




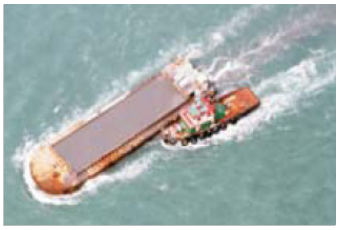
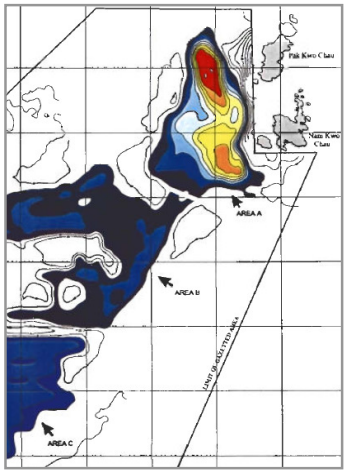

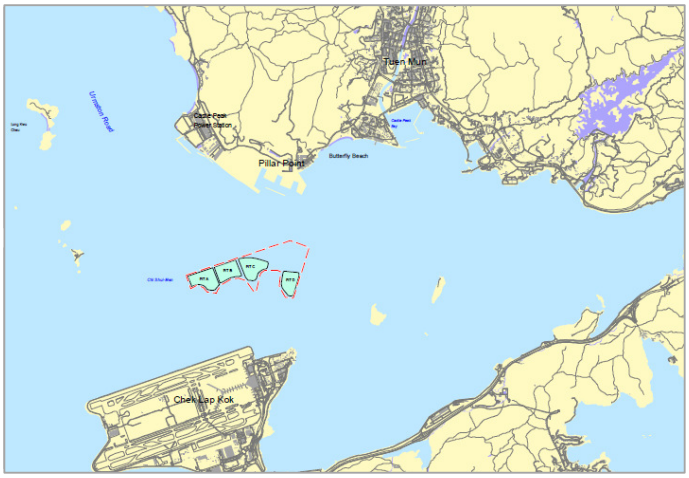

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Civil Engineering and Development Department

Environmental Monitoring and Audit for Contaminated Mud Pit at Sha Chau (2009-2013) – Investigation

Agreement No. CE 4/2009(EP)

41st Monthly Progress Report for Contaminated Mud Pits at Sha Chau – November 2012

Revision 0

14 December 2012

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Environmental Monitoring and Audit for Contaminated Mud Pit at Sha Chau (2009-2013) – Investigation

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Document Code: 0103262 Monthly Progress Nov 12_v0.doc

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Client: Civil Engineering and Development Department (CEDD)	Project No: 0103262
Summary: This document presents progress of monitoring works on contaminated mud pits at Sha Chau in November 2012 under Agreement No. CE 4/2009 (EP).	Date: 14 December 2012 Approved by:  *Dr Robin Kennish* *Director*

Revision	Description	By	Checked	Approved	Date
0	41st Monthly Progress Report for CMP	RC	JT	RK	14/12/12

Distribution

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CEDD Civil Engineering and Development Department

New Contaminated Mud Marine Disposal Facility at Airport East/East Sha Chau Area

Environmental Certification Sheet
EP-312/2008/A

Reference Document/Plan

Document/~~Plan~~ to be ~~Certified~~/ Verified:	41st Monthly Progress Report for Contaminated Mud Pits at Sha Chau – November 2012
Date of Report: 3/12/2012	
Date received by ET: 3/12/2012	
Date received by IA: 3/12/2012	

Reference EP Condition

Environmental Permit Condition:	Condition No.: 3.4

Content:

Four hard copies and one electronic copy of monthly EM&A Report shall be submitted to the Director within 10 working days 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 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-312/2008/A

Dr Robin Kennish,
Environmental Team Leader: Robin Kennish Date: 14/12/2012

IA Verification

I hereby verify that the above referenced document/~~plan~~ complies with the above referenced condition of EP-312/2008/A

Dr Wang Wen Xiong,
Independent Auditor: Wang Wen Xiong Date: 14/12/2012

Notes:

CONTENTS

ANNEXES

Agreement No. CE 4/2009 (EP)
Environmental Monitoring and Audit
for Contaminated Mud Pit at Sha Chau (2009-2013) - Investigation

41st MONTHLY PROGRESS REPORT FOR CONTAMINATED MUD PITS AT SHA CHAU November 2012

1.1 BACKGROUND

1.1.1 Since 1992, the East of Sha Chau area has been the site of a series of dredged contaminated mud pits (CMPs) designed to provide confined marine disposal capacity for contaminated mud arising from the HKSAR's dredging and reclamation projects. In November 2012, the following works were being undertaken at the CMPs:

- Capping was being undertaken at CMP IVc;
- Disposal of contaminated mud was taking place at CMP Va; and
- The dredging of CMP Vd was in progress.

1.1.2 The Environmental Monitoring and Audit (EM&A) programme for the CMPs at the East of Sha Chau area (ESC) presently covers the above operations.

1.2 REPORTING PERIOD

This *Monthly Progress Report* covers the monitoring period of November 2012.

1.3 DETAILS OF SAMPLING AND LABORATORY TESTING ACTIVITIES

1.3.1 The following monitoring activities have been undertaken for CMP V in November 2012:

- *Routine Water Quality Monitoring* was conducted on 5 November 2012;
- *Water Column Profiling* was conducted on 6 November 2012;
- *Impact Water Quality Monitoring during Dredging Operations* was conducted on 7 November 2012; and
- *Pit Specific Sediment Chemistry* was conducted on 8 November 2012.

1.3.2 A summary of field activities are presented in Annex A.

1.4 DETAILS OF OUTSTANDING SAMPLING AND / OR ANALYSIS

1.4.1 No outstanding sampling remained and laboratory analysis of *Pit Specific Sediment Chemistry* was yet to be completed during preparation of this monthly report.

1.5 BRIEF DISCUSSION OF THE MONITORING RESULTS FOR CMP V

1.5.1 *Table 1.1* summarises the monitoring results that are presented in the current monthly report.

1.5.2 Brief discussion of the monitoring results is presented in this section. Detailed discussion will be presented in the corresponding *Quarterly Report*.

Table 1.1 Monitoring activities in November 2012

Monitoring activities	**Date of Monitoring**	**Monitoring results presented in this report?**
Routine Water Quality Monitoring for CMP Va	5 November 2012	Yes
Water Column Profiling for CMP Va	6 November 2012	Yes
Impact Water Quality Monitoring during Dredging Operations of CMP Vd	7 November 2012	Yes
Pit Specific Sediment Chemistry Monitoring for CMP Va	8 November 2012	No. Laboratory analysis yet to be completed during preparation of this monthly report.

1.5.3 Impact Water Quality Monitoring during Dredging Operations of CMP Vd – November 2012

1.5.4 *Impact Water Quality Monitoring during Dredging Operations of CMP Vd* was conducted on 7 November 2012. On the 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 Vd (*Figure 1.1*). Monitoring was also conducted at the Ma Wan station. At each station, *in-situ* measurements of water quality parameters as well as water samples were taken from three depths in the water column (ie surface: 1 m below sea surface, mid-depth and bottom: 1 m above the seabed).

1.5.5 Monitoring results are presented in *Table B1* of *Annex B*. Levels of Dissolved Oxygen (DO), Turbidity and Suspended Solids (SS) complied with the Action and Limit Levels set in the Baseline Monitoring Report (1).

1.5.6 Overall, there appears to be no unacceptable water quality impacts causing by the dredging operations at CMP Vd and no additional measures are thus considered required except for those stated in the Environmental Permit (*EP-312/2008*).

1.5.7 Water Column Profiling for CMP Va – November 2012

In-situ Measurements

1.5.8 Water Column Profiling was undertaken at a total of two sampling stations in November 2012. The water quality monitoring results for November 2012 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 dry season period (November to March) of 1999-2010 from stations in the Northwestern Water Control Zone, where 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 C*.

1.5.9 Analyses of results for November 2012 indicated that levels of Salinity, pH and DO all complied with the WQOs at both Upstream and Downstream stations (*Figures 1 – 3 of Annex C*). DO and Turbidity complied with the Action and Limit Levels set in the *EM&A Manual* (2).

