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TEST REPORT

PENTA-OCEAN CONSTRUCTION COMPANY LIMITED

REMAINING ENGINEERING INFRASTRUCTURE WORKS FOR PAK SHEK KOK DEVELOPMENT PACKAGE 1 (CONTRACT NO.: TP 35/02)

QUARTERLY EM&A SUMMARY REPORT

(FROM JANUARY TO MARCH 2004)

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INDEPENDENT ENVIRONMENTAL CHECKER

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EXECUTIVE SUMMARY

This report is the fifth quarterly EM&A summary report (No.5) and has been prepared to document the impact monitoring works conducted for the Contract of the Remaining Engineering Infrastructure Works for Pak Shek Kok Development Package 1 (Contract No: TP 35/02) during the reporting period from 01 January to 31 March 2004.

Construction Progress in this Quarter

The major construction works in this quarter are as below:

Month	Major Activities
January	▪ Excavation of Culvert C10 and it associated outfall ▪ Cofferdam construction/sheetpiling for culvert C10 and pump station no.2 ▪ Drainage work in Area 1, Area 2, Area 9A, Area 9B, Area 7B, Zone S2 and Area 15 ▪ Re-removal RE wall works in Zone F, subway SB1 construction in Zone N2 ▪ Water main works in Area 8A and Zone A ▪ extraction of sheetpiling and backfilling for culvert C10 ▪ sewage works in Area 1, Area 15 and Area 6 ▪ installation of the Watermain works at Zone L ▪ formation of stockpile areas in Zone T ▪ modification of headwall and trapezoidal channel at Zone L ▪ bored piling works for pumping station No.1 ▪ construction of underpass extension structure ▪ roadworks for Area 1, 8A and 9B ▪ precasting works for twin DN 2500 pipe outfall
February	▪ *Excavation for twin DN 2500 pipes and it associated outfall* ▪ *Installation of precast unit for Twin DN 2500 Outfall* ▪ *Drainage work in Area 1, Area 2, Area 9A, Area 9B, Area 7B, Zone S2, Area 15* ▪ *Subway SB1 Finishing work in Zone N2* ▪ *Watermain works in Area 8A and Area 2, Area 9A and Area 15* ▪ *Sewage works in Area 1, Area 15 and Area 16* ▪ *Installation of the Watermain works at Zone L* ▪ *Formation of stockpile areas and hydroseeding in Zone T and J* ▪ *Modification of headwall and trapezoidal channel at Zone L* ▪ *Bored pilling works for D1 bridge* ▪ *Finishing workings for the PSK construction of underpass extension structure* ▪ *Bored pilling works for pump station no.1 and no.2* ▪ *Installation of foul sewer line at Zone L and under PSK bridge* ▪ *Roadworks for Area 1, Area 2, Area 8A and Area 8B* ▪ *Connection works to existing 5-cell culvert* ▪ *Sheetpiling works at pumping station no.2*
March	▪ *Excavation for twin DN 2500 pipes and it associated outfall* ▪ *Installation of precast unit for Twin DN 2500 Outfall* ▪ *Drainage work in Area 1, Area 2, Area 9A, Area 9B, Area 7B, Zone S2, Area 15* ▪ *Subway SB1 Finishing work in Zone N2* ▪ *Watermain works in Area 8A and Area 2, Area 9A and Area 15* ▪ *Sewage works in Area 1, Area 15 and Area 16* ▪ *Installation of the Watermain works at Zone L* ▪ *Formation of stockpile areas and hydroseeding in Zone T and J* ▪ *Modification of headwall and trapezoidal channel at Zone L* ▪ *Bored pilling works for D1 bridge* ▪ *Finishing workings for the PSK construction of underpass extension structure* ▪ *Bored pilling works for pump station no.1 and no.2* ▪ *Installation of foul sewer line at Zone L and under PSK bridge* ▪ *Roadworks for Area 1, Area 2, Area 8A and Area 8B* ▪ *Connection works to existing 5-cell culvert* ▪ *Sheetpiling works at pumping station no.2*

Environmental Monitoring Progress

The summary of the monitoring activities in this quarter is listed below:

- Noise Monitoring (Day-time): 13 Occasions at 3 designated locations;
- Noise Monitoring (Evening-time): 12 Occasions at 3 designated locations;
- Noise Monitoring (Holiday): 12 Occasions at 3 designated locations;
- 24-hour TSP Monitoring: 16 Occasions at 2 designated location;
- 1-hour TSP Monitoring: 38 Occasions at 2 designated locations;
- Weekly-site inspection: 13 Occasions.

Noise Monitoring

No exceedances of Action and Limit levels for noise monitoring were recorded in this quarter.

Air Monitoring

No exceedances of Action and Limit levels were recorded for 24-hr TSP and 1-hr TSP monitoring in this quarter.

Environmental Complaints

No environmental complaints were received in this reporting period.

Notification of summons and successful prosecutions

No notification of summons and prosecutions with respect to environmental issues registered in this quarter.

The monitored environmental data indicated that no unacceptable environmental impacts arising from the Project had been caused to the surrounding sensitive receivers. The environmental measures had been effective in controlling potential impacts to within acceptable sensitive receivers. However, the Contractor had been recommended to introduce more effort on environmental mitigation measures to minimize the environmental impact from the Project.

1.0 INTRODUCTION

Penta-Ocean Construction Co., Ltd. (POC) appointed Environmental Team (ET) of ETS-Testconsult Limited (ETL) to undertake the Environmental Monitoring and Audit for Remaining Engineering Infrastructure Works for Pak Shek Kok Development Package 1 (Contract No.: TP 35/02).

Under the requirements of Section 10 of Environmental Permit to Construct and Operate a Designate Project (EP-108/2001/AEP-108/2001), EM&A programme as set out in the EM&A Manual is required to be implemented. In accordance with the EM&A manual, environmental monitoring of air quality and noise is required for the Project. The EM&A requirement for each parameter are described in details in subsequent sections, including:

- All monitoring parameters;
- Action and Limit levels for all environmental parameters;
- Event-Action Plans;
- Environmental mitigation measures, as recommended in the project EIA study report;
- Environmental requirements in contract documents.

