



**PENTA-OCEAN CONSTRUCTION COMPANY LIMITED**

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

MONTHLY EM&A REPORT  
(MARCH 2004)

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### EXECUTIVE SUMMARY

This report is the fifteen monthly EM&A report (No.15) 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 to 31 March 2004.

#### Construction Progress

The major construction works in this reporting month were as below:

- Excavation for twin DN 2500 pipes and its 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 piling works for D1 bridge
- Finishing workings for the PSK construction of underpass extension structure
- Bored piling 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 monitoring month is listed below:

- Noise Monitoring (Day-time): 5 Occasions at 4 designated locations;
- Noise Monitoring (Evening-time): 4 Occasions at 4 designated locations;
- Noise Monitoring (Holiday): 4 Occasions at 5 designated locations;
- 24-hour TSP Monitoring: 5 Occasions at 2 designated locations;
- 1-hour TSP Monitoring: 13 Occasions at 2 designated locations;
- Weekly-site inspection: 4 Occasions.

#### Noise Monitoring

No exceedances of Action and Limit levels for noise monitoring were recorded in the reporting month.

#### Air Monitoring

No exceedances of Action and Limit levels were recorded for 24-hr TSP and 1-hr TSP monitoring in the reporting month.

#### Site Inspection

Environmental site inspections conducted in this reporting month are presented as follows:

<u>Concerned Parties</u>	<u>Dates of Audit / Inspection</u>
ET (weekly site inspection)	04, 11, 18, 25
IEC/POC/ET (Monthly site inspection)	25

There were one non-compliance and four observations raised during this reporting month. The site inspection findings are presented as follows:

<u>Item</u>	<u>IEC/ET</u>	<u>Aspects</u>	<u>Findings</u>	<u>Action(s) taken by POC</u>	<u>ET Verification</u>
1	IEC/ET	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.	<ul style="list-style-type: none"> <li>▪ Silt trails found were already cleaned.</li> <li>▪ The Contractor replied to increase the manpower to cleanup the roundabout and public road more frequently.</li> </ul>	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.



Item	IEC/ET	Aspects	Findings	Action(s) taken by POC	ET Verification
2	ET	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	IEC/ET	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.	<ul style="list-style-type: none"><li>The Contractor replied to clean the wheel washing bay more frequently.</li><li>Workers and sub-contractors were instructed to use the wheel washing bay before offsite.</li></ul>	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	IEC/ET	Water (Obs)	Stagnant water was found inside the u-channel along the southern wheel washing area during 25/03/04 site inspection	<ul style="list-style-type: none"><li>The stagnant water inside the u-channel was already drained out.</li><li>More manpower was provided to drain the stagnant water inside the u-channel away regularly or when necessary.</li></ul>	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

### **Environmental Complaints**

No environmental complaints were received in this monitoring month.

### **Notification of summons and successful prosecutions**

No notification of summons and prosecutions with respect to environmental issues were registered in this reporting month.



### **Future Key Issues**

Base on the site inspections and forecast of engineering works in the coming month, key issues to be considered are as follows:

- Noise and air quality impact due to construction works;
- Maintain wheel washing facilities and sedimentation tanks properly;
- Cleanup the access road regularly;
- Watering, hydro-seeding or covering all stockpiles with tarpaulin to avoid wind and water erosion;
- Diverting the silty runoff to sedimentation tank / trap before discharge;
- Maintain good site practice and waste management to minimize environmental impacts at the site;
- Follow-up improvements on waste management issues.



## 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 monthly EM&A report summarizes the impact monitoring results and audit findings of the EM&A program during the reporting period from 01 to 31 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 1 and 2 show the noise and air monitoring locations of this project.

### 2.3 Construction Programme

Details of construction programme (from March to May 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 REPORTING MONTH

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

A summary of the major construction activities undertaken in this monitoring month is shown in Table 3.1. The implementation of corresponding mitigation measures is summarized in Table 3.2.