(1) ERM (2009) Baseline Monitoring Report. Environmental Monitoring and Audit for Contaminated Mud Pit at Sha Chau (2009-2013) – Investigation. Agreement No. CE 4/2009(EP). Submitted to EPD in September 2009.

(2) 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).

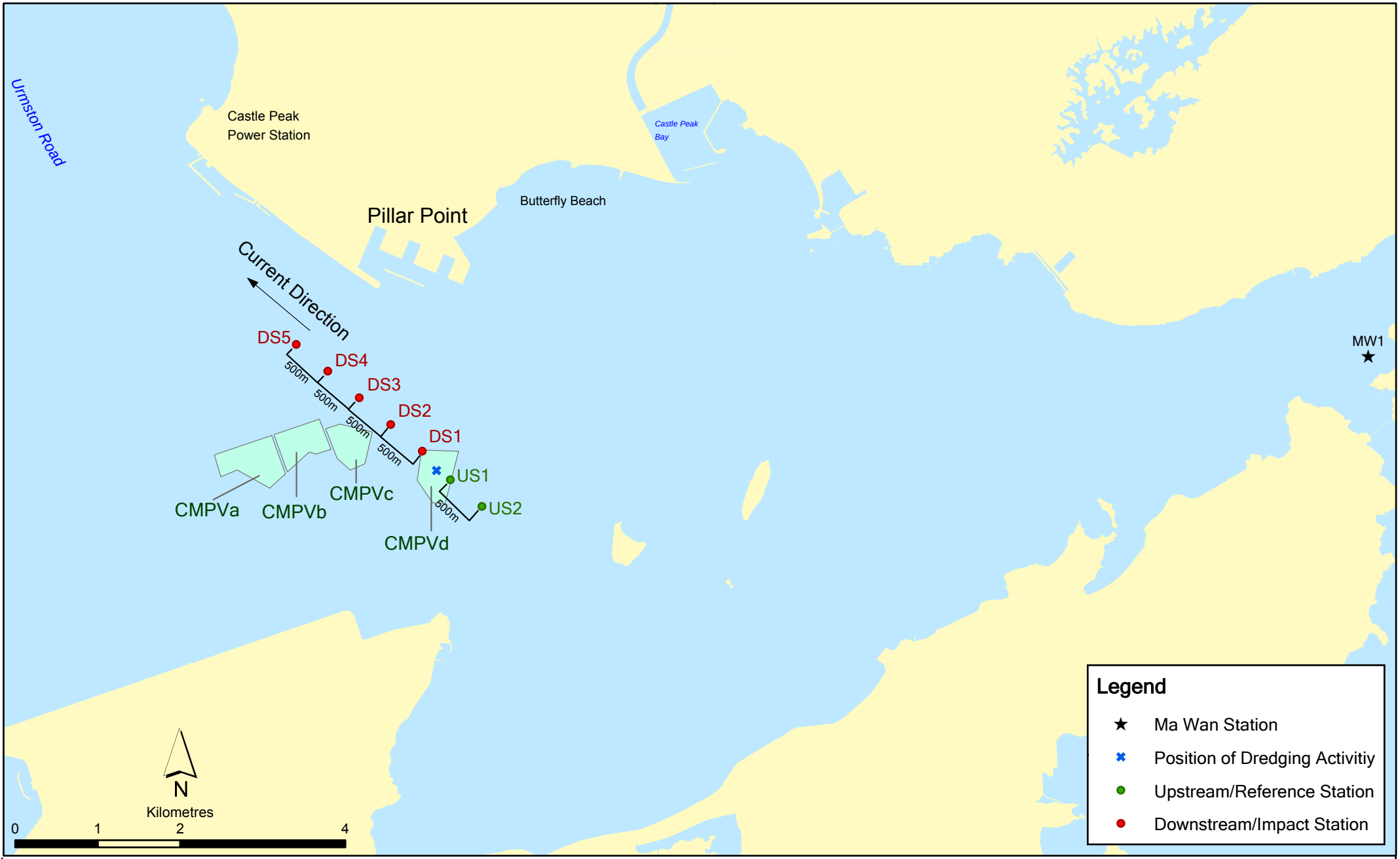

Figure 1.1

Indicative Dredging Impact Sampling Stations for CMPVd

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

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Date: 28/11/2012

Environmental Resources Management

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Laboratory Measurements for Suspended Solids (SS)

1.5.10 Analyses of data obtained in November 2012 indicated that the SS levels at both Upstream and Downstream stations complied with the WQO (*Figure 4 of Annex C*). Also, SS levels at all stations measured in November 2012 complied with the Action and Limit Levels set in the *EM&A Manual*.

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

1.5.12 Routine Water Quality Monitoring for CMP Va – November 2012

1.5.13 The results for the *Routine Water Quality Monitoring* conducted during November 2012 in the dry season have been assessed for compliance with the WQOs set by EPD as presented in *Section 1.5.8* above (please see *Figure 1.2* for the monitoring locations). *In-situ* monitoring and laboratory results are shown in *Table 1.2* and *1.3,* respectively, with graphical presentation provided in *Annex C*. Monitoring was undertaken at a total of ten stations in the reporting month.

In-situ Measurements

1.5.14 Analyses of results for November 2012 indicated that for all stations (Impact, Intermediate and Reference), levels of pH, DO and salinity complied with the WQOs (*Figures 5-8 of Annex C*). Levels of DO and Turbidity within the reporting month complied with the Action and Limit Levels set in the *EM&A Manual* (1) (*Figures 6 and 9 of Annex C*). All *in-situ* water quality measurements showed relatively minor variations amongst Impact, Intermediate and Reference stations (*Figures 5 to 9* of *Annex C*).

(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).

