.33
		WSR46	7.07	7.29	5.90	10.67

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. Samplings during mid-ebb tide of 3 August 2013 and both mid-ebb and mid-flood tides of 1 and 14 August 2013 were not carried out due to adverse weather.
6. Sampling at THB2 was cancelled at mid-ebb tide due to adverse weather condition on 30 August 2013.

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 *In-situ Monitoring Results for Routine Water Quality Monitoring of CMP 1 in October 2013*

Sampling Date	Stations	Temp (°C)	Salinity	Turbidity (NTU)	Dissolved Oxygen (%)		pH (mg L^{-1})
2013/10/3	RFF (Reference)	28.26	28.68	21.13	96.01	6.38	8.10
	IPF (Impact)	28.20	28.40	16.70	99.36	6.62	8.13
	INF (Intermediate)	27.96	27.35	10.15	84.50	5.67	7.92
	Ma Wan Station	28.07	30.51	13.25	86.00	5.67	8.09
	Shum Shui Kok Station	28.11	29.45	12.00	90.61	6.01	8.11
	Tai Mo To Station	28.20	29.00	30.00	91.44	6.07	8.08
	Tai Ho Bay Station 1	28.34	28.11	14.80	101.79	6.78	8.14
	Tai Ho Bay Station 2	28.84	27.85	21.04	118.23	7.82	7.99
	WQO	N/A	25.81-31.55#	N/A	N/A	>4	6.5-8.5
2013/10/5	RFF (Reference)	28.06	28.38	30.51	89.74	5.99	8.01
	IPF (Impact)	28.25	28.61	16.61	97.21	6.46	8.07
	INF (Intermediate)	28.13	28.49	33.74	95.97	6.40	8.05
	Ma Wan Station	27.98	30.13	12.58	82.38	5.46	7.96
	Shum Shui Kok Station	27.98	29.64	9.08	86.22	5.73	8.07
	Tai Mo To Station	28.06	28.62	33.30	92.62	6.18	8.04
	Tai Ho Bay Station 1	28.18	28.44	11.58	104.50	6.96	8.10
	Tai Ho Bay Station 2	28.83	27.99	12.88	96.51	6.38	8.02
	WQO	N/A	25.54-31.22#	N/A	N/A	>4	6.5-8.5
2013/10/8	RFF (Reference)	27.27	28.32	18.22	91.44	6.19	8.01
	IPF (Impact)	27.46	28.62	12.13	89.55	6.03	7.97
	INF (Intermediate)	27.69	29.09	21.18	88.80	5.94	7.99
	Ma Wan Station	27.61	29.56	13.03	84.83	5.67	8.02
	Shum Shui Kok Station	27.46	28.74	15.54	89.52	6.03	8.06
	Tai Mo To Station	27.48	28.58	13.49	90.17	6.07	7.97
	Tai Ho Bay Station 1	27.21	28.41	16.24	91.56	6.20	8.00
	Tai Ho Bay Station 2	27.62	28.47	9.99	81.33	5.47	7.47
	WQO	N/A	25.49-31.15#	N/A	N/A	>4	6.5-8.5
2013/10/11	RFF (Reference)	27.71	27.97	12.50	90.70	6.11	7.92
	IPF (Impact)	27.61	27.96	17.14	91.03	6.14	7.94
	INF (Intermediate)	27.64	28.47	11.25	86.56	5.82	7.92
	Ma Wan Station	27.77	29.93	15.24	83.61	5.56	7.92
	Shum Shui Kok Station	27.81	28.56	11.38	87.69	5.87	7.91
	Tai Mo To Station	27.56	28.20	20.45	89.33	6.02	7.94
	Tai Ho Bay Station 1	27.93	27.66	8.93	94.04	6.32	7.94
	Tai Ho Bay Station 2	28.17	27.97	11.48	77.46	5.18	7.40
	WQO	N/A	25.17-30.76#	N/A	N/A	>4	6.5-8.5
2013/10/13	RFF (Reference)	27.78	27.86	8.87	94.55	6.36	7.91
	IPF (Impact)	27.75	27.87	9.23	95.21	6.41	7.91
	INF (Intermediate)	27.84	28.67	7.41	87.86	5.88	7.86
	Ma Wan Station	27.74	29.37	6.51	86.05	5.74	7.80
	Shum Shui Kok Station	27.66	28.04	5.97	90.53	6.10	7.90
	Tai Mo To Station	27.66	28.20	10.22	87.25	5.87	7.86
	Tai Ho Bay Station 1	28.31	27.71	12.15	103.47	6.91	7.93