Table 3.1 Major Construction Activities in this reporting month

Location	Major Construction Activity
Area 1, Area 2, Area 9A, Area 9B, Area 7B, Zone S2, Area 15	Drainage work
Area 1, Area 2, Area 8A and Area 8B	Roadworks
Zone N2	Subway SB1 Finishing work
Area 8A and 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
Zone T and J	Formation of stockpile areas and hydroseeding
Zone L	Modification of headwall and trapezoidal channel
Zone L and under PSK bridge	Installation of foul sewer line
---	Excavation for twin DN 2500 pipes and its associated outfall
---	Installation of precast unit for Twin DN 2500 Outfall
---	Bored piling works for D1 bridge
---	Finishing workings for the PSK construction of underpass extension structure
---	Bored piling works for pump station no.1 and no.2
---	Connection works to existing 5-cell culvert
---	Sheetpiling works at pumping station no.2

Table 3.2 Implementation of Environmental Mitigation Measures

General construction works	<ul style="list-style-type: none"> <li>• Effective water sprays used on the site at potential dust emission sources such as unpaved area;</li> <li>• The heights from which fill materials are dropped should be controlled to a practical height to minimize the fugitive dust arising from unloading;</li> <li>• Minimize of exposed soil areas to reduce the potential for increased siltation and contamination of run-off;</li> <li>• Water, hydro-seed or cover the open stockpile and exposed loose soil areas by using clean tarpaulin sheets;</li> <li>• Provide proper and efficient drainage facilities (e.g. wheel washing facilities) and sedimentation system to ensure that site runoff should be treated before discharged to drains;</li> <li>• Maintain the curtain properly;</li> <li>• Remove the sand/rubbish accumulated in the drain/channel regularly;</li> <li>• Provide good site practice (e.g. selection of quieter plant and working methods and reduction in number of plant operating in critical areas close to NSRs) to limit noise emissions at source;</li> <li>• Remove the construction waste accumulated inside or outside the site regularly;</li> <li>• Keep good waste management.</li> </ul>
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#### 4.0 AIR QUALITY MONITORING

##### 4.1 Monitoring Requirement

1-hour and 24-hour TSP monitoring were required to be conducted to monitor the air quality, 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) for 1-hr TSP monitoring;
- Cheung Shue Tan Village (in front of Man Kee Store) for 24-hr TSP monitoring.

##### 4.2 Monitoring Equipment

Continuous 24-hour TSP air quality monitoring was performed using a GMWS2310 High Volume Air Sampler (HVS) located at each of the designated monitoring station. One portable dust meter was used to carry out the 1-hour TSP monitoring. Table 4.1 summarizes the equipment used in the air quality monitoring programme. A copy of the calibration certificate for the HVS and portable dust meter are attached in Appendix B1.

Table 4.1 Air Quality Monitoring Equipment

Equipment	Model and Make
HVS Sampler	Greasby GMWS2310
Calibrator	G25 A
1-hour TSP Dust Meter	TSI Model 8520 Dust Trak™ Aerosol Monitor

##### 4.3 Monitoring Parameters, Frequency and Duration

Table 4.2 summarizes the monitoring parameters, monitoring duration and frequencies of air quality monitoring.

Table 4.2 Monitoring parameters, duration, frequencies 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

##### 4.4 Monitoring Locations and Schedule

Two designated air quality monitoring locations – Cheung Shue Tan Village and HKIB Staff Accommodation were selected. Table 4.3 tabulates the air quality monitoring locations of this project.

Table 4.3 Air quality monitoring locations

Air quality Monitoring stations	Locations
AM1	HKIB Staff Accommodation (on ground floor near the entrance facing south-east) for 1-hr TSP monitoring
AM3	Cheung Shue Tan Village (near the outer building, temple) for 1-hr TSP monitoring
AM3A	Cheung Shue Tan (in front of Man Kee Store) for 24-hr TSP monitoring

The air quality monitoring schedule for 24-hr and 1-hr TSP monitoring at designated monitoring locations is summarized in table 4.4.