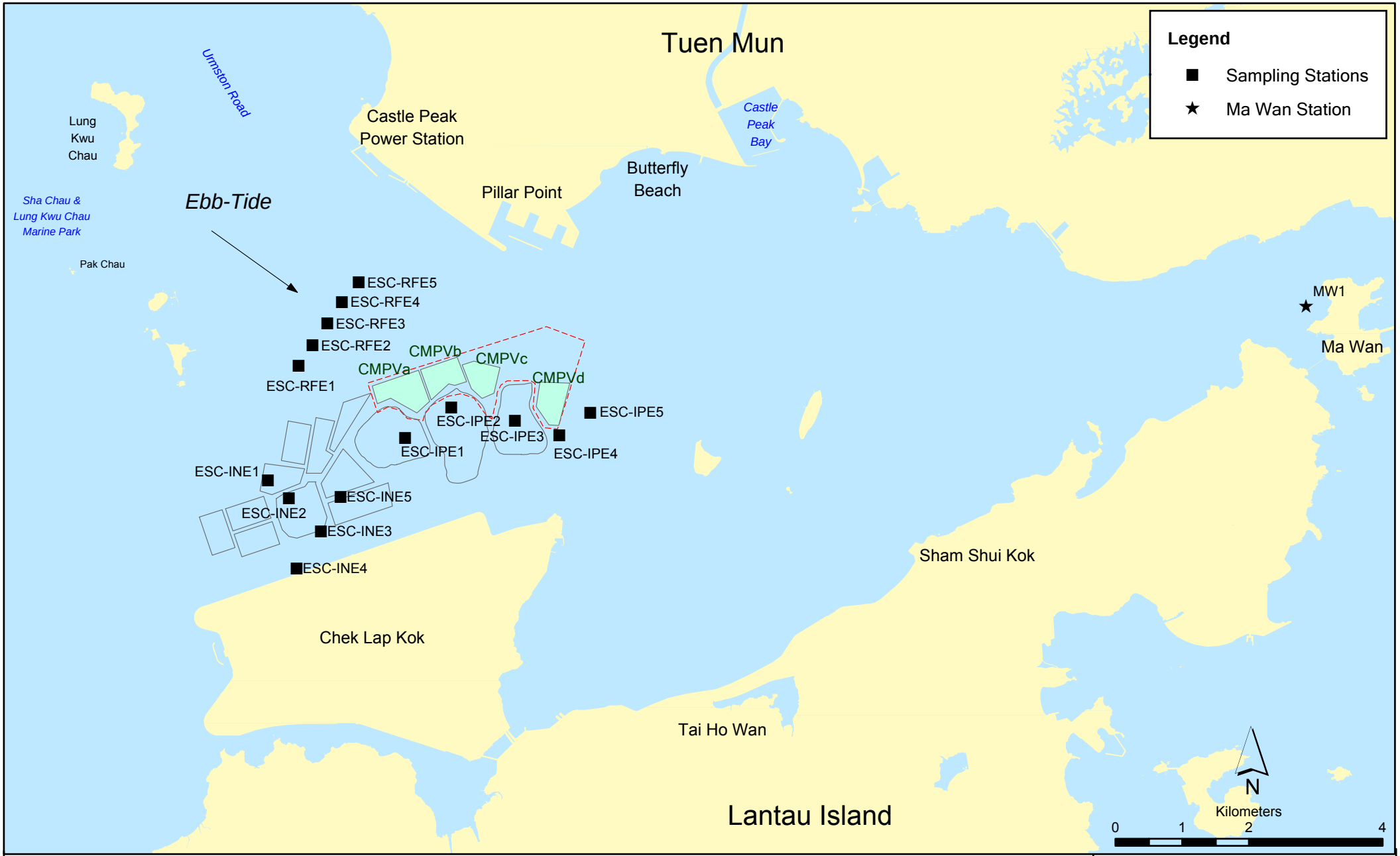

Figure 1.2

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

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Date: 3/12/2012

Environmental Resources Management

ERM

Laboratory Measurements

1.5.15 Analyses of November 2012 results indicate that concentrations of Cadmium, Mercury and Silver were below their limit of reporting at all stations. Arsenic, Copper, Lead, Nickel and Zinc were detected in samples from all stations (*Figures 10 and 11 of Annex C*). Concentrations of Arsenic, Chromium, Lead and Nickel appeared to be similar amongst all stations while concentration of Zinc was the highest at Reference stations. Levels of 5-day Biochemical Oxygen Demand (BOD_5), Total Inorganic Nitrogen (TIN) and NH_3-N were similar amongst all stations (*Figures 12 and 13 of Annex C*). Concentrations of SS exceed WQO (15.34 mg/L for dry season) at Impact and Intermediate Stations while all of them complied with the Action and Limit Levels at all stations within the reporting month (*Figure 14 of Annex C*).

Table 1.2 ***In-situ Monitoring Results for Routine Water Quality Monitoring during November 2012***

Stations	Temp (°C)	Salinity	Turbidity (NTU)	pH	Dissolved Oxygen (%)	Dissolved Oxygen (mg L^{-1})
RFE (Reference)	24.86	29.05	6.89	7.53	90.06	6.33
IPE (Impact)	24.96	29.84	9.57	7.67	88.10	6.15
INE (Intermediate)	25.04	29.78	9.02	7.48	86.54	6.03
Ma Wan Station	25.09	30.74	6.04	7.54	84.74	5.88
WQO	*N/A*	26.15-31.96	*N/A*	*6.5-8.5*	*N/A*	>4

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

Table 1.3 ***Laboratory Results for Routine Water Quality Monitoring during November 2012***

Stations	As (µg/L)	Ag (µg/L)	Cd (µg/L)	Cr (µg/L)	Cu (µg/L)	Hg (µg/L)	Pb (µg/L)	Ni (µg/L)	Zn (µg/L)	NH_3-N (mg/L)	TIN (mg/L)	BOD_5 (mg/L)	SS (mg/L)
RFE	1.96	<LOR	<LOR	0.67	10.58	<LOR	1.29	3.08	19.50	0.04	0.55	1.24	13.75
IPE	2.00	<LOR	<LOR	1.15	5.67	<LOR	0.88	2.25	7.38	0.04	0.46	0.91	16.38
INE	2.08	<LOR	<LOR	0.63	6.96	<LOR	0.90	2.04	11.50	0.05	0.49	1.00	15.46
Ma Wan Station	1.88	<LOR	<LOR	1.00	5.50	<LOR	1.19	2.25	15.50	0.06	0.39	1.51	13.50
												WQO of SS	15.34

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

1.6 ACTIVITIES SCHEDULED FOR THE NEXT MONTH

1.6.1 The following monitoring programmes will be conducted in the next monthly period of December 2012:

<u>CMP V</u>

- *Pit Specific Sediment Chemistry* for CMP Va;

- *Cumulative Impact Sediment Chemistry* for CMP Va;
- *Water Column Profiling* for CMP Va; and
- *Impact Water Quality Monitoring during Dredging Operations* for CMP Vd.

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

1.7 STUDY PROGRAMME

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 B

Results of Impact Monitoring during CMP Vd Dredging Operations for November 2012

Table B1 Summary Table of DO, Turbidity and SS Levels Recorded in November 2012

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average SS Level (mg/L)
			Bottom	Surface and Mid Depth		
2012/11/07	ME	DS1	6.28	6.47	4.42	5.17
		DS2	6.30	6.45	7.42	5.67
		DS3	6.18	6.42	4.67	3.17
		DS4	6.08	6.38	4.24	5.00
		DS5	6.21	6.33	4.37	4.83
		MW1	5.76	5.76	2.37	3.00
		US1	6.24	6.45	4.17	4.00
		US2	5.93	6.40	4.19	4.50
	MF	DS1	6.37	6.45	7.32	8.83
		DS2	6.47	6.48	8.17	10.17
		DS3	6.49	6.49	5.44	6.50
		DS4	6.45	6.44	4.51	4.83
		DS5	6.15	6.32	5.54	6.83
		MW1	5.79	5.86	5.14	5.83
		US1	6.43	6.48	8.56	10.67
		US2	6.39	6.38	6.87	7.17

Notes:

1. Cell shaded yellow indicated value exceeding the Action Level criteria.
2. Cell shaded red indicated value exceeding the Limit Level criteria.
3. DO for Surface and Mid-depth: less than 3.76 mg L^{-1} (Action Level); less than 3.11 mg L^{-1} (Limit Level)
   DO for Bottom: less than 2.96 mg L^{-1} (Action Level); less than 2 mg L^{-1} (Limit Level)
   Depth-average Turbidity: greater than 28.14 NTU(Action Level); greater than 38.32 NTU(Limit Level)
   Depth-average SS: greater than 37.88 mg L^{-1} (Action Level); greater than 61.92 mg L^{-1} (Limit Level)

Annex C

Monitoring Results

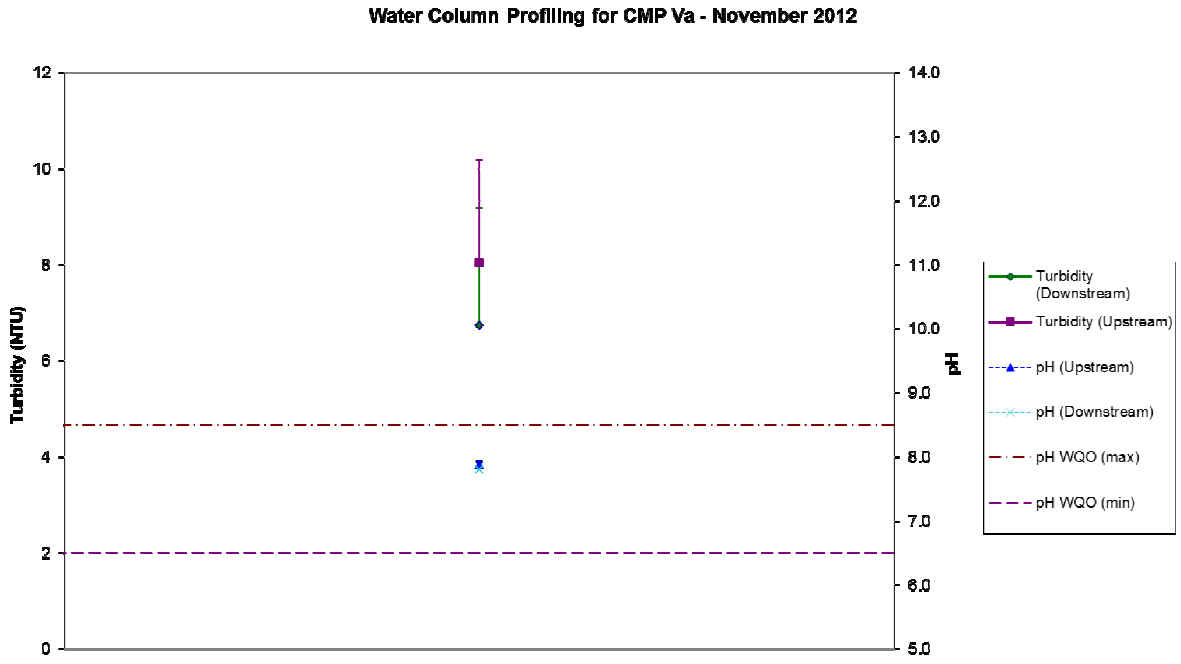

Figure 1: Turbidity and pH (mean + SD) recorded during Water Column Profiling for disposal operations at CMP Va in November 2012.