This quarterly EM&A summary report summarizes the impact monitoring results and audit findings of the EM&A program during the reporting period from 01 January to 31 March 2004. It covers 3 monthly reports produced for January 2004, February 2004 and March 2004.

2.0 PROJECT INFORMATION

2.1 Background

Remaining Engineering Infrastructure Works for Pak Shek Kok Development Package 1 (Contract No.: TP 35/02) was planned and designed by the Territory Development Department (TDD).

As the main Contractor of the captioned project: contracted by, POC will follow the environmental monitoring recommendation stated at the EM&A Manual that was prepared with reference to the EIA Study for Feasibility Study on the Pak Shek Kok Development Area (PSKDA) Environmental Monitoring and Audit Manual under Agreement No. CE 90/96.

2.2 Site Description

Generally, the construction site is located at Pak Shek Kok development area. Surrounding the construction site, there are two air sensitive receivers: HKIB Staff Accommodation and Cheung Shue Tan Village and three noise sensitive receivers: HKIB Staff Accommodation, CUHK Residence No.10 and Cheung Shue Tan Village.

Figure 1and 2 show the noise and air monitoring locations of this project.

2.3 Construction Programme

The details of construction programme (from January to March 2004) are shown in Appendix F.

2.4 Project Organization and Management Structure

The organization chart and lines of communication with respect to the on-site environmental management and monitoring program are shown in Appendix A.

2.5 Contact Details of Key Personnel

The key personnel contact names and telephone numbers, and construction programme are shown in table 2.1.

Table 2.1 Contact Details of Key Personnel

Organization	*Project Role*	*Name of Key Staff*	*Tel. No.*	*Fax No.*
TDD	*Employer*	*Mr. H W Lau*	*2158 5629*	---
Hyder	*Engineer*	*Mr. Herman Fong*	*2911 2233*	*2805 5028*
Hyder	*Independent Environmental Checker*	*Ir. Coleman Ng*	*2911 2233*	*2827 2891*
POC	*Contractor*	*Mr. Roger Lau*	*9870 6390*	*2691 6012*
ETL	*Contractor's Environmental Team*	*Mr C L Lau (Environmental Team Leader)*	*2946 7792*	*2695 3944*

3.0 CONSTRUCTION PROGRESS IN THIS QUARTER

The site area of this project is shown in Appendix G.

A summary of the major construction activities undertaken in this quarter is shown in Table 3.1.

Table 3.1 Major Construction Activities in this quarter

Location	*Major Construction Activity*
Area1, Area2, Area9A+9B, ZoneA, Area7B, ZoneS2 and Area15	*Drainage work and watermain installation works*
Zone F	*Re-removal RE wall works*
Zone N2	*Subway SR1 construction work*
Zone A, Area 8A, Area 2, Area 9A and Area 15	*Watermain works*
Area 1, Area 15 and Area 16	*Sewage works*
Zone L	*Installation of the Watermain works, modification of headwall and trapezoidal channel and Installation of foul sewer line.*
Zone T and J	*Formation of stockpile areas and hydroseeding*
Area 1, Area 2, Area 8A and Area 8B	*Roadworks*
Zone L	*Modification of headwall and trapezoidal channel*
Zone L and under PSK bridge	*Installation of foul sewer line*
---	*Cofferdam construction / sheetpiling for culvert C10 and pump station No.2*
---	*Extraction of sheetpiling and backfilling for culvert C10*
---	*Bored piling works for pumping station No.1, No.2 and D1 bridge*
---	*Construction of underpass extension structure*
---	*Excavation of Culvert C10 and its associated outfall*
---	*Precasting works for twin DN2500 pipe outfall*
---	*Excavation for twin DN 2500 pipes and it associated outfall*
---	*Installation of precast unit for Twin DN 2500 Outfall*
---	*Finishing workings for the PSK construction of underpass extension structure*
---	*Connection works to existing 5-cell culvert*
---	*Sheetpiling works at pumping station no.2*

4.0 AIR QUALITY MONITORING

4.1 Monitoring Locations

1-hour and 24-hour TSP monitoring are required to conducted to monitor the air quality, at designated monitoring locations:

- HKIB Staff Accommodation (on ground floor near the entrance facing south-east) for 1-hr TSP monitoring;
- Cheung Shue Tan Village (near the outer building, temple) for 1-hr TSP monitoring;
- Cheung Shue Tan Village (in front of Man Kee Store) for 24-hr TSP monitoring.

4.2 Monitoring Parameters, Frequency, Duration and Schedule

Table 4.1 summarizes the monitoring parameters, monitoring duration and frequencies of air quality monitoring. The air quality monitoring schedule for 24-hr and 1-hr TSP monitoring at designated monitoring locations in this quarter is summarized in table 4.2.

Table 4.1 Monitoring parameters, duration and frequency of impact air quality monitoring

Parameter	*Duration*	*Frequency*
24-hr TSP	*24 hr (0000-2400)*	*Once every six days*
1-hr TSP	*1 hr (0700-1900)*	*Three times every six days*