Table 4.4 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					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
		AM3	Cheung Shue Tan Village (near the outer building, temple)					02/03/04
						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			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			
AM3A	Cheung Shue Tan (in front of Man Kee Store)	26/03/04	12:55	27/03/04	13:11			
		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			

#### 4.5 Monitoring Methodology

##### 4.5.1 24-hour TSP Monitoring

###### Instrumentation

High volume sampler, as HVS, (Greasby GMWS2310) complete with appropriate sampling inlets are employed for 24-hour TSP. The sampler is composed of a motor, a filter holder, a flow controller and a sampling inlet and its performance specification complies with that required by USEPA standard Title 40, Code of Federation Regulations Chapter 1 (Part 50).

###### Installation

The installation of HVS refers to the requirement stated in EM&A Manual.

###### Operation/Analytical Procedures

Operating/analytical procedures for the operation of HVS are as below:

Prior to the commencement of the dust sampling, the flow rate of the high volume sampler was properly set (between 0.6m<sup>3</sup>/min and 1.7m<sup>3</sup>/min.) in accordance with the manufacturer's instruction to within the range recommended in USEPA Standard Title 40, CFR Part 50.



- For TSP sampling, fiberglass filters (GA-55) were used.
- The power supply was checked to ensure the sampler worked properly.
- On sampling, the sampler was operated 5 minutes to establish thermal equilibrium before placing any filter media at designated air monitoring station.
- The filter holding frame was then removed by loosening the four nuts and carefully a weighted and conditioned filter was centered with the stamped number upwards, on a supporting screen.
- The filter was aligned on the screen so that the gasket formed an air-tight seal on the outer edges of the filter. Then the filter holder frame was tightened to the filter holder with swing bolts. The applied pressure should be sufficient to avoid air leakage at the edges.
- The programmable timer will be set for a sampling period of 24 hours. Information was recorded on the record sheet, which included the starting time, the weather condition and the filter number (the initial weight of the filter paper can be found out by using the filter number.).
- After sampling, the filter was transferred from the filter holder of the HVS to a sealed plastic bag and sent to the laboratory for weighting. The elapsed time was also recoded.
- Before weighting, all filters were equilibrated in a desiccator for 24 hour with the temperature of  $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$  and the relative humidity (RH)  $<50\% \pm 5\%$ .

#### Maintenance & Calibration

- The HVS and their accessories should be maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply.
- HVS should be calibrated at bi-monthly intervals.

### 4.5.2 1-hour TSP Monitoring

#### Measuring Procedures

The measuring procedures of the 1-hr dust meter are in accordance with the Manufacturer's instruction Manual as follows:

- Set POWER to ON, check the battery indicator to ensure whether the power supply is enough to conduct the TSP monitoring;
- Calibrate the dust meter by zero check;
- Set the TIME CONSTANT of the dust meter;
- Press SAMPLE to start the TSP monitoring;
- Record the maximum, minimum and average reading directly from the dust meter by press STATISTICS when monitoring complete.

#### Maintenance & Calibration

- 1-hr dust meter should be checked at 3-month intervals and calibrated at 1-year intervals throughout all stages of impact air quality monitoring.

### 4.5.3 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 month are shown in Appendix D.

## 4.6 Action and Limit Levels

Action and Limit levels for 24-hr TSP and 1-hr TSP derived as illustrated in Table 4.5.



Table 4.5 Action and Limit Levels for 24-hr TSP and 1-hr TSP

Monitoring Location	24-hr TSP ( $\mu\text{g}/\text{m}^3$ )		1-hr TSP ( $\mu\text{g}/\text{m}^3$ )	
	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

#### 4.7 Event-Action Plans

Please refer to Appendix E for details.

#### 4.8 Results

##### 4.8.1 24-hour TSP Monitoring

24-hour TSP monitoring at HKIB Staff Accommodation was started from 14 November 2003. Hence, both 1-hour and 24-hour TSP monitoring at HKIB Staff Accommodation was conducted to monitor the air quality in this reporting month. All monitoring data of 24-hour TSP monitoring is provided in Appendix B2. Graphical presentation of 24-hour TSP monitoring results for the reporting month is shown in Appendix B3.