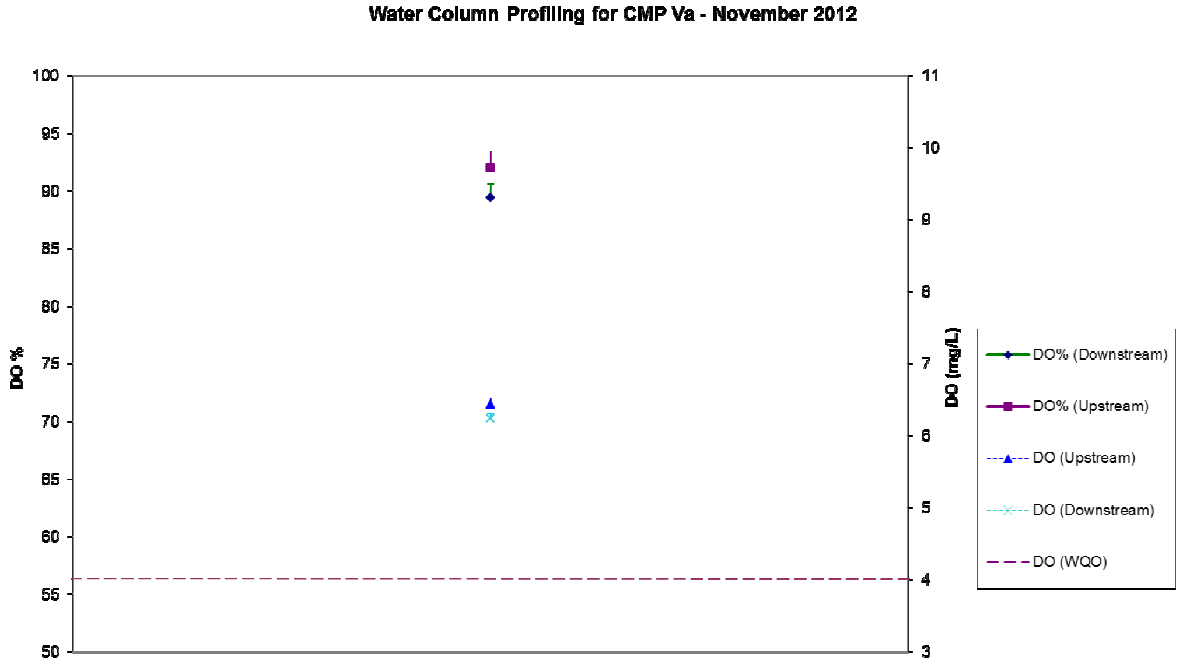

Figure 2: Dissolved Oxygen (mean + SD) recorded during Water Column Profiling for disposal operations at CMP Va in November 2012.

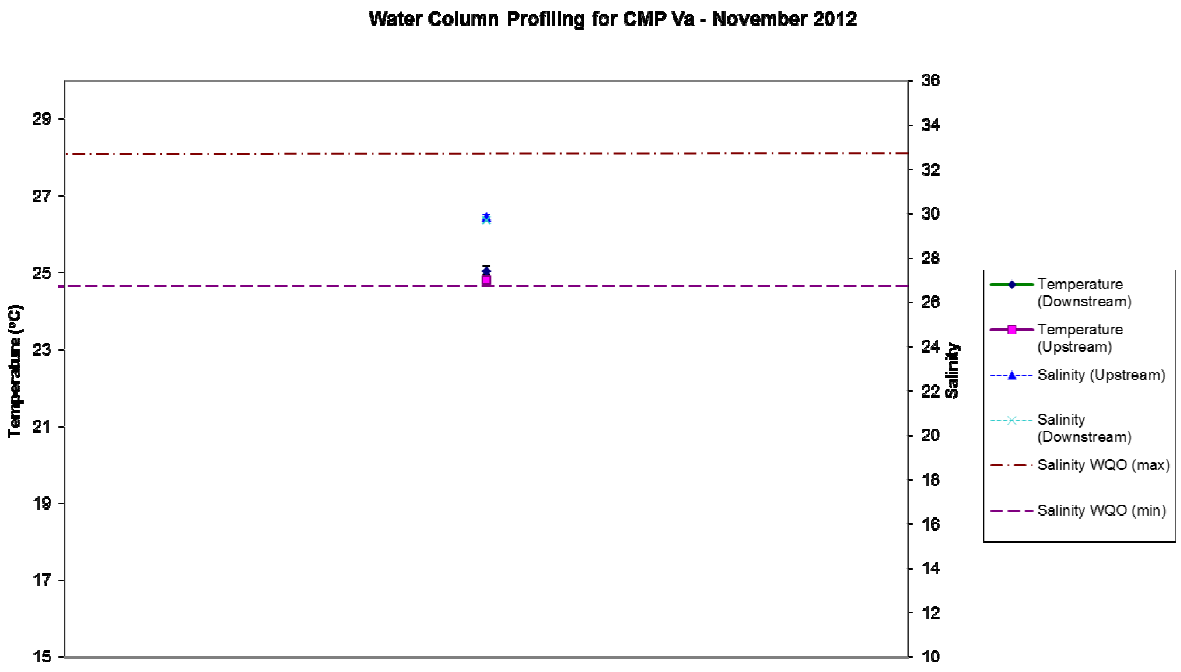

Figure 3: Salinity and Temperature (mean + SD) recorded during Water Column Profiling for disposal operations at CMP Va in November 2012.

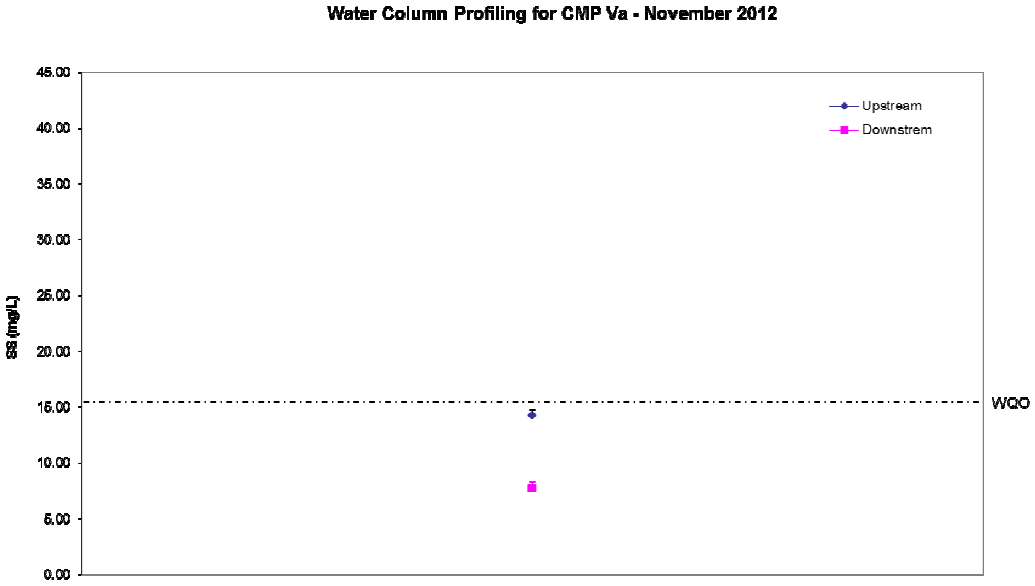

Figure 4: Suspended Solids (mean + SD) recorded during Water Column Profiling for disposal operations at CMP Va in November 2012.