Table 4.2 Monitoring Schedule for the air quality monitoring stations

Air quality monitoring stations	*Location*	*Monitoring Period*						
		24-hr TSP				*1-hr TSP*		
		Start		*Finish*		*Date*	*Start*	*Finish*
		Date	*Time*	*Date*	*Time*			
AM1	*HKIB Staff Accommodation*	---				*03/01/04*	*10:40*	*11:40*
						06/01/04	*13:00*	*14:00*
						08/01/04	*09:20*	*10:20*
						10/01/04	*10:00*	*11:00*
						13/01/04	*15:15*	*16:15*
						15/01/04	*10:40*	*11:40*
						17/01/04	*11:35*	*12:35*
						19/01/04	*09:00*	*10:00*
						20/01/04	*09:35*	*10:35*
						21/01/04	*13:10*	*14:10*
						27/01/04	*08:40*	*09:40*
						29/01/04	*09:45*	*10:45*
						31/01/04	*10:00*	*11:00*
						03/02/04	*08:41*	*09:41*
						05/02/04	*10:04*	*11:04*
						07/02/04	*09:30*	*10:30*
						10/02/04	*10:45*	*11:45*
						12/02/04	*09:30*	*10:30*
						14/02/04	*10:32*	*11:32*
						17/02/04	*08:31*	*09:31*
						19/02/04	*13:13*	*14:13*
						21/02/04	*10:00*	*11:00*
						24/02/04	*10:21*	*11:21*
						26/02/04	*13:12*	*14:12*
						28/02/04	*13:08*	*14:08*
						02/03/04	*10:53*	*11:53*
						04/03/04	*08:45*	*09:45*
						06/03/04	*13:02*	*14:02*
						09/03/04	*10:30*	*11:30*
						11/03/04	*10:48*	*11:48*
						13/03/04	*13:06*	*14:06*
						16/03/04	*10:40*	*11:40*
						18/03/04	*10:31*	*11:31*
						20/03/04	*09:10*	*10:10*
						23/03/04	*10:08*	*11:08*
						25/03/04	*13:08*	*14:08*
						27/03/04	*09:40*	*10:40*
						30/03/04	*09:45*	*10:45*

Air quality monitoring stations	Location	Monitoring Period						
		24-hr TSP				1-hr TSP		
		Start		Finish		Date	Start	Finish
		Date	Time	Date	Time			
AM3	Cheung Shue Tan Village (near the outer building, temple)	---				03/01/04	15:00	16:00
						06/01/04	14:38	15:38
						08/01/04	13:50	14:50
						10/01/04	14:50	15:50
						13/01/04	15:43	16:43
						15/01/04	09:05	10:05
						17/01/04	09:40	10:40
						19/01/04	10:15	11:15
						20/01/04	10:50	11:50
						21/01/04	14:25	15:25
						27/01/04	10:15	11:15
						29/01/04	13:21	14:21
						31/01/04	11:15	12:15
						03/02/04	13:18	14:18
						05/02/04	14:02	15:02
						07/02/04	14:35	15:35
						10/02/04	13:08	14:08
						12/02/04	15:04	16:04
						14/02/04	14:07	15:07
						17/02/04	13:10	14:10
						19/02/04	15:18	16:18
						21/02/04	11:15	12:15
						24/02/04	13:08	14:08
						26/02/04	14:45	15:45
						28/02/04	14:41	15:41
						02/03/04	15:00	16:00
						04/03/04	12:30	13:30
						06/03/04	14:28	15:28
						09/03/04	15:35	16:35
						11/03/04	13:02	14:02
						13/03/04	14:30	15:30
						16/03/04	15:15	16:15
						18/03/04	09:10	10:10
						20/03/04	10:30	11:30
						23/03/04	15:39	16:39
						25/03/04	10:31	11:31
						27/03/04	13:00	14:00
						30/03/04	13:09	14:09
AM1	HKIB Staff Accommodation	02/01/04	10:45	03/01/04	10:45			
		08/01/04	09:20	09/01/04	09:10			
		14/01/04	14:45	15/01/02	14:45			
		20/01/04	10:15	21/01/04	10:15			
		26/01/04	14:15	27/01/04	14:15			
		30/01/04	09:20	31/01/04	09:20			
		05/02/04	11:00	06/02/04	11:00			
		11/02/04	09:00	12/02/04	09:00			
		17/02/04	13:20	18/02/04	13:06			
		23/02/04	09:00	24/02/04	09:07			
		27/02/04	16:30	28/02/04	16:15			
		04/03/04	15:45	05/03/04	15:39			
		10/03/04	17:15	11/03/04	17:15			
		16/03/04	10:30	17/03/04	09:53			
		22/03/04	11:10	23/03/04	11:14			
		26/03/04	12:55	27/03/04	13:11			
AM3A	Cheung Shue Tan (in front of Man Kee Store)	02/01/04	11:00	03/01/04	11:00	---		
		08/01/04	13:40	09/01/04	13:40			
		14/01/04	14:10	15/01/02	14:10			
		20/01/04	13:30	21/01/04	13:30			
		26/01/04	14:30	27/01/04	14:30			
		30/01/04	09:30	31/01/04	09:30			
		05/02/04	14:15	06/02/04	14:15			
		11/02/04	09:20	12/02/04	09:20			
		17/02/04	14:50	18/02/04	14:50			
		23/02/04	09:30	24/02/04	09:30			
		27/02/04	11:05	28/02/04	11:05			
		04/03/04	16:05	05/03/04	16:05			
		10/03/04	17:35	11/03/04	17:35			
		16/03/04	11:15	17/03/04	11:25			
		22/03/04	11:25	23/03/04	11:48			
		26/03/04	12:40	27/03/04	12:52			

4.3 Wind Data Monitoring

Wind data (wind speed and wind direction) were directly extracted from Sha Tin Station (located at Sha Tin Race Course) of Hong Kong Observatory. All wind data during this reporting period are shown in Appendix D.

4.4 Action and Limit Levels

Action and Limit levels for 24-hr TSP and 1-hr TSP derived as illustrated in Table 4.3.

Table 4.3 Action and Limit Levels for 24-hr TSP and 1-hr TSP

Monitoring Location	*24-hr TSP ($\mu g/m^3$)*		*1-hr TSP ($\mu g/m^3$)*	
	Action Level	*Limit Level*	*Action Level*	*Limit Level*
AM1	*164 **	*260 **	*325 **	*500 **
AM3	---	---	*306*	*500*
AM3A	*183*	*260*	---	---

* = Reference to the information contained in the Baseline Monitoring Report submitted under the "Advance Engineering Infrastructure Works for Pak Shek Kok Development – Southern Access Road and Sewage Pumping Station No.3

4.5 Event-Action Plans

Please refer to Appendix E for details.

4.6 Air Quality Monitoring Results

4.6.1 24-hour TSP Monitoring

24-hour TSP monitoring was carried out at monitoring stations, AM1 and AM3 in the reporting period. Graphical presentation of 24-hour TSP monitoring results for these reporting months is shown in Appendix B.