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

##### 4.8.2 1-hour TSP Monitoring

1-hour TSP monitoring was carried out at monitoring stations, AM1 and AM3 in the reporting month. All monitoring data of 1-hour TSP monitoring is provided in Appendix B2. Graphical presentation of 1-hour TSP monitoring results for the reporting month is shown in Appendix B3.

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

#### 5.0 Noise Monitoring

##### 5.1 Monitoring Requirements

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 Equipment

Integrating Sound Level Meters were used for noise monitoring. They were Type 1 sound level meters capable of giving a continuous readout of the noise level reading including equivalent continuous sound pressure level ( $L_{eq}$ ) and percentile sound pressure level ( $L_x$ ). They comply with International Electro technical Commission Publications 651:1979 (Type1) and 804:1985 (Type1), and speed in m/s was used to monitor the wind speed.

Table 5.1 summarized noise monitoring equipment model being used. A copy of the calibration certificates for noise meters and calibrator are attached in Appendix C1.



Table 5.1 Noise Monitoring Equipment

Equipment	Model
Integrating Sound Level Meter	Rion NL-14 Sound Level Meter
Calibrator	Quest QC-20 Acoustic Calibrator
Portable Wind Speed Indicator	TSI Model 8340-M Air Velocity Meter

### 5.3 Monitoring Parameters, duration and Frequency

Noise monitoring for the A-weighted levels  $L_{eq}$ ,  $L_{10}$  and  $L_{90}$  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 5.2.

Table 5.2 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

### 5.4 Monitoring Locations and Period

In accordance with the EM&A Manual, there are three noise monitoring locations: HKIB Staff Accommodation, Cheung Shue Tan Village and CUHK Residence No.10. The location of the monitoring stations are described in Table 5.3 and depicted in Figure 1.

Table 5.3 Noise Monitoring Locations

Noise Monitoring station	Location
NM1	HKIB Staff Accommodation (on ground floor near the entrance facing south-east)
NM2	CUHK Residence No.10
NM3	Cheung Shue Tan Village (near the outer building, a temple)

The noise monitoring programme of monitoring locations (Day-time, Evening-time, Holiday and Night-time) is summarized in Table 5.4.

Table 5.4 Monitoring Periods for noise monitoring stations

Noise monitoring stations	Monitoring Period							
	Day-time		Evening-time		Holiday		Night-time	
NM1	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	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 *	---	---	---	---	---



Noise monitoring stations	Monitoring Period							
	Day-time		Evening-time		Holiday		Night-time	
NM3	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 evening noise monitoring (30/03/04) was cancelled due to the rain.

## 5.5 Monitoring Procedures and Calibration Details

### Operation/Analysis Procedures

- The Sound Level Meter was set on a tripod at a height of 1.2m above the ground.
- For free field measurement, the meter was positioned away from any nearby reflective surfaces.
- The battery condition was checked to ensure the correct functioning of the meter.
- Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:
  - Frequency weighting: A
  - Time weighting: Fast
  - Time measurement: 5 mins
- Prior to and after each noise measurement, the meter was calibrated using a Calibrator for 94 dB at 1000HZ. If the difference in the calibration level before and after measurement was more than 1 dB(A), the measurement would be considered invalid and repeat measurement would be required after re-calibration or repair of the equipment.
- The wind speed was frequently checked with a portable wind meter.
- During the monitoring period, the Leq, L10 and L90 were recorded. In addition, site conditions and noise sources were recorded on a standard record sheet.
- Free Field correction to the measurements should be made. Correction factor of +3dB(A) should be made to the free Field measurements.
- Noise monitoring would be cancelled in the presence of fog, rain, wind with a steady speed exceeding 5m/s, or wind gusts exceeding 10m/s.

### Maintenance and Calibration

- The microphone head of the sound level meter and calibrator is cleaned with soft cloth at quarterly intervals.
- The meter is sent to be supplier or HOKLAS laboratory to check and calibrated at yearly intervals.

## 5.6 Action and Limit Levels

The Action and Limit levels for noise levels derived as illustrated in Table 5.5.

Table 5.5 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		55 dB(A) **
Night-time	2300-0700 hrs of next day		

\* = 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".