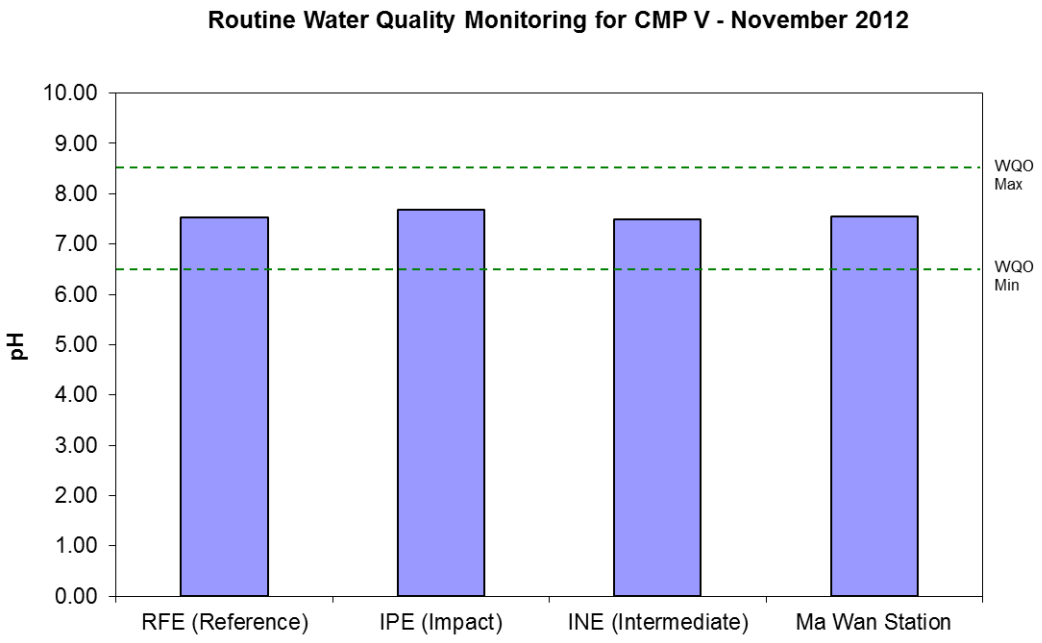

Figure 5: Level of pH (mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP Va in November 2012.

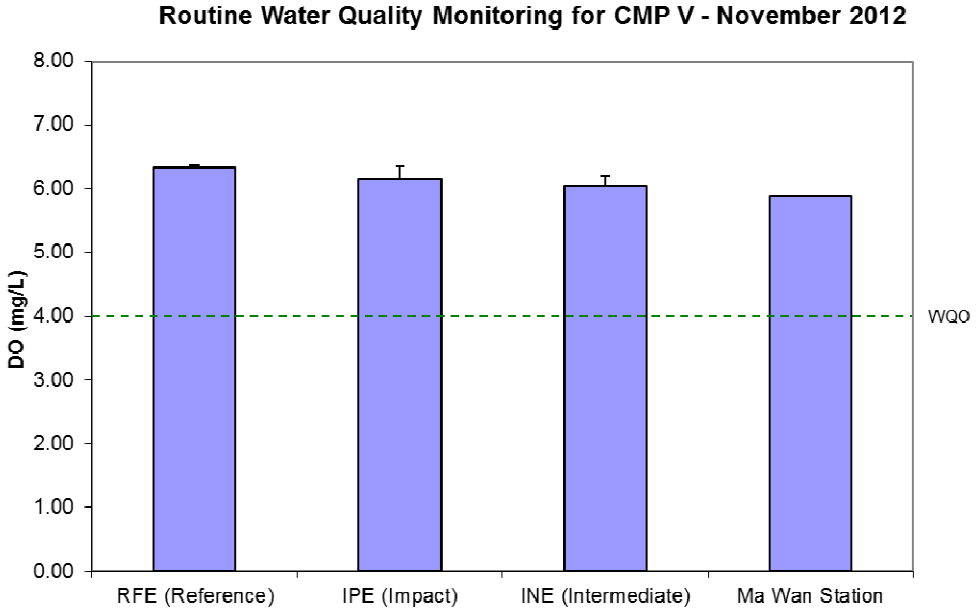

Figure 6: Concentration of Dissolved Oxygen (mg/L; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP Va in November 2012.

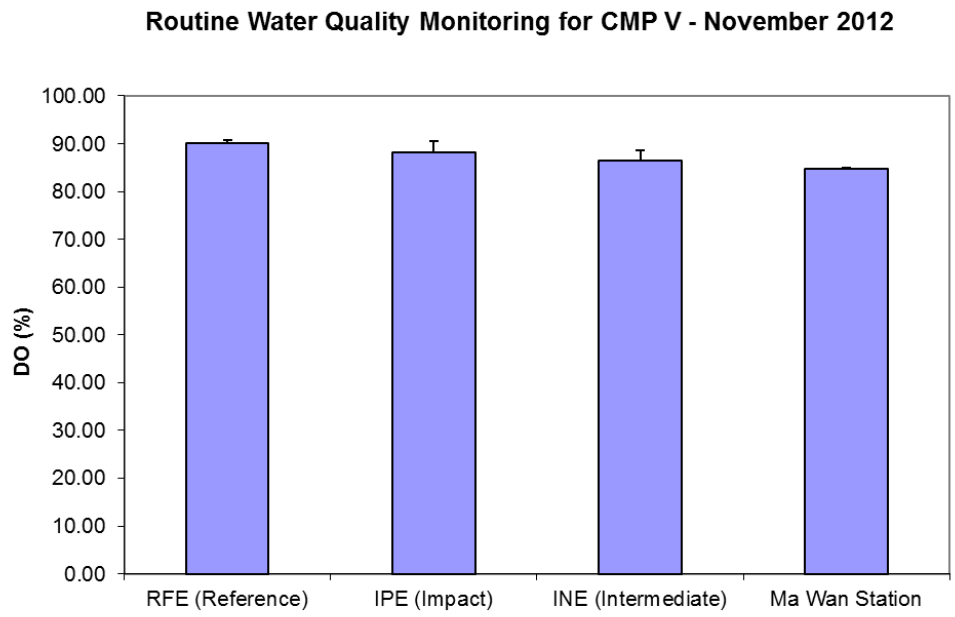

Figure 7: Level of Dissolved Oxygen (% saturation; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP Va in November 2012.

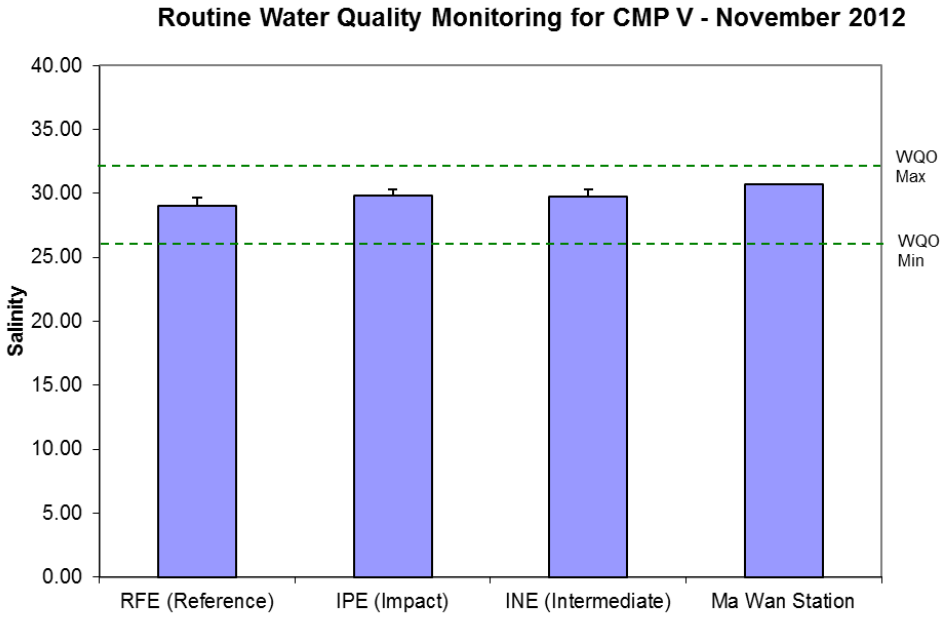

Figure 8: Level of Salinity (mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP Va in November 2012.