No exceedances of Action and Limit Level of 24-hour TSP monitoring results were recorded during the reporting period.

4.6.2 1-hour TSP Monitoring

1-hour TSP monitoring was carried out at monitoring stations, AM1 and AM3 in the reporting period. Graphical presentation of 1-hour TSP monitoring results for these reporting months is shown in Appendix B.

No exceedances of Action and Limit Level of 1-hour TSP monitoring results were recorded during the reporting period.

5.0 Noise Monitoring

5.1 Monitoring Locations

As the requirement in EM&A Manual, noise monitoring was conducted at designated monitoring locations:

- HKIB Staff Accommodation (on ground floor near the entrance facing south-east);
- Cheung Shue Tan Village (near the outer building, temple);
- CUHK Residence No.10.

5.2 Monitoring Parameters, duration, Frequency and Schedule

Noise monitoring for the A-weighted levels Leq, L10 and L90 were recorded. The following guide on the regular monitoring frequency for each monitoring station on a per week basis when noise generating activities are underway:

- *One set of measurements between 0700-1900 hours on normal weekdays (6 consecutive $L_{eq(5\text{-}min)}$);*
- *One set of measurements between 1900-2300 hours (3 consecutive $L_{eq(5\text{-}min)}$)*;*
- *One set of measurements between 2300-0700 hours of next day (3 consecutive $L_{eq(5\text{-}min)}$)*;*
- *One set of measurements between 0700-1900 hours on holidays (3 consecutive $L_{eq(5\text{-}min)}$)*.*

(*): Noise monitoring to be conducted only when there is construction work.

Duration, frequencies and parameters of noise measurement are presented in Table 5.1.

Table 5.1 Duration, Frequencies and Parameters of Noise Monitoring

Time period	*Duration/min*	*Parameters*	*Frequency*
Day-time: 0700-1900 hrs on normal weekday	*30*	L_{eq}, L_{10}, L_{90}	*Once per week*
Evening-time: 1900-2300 hrs	*15*	L_{eq}, L_{10}, L_{90}	*Once per week*
Night-time: 2300-0700 hrs of next day	*15*	L_{eq}, L_{10}, L_{90}	*Once per week*
Holiday: 0700-1900 hrs	*15*	L_{eq}, L_{10}, L_{90}	*Once per week*

The noise monitoring programme of monitoring locations (Day-time, Evening-time, Holiday and Night-time) is summarized in Table 5.2.

Table 5.2 Monitoring Schedule for noise monitoring stations

Noise monitoring stations	*Monitoring Period*							
	Day-time		*Evening-time*		*Holiday*		*Night-time*	
NM1	*06/01/04*	*13:10*	*06/01/04*	*19:05*	*04/01/04*	*08:50*	---	---
	13/01/04	*09:30*	*13/01/04*	*19:02*	*11/01/04*	*14:26*	---	---
	20/01/04	*09:40*	*20/01/04*	*20:10*	*18/01/04*	*08:40*	---	---
	27/01/04	*08:45*	*27/01/04*	*19:16*	*25/01/04*	*11:40*	---	---
	03/02/04	*08:55*	*03/02/04*	*19:05*	*01/02/04*	*11:02*	---	---
	10/02/04	*10:41*	*10/02/04*	*19:00*	*08/02/04 **	---	---	---
	17/02/04	*08:40*	*17/02/04*	*19:00*	*15/02/04*	*13:40*	---	---
	24/02/04	*10:26*	*24/02/04*	*19:00*	*22/02/04*	*14:12*	---	---
	---	---	---	---	*29/02/04*	*09:25*	---	---
	02/03/04	10:55	02/03/04	19:05	07/03/04	14:10	---	---
	09/03/04	10:35	09/03/04	19:00	14/03/04	13:48	---	---
	16/03/04	10:32	16/03/04	19:18	21/03/04	09:00	---	---
	23/03/04	10:10	23/03/04	20:50	28/03/04	11:56	---	---
	30/03/04	10:02	30/03/04 *	---	---	---	---	---
NM2	*06/01/04*	*16:00*	*06/01/04*	*19:30*	*04/01/04*	*09:30*	---	---
	13/01/04	*15:50*	*13/01/04*	*19"40*	*11/01/04*	*14:55*	---	---
	20/01/04	*11:00*	*20/01/04*	*19:37*	*18/01/04*	*10:05*	---	---
	27/01/04	*09:50*	*27/01/04*	*19:53*	*25/01/04*	*10:52*	---	---
	03/02/04	*11:30*	*03/02/04*	*19:30*	*01/02/04*	*11:39*	---	---
	10/02/04	*11:20*	*10/02/04*	*19:35*	*08/02/04 **	---	---	---
	17/02/04	*16:38*	*17/02/04*	*19:25*	*15/02/04*	*14:15*	---	---
	24/02/04	*14:19*	*24/02/04*	*19:40*	*22/02/04*	*14:48*	---	---
	---	---	---	---	*29/02/04*	*09:50*	---	---
	02/03/04	16:20	02/03/04	19:42	07/03/04	14:45	---	---
	09/03/04	11:40	09/03/04	19:25	14/03/04	14:18	---	---
	16/03/04	16:30	16/03/04	19:50	21/03/04	09:25	---	---
	23/03/04	11:25	23/03/04	20:20	28/03/04	10:50	---	---
	30/03/04	13:55	30/03/04 *	---	---	---	---	---

Remark: (*) indicated that the noise monitoring at 08/02/04 and 30/03/04 were cancelled due to the rain.