## 5.7 Event-Action Plans

Please refer to the Appendix E for details.



## 5.8 Results

Day-time, Evening-time and Holiday noise monitoring were carried out at monitoring stations, NM1, NM2 and NM3 in this reporting month. No night-time noise monitoring were required since no construction works were processed during the night-time period. All noise levels are provided in Appendix C2. Graphical presentation of the monitoring results for the reporting month are shown in Appendix C3.

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 month. Besides, no exceedances in Limit Level were recorded according to the results from day-time, evening-time and holiday noise monitoring.

During the restricted hours, ET found that the PMEs used complied with the requirements stated in the valid CNP and no PMEs other than ones specified in the CNP to be used in the construction site.

## 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 transported 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 19<sup>th</sup> 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 March 2004, the wastewater monitoring was carried out by ET at 27 March 2004 at two discharge 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 transported 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. The test report for this monitoring was attached in Appendix J.
- 6.5 Since the effluent discharge licence required to carry out wastewater monitoring of suspended solids quarterly at all effluent discharge points within the site, the next wastewater monitoring should be at June 2004 and no wastewater monitoring was required in this reporting month.

## 7.0 ENVIRONMENTAL NON-CONFORMANCE

### 7.1 Summary of air quality, noise and wastewater monitoring

No exceedances of Action and Limit Level of 24-hour and 1-hour TSP monitoring results were recorded during the reporting month.

No day-time, evening-time and holiday noise levels recorded at all monitoring stations exceeded the Action and Limit Level in the reporting month.



The suspended solids results of wastewater samples from Discharge points were found within the discharge limit during monitoring period.

### 7.2 Summary of Environmental Complaints

No environmental complaints were received in this monitoring month.

### 7.3 Summary of Notification of Summons and Prosecution

There were no notification of summons respect to environmental issues registered in this month. Cumulative log of Notification of Summons and Prosecution is tabulated in Table 7.1.

Table 7.1 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.	<ul style="list-style-type: none"> <li>POC paved the site main haul road with concrete and bituminous materials;</li> <li>The road surface was wet by the spraying of water regularly by POC.</li> </ul>	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 during the reporting month.
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.

## 8.0 SITE INSPECTION

Weekly site inspections were carried out by the ET. Five site inspections were undertaken in this reporting month (04, 11, 18 and 25 March 2004). Monthly joint site inspection at 25 March 2004 was carried out by Engineer's Representative, IEC, POC and ET. A summary of the implementation status of the mitigation measures on site inspections is presented in Appendix H.

### 8.1 Summary of the site inspection findings and Action(s) taken by POC and ET

Summaries of the site inspection findings in this reporting month are shown in Table 8.1.

Table 8.1 The summary of the site inspection findings and Action(s) taken by POC and ET

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.	<ul style="list-style-type: none"> <li>Silt trails found were already cleaned.</li> <li>The Contractor replied to increase the manpower to cleanup the roundabout and public road more frequently.</li> </ul>	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.





Item	Aspects	Findings	Action(s) taken by POC	ET Verification
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.	<ul style="list-style-type: none"> <li>▪ The Contractor replied to clean the wheel washing bay more frequently.</li> <li>▪ Workers and sub-contractors were instructed to use the wheel washing bay before offsite.</li> </ul>	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	<ul style="list-style-type: none"> <li>▪ The stagnant water inside the u-channel was already drained out.</li> <li>▪ More manpower was provided to drain the stagnant water inside the u-channel away regularly or when necessary.</li> </ul>	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.

## 8.2 Status of Environmental Licensing and Permitting

All permits/licenses obtained in March 2004 are summarized in Table 8.2.