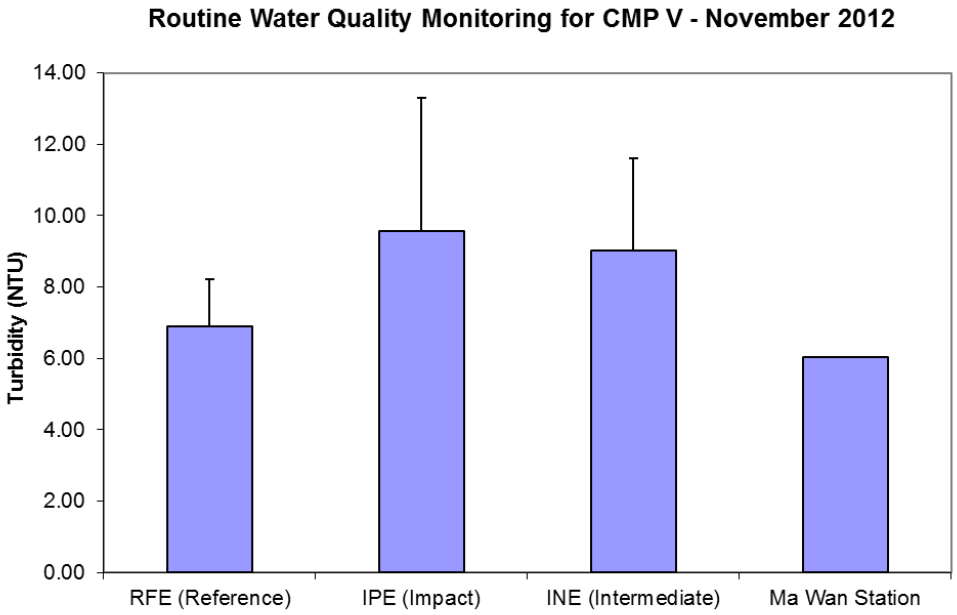

Figure 9: Level of Turbidity (NTU; mean + SD) recorded during Routine Water Quality Monitoring for disposal operations at CMP Va in November 2012.

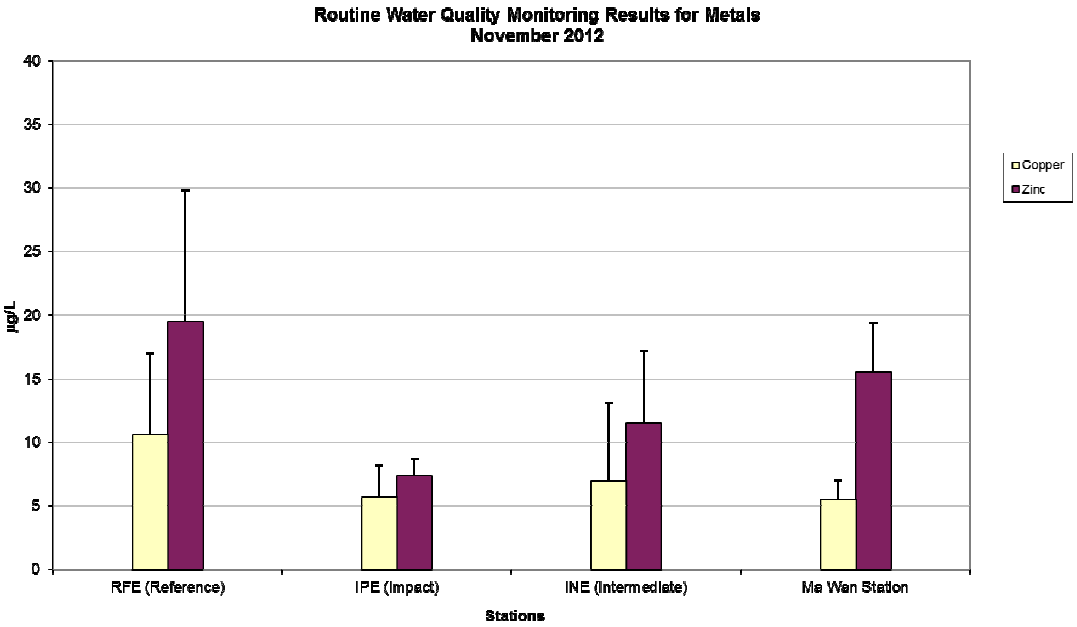

Figure 10: Concentration of Copper and Zinc (mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP Va in November 2012.

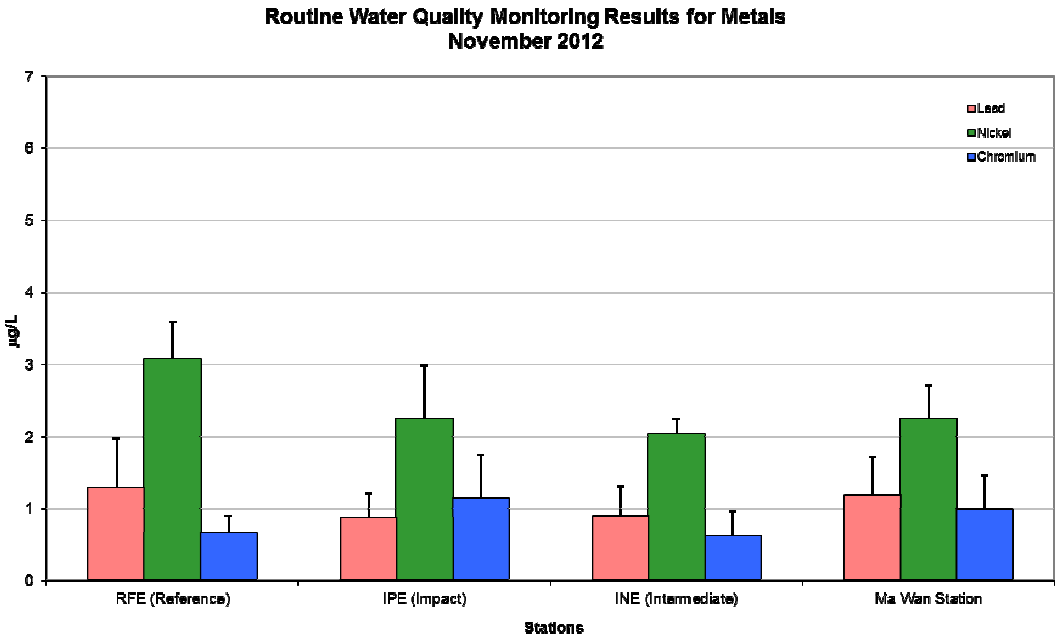

Figure 11: Concentration of Lead, Nickel and Chromium (mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP Va in November 2012.

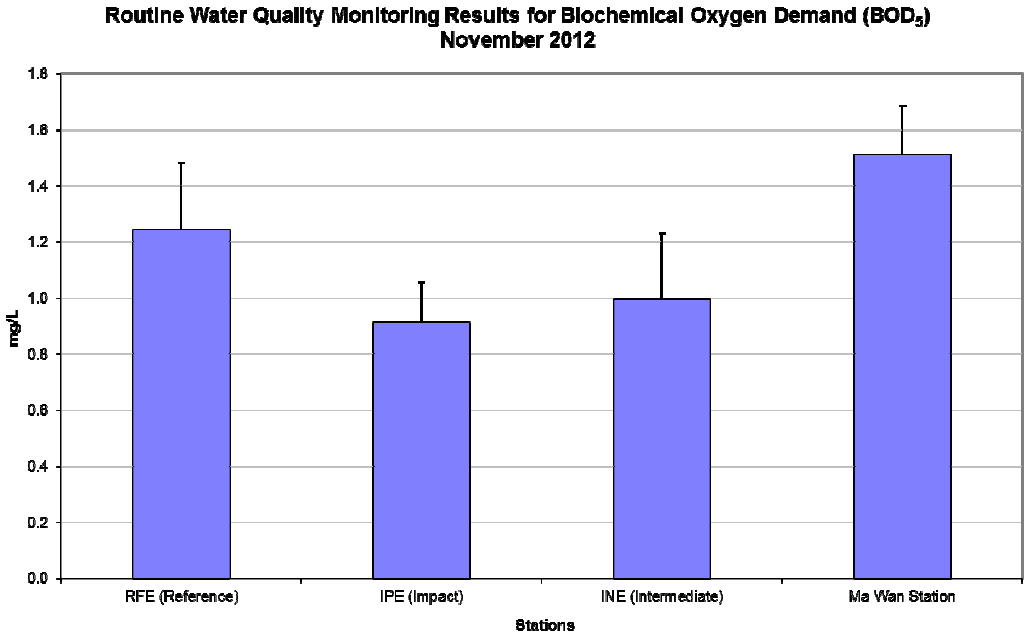

Figure 12: Level of Biochemical Oxygen Demand (BOD_5; mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP Va in November 2012.