Sampling Date	Stations	Temp (°C)	Salinity	Turbidity (NTU)	Dissolved Oxygen (%)		pH (mg L^{-1})
	Tai Ho Bay Station 2	28.01	27.21	7.98	97.22	6.54	7.48
	WQO	N/A	25.08-30.65#	N/A	N/A	>4	6.5-8.5
2013/10/15	RFF (Reference)	27.64	28.11	15.64	87.67	5.90	7.87
	IPF (Impact)	27.50	27.70	15.60	95.45	6.46	7.92
	INF (Intermediate)	27.67	27.88	25.66	97.65	6.58	7.91
	Ma Wan Station	27.65	30.14	5.15	86.07	5.73	7.90
	Shum Shui Kok Station	27.49	27.74	5.45	94.18	6.37	7.92
	Tai Mo To Station	27.65	26.77	6.02	95.30	6.46	7.87
	Tai Ho Bay Station 1	27.64	27.83	13.82	102.07	6.88	7.95
	Tai Ho Bay Station 2	27.91	27.58	15.36	69.50	4.67	7.48
	WQO	N/A	25.30-30.92#	N/A	N/A	>4	6.5-8.5

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

Table C4 Laboratory Results for Routine Water Quality Monitoring of CMP 1 in October 2013

Date	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)
10/3	RFF	1.54	<LOR	1.63	9.92	2.08	<LOR	2.88	<LOR	13.92	0.04	0.44	1.17	23.46
	IPF	1.42	<LOR	1.38	10.46	1.67	<LOR	2.46	<LOR	8.17	0.03	0.45	1.09	22.46
	INF	1.29	<LOR	0.69	5.00	1.06	<LOR	2.33	<LOR	8.13	0.07	0.40	0.97	13.04
	Ma Wan Station	1.25	0.11	1.38	13.88	2.63	<LOR	2.88	<LOR	31.50	0.08	0.30	0.93	19.00
	Shum Shui Kok Station	1.63	<LOR	0.63	4.50	1.13	<LOR	1.88	<LOR	6.25	0.06	0.40	0.61	17.25
	Tai Mo To Station	2.13	<LOR	2.00	4.00	2.00	<LOR	2.00	<LOR	8.00	0.04	0.42	0.94	45.50
	Tai Ho Bay Station 1	1.38	0.11	1.50	8.13	2.13	<LOR	4.50	<LOR	30.75	0.01	0.45	1.65	16.00
	Tai Ho Bay Station 2	1.00	<LOR	<LOR	<LOR	<LOR	<LOR	1.06	<LOR	3.38	0.01	0.18	1.51	4.63
10/5	RFF	2.03	<LOR	0.55	3.55	0.83	<LOR	2.08	<LOR	4.90	0.03	0.46	0.27	28.45
	IPF	1.73	<LOR	0.68	2.18	0.81	<LOR	1.35	<LOR	5.10	0.02	0.36	0.41	15.73
	INF	2.00	<LOR	0.78	3.45	1.58	<LOR	2.53	<LOR	6.88	0.02	0.38	0.25	34.63
	Ma Wan Station	1.63	<LOR	0.94	1.38	0.56	<LOR	0.75	<LOR	5.38	0.06	0.29	0.25	16.63
	Shum Shui Kok Station	2.13	<LOR	0.63	1.44	<LOR	<LOR	0.75	<LOR	5.50	0.07	0.35	0.25	11.75
	Tai Mo To Station	2.00	<LOR	0.56	3.75	0.94	<LOR	1.19	<LOR	6.63	0.02	0.41	0.28	29.38
	Tai Ho Bay Station 1	1.63	<LOR	0.56	2.63	<LOR	<LOR	1.38	<LOR	5.00	<LOR	0.31	0.25	11.75
	Tai Ho Bay Station 2	1.25	<LOR	<LOR	0.88	<LOR	<LOR	1.00	<LOR	14.38	<LOR	0.29	0.25	7.88
10/8	RFF	1.92	<LOR	1.13	2.58	1.19	<LOR	2.00	<LOR	4.92	<LOR	0.39	0.28	27.00
	IPF	1.17	<LOR	0.65	1.79	0.54	<LOR	1.96	<LOR	2.29	0.01	0.38	0.52	20.92
	INF	1.50	<LOR	1.10	2.10	1.00	<LOR	1.71	<LOR	3.63	0.02	0.34	0.28	26.96
	Ma Wan Station	2.00	<LOR	1.38	6.13	2.38	<LOR	2.38	<LOR	11.50	0.03	0.35	2.42	20.13
	Shum Shui Kok Station	2.00	<LOR	1.13	2.50	1.00	<LOR	2.00	<LOR	6.50	<LOR	0.36	0.82	22.13
	Tai Mo To Station	2.00	<LOR	0.69	2.13	0.94	<LOR	2.00	<LOR	3.13	<LOR	0.37	1.16	20.63
	Tai Ho Bay Station 1	2.00	<LOR	0.94	2.13	0.88	<LOR	2.00	<LOR	3.50	<LOR	0.37	0.31	24.00

