








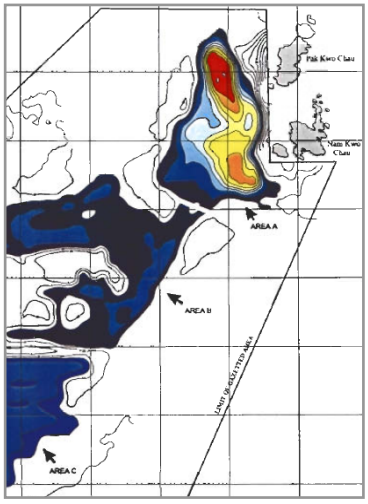

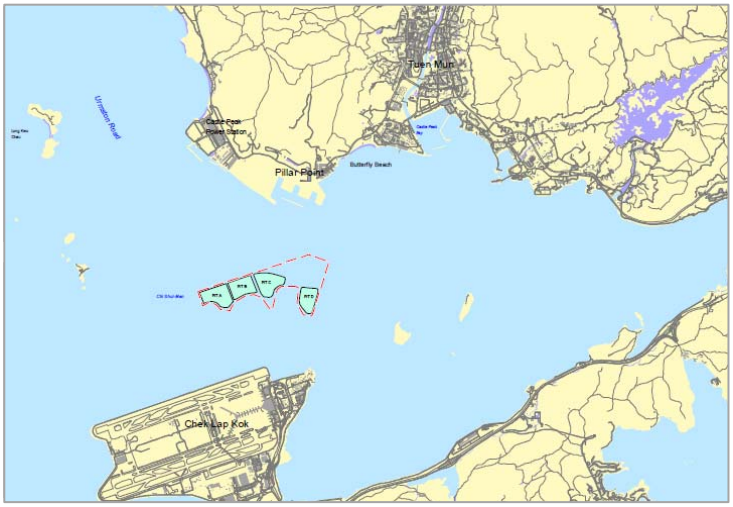

土木工程拓展署
Civil Engineering and Development Department

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

Agreement No. CE 4/2009(EP)

21st Monthly Progress Report for Contaminated Mud Pits at Sha Chau – March 2011

Revision 0

17 June 2011

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

21st Monthly Progress Report for Contaminated Mud Pits at Sha Chau – March 2011

Revision 0

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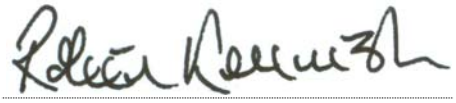
Client:	Project No:
Civil Engineering and Development Department (CEDD)	0103262
Summary: This document presents progress of monitoring works on contaminated mud pits at Sha Chau in March 2011 under Agreement No. CE 4/2009 (EP).	Date: 17 June 2011 Approved by:  *Dr Robin Kennish* *Director*

Revision	Description	By	Checked	Approved	Date
0	21st Monthly Progress Report for CMP – Draft	NZ	CAR	RK	17/06/11

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CONTENTS

ANNEXES

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

21st MONTHLY PROGRESS REPORT FOR CONTAMINATED MUD PITS AT SHA CHAU (for MARCH 2011)

June 2011

1.1 BACKGROUND

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. CMP IVc is presently in operation for backfilling by contaminated mud and is anticipated to reach its capacity in 2011. A series of four newly constructed seabed pits at the East of Sha Chau area, CMP Va-d, will be provided for the disposal of contaminated mud after CMP IVc is full. Dredging operations were completed for the construction of CMP Va and are now taking place to construct CMP Vb. The environmental monitoring and audit (EM&A) programme for the CMPs at the East of Sha Chau area presently covers disposal and capping operations at CMP IV and dredging operations at CMP Vb.

1.2 REPORTING PERIOD

This *Monthly Progress Report* covers the monitoring period of March 2011.

1.3 DETAILS OF SAMPLING AND LABORATORY TESTING ACTIVITIES

No field sampling activities were scheduled for CMP IVc in this monthly period. For CMP V, sampling for *Impact Monitoring during Dredging Operations* was conducted on 8 March 2011. A summary of field activities are presented in *Annex A*.

A summary of laboratory analysis results submitted by the Contractor in this reporting month is presented on *Table 1.1*.

Table 1.1 ***Summary of laboratory analysis results submitted by the Contractor during the reporting month***

Key Task	Monitoring Component	Results Received from the Contractor
CMP IV		
Demersal Trawling	Marine Biota	February 2011: *15 March 2011*
CMP V		
Impact Monitoring during Dredging Operations	Water Quality	March 2011: *15 March 2011*

1.4 DETAILS OF OUTSTANDING SAMPLING AND/OR ANALYSIS

No outstanding sampling and laboratory analysis remained from March 2011.