Noise monitoring stations	Monitoring Period							
	Day-time		Evening-time		Holiday		Night-time	
NM3	06/01/04	16:30	06/01/04	20:00	04/01/04	10:05	---	---
	13/01/04	15:18	13/01/04	20:15	11/01/04	15:20	---	---
	20/01/04	10:55	20/01/04	19:05	18/01/04	09:30	---	---
	27/01/04	11:20	27/01/04	20:25	25/01/04	10:15	---	---
	03/02/04	14:30	03/02/04	19:55	01/02/04	12:16	---	---
	10/02/04	13:00	10/02/04	20:10	08/02/04 *	---	---	---
	17/02/04	17:15	17/02/04	19:50	15/02/04	14:55	---	---
	24/02/04	15:25	24/02/04	20:18	22/02/04	15:16	---	---
	---	---	---	---	29/02/04	10:25	---	---
	02/03/04	15:05	02/03/04	20:14	07/03/04	15:20	---	---
	09/03/04	15:40	09/03/04	19:50	14/03/04	14:50	---	---
	16/03/04	15:20	16/03/04	20:14	21/03/04	09:50	---	---
	23/03/04	15:43	23/03/04	19:45	28/03/04	11:20	---	---
	30/03/04	13:13	30/03/04 *	---	---	---	---	---

Remark: (*) indicated that the noise monitoring at 08/02/04 and 30/03/04 were cancelled due to the rain.

5.3 Action and Limit Levels

The Action and Limit levels for noise levels derived as illustrated in Table 5.3.

Table 5.3 Action and Limit Levels for noise monitoring

Time Period	Time Period	Action	Limit
Normal hours	0700-1900 hrs on normal weekdays	When one documented complaint is received	75 dB(A) *
Holiday	0700-1900 hrs on holidays		70 dB(A) **
Evening-time	1900-2300 hrs on all other days		
Night-time	2300-0700 hrs of next day		55 dB(A) **

* = Reduce to 70 dB(A) for schools and 65 dB(A) during school examination periods.
** = Area Sensitivity Rating (ASR) C is selected from the "Technical Memorandum on Noise from Construction Work Other Than Percussive Piling".

5.4 Event-Action Plans

Please refer to the Appendix E for details.

5.5 Noise Monitoring Results

Day-time, Evening-time and Holiday noise monitoring were carried out at monitoring Stations, NM1, NM2 and NM3 in this reporting period. No night-time noise monitoring were required since no construction works were processed during the night-time period. Graphical presentation of the monitoring results for these reporting months are shown in Appendix C.

No day-time, evening-time and holiday noise monitoring results at all monitoring stations exceeded the Action Level since no documented complaints were received in this reporting period. Besides, no exceedances in Limit Level were recorded according to the results from day-time, evening-time and holiday noise monitoring.

6.0 WASTEWATER MONITORING

6.1 According to the Discharge of Industrial Trade Effluent Licence (Licence No.: 2946), POC is required to carry out wastewater monitoring of suspended solids quarterly at all effluent discharge points within the site.

6.2 POC appointed ET of ETL to sampling the wastewater samples at the effluent discharge points. The collected sample will be transport to the Environmental Laboratory of ETL for suspended solids content analysis. The Environmental Laboratory of ETL is HOKLAS accredited and the test method used for suspended solids analysis is also HOKLAS accredited in accordance with the 2540D of Standard Methods for the Examination of Water and Wastewater (APHA 19th edition).

6.3 Under the Wastewater Discharge Licence (No.: 2946), the discharge limit of Suspended Solids content of the effluent at this site should be 30mg/L. It means that the suspended solids of wastewater discharged should be less than 30mg/L or otherwise no wastewater can be discharged under this Licence.

6.4 During this quarter, one wastewater monitoring was carried out.

During March 2004, the wastewater monitoring was carried out by ET at 27 March 2004 at two discharges points. The locations of these discharge points were shown in the figures at Appendix G. During this monitoring, two wastewater samples were collected from these effluent discharge points and transport to ETL immediately for analysis. The results of suspended solids content of these wastewater samples were found below 30mg/L and within the discharge limit of the Discharge Licence.

6.5 The test reports for these two wastewater monitoring were attached in Appendix I.

7.0 Review of the Reasons for and the implications of Non-compliance

According to the summary of environmental monitoring results, no exceedances of noise and air quality monitoring were recorded in this quarter. Hence, no further mitigation measures and action were required.

8.0 Summary of Environmental Complaints

No environmental complaints on this Project were received in this quarter. A statistical summary of environmental complaints is presented in Table 8.1.

Table 8.1 Statistical Summary of Environmental Complaints

Reporting Month	*Complaints Statistics*		
	Frequency	*Cumulative*	*Complaint Nature*
January 2004	*0*	*0*	*N/A*
February 2004	*0*	*0*	*N/A*
March 2004	*0*	*0*	*N/A*

9.0 Environmental Summons

There were no notification of summons respect to environmental issues registered in this quarter. Cumulative log of Notification of Summons and Prosecution is tabulated in Table 9.1.

Table 9.1 Cumulative Log of Notification of Summons and Prosecution

Date	*Detail of Notice of Summons or Prosecution*	*Action Taken*	*Environmental Outcome*
16 Oct 2002	*The site main haul road was neither paved with any one of concrete, bituminous materials, hard core or metal plates, nor had the entire road surface maintained wet by the spraying of water or dust suppression chemical.*	• *POC paved the site main haul road with concrete and bituminous materials;* • *The road surface was wet by the spraying of water regularly by POC.*	*It was observed that the problem of dust emission from the site main haul road has been improved. No further complaint or ticket was received until September 2003.*

Date	Detail of Notice of Summons or Prosecution	Action Taken	Environmental Outcome
11 July 2003	Three stockpiles of dusty material namely aggregate, were wither covered entirely by impervious sheeting, nor place in an area sheltered on top and three sites, nor sprayed with water or dust suppression chemical so as to maintain entire surface wet.	The stockpiles of aggregates / excavated materials were covered with tarpaulin sheet / sprayed with water in order to avoid the dust emission.	No further complaints were received during the reporting month.

10.0 Status of Environmental Licensing and Permitting

All permits/licenses obtained in this quarter are summarises in Table 10.1.