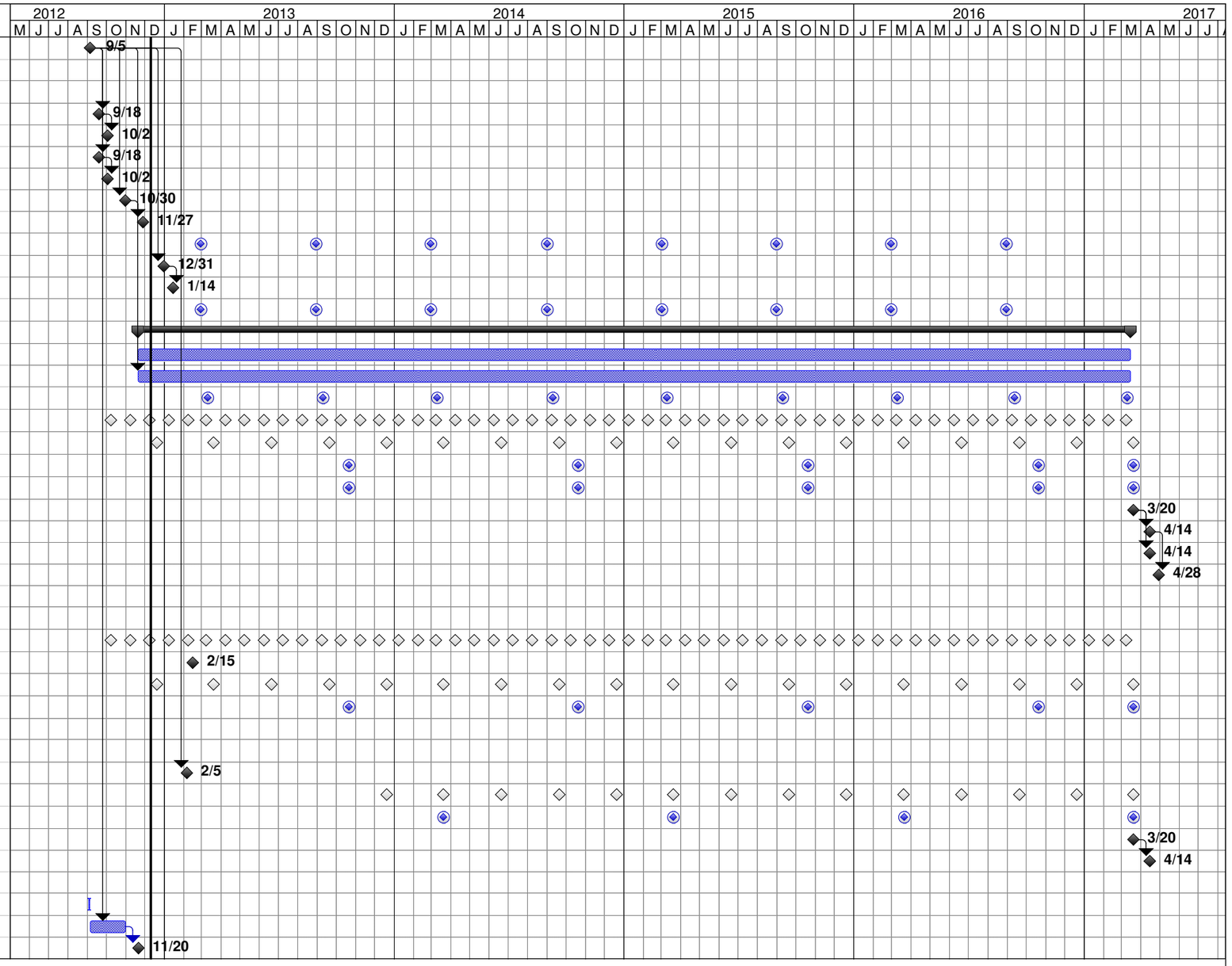
Date	Stations	As (μg/L)	Cd (μg/L)	Cr (μg/L)	Cu (μg/L)	Pb (μg/L)	Hg (μg/L)	Ni (μg/L)	Ag (μg/L)	Zn (μg/L)	NH_3 (mg/L)	TIN (mg/L)	BOD_5 (mg/L)	SS (mg/L)
	Tai Ho Bay Station 2	1.38	0.26	2.19	5.25	3.63	<LOR	2.63	<LOR	10.75	<LOR	0.25	0.71	8.00
10/11	RFF	2.42	<LOR	0.79	7.46	0.69	<LOR	1.92	<LOR	11.67	0.01	0.50	0.83	10.29
	IPF	1.92	<LOR	0.83	5.46	0.92	<LOR	2.17	<LOR	7.25	<LOR	0.49	0.78	21.67
	INF	1.75	<LOR	<LOR	1.77	0.52	<LOR	1.79	<LOR	6.08	<LOR	0.46	0.72	10.50
	Ma Wan Station	2.00	<LOR	0.56	10.88	0.88	<LOR	0.81	<LOR	12.25	0.02	0.33	0.56	13.75
	Shum Shui Kok Station	2.13	<LOR	<LOR	3.63	<LOR	<LOR	0.75	<LOR	6.63	<LOR	0.46	0.54	10.13
	Tai Mo To Station	2.00	<LOR	<LOR	1.88	0.75	<LOR	1.00	<LOR	5.25	<LOR	0.47	0.76	13.25
	Tai Ho Bay Station 1	1.75	<LOR	<LOR	16.63	<LOR	<LOR	2.00	<LOR	10.63	<LOR	0.52	0.79	5.88
	Tai Ho Bay Station 2	2.38	0.16	<LOR	1.19	0.75	<LOR	1.63	<LOR	23.13	<LOR	0.38	2.18	6.88
10/13	RFF	1.38	<LOR	0.56	8.08	0.52	<LOR	2.00	<LOR	8.21	0.02	0.56	0.96	7.79
	IPF	1.50	<LOR	0.58	5.08	<LOR	<LOR	2.04	<LOR	6.79	0.03	0.58	1.17	7.46
	INF	1.25	<LOR	0.67	6.08	<LOR	<LOR	2.00	<LOR	8.38	0.02	0.49	0.86	6.67