Table 8.2 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
Waste Producer	5213 729 P2800 11	03/10/02	---	Generating waste at the work site



Description	Permit No.	Valid Period		Section
		From	To	
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
Construction Noise Permit (General / Prescribed construction works)	GW-TN0095-04	15/05/04	14/09/04	<p><u>Group A (For Area B or C):</u></p> <ul style="list-style-type: none"> <li>• 1 Dump truck (CNP 067)</li> <li>• 2 Excavator, tracked (CNP 081)</li> <li>• 1 Bulldozer (CNP 030)</li> </ul> <p><u>Group B (For Area A, D or E):</u></p> <ul style="list-style-type: none"> <li>• 1 Dump trucks (CNP 067)</li> <li>• 1 Excavator, tracked (CNP 081)</li> </ul> <p><u>Group C (For Area B, B2 or E):</u></p> <ul style="list-style-type: none"> <li>• 1 Crane, mobile (CNP 048)</li> <li>• 1 Generator (CNP 102)</li> <li>• 1 Vibration Hammer</li> <li>• 1 Power Pack</li> </ul> <p><u>Group D (For Area B2 or E):</u></p> <ul style="list-style-type: none"> <li>• 1 Generator (CNP 102)</li> <li>• 1 Crane, mobile (CNP 048)</li> <li>• 1 Oscillator, piling large diameter bored (CNP 165)</li> <li>• 2 Concrete lorry mixers (CNP 044)</li> </ul> <p><u>Group E (For Area B2 or E):</u></p> <ul style="list-style-type: none"> <li>• 2 Concrete lorry mixers (CNP 044)</li> <li>• 1 Concrete pump lorry (CNP047)</li> <li>• 1 Poker, handheld (CNP 170)</li> </ul> <p><u>Group F (For Area B2 or E):</u></p> <ul style="list-style-type: none"> <li>• 2 Concrete lorry mixers (CNP 044)</li> <li>• 1 Crane, mobile (CNP 048)</li> <li>• 1 Poker, handheld (CNP 170)</li> </ul> <p><u>Group G (For Area B, C or D):</u></p> <ul style="list-style-type: none"> <li>• 2 Concrete lorry mixers (CNP 044)</li> <li>• 1 Excavator, tracked (CNP 081)</li> <li>• 1 Poker, handheld (CNP 170)</li> </ul> <p><u>Group H (For Area B2 or E):</u></p> <ul style="list-style-type: none"> <li>• 1 Air compressor, air flow &gt;10m<sup>3</sup>/min and ,30m<sup>3</sup>/min (CNP 002)</li> <li>• 1 Crane, mobile (diesel) (CNP 048)</li> <li>• 1 Generator, silenced, 75 dB(A) at 7m (CNP 102)</li> <li>• 1 piling, large diameter bored crab and chisel (CNP 164)</li> <li>• 1 piling, large diameter bored oscillator (CNP 165)</li> <li>• 1 Piling, large diameter bored, reverse circulation drill (CNP 166)</li> </ul> <p><u>Group I (For Area B, C or D):</u></p> <ul style="list-style-type: none"> <li>• 1 Dump truck (CNP 067)</li> <li>• 1 Asphalt Paver (CNP 004)</li> <li>• 1 Roller, vibratory (CNP 186)</li> <li>• 1 Road Roller (CNP 185)</li> </ul> <p><u>Group J (For Area A or F):</u></p> <ul style="list-style-type: none"> <li>• 1 Excavator, tracked (CNP 081)</li> <li>• 1 Roller, vibratory (CNP 186)</li> </ul>

### 8.3 Recommendations on site inspection findings in Site Inspections of this month

Based on the site inspection findings, the recommendations are as below:

- All stockpiles with a volume of greater than 50m<sup>3</sup> should be covered with clean tarpaulin sheets, watering or hydro-seeding to avoid wind and water erosion;
- 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;



- Diverting silty runoff to sedimentation system before discharge;
- Placing enough sand bags or other protection should be applied to prevent the silty surface runoff onto the drains system;
- Removing the sand/rubbish accumulated in the drain/channel regularly;
- Checking and maintaining all the site machines to prevent dust emission;
- Providing briefing to the concerned site staff on remedial actions, such as handling method of chemicals and chemical waste;
- Maintain good waste management at the site.

## 9.0 WASTE MANAGEMENT

### 9.1 Waste Management Audit

Waste management audit was carried out by the ET on a weekly basis. A summary of the implementation status of the mitigation measures on waste management is presented in Appendix H.