Table 10.1 Summary of environmental licensing and permit status

Description	Permit No.	Valid Period		Section
		From	To	
Environmental Permit	EP-108/2001	05/11/02	---	Whole work site
Construction Noise Permit (Percussive Piling)	PP-TN0005-04	18/02/04	18/06/04	1 drop hammer driving steel sheet pile
Construction Noise Permit	GW-TN0299-2003	27/08/03	26/02/04	Group A: • 2 Dump trucks (CNP 067) • 2 Excavator, tracked (CNP 081) • 1 Generator, super silenced, 70dB(A) at 7m (CNP 103) • 1Bulldozer (CNP 030) Group B: • 1 Dump trucks (CNP 067) • 2 Excavator, tracked (CNP 081) • 1 Generator, super silenced, 70dB(A) at 7m (CNP 103) • 1 Water pump (electric) (CNP 281) Group C: • 1 Dump trucks (CNP 067) • 2 Excavator, tracked (CNP 081) • 1 Generator, super silenced, 70dB(A) at 7m (CNP 103) • 1 Crane, mobile (diesel) (CNP 048) Group D: • 2 Poker, vibratory, hand-held (CNP 170) • 1 Concrete pump, lorry mounted (CNP 047) • 2 Concrete lorry mixer (CNP 044) Group E: • 2 Concrete lorry mixer (CNP 044) • 1 Crane, mobile (CNP 048) • 1 Piling, large diameter bored, oscillator (CNP 165) Group F: • 1 Air compressor, with noise emission label, Sound Power Level ≤ 102 dB(A) • 1 Crane, mobile (diesel) (CNP 048) • 1 Generator, silenced, 75 dB(A) at 7m (CNP 102) • 1 Piling, large diameter bored, reverse circulation drill (CNP 166) Group G: • 2 Excavator, tracked (CNP 081) • 1 Generator, super silenced, 70 dB(A) at 7m (CNP 103)

Description	Permit No.	Valid Period		Section
		From	To	
Construction Noise Permit (General / Prescribed construction works)	GW-TN0095-04	15/03/04	14/09/04	Group A (For Area B or C): • 1 Dump truck (CNP 067) • 2 Excavator, tracked (CNP 081) • 1Bulldozer (CNP 030) Group B (For Area A, D or E): • 1 Dump trucks (CNP 067) • 1 Excavator, tracked (CNP 081) Group C (For Area B, B2 or E): • 1 Crane, mobile (CNP 048) • 1 Generator (CNP 102) • 1 Vibration Hammer • 1 Power Pack Group D (For Area B2 or E): • 1 Generator (CNP 102) • 1 Crane, mobile (CNP 048) • 1 Oscillator, piling large diameter bored (CNP 165) • 2 Concrete lorry mixers (CNP 044) Group E (For Area B2 or E): • 2 Concrete lorry mixers (CNP 044) • 1 Concrete pump lorry (CNP047) • 1 Poker, handheld (CNP 170) Group F (For Area B2 or E): • 2 Concrete lorry mixers (CNP 044) • 1 Crane, mobile (CNP 048) • 1 Poker, handheld (CNP 170) Group G (For Area B, C or D): • 2 Concrete lorry mixers (CNP 044) • 1 Excavator, tracked (CNP 081) • 1 Poker, handheld (CNP 170) Group H (For Area B2 or E): • 1 Air compressor, air flow >10m^3/min and ,30m^3/min (CNP 002) • 1 Crane, mobile (diesel) (CNP 048) • 1 Generator, silenced, 75 dB(A) at 7m (CNP 102) • 1 piling, large diameter bored crab and chisel (CNP 164) • 1 piling, large diameter bored oscillator (CNP 165) • 1 Piling, large diameter bored, reverse circulation drill (CNP 166) Group I (For Area B, C or D): • 1 Dump truck (CNP 067) • 1 Asphalt Paver (CNP 004) • 1 Roller, vibratory (CNP 186) • 1 Road Roller (CNP 185) Group J (For Area A or F): • 1 Excavator, tracked (CNP 081) • 1 Roller, vibratory (CNP 186)
Waste Producer	5213 729 P2800 11	03/10/02	---	Generating waste at the work site
Wastewater Discharge License	No. 2946	18/12/02	18/12/07	Discharge of trade Effluent, surface run-off and all other wastewater arising from the construction site and sedimentation tank

11.0 WASTE MANAGEMENT

11.1 Summary of Waste Quantities

The summary of waste generated at the site in the reporting period is summarized in Table 11.1.

Table 11.1 Summary of Quantities of Waste generated at this reporting period

Type of Waste	*Quantity*	*Disposal Location*
C&D Material (Inert) (m^3)	*0*	*Nil*
C&D material (Non-inert) (m^3)	*0*	*Disposed of at SENT Landfills*
General Refuse (m^3)	*85*	*Disposed at NENT Landfills*
Chemical Waste (L)	*400*	*Collected by licensed waste hauliers*

12.0 SITE INSPECTION / AUDIT

12.1 Summary of Weekly Site Inspection and Monthly Joint Site Audit Findings

Weekly site inspection was carried out by the ET. A total 13 weekly site inspections were undertaken in this quarter. Monthly joint site audit was carried out by the RE, the IEC, POC and ET at 16 January, 19 February and 25 March 2004 in this quarter. The summary of weekly site inspection and monthly joint site audit findings from this quarter is shown in Table 12.1.

Table 12.1 Summaryof Weekly Site Inspection and Monthly Joint Site Audit Findings

January 2004				
Item	*Aspects*	*Findings*	*Action(s) taken by POC*	*ET Verification*
1	*Water (NC)*	*During monthly site inspection, it was found that excavation of a trench was undertaken in the nullah. There were stockpiles of excavated materials in the nullah. This is not an acceptable practice as the soft excavated soil was washed away and eventually discharged into Tolo Harbour. Removal of the stockpiles or other possible measures should be taken to stop polluting the water I the nullah. Immediate rectification is required.*	*The stockpiles of excavated materials were already removed, aggregates and geotextile were used to act as bund to prevent the pollution of nullah.*	*During the subsequent weekly site inspection, it was found that the stockpiles of excavated materials were removed. Aggregates and geotextile were used to prevent the excavated soil and silty water discharging into the Tolo Harbour*
2	*Water (Obs)*	*Oil stain near the generator for the high pressure water jet at the northern exit was observed during monthly site inspection. Oil filling should be performed carefully.*	*The subcontractor was reminded to fill the generator more carefully.*	*During the subsequent weekly site inspection, it was found that the oil stain near the generator had been removed and treated as chemical waste. POC had reminded the subcontractors to fill or repair the generator more carefully to prevent oil spillage.*
3	*Water (Obs)*	*During monthly and weekly site inspections, muddy deposit surrounding the storm drains near the wheel washing area at the northern exit was observed. The mud should be removed immediately and the runoff from wheel washing should be directed to the wheel washing bay.*	*The mud deposit surrounding the storm drains near the wheel washing area at the northern exit was already removed.*	*During the subsequent weekly site inspection, it was found that the mud deposit surrounding the storm drains near the wheel washing area at the northern exit had been removed.*
4	*Water (Obs)*	*A concrete lorry was washing outside the site exit at the northern side. All vehicle washing should be conducted within the site during monthly site inspection.*	*The subcontractor was reminded to use wheel washing bay before leaving the site.*	*During the subsequent ET weekly site inspection, subcontractor's vehicle was found using wheel washing bay before leaving the site.*