	Ma Wan Station	1.13	<LOR	<LOR	5.13	1.75	<LOR	1.63	<LOR	10.75	0.03	0.43	0.68	6.88
	Shum Shui Kok Station	1.75	0.11	0.56	10.50	1.38	<LOR	2.13	<LOR	14.75	0.01	0.54	0.95	6.25
	Tai Mo To Station	1.88	<LOR	<LOR	3.00	<LOR	<LOR	1.75	<LOR	5.25	<LOR	0.53	0.98	8.38
	Tai Ho Bay Station 1	1.88	<LOR	1.44	14.75	0.75	<LOR	2.13	<LOR	10.00	0.02	0.55	1.05	11.13
	Tai Ho Bay Station 2	1.63	<LOR	<LOR	1.88	<LOR	<LOR	2.00	<LOR	10.13	0.02	0.42	1.19	6.63
10/15	RFF	1.43	<LOR	1.21	4.23	0.64	<LOR	2.65	<LOR	6.05	0.01	0.48	0.35	16.80
	IPF	1.18	<LOR	0.59	3.55	0.53	<LOR	2.35	<LOR	6.42	<LOR	0.50	0.65	21.13
	INF	1.75	<LOR	0.95	5.58	1.03	<LOR	2.33	<LOR	10.40	<LOR	0.46	0.72	34.45
	Ma Wan Station	1.75	<LOR	0.56	4.63	1.88	<LOR	5.13	<LOR	14.63	0.01	0.32	0.80	5.75
	Shum Shui Kok Station	1.75	<LOR	<LOR	4.13	0.56	<LOR	2.13	<LOR	9.00	<LOR	0.50	0.68	6.13
	Tai Mo To Station	1.38	<LOR	0.56	6.75	0.69	<LOR	2.50	<LOR	9.63	<LOR	0.60	0.70	4.63
	Tai Ho Bay Station 1	2.00	<LOR	0.69	3.50	0.56	<LOR	2.25	<LOR	7.88	<LOR	0.43	0.55	6.25
	Tai Ho Bay Station 2	1.25	<LOR	<LOR	0.75	0.50	<LOR	1.50	<LOR	7.00	<LOR	0.40	0.28	1.88

WQO of SS: 12.2 mg/L

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