1.5 BRIEF DISCUSSION OF THE MONITORING RESULTS

Results of *Demersal Trawling* for February 2011 are presented for CMP IV and results of *Impact Monitoring during Dredging Operations* for March 2011 are presented for CMP V. Detailed results will be discussed in the *7th Quarterly Report*.

1.5.1 CMP IV

Demersal Trawling in February 2011

The final *Demersal Trawling* samples for the 2011 dry season were collected at CMP IV on 16 and 17 February 2011. Mean number of faunal species was relatively consistent between Impact and Reference stations (*Table 1.2*) but Number of Individuals, Biomass, Catch-per-Uni-Effort (CPUE) and Yield-per-Unit-Effort (YPUE) were notable higher at Impact station INA (*Table 1.3*). These results will be analysed in greater depth together with results from *Demersal Trawling* carried out in December 2010 and January 2011 in the *8th Quarterly Report*.

Table 1.2 ***Mean Number of Faunal Species caught February 2011 Monitoring.***

Date of Sampling	IMPACT STATIONS		REFERENCE STATIONS			
	INA	INB	TNA	TNB	TSA	TSB
Feb 2011	42.2	33.8	38.8	39.0	42.7	37.6

Table 1.3 Summary of CPUE and YPUE during February 2011 Monitoring

Station	Impact / Reference Area	No. of Individuals	Total Biomass (g)	Mean CPUE[#1] per Tow	Mean YPUE[#2] per Tow (g)
INA	Impact	38,468	343,150	7,694	68,630
INB	Impact	10,839	93,246	2,168	18,649
TNA	Reference	3,560	26,635	712	5,327
TNB	Reference	8,442	53,418	1,688	10,684
TSA	Reference	13,498	202,931	2,700	40,586
TSB	Reference	23,759	197,487	4,752	39,497

[#1] CPUE is calculated by dividing the number of individuals with the trawling time and number of nets (in hour and number of nets)

[#2] YPUE is calculated by dividing the weight (g) of fish with trawling effort (in hour and number of nets)

1.5.2 CMP V

Impact Water Quality Monitoring during Dredging Operations of CMP V – May 2011

Impact Water Quality Monitoring during Dredging Operations of CMP V was conducted on 24 May 2011. 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 V. 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).

Monitoring results are presented in *Table B1* of *Annex B*. Levels of Dissolved Oxygen (DO), Turbidity and Total Suspended Solids (TSS) complied with the Action and Limit Levels set in the *Baseline Monitoring Report* (1). Therefore, there appears to be no evidence of any unacceptable adverse water quality impacts arising from the dredging operations of CMP V at ESC.

1.6 ACTIVITIES SCHEDULED FOR THE NEXT MONTH

Pit Specific Sediment Chemistry Monitoring for CMP IV and *Impact Monitoring during Dredging Operations* for CMP V are scheduled in the next monthly period of April 2011. The sampling schedule is presented in *Annex A*.

1.7 STUDY PROGRAMME

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

(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.

Annex A

Sampling Schedule

Annex A1 - East of Sha Chau Environmental Monitoring and Audit Sampling Schedule until the end of 2011