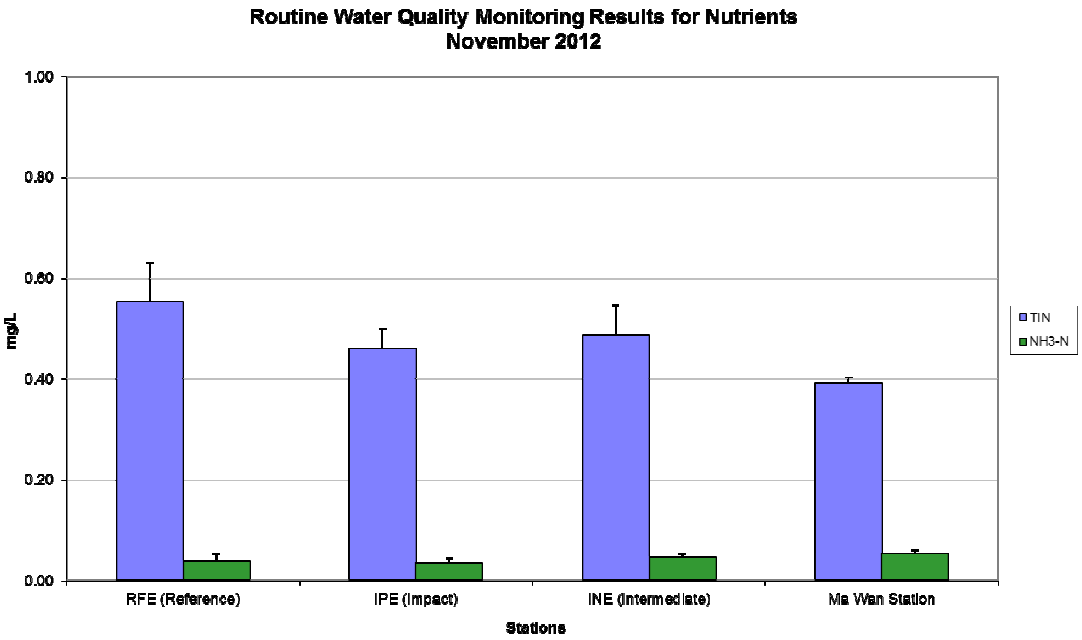

Figure 13: Concentration of Total Inorganic Nitrogen and NH_3-N (mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP Va in November 2012.

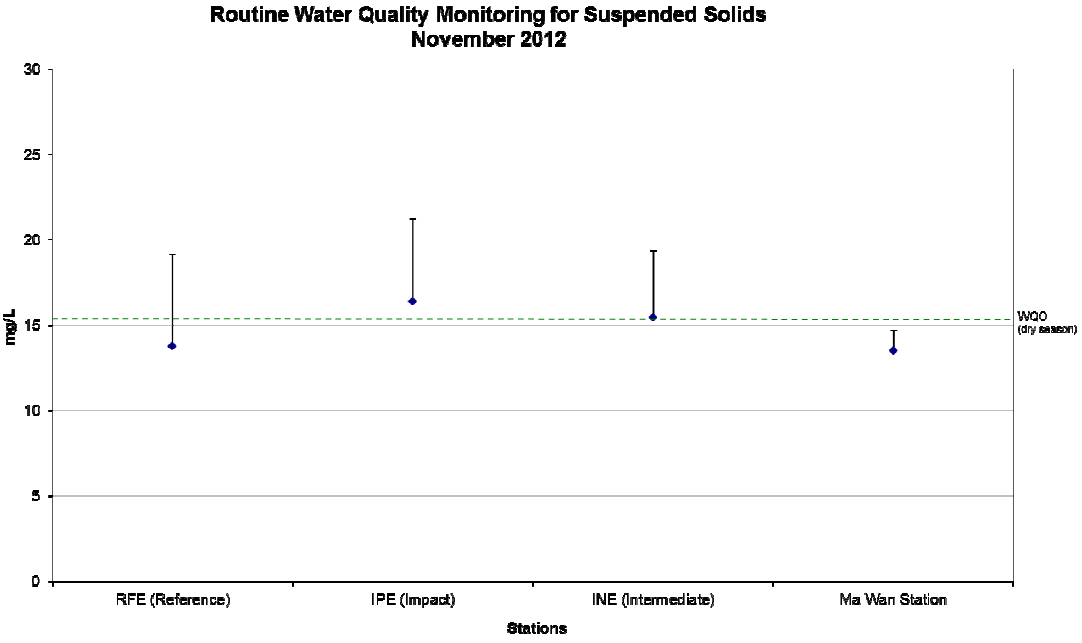

Figure 14: Concentration of Suspended Solids (mean + SD) in water samples collected from Routine Water Quality Monitoring for disposal operations at CMP Va in November 2012.

Annex D

Study Programme

ID	Task Name
1	**Project Commencement**
2	
3	**For CMP IV and New Facility at East Sha Chau**
4	
5	Submission of Draft Inception Report & Draft Programme
6	Submission of Final Inception Report & Final Programme
7	Submission of Draft Operations Manual
8	Submission of Final Operations Manual
9	**Submission of Operations Manual Updates**
17	Submission of Draft Monitoring And Audit Manual (Rev 1)
18	Submission of Final Monitoring And Audit Manual (Rev 1)
19	Submission of Draft Monitoring And Audit Manual (Rev 2)
20	Submission of Final Monitoring And Audit Manual (Rev 2)
21	**Submission of EM&A Manual Updates**
29	
30	**Monitoring Contract Works**
31	Prepare Draft Letters of Invitation, Gazette Documents & Tender Documents
32	Submission of Draft Tender Documents
33	Submission of Draft Gazette Documents
34	Submission of Final Tender Documents
35	Submission of Final Gazette Documents
36	Tendering and Tender Assessment
37	Prepare Contact Documents
38	Submission of Contract Documents
39	Administrate and Supervise Contracted Field and Laboratory Works
40	**Submission of Report on Dredging & Capping Operations**
49	**Monthly Progress Report**
101	**Quarterly EM&A Reports**
115	**Submission of Annual Review Report**
120	**Submission of Annual Risk Assessment Report**
125	**Submission of Draft Final Report**
126	**Submission of the Final Report**
127	**Submission of Draft Executive Summary Report**
128	**Submission of Final Executive Summary Reports**
129	
130	**For East Tung Lung Chau Disposal Facility**
131	
132	**Submission of Monitoring Results & Monthly EM&A Progress Report**
133	October 2009
134	November 2009
135	December 2009
136	January 2010