### 9.2 Records of Waste Quantities

All type of wastes arising from the construction work are classified into the following:

- General refuses;
- Chemical waste;
- Construction & demolition (C&D) material.

The quantities of waste for disposal in this month are summarized in Table 9.1.

Table 9.1 Summary of Quantities of Waste for Disposal in this reporting month

Type of Waste	Quantity	Disposal Location
C&D Material (Inert) (m <sup>3</sup> )	0	Nil
C&D material (Non-inert) (m <sup>3</sup> )	0	Nil
General Refuse (m <sup>3</sup> )	40	Disposed at NENT Landfills
Chemical Waste (L)	0	Nil

## 10.0 IMPLEMENTATION STATUS

### 10.1 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 status 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 I were implemented properly in this reporting month.



#### 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 the curtain, 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.

#### 10.2 Implementation Status of Event and Action Plan

There were no exceedances in air quality and noise monitoring parameters recorded in this monitoring month. No further mitigation measures were required.

#### 10.3 Implementation Status of Environmental Complaint Handling

No complaints had been received during this monitoring month.

### 11.0 CONCLUSION

Impact monitoring of air quality and noise were carried out at designated locations in accordance with the EM&A Manual in this reporting month.

According to the summary of air and noise monitoring results, no exceedances of Action and Limit Level of 24-hour and 1-hour TSP monitoring results were recorded during the reporting month. Besides, no day-time, evening-time and holiday noise levels were recorded at all monitoring stations exceeded the Action and Limit Level in this reporting month. No night-time noise monitoring were required since no construction works were processed during the night-time period.

During the restricted hours, ET found that the PMEs used complied with the requirements stated in the valid CNP and no PMEs other than ones specified in the CNP to be used in the site.

The suspended solids results of wastewater samples from Discharge points were found within the discharge limit in this reporting month.

According to the ET weekly site inspections and IEC monthly site audit carried out this month, it indicated that site practices of the POC were generally undertaken in an environmentally acceptable manner and the overall site environmental performance was satisfactory.

### 12.0 FUTURE KEY ISSUES

#### 12.1 Upcoming EM&A Schedule in coming two months

The Proposed EM&A program in coming two months are presented as following table:

Table 12.1 – Upcoming EM&A Schedule in coming two months

Type of Monitoring	April 2004	May 2004
Noise Monitoring (Day-time)	06, 13, 20, 27	04, 11, 18, 25
Noise Monitoring (Evening-time)	06, 13, 20, 27	04, 11, 18, 25
Noise Monitoring (Holiday)	04, 11, 18, 25	02, 09, 16, 23, 30
1-hour TSP	01, 03, 06, 07, 08, 13, 15, 17, 20, 22, 24, 27, 29, 30	04, 06, 08, 11, 13, 15, 18, 20, 22, 25, 27, 29
24-hour TSP	01, 07, 13, 19, 23, 29	05, 11, 17, 22, 28
Site Inspection	01, 08, 15, 22, 29	06, 13, 20, 27



## 12.2 Upcoming construction works schedule in the coming month

The major construction works planned to be carried out in next two months and their possible impact is tabulated (Table 12.2) for reference.

Table 12.2 – Construction Plan in the coming month

Month	Works Planned to be Carried Out
April and May 2004	<ul style="list-style-type: none"><li>- Drainage work in area 1, 2, 9A, Zone N1 &amp; N2, Zone P, Zone L and Zone H;</li><li>- Cofferdam construction / sheet piling for culvert C10 and pump station No.2;</li><li>- Subway construction work in Zone N3;</li><li>- Watermain installation work;</li><li>- Construction of PSK underpass extension;</li><li>- Roadworks at Area 5 and 8A;</li><li>- Excavation / removal of surcharge mound S2 and S4;</li><li>- Modification of Trapezoidal channel and headwall at Zone L;</li><li>- Construction of culvert C10 outfall and DN2500 twin pipe outfall;</li><li>- Construction of bored pile;</li><li>- Drainage and watermain works under KCRC Bridge;</li><li>- Sheetpiling and excavation works for PS1 and PS2.</li></ul>