January 2004				
Item	Aspects	Findings	Action(s) taken by POC	ET Verification
5	Air (Obs)	Some of the stockpiles of C&D and excavated materials were not entirely covered during monthly site inspection. They should be backfilled, entirely covered with impervious tarpaulin sheets or hydroseeded, especially before the holidays.	The stockpile of C&D and excavated material were covered with tarpaulin sheets, some slope of the stockpile was already hydroseeded.	During the subsequent weekly site inspection, part of the stockpile of C&D and excavated material were covered with tarpaulin sheets or hydroseeded. POC was reminded to cover or wet the stockpiles especially before the holidays at dry season.
6	Air (Obs)	It was found that some of the offsite vehicles occupied by other contractors had not used the Northern Wheel-washing Bay before leaving the site during weekly site inspection.	The subcontractors were reminded to use the wheel washing facilities. Instruction and training were provided to the driver to use the wheel washing facilities.	Most of vehicles were found to use the Northern wheel-washing bay before leaving the site during weekly site inspection. However, POC was still reminded to display notice in front of site exit to instruct their workers and subcontractors to use wheel washing bay before leaving the site.
7	Air (Obs)	The haul road was found to be dry and dusty during weekly site inspection.	Water tracks were arranged to spray the haul road by water to reduce the dust emission.	During the subsequent weekly site inspection, it was found that some sections of the haul road were found to be wet but some were still dry. POC was reminded to increase the frequency of water spraying by water tanker when necessary.
8	Waste (Obs)	During monthly site inspection, concrete residue was found at different site areas. Concrete residue should be reused as far as possible. Designated areas for temporary storage, proper disposal of the frequent removal of concrete waste are recommended.	Concrete residue will be removed regularly and arranged to reused surface paving.	During the subsequent weekly site inspection, it was found that concrete residual was still found at different site areas. POC was reminded that the concrete residual should be removed and stored properly before reused.
9	Waste (Obs)	Segregation of waste and the excavated materials from bore-piling should be performed properly on site during monthly site inspection.	Segregation of waste and excavated materials was performed properly.	During the subsequent weekly site inspection, it was found that segregation of waste and excavated materials from bore-pilling was performed. POC was still reminded to segregate waste and excavated material before storage and disposal.
10	Waste (Obs)	Rubbish were deposited on bare ground in the construction site during weekly site inspections.	Rubbish receptacles were provided at the site area.	During the subsequent weekly site inspection, rubbish were still observed on the bare ground although rubbish receptacles were provided. Therefore, POC was reminded to provide training or instruction to the workers and the Subcontractors to deposit the rubbish receptacles. Besides, rubbish receptacles with cover should be provided at this area.

February 2004				
Item	Aspects	Findings	Action(s) taken by POC	ET Verification
1	Air (Obs)	During monthly site inspection, concrete breaking by hydraulic breaker was undertaking at Zone R and fugitive dust was generated due to no dust mitigation measure being implemented. Water spraying should be provided during such dusty activity.	Workers were trained and instructed to implement dust mitigation measure like water spraying during the operation of breaker for the concrete breaking activities.	During the subsequent weekly site inspection, it was found that no fugitive dust was observed during such construction activities.
2	Water (Obs)	During monthly site inspection, outfall installation was undertaken at L4 road and a silt curtain was placed outside the outfall. However, the length of silt curtain was too short that it could not enclose the outfall entirely and soil at the landward side was washed away by tidal motion. POC should increase the length of the silt curtain and to provide measure(s) to prevent washing away of soil (e.g. prevent seawater getting in).	The length of the silt curtain was increased to enclose the outfall entirely.	During the subsequent weekly site inspection, it was found that the length of silt curtain was increased to enclose the outfall entirely.
3	Waste (Obs)	Accumulation of general refuses was found adjacent to the haul road at the southern wheel washing area. It was suspected that the refuses were dumped by other contractor of another project, however, POC should follow up the situation to prevent recurrence.	More man power will be provided to collected and disposed routinely to prevent accumulation of wastes within the site area.	During the subsequent weekly site inspection, it was found that most of general refuses were collected and disposed. But, few general refuses were still found at this area. POC was reminded to provide more man power to collect and dispose the waste generated at the site routinely.
4	Air (Obs)	Open stockpiles were occasionally found onsite. It should be covered by impervious sheeting, hydroseeded or wetted regularly.	The stockpiles will be either covered by tarpaulin sheet, hydroseeded or wetted regularly to prevent dust emission.	During the subsequent weekly site inspection, part of the stockpiles was covered with tarpaulin sheets or hydroseeded. POC was reminded to cover or wet the stockpiles immediately.
5	Air (Obs)	Silt trails were found on Science Park Road and it was due to incomplete wheel washing of site vehicles is properly implemented and the silt in the wheel washing bay is removed regularly.	Silt trails found at Science Park Road were already cleaned. Workers were instructed to use the wheel washing bay before offsite.	During the subsequent weekly site inspection, it was found that Silt trails found at Science Park Road were already cleaned.
6	Air (Obs)	The haul road was found to be dry and dusty during weekly site inspection.	Water tracks were arranged to spray the haul road by water to reduce the dust emission.	During the subsequent weekly site inspection, it was found that some sections of the haul road were found to be wet but some were still dry. POC was reminded to increase the frequency of water spraying by water tanker when necessary.
7	Waste (Obs)	Rubbish were deposited on bare ground in the construction site during weekly site inspections.	Rubbish receptacles were provided at the site area.	During the subsequent weekly site inspection, rubbish were still observed on the bare ground although rubbish receptacles were provided. Therefore, POC was reminded to provide training or instruction to the workers and the Subcontractors to deposit the rubbish receptacles. Besides, rubbish receptacles with cover should be provided at this area.