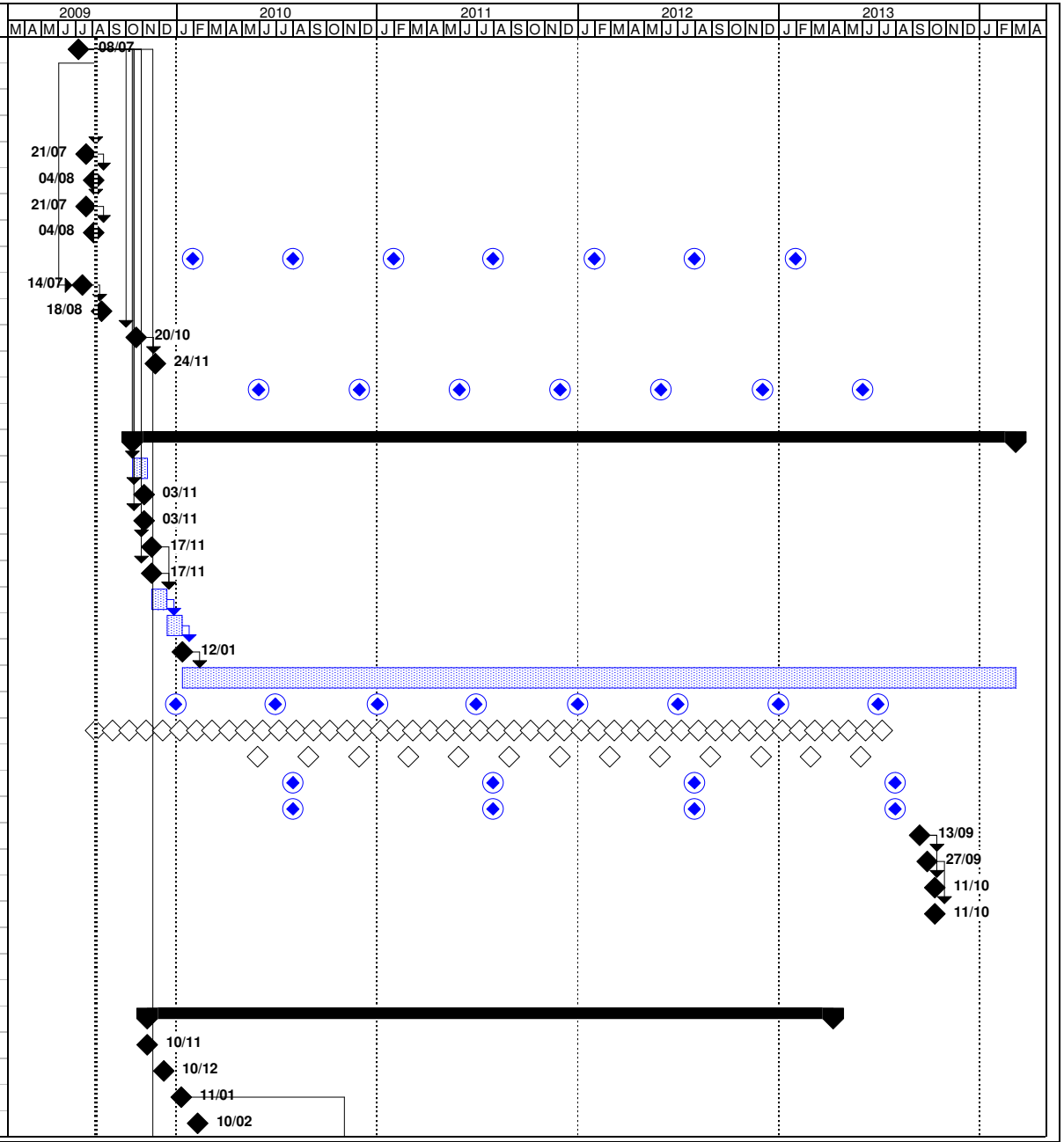

Figure 4.1 - Study Programme

Task | Milestone | Rolled Up Task
Progress | Summary | Rolled Up Milestone

Project: Agreement No. CE 4/2009 (EP) Environmental Monitoring and Audit for Contaminated Mud Pits at Sha Chau (2009-2013) - Investigation

ID	Task Name
137	February 2010
138	March 2010
139	October 2010
140	November 2010
141	December 2010
142	January 2011
143	February 2011
144	March 2011
145	October 2011
146	November 2011
147	December 2011
148	January 2012
149	February 2012
150	March 2012
151	October 2012
152	November 2012
153	December 2012
154	January 2013
155	February 2013
156	March 2013
157	**Submission of Initial Review Report**
158	**Submission of Quarterly EM&A Report**
159	Quarter 1 2010
160	Quarter 2 2010
161	Quarter 3 2011
162	Quarter 4 2011
163	Quarter 5 2012
164	Quarter 2 2012
165	Quarter 1 2013
166	**Submission of Annual Report**
167	Annual Report 1 2010
168	Annual Report 2 2011
169	Annual Report 3 2012
170	
171	**Alternative / Modified Capping Design**
172	
173	**Submission of Investigation Report**
174	**Submission of Annual Report**
175	Capping Design Annual Report 2010
176	Capping Design Annual Report 2011
177	Capping Design Annual Report 2012

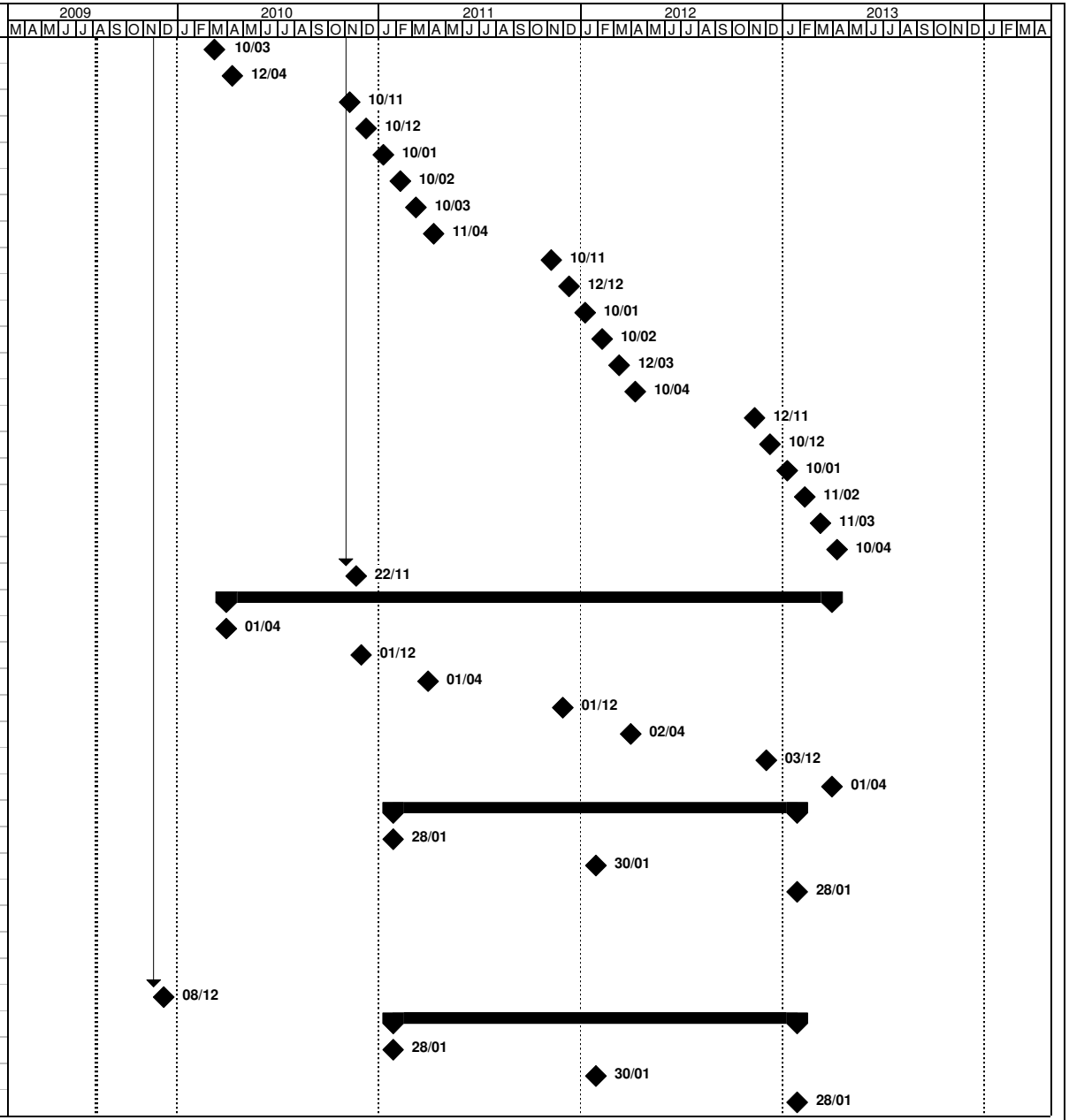

Figure 4.1 - Study Programme

Task | Milestone | Rolled Up Task
Progress | Summary | Rolled Up Milestone

Project: Agreement No. CE 4/2009 (EP) Environmental Monitoring and Audit for Contaminated Mud Pits at Sha Chau (2009-2013) - Investigation