			2011										
Water Column Profiling			**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Plume Stations	WCP1	6 times per year	2				2	2	2				2
	WCP2	6 times per year	2				2	2	2				2
Routine Water Quality Monitoring			**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Ebb Tide													
Impact Station Downcurrent	IPE1	2 times per year	*						*				
	IPE2	2 times per year	*						*				
	IPE3	2 times per year	*						*				
	IPE4	2 times per year	*						*				
	IPE5	2 times per year	*						*				
Intermediate Station Downcurrent	INE1	2 times per year	*						*				
	INE2	2 times per year	*						*				
	INE3	2 times per year	*						*				
	INE4	2 times per year	*						*				
	INE5	2 times per year	*						*				
Reference Station Upcurrent	RFE1	2 times per year	*						*				
	RFE2	2 times per year	*						*				
	RFE3	2 times per year	*						*				
	RFE4	2 times per year	*						*				
	RFE5	2 times per year	*						*				
Flood Tide													
Impact Station Downcurrent	INF1	2 times per year	*						*				
	INF2	2 times per year	*						*				
	INF3	2 times per year	*						*				
Intermediate Station Downcurrent	IPF1	2 times per year	*						*				
	IPF2	2 times per year	*						*				
	IPF3	2 times per year	*						*				
Reference Station Upcurrent	RFF1	2 times per year	*						*				
	RFF2	2 times per year	*						*				
	RFF3	2 times per year	*						*				
Pit Specific Sediment Chemistry	**Code**	**Frequency**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Active-Pit	NCA 1 - 8	3 times per year			*				*				*
	NCB 1 - 8	3 times per year			*				*				*
Pit-Edge	CPA 1-8	3 times per year			*				*				*
	CPB 1-8	3 times per year			*				*				*
Near-Pit	CNA 1-8	3 times per year			*				*				*
	CNB 1-8	3 times per year			*				*				*
Cumulative Impact Sediment Chemistry			**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Near-field Stations	RNA 1-9	2 times per year							*				*
	RNB 1-9	2 times per year							*				*
Mid-field Stations	RMA 1-9	2 times per year							*				*
	RMB 1-9	2 times per year							*				*
Capped Pit Stations	RCA 1-9	2 times per year							*				*
	RCB 1-9	2 times per year							*				*
Far-Field Stations	RFA 1-9	2 times per year							*				*
	RFB 1-9	2 times per year							*				*
Sediment Toxicity Tests			**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Near-Field Stations	TCA	2 times per year							3				3
	TCB	2 times per year							3				3
Reference Stations	TRA	2 times per year							3				3
	TRB	2 times per year							3				3
Benthic Recolonisation Studies			**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Capped Contaminated Mud Pits	CPA 1-3	2 times per year							3				3
	CPB 1-3	2 times per year							3				3
	CPC 1-3	2 times per year							3				3
Reference Stations	RBA 1-3	2 times per year							3				3
	RBB 1-3	2 times per year							3				3
	RBC 1-3	2 times per year							3				3
Demersal Trawling			**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Near Pit Stations	INA 1-5	4 times per year	5					5	5				
	INB 1-5	4 times per year	5					5	5				
Reference North	TNA 1-5	4 times per year	5					5	5				
	TNB 1-5	4 times per year	5					5	5				
Reference South	TSA 1-5	4 times per year	5					5	5				
	TSB 1-5	4 times per year	5					5	5				
Tissue/ Whole Body Sampling			**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Near-Pit Stations	INA	2 times per year	*						*				
	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	*						*				
Capping			**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Ebb Tide													
Impact Station Downcurrent	IPE1	4 times per year	3				3		3				3
	IPE2	4 times per year	3				3		3				3
	IPE3	4 times per year	3				3		3				3
	IPE4	4 times per year	3				3		3				3
	PFC1	4 times per year	3				3		3				3
Intermediate Station Downcurrent	INE1	4 times per year	3				3		3				3
	INE2	4 times per year	3				3		3				3
	INE3	4 times per year	3				3		3				3
	INE4	4 times per year	3				3		3				3
	INE5	4 times per year	3				3		3				3
Reference Station Upcurrent	RFE1	4 times per year	3				3		3				3
	RFE2	4 times per year	3				3		3				3
	RFE3	4 times per year	3				3		3				3
	RFE4	4 times per year	3				3		3				3
	RFE5	4 times per year	3				3		3				3
Flood Tide													
Impact Station Downcurrent	INF1	4 times per year	3				3		3				3
	PFC2	4 times per year	3				3		3				3
	INF3	4 times per year	3				3		3				3
Intermediate Station Downcurrent	IPF1	4 times per year	3				3		3				3
	IPF2	4 times per year	3				3		3				3
	IPF3	4 times per year	3				3		3				3
Reference Station Upcurrent	RFF1	4 times per year	3				3		3				3
	RFF2	4 times per year	3				3		3				3
	RFF3	4 times per year	3				3		3				3

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

Sampling completed

Annex A2 - East of Sha Chau Environmental Monitoring and Audit Sampling Schedule for CMP V until the end of 2011

		2011										
Water Quality Impact Monitoring for Dredging		**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Downcurrent Impact Stations	DS1	*	*	*	*	*	*	*	*	*	*	*
	DS2	*	*	*	*	*	*	*	*	*	*	*
	DS3	*	*	*	*	*	*	*	*	*	*	*
	DS4	*	*	*	*	*	*	*	*	*	*	*
	DS5	*	*	*	*	*	*	*	*	*	*	*
Upcurrent Stations	US1	*	*	*	*	*	*	*	*	*	*	*
	US2	*	*	*	*	*	*	*	*	*	*	*
Ma Wan Station	MW1	*	*	*	*	*	*	*	*	*	*	*

Sampling completed
Scheduled sampling

Annex B

Monitoring Results

Table B1 Summary Table of DO, Turbidity and TSS Levels recorded in March 2011

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average TSS Level (mg/L)
			Bottom	Surface and Mid Depth		
2011/03/08	ME	DS1	7.18	7.20	14.16	16.50
		DS2	7.18	7.21	12.56	15.50
		DS3	7.06	7.11	10.45	13.83
		DS4	7.10	7.17	9.30	10.17
		DS5	7.20	7.20	8.11	9.67
		MW1	7.23	7.18	3.00	4.17
		US1	7.37	7.35	23.37	30.00
		US2	7.39	7.36	14.83	20.17
	MF	DS1	7.33	7.45	14.64	20.00
		DS2	7.45	7.53	12.26	17.17
		DS3	7.57	7.56	10.72	12.83
		DS4	7.61	7.55	12.26	13.17
		DS5	7.57	7.51	7.25	8.33
		MW1	7.53	7.61	3.12	5.83
		US1	7.43	7.40	26.15	37.50
		US2	7.33	7.34	14.17	20.17

Annex C

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

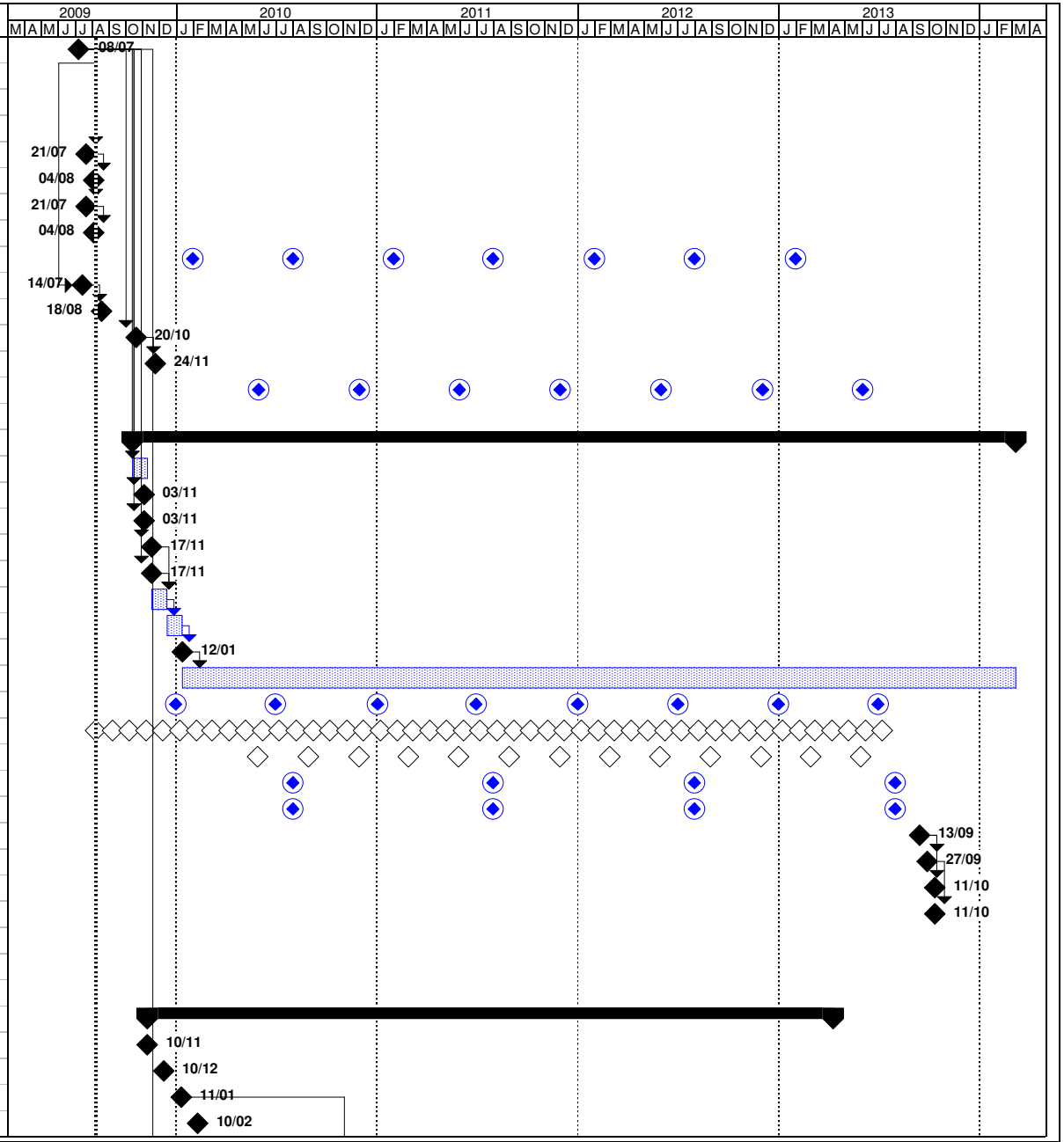

Figure 4.1 - Study Programme

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

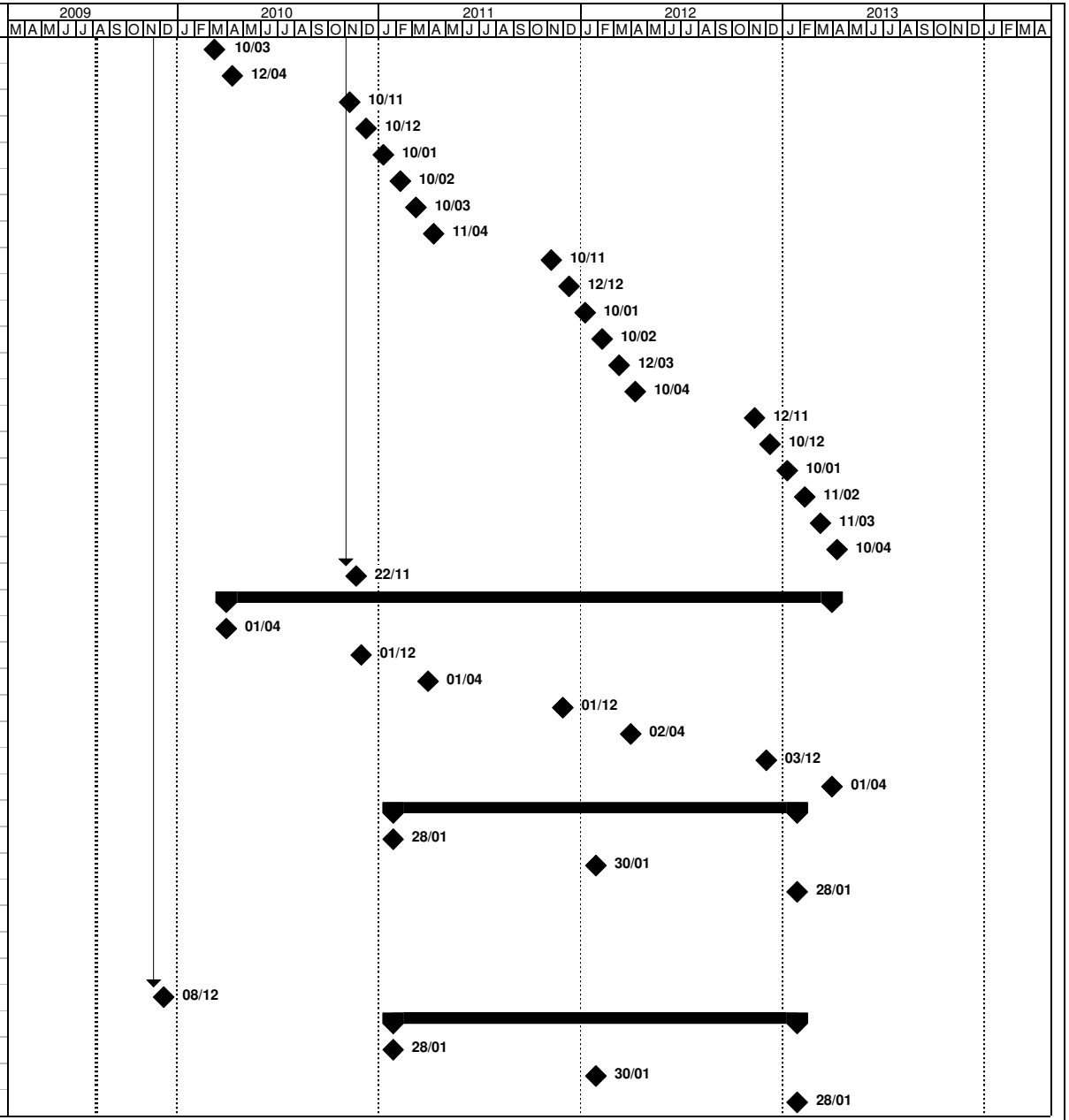

Figure 4.1 - Study Programme

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