Remark: "NC" = Non-compliance and "Obs" = Observation

March 2004				
Item	*Aspects*	*Findings*	*Action(s) taken by POC*	*ET Verification*
1	*Air (Obs)*	*Silt trails were observed on the roundabout and the path to Tolo Highway outside the northern wheel washing area during 25/03/04 site inspection.*	*Silt trails found were already cleaned. The Contractor replied to increase the manpower to cleanup the roundabout and public road more frequently.*	*Since the finding was found at the last weekly site inspection of this reporting month, it will be verified at the subsequent weekly site inspection in the next month.*
2	*Air (Obs)*	*Open stockpiles were occasionally found onsite during weekly site inspection. It should be covered by impervious sheeting, hydroseeded or wetted regularly.*	*The stockpiles will be either covered by tarpaulin sheet, hydroseeded or wetted regularly to prevent dust emission.*	*During the last weekly site inspection in this reporting month, part of the stockpiles was covered with tarpaulin sheets or hydroseeded. POC was reminded to cover or wet the stockpiles immediately. Since the finding was still observed at the last ET weekly site inspection in this reporting month, ET verification on this finding will be carried out at the following inspection in next month.*
3	*Water (Obs)*	*During 25/03/04 site inspection, the water in the wheel washing bay was found to be silty and some vehicles did not use the bay before leaving.*	*The Contractor replied to clean the wheel washing bay more frequently. Workers and sub-contractors were instructed to use the wheel washing bay before offsite.*	*Since the finding was found at the last weekly site inspection of this reporting month, it will be verified at the subsequent weekly site inspection in the next month.*
4	*Water (Obs)*	*Stagnant water was found inside the u-channel a long the southern wheel washing area during 25/03/04 site inspection*	*The stagnant water inside the u-channel was already drained out. More manpower was provided to drain the stagnant water inside the u-channel away regularly or when necessary.*	*Since the finding was found at the last weekly site inspection of this reporting month, it will be verified at the subsequent weekly site inspection in the next month.*

Remark: "NC" = Non-compliance and "Obs" = Observation

13.0 IMPLEMENTATION STATUS

13.1 Implementation Status of Environmental Mitigation Measures

POC has been implementing the required environmental mitigation measures according to Implementation of Mitigation Measures (clause 4.2, 5.2 and 6.2) in Environmental Management Plan for Contract No. TP 35/02 Remaining Engineering Infrastructure Works for PaK Shek Kok Development Package 1 (Revision 2). A summary of the implementation schedule of the mitigation measures is presented in Appendix H.

Air Quality

Only partial stockpiles were covered by using tarpaulin sheets and hydroseeded. The Contractor was reminded to water, hydro-seed or cover all the stockpiles by using clean tarpaulin sheets. The Contractor was also reminded to cleanup the access road regularly to avoid dust emission.

Noise

All mitigation measures stated in Appendix H were implemented properly in this reporting period.

Water Quality

The Contractor was reminded to provide more effort to implement mitigation measures, such as diverting site runoff to suitable treatment processes before discharge, proper maintenance of sedimentation system and drainage facilities (e.g. sedimentation tank and U-channels), and remove the sand/rubbish accumulated in the drain/channel and sedimentation tanks regularly.

Waste Management

POC has been implementing most mitigation measures on waste management. However, rubbish was observed at the site and no skips or bins were provided for collecting rubbish at site. The Contractor was remained to provide more manpower to clean up of rubbish accumulated at the site and provide rubbish bin/skips for collected the rubbish.

13.2 Implementation Status of Event and Action Plan

There were no exceedances in air quality and noise monitoring parameters recorded in this quarter. Hence, no further mitigation measures were required.

13.3 Implementation Status of Environmental Complaint Handling

No complaints had been received during this quarter.

14.0 Conclusions and Recommendations

All 1-hr TSP and 24-hr TSP levels in air quality monitoring were recorded below the Action and Limit levels in this quarter. At the same time, no noise monitoring exceedances were recorded and no complaints were received in this quarter. Therefore, no further mitigation measures and actions were required.

The monitored environmental data indicated that no unacceptable environmental impacts arising from the Project had been caused to the surrounding sensitive receivers. The environmental measures had been effective in controlling potential impacts to within acceptable sensitive receivers. However, the Contractor had been recommended to introduce more effort on environmental mitigation measures to minimize the environmental impact from the Project.

Based on the site inspections and audit findings during the reporting period, the following recommendation for further improvement of the current conditions are as below:

- All stockpiles with a volume of greater than $50m^3$ should be covered with clean tarpaulin sheets, watering or hydro-seeding to avoid wind and water erosion;
- Providing more manpower to clean up of rubbish accumulated at the site;
- Providing rubbish bin/skips for collected the rubbish;
- Site inspection and maintenance of all sedimentation system and drainage facilities by the contractor's site staff should be conducted regularly to ensure proper and efficient operation all the times;
- Draining the stagnant water out from the idle sedimentation tank and u-channel to prevent mosquito breeding;
- Diverting silty runoff to sedimentation system before discharge;
- Placing enough sand bags or other protection should be applied to prevent the slity surface runoff onto the drains system;
- Removing the sand/rubbish accumulated in the drain/channel regularly;
- Removing the oil in the drip tray and treat as chemical waste regularly
- Checking and maintaining all the site machines to prevent oil leakage regularly;
- Providing briefing to the concerned site staff on remedial actions in case of oil spillage, such as handling method of chemical waste;
- Maintain good waste management